

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, R30-03100002-2017

Dear Mr. Durham,

Columbia Gas Transmission, LLC (CGT) and SLR International Corporation have prepared the attached 45CSR30 Title V Renewal Application for the Lost River Compressor Station located in Hardy County, West Virginia (Facility ID 031-00002). The facility is currently operating under Title V operating permit number R30-03100002-2017.

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
Principal Engineer

Cc: Mr. Mitch Lagerstrom, CGT Air Compliance Manager



global environmental solutions

Columbia Gas Transmission, LLC

Lost River Compressor Station

Facility ID No. 031-00002

Mathias, West Virginia

Title V Operating Permit Renewal Application

SLR Ref: 116.01272.00032

April 2017





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.

A handwritten signature in blue ink that reads "Chris Boggess".

Chris Boggess
Associate Engineer

A handwritten signature in blue ink that reads "Jesse Hanshaw".

Jesse Hanshaw, P.E.
Principal Engineer

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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

**Lost River Compressor Station, Facility ID No. 031-00002
Mathias, 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

Form with 10 numbered sections: 1. Name of Applicant, 2. Facility Name or Location, 3. DAQ Plant ID No., 4. Federal Employer ID No. (FEIN), 5. Permit Application Type, 6. Type of Business Entity, 7. Is the Applicant the: Owner, Operator, Both, 8. Number of onsite employees, 9. Governmental Code, 10. Business Confidentiality Claims.

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

12. Facility Location			
Street: Upper Cove Run Rd.	City: Mathias	County: Hardy	
UTM Easting: 685.534 km	UTM Northing: 4,305.258 km	Zone: <input checked="" type="checkbox"/> 17 or <input type="checkbox"/> 18	
Directions: Traveling on U.S. 81 (in VA), take exit 257 to U.S. Route 11. Take left on U.S. 11 to State Route 259. Travel North on SR 259 to Mathias, WV. Turn right onto Upper Cove Run Rd and travel ¼ mile toward Basore. Entrance to facility is on the left.			
Portable Source? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Is facility located within a nonattainment area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		If yes, for what air pollutants?	
Is facility located within 50 miles of another state? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		If yes, name the affected state(s). Maryland Virginia	
Is facility located within 100 km of a Class I Area¹? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		If yes, name the area(s). Dolly Sods, WV	
If no, do emissions impact a Class I Area¹? <input type="checkbox"/> Yes <input type="checkbox"/> No		Otter Creek Wilderness, WV	
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: Timothy Chenoweth		Title: Manager Of Operations
Street or P.O. Box: 67 Ward Rd		
City: Elkins	State: WV	Zip: 26241
Telephone Number: (304) 924 7937	Fax Number: (304) 357-2770	
E-mail address: timothy_chenoweth@transcanada.com		
Environmental Contact: Lacey Ivey		Title: Principal Air
Street or P.O. Box: 201 Energy Parkway, Suite 100		
City: Lafayette	State: LA	Zip: 70508
Telephone Number: (337) 241-0686	Fax Number:	
E-mail address: Lacey_Ivey@transcanada.com		
Application Preparer: Jesse Hanshaw		Title: Principal Engineer
Company: SLR International Corporation		
Street or P.O. Box: 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 Transmission	Natural Gas	486210	4922

Provide a general description of operations.

Lost River Compressor Station is a natural gas transmission facility covered by Standard Industrial Classification (SIC) Code 4922. 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 three (3) 2,700 hp, Clark TLA-8, 2SLB reciprocating engines, one (1) 4,640 hp, Clark TLAD-10, 2SLB reciprocating engine, one (1) 4,735 hp, Caterpillar G3616 4SLB reciprocating engine, (2) 11,557 hp, Solar; Taurus 70 turbine engines, two (2) 15,067 hp, Solar; Mars 100 turbine engines, one (1) 1,063 hp, Waukesha VGF-P48GL, 4SLB reciprocating engine/generator, one (1) 0.195 mmBtu/hr wastewater evaporator boiler, one (1) 0.25 mmBtu/hr fuel gas heater, one (1) 0.50 mmBtu/hr fuel gas heater, one (1) 0.75 mmBtu/hr fuel gas heater and 88 catalytic space heaters of various sizes. The site also utilizes various de minimis storage vessels for pipeline liquids, engine oil, and antifreeze.

- 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.	
<input checked="" type="checkbox"/> SIP	<input type="checkbox"/> FIP
<input type="checkbox"/> Minor source NSR (45CSR13)	<input checked="" type="checkbox"/> PSD (45CSR14)
<input checked="" type="checkbox"/> NESHAP (45CSR34)	<input type="checkbox"/> Nonattainment NSR (45CSR19)
<input checked="" type="checkbox"/> Section 111 NSPS	<input checked="" type="checkbox"/> Section 112(d) MACT standards
<input type="checkbox"/> Section 112(g) Case-by-case MACT	<input type="checkbox"/> 112(r) RMP
<input type="checkbox"/> Section 112(i) Early reduction of HAP	<input type="checkbox"/> Consumer/commercial prod. reqts., section 183(e)
<input type="checkbox"/> Section 129 Standards/Reqts.	<input type="checkbox"/> Stratospheric ozone (Title VI)
<input type="checkbox"/> Tank vessel reqt., section 183(f)	<input type="checkbox"/> Emissions cap 45CSR§30-2.6.1
<input type="checkbox"/> NAAQS, increments or visibility (temp. sources)	<input type="checkbox"/> 45CSR27 State enforceable only rule
<input checked="" type="checkbox"/> 45CSR4 State enforceable only rule	<input type="checkbox"/> Acid Rain (Title IV, 45CSR33)
<input type="checkbox"/> Emissions Trading and Banking (45CSR28)	<input type="checkbox"/> Compliance Assurance Monitoring (40CFR64)
<input type="checkbox"/> CAIR NO _x Annual Trading Program (45CSR39)	<input type="checkbox"/> CAIR NO _x Ozone Season Trading Program (45CSR40)
<input type="checkbox"/> CAIR SO ₂ Trading Program (45CSR41)	

19. Non Applicability Determinations
<p>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.</p> <p>45CSR4 – <i>To Prevent and Control the Discharge of Air Pollutants into the Open Air Which Causes or Contributes to an Objectionable Odor or Odors:</i> 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</p> <p>45CSR10 – <i>To Prevent and Control Air Pollution from the Emission of Sulfur Oxides:</i> 45CSR10 is not applicable to the facility's heaters because maximum design heat input (DHI) is less than 10 MMBtu/hr</p> <p>45CSR21 – <i>To Prevent and Control Air Pollution from the Emission of Volatile Organic Compounds:</i> The site is not located within a VOC maintenance county. The subject counties defined by this Rule are as follows: Wood, Wayne, Putnam, Kanawha, or Cabell.</p> <p>45CSR27 – <i>To Prevent and Control the Emissions of Toxic Air Pollutants:</i> 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."</p>
<input checked="" type="checkbox"/> 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.

40 CFR 60 Subpart Dc – *Standards of Performance for Steam Generating Units*: The line heaters and boiler at this facility are 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 75m³ (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 OOOO – *Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution*: This subpart potentially applies to storage vessel affected sources at transmission facilities. So it is exempt from the requirements for gas wells, centrifugal compressors, reciprocating compressors, and/or pneumatic controllers. The storage vessels at this location were evaluated and found to not be affected sources under this subpart because they were all constructed, modified, or reconstructed after August 23, 2011.

40 CFR 60 Subpart OOOOa – *Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification, or Reconstruction Commenced after September 18, 2015*. The GHG and VOC requirements defined by this NSPS are not applicable to this site because all affected sources commenced constructed 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 facility does not have a glycol dehydration unit and is therefore not subject to the requirements of this subpart.

40 CFR 64 – *Compliance Assurance Monitoring (CAM)*: There are no add-on controls at this facility; 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 construction permit 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 <i>(if any)</i>
CO-R1-C-2007-4A (2005)	11/14/2007	
R14-0013E	05/11/2016	
R30-03100002-2012(SM02)	09/20/2016	
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Section 3: Facility-Wide Emissions

23. Facility-Wide Emissions Summary [Tons per Year]	
Criteria Pollutants	Potential Emissions
Carbon Monoxide (CO)	532.93
Nitrogen Oxides (NO _x)	800.19
Lead (Pb)	-
Particulate Matter (PM _{2.5}) ¹	35.62
Particulate Matter (PM ₁₀) ¹	35.62
Total Particulate Matter (TSP)	35.62
Sulfur Dioxide (SO ₂)	1.82
Volatile Organic Compounds (VOC)	128.02
Hazardous Air Pollutants ²	Potential Emissions
Benzene	0.93
Toluene	0.73
Ethylbenzene	0.12
Xylene	0.27
n-Hexane	0.39
Formaldehyde	30.63
Acetaldehyde	4.58
Total HAPs	44.82
Regulated Pollutants other than Criteria and HAP	Potential Emissions
CO _{2e}	320,244.46

¹PM_{2.5} and PM₁₀ are components of TSP.
²For 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)	
<input checked="" type="checkbox"/>	1. Air compressors and pneumatically operated equipment, including hand tools.
<input type="checkbox"/>	2. Air contaminant detectors or recorders, combustion controllers or shutoffs.
<input checked="" type="checkbox"/>	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.
<input checked="" type="checkbox"/>	4. Bathroom/toilet vent emissions.
<input checked="" type="checkbox"/>	5. Batteries and battery charging stations, except at battery manufacturing plants.
<input type="checkbox"/>	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.
<input type="checkbox"/>	7. Blacksmith forges.
<input type="checkbox"/>	8. Boiler water treatment operations, not including cooling towers.
<input checked="" type="checkbox"/>	9. Brazing, soldering or welding equipment used as an auxiliary to the principal equipment at the source.
<input type="checkbox"/>	10. CO ₂ lasers, used only on metals and other materials which do not emit HAP in the process.
<input checked="" type="checkbox"/>	11. Combustion emissions from propulsion of mobile sources, except for vessel emissions from Outer Continental Shelf sources.
<input checked="" type="checkbox"/>	12. Combustion units designed and used exclusively for comfort heating that use liquid petroleum gas or natural gas as fuel.
<input checked="" type="checkbox"/>	13. Comfort air conditioning or ventilation systems not used to remove air contaminants generated by or released from specific units of equipment.
<input type="checkbox"/>	14. Demineralized water tanks and demineralizer vents.
<input type="checkbox"/>	15. Drop hammers or hydraulic presses for forging or metalworking.
<input type="checkbox"/>	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.
<input type="checkbox"/>	17. Emergency (backup) electrical generators at residential locations.

24. Insignificant Activities (Check all that apply)																																											
<input type="checkbox"/>	18. Emergency road flares.																																										
<input checked="" type="checkbox"/>	<p>19. Emission units which do not have any applicable requirements and which emit criteria pollutants (CO, NO_x, SO₂, 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.</p> <p>Please specify all emission units for which this exemption applies along with the quantity of criteria pollutants emitted on an hourly and annual basis:</p> <p>Tanks</p> <table border="1"> <thead> <tr> <th><i>Emission Point</i></th> <th><i>VOC Emissions (lb/hr)</i></th> <th><i>VOC Emissions (lb/yr)</i></th> </tr> </thead> <tbody> <tr><td>A01</td><td>0.000</td><td>0.05</td></tr> <tr><td>A02</td><td>0.000</td><td>0.09</td></tr> <tr><td>A03</td><td>0.000</td><td>0.15</td></tr> <tr><td>A05</td><td>0.191</td><td>1674.29</td></tr> <tr><td>A06</td><td>0.191</td><td>1674.29</td></tr> <tr><td>A07</td><td>0.000</td><td>2.16</td></tr> <tr><td>A12</td><td>0.000</td><td>2.73</td></tr> <tr><td>A13</td><td>0.000</td><td>0.17</td></tr> <tr><td>A14</td><td>0.000</td><td>0.17</td></tr> <tr><td>B04</td><td>0.000</td><td>0.82</td></tr> <tr><td>B05</td><td>0.000</td><td>1.62</td></tr> <tr><td>B06</td><td>0.000</td><td>3.80</td></tr> <tr> <td>Totals</td> <td>0.38</td> <td>3360.33</td> </tr> </tbody> </table>	<i>Emission Point</i>	<i>VOC Emissions (lb/hr)</i>	<i>VOC Emissions (lb/yr)</i>	A01	0.000	0.05	A02	0.000	0.09	A03	0.000	0.15	A05	0.191	1674.29	A06	0.191	1674.29	A07	0.000	2.16	A12	0.000	2.73	A13	0.000	0.17	A14	0.000	0.17	B04	0.000	0.82	B05	0.000	1.62	B06	0.000	3.80	Totals	0.38	3360.33
<i>Emission Point</i>	<i>VOC Emissions (lb/hr)</i>	<i>VOC Emissions (lb/yr)</i>																																									
A01	0.000	0.05																																									
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A07	0.000	2.16																																									
A12	0.000	2.73																																									
A13	0.000	0.17																																									
A14	0.000	0.17																																									
B04	0.000	0.82																																									
B05	0.000	1.62																																									
B06	0.000	3.80																																									
Totals	0.38	3360.33																																									
<input type="checkbox"/>	<p>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.</p> <p>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:</p>																																										
<input type="checkbox"/>	21. Environmental chambers not using hazardous air pollutant (HAP) gases.																																										
<input checked="" type="checkbox"/>	22. Equipment on the premises of industrial and manufacturing operations used solely for the purpose of preparing food for human consumption.																																										
<input type="checkbox"/>	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.																																										
<input checked="" type="checkbox"/>	24. Equipment used for quality control/assurance or inspection purposes, including sampling equipment used to withdraw materials for analysis.																																										
<input type="checkbox"/>	25. Equipment used for surface coating, painting, dipping or spray operations, except those that will emit VOC or HAP.																																										
<input checked="" type="checkbox"/>	26. Fire suppression systems.																																										
<input checked="" type="checkbox"/>	27. Firefighting equipment and the equipment used to train firefighters.																																										
<input checked="" type="checkbox"/>	28. Flares used solely to indicate danger to the public.																																										
<input checked="" type="checkbox"/>	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.																																										
<input type="checkbox"/>	30. Hand-held applicator equipment for hot melt adhesives with no VOC in the adhesive formulation.																																										

24. Insignificant Activities (Check all that apply)	
<input checked="" type="checkbox"/>	31. Hand-held equipment for buffing, polishing, cutting, drilling, sawing, grinding, turning or machining wood, metal or plastic.
<input type="checkbox"/>	32. Humidity chambers.
<input type="checkbox"/>	33. Hydraulic and hydrostatic testing equipment.
<input checked="" type="checkbox"/>	34. Indoor or outdoor kerosene heaters.
<input checked="" type="checkbox"/>	35. Internal combustion engines used for landscaping purposes.
<input type="checkbox"/>	36. Laser trimmers using dust collection to prevent fugitive emissions.
<input type="checkbox"/>	37. Laundry activities, except for dry-cleaning and steam boilers.
<input checked="" type="checkbox"/>	38. Natural gas pressure regulator vents, excluding venting at oil and gas production facilities.
<input type="checkbox"/>	39. Oxygen scavenging (de-aeration) of water.
<input type="checkbox"/>	40. Ozone generators.
<input checked="" type="checkbox"/>	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.)
<input checked="" type="checkbox"/>	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.
<input type="checkbox"/>	43. Process water filtration systems and demineralizers.
<input checked="" type="checkbox"/>	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.
<input type="checkbox"/>	45. Repairs or maintenance where no structural repairs are made and where no new air pollutant emitting facilities are installed or modified.
<input type="checkbox"/>	46. Routing calibration and maintenance of laboratory equipment or other analytical instruments.
<input type="checkbox"/>	47. Salt baths using nonvolatile salts that do not result in emissions of any regulated air pollutants. Shock chambers.
<input type="checkbox"/>	48. Shock chambers.
<input type="checkbox"/>	49. Solar simulators.
<input checked="" type="checkbox"/>	50. Space heaters operating by direct heat transfer.
<input type="checkbox"/>	51. Steam cleaning operations.
<input type="checkbox"/>	52. Steam leaks.
<input type="checkbox"/>	53. Steam sterilizers.

24. Insignificant Activities (Check all that apply)	
<input checked="" type="checkbox"/>	54. Steam vents and safety relief valves.
<input type="checkbox"/>	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.
<input type="checkbox"/>	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.
<input type="checkbox"/>	57. Such other sources or activities as the Director may determine.
<input checked="" type="checkbox"/>	58. Tobacco smoking rooms and areas.
<input checked="" type="checkbox"/>	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	
<i>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.</i>	
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: Timothy Chenoweth	Title: Manager of Operations
Responsible official's signature:	
Signature: 	Signature Date: <u>4-7-17</u>
<small>(Must be signed and dated in blue ink)</small>	

Note: Please check all applicable attachments included with this permit application:	
<input checked="" type="checkbox"/>	ATTACHMENT A: Area Map
<input checked="" type="checkbox"/>	ATTACHMENT B: Plot Plan(s)
<input checked="" type="checkbox"/>	ATTACHMENT C: Process Flow Diagram(s)
<input checked="" type="checkbox"/>	ATTACHMENT D: Equipment Table
<input checked="" type="checkbox"/>	ATTACHMENT E: Emission Unit Form(s)
<input type="checkbox"/>	ATTACHMENT F: Schedule of Compliance Form(s)
<input type="checkbox"/>	ATTACHMENT G: Air Pollution Control Device Form(s)
<input type="checkbox"/>	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/dag, requested by phone (304) 926-0475, and/or obtained through the mail.

ATTACHMENT A

AREA MAP

Title V Operating Permit Renewal Application

**Lost River Compressor Station, Facility ID No. 031-00002
Mathias, West Virginia**

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

April 2017



CPG - Lost River Compressor Station

GPS Coordinates of Sites:

Lat: 38.87519, Long: -78.86162

UTM Coordinates of Sites:

Easting: 685.534 km, Northing: 4,305.258 km, Zone: 17

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

Report

Title V Operating Permit Renewal Application
Lost River Compressor Station (ID No. 031-00002)

Drawing

Attachment A - Area Map

Date: July 2016

Drawn By: CLB

Project: 116.01272.00032



ATTACHMENT B

PLOT PLAN

Title V Operating Permit Renewal Application

**Lost River Compressor Station, Facility ID No. 031-00002
Mathias, West Virginia**

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

April 2017

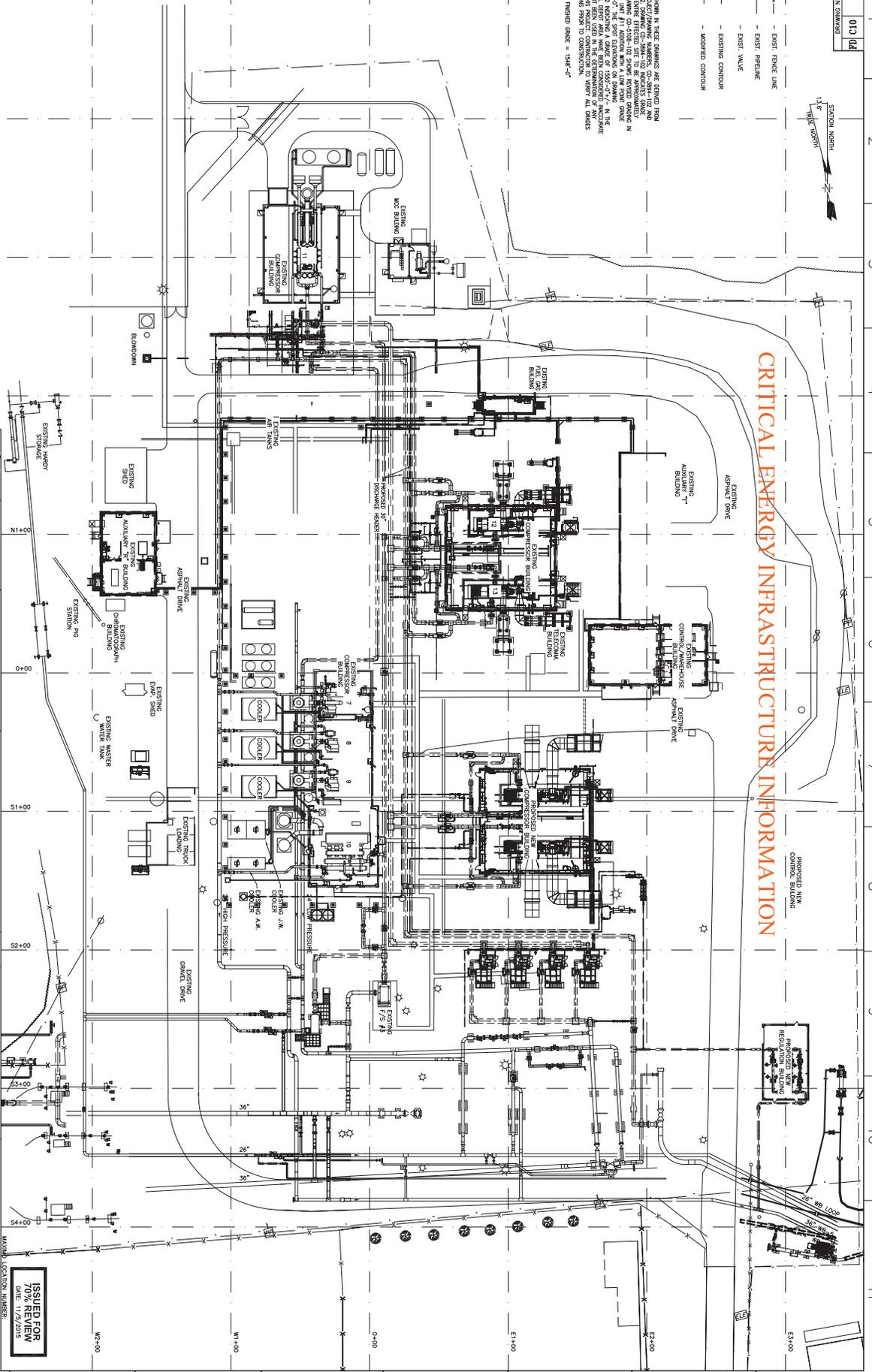
Sheet No.	001
Project No.	013
Revision	FD



- LEGEND**
- — — — — EXIST. FENCE LINE
 - — — — — EXIST. PIPELINE
 - — — — — EXIST. VALVE
 - — — — — EXISTING CONTOUR
 - — — — — EXISTING CONTOUR
 - — — — — WORKED CONTOUR

NOTE:
 OBJECTS AS SHOWN IN THESE DRAWINGS ARE DERIVED FROM PROPOSED PROJECT DRAWINGS, 03-28-11-02 AND 03-28-11-02 AND SHOULD BE VERIFIED BY THE FIELD ENGINEER PRIOR TO CONSTRUCTION. THE ENGINEER SHALL BE RESPONSIBLE FOR VERIFYING THE EXISTING CONDITIONS AND THE LOCATION OF ALL UTILITIES AND STRUCTURES. THE LOCATION OF ALL UTILITIES AND STRUCTURES SHALL BE VERIFIED BY THE FIELD ENGINEER PRIOR TO CONSTRUCTION. THE LOCATION OF ALL UTILITIES AND STRUCTURES SHALL BE VERIFIED BY THE FIELD ENGINEER PRIOR TO CONSTRUCTION. THE LOCATION OF ALL UTILITIES AND STRUCTURES SHALL BE VERIFIED BY THE FIELD ENGINEER PRIOR TO CONSTRUCTION.

CRITICAL ENERGY INFRASTRUCTURE INFORMATION



NO.	DATE	DESCRIPTION	BY	CHKD.	APP'D.
1	12/04/2015	ISSUED FOR CONSTRUCTION	...	...	...
2	...	...	...	...	...
3	...	...	...	...	...

DATE	12/04/2015
SCALE	1"=40'
TITLE	LOST RIVER COMPRESSOR STATION
PROJECT NO.	013
ISSUED FOR	CONSTRUCTION
DATE	12/04/2015

ISSUED FOR 70% REVIEW
DATE: 11/27/2015

FIELD SERVICES ENGINEERING SERVICES
 ENGINEERING SERVICES
 10000 W. 10th Ave., Suite 100
 Denver, CO 80202
 PHONE: 303.733.8800
 FAX: 303.733.8801
 WWW: www.fse.com

PROJECT INFORMATION
 PROJECT NO.: 013
 PROJECT NAME: LOST RIVER COMPRESSOR STATION
 PROJECT LOCATION: ...

DATE: 12/04/2015
SCALE: 1"=40'
TITLE: LOST RIVER COMPRESSOR STATION
ISSUED FOR: CONSTRUCTION
DATE: 12/04/2015

ATTACHMENT C

PROCESS FLOW DIAGRAM

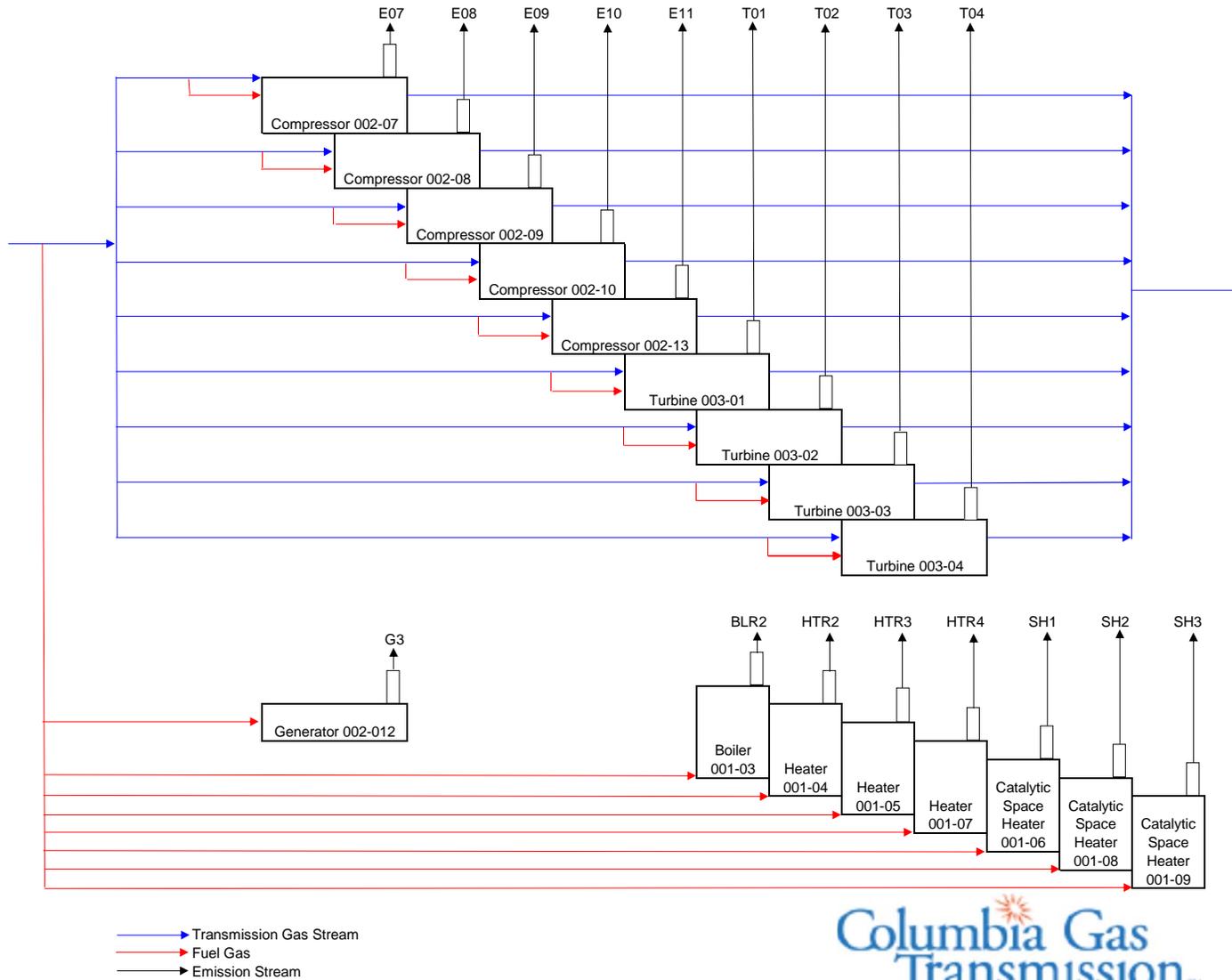
Title V Operating Permit Renewal Application

**Lost River Compressor Station, Facility ID No. 031-00002
Mathias, West Virginia**

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

April 2017

**ATTACHMENT C
LOST RIVER COMPRESSOR STATION PROCESS FLOW DIAGRAM**



ATTACHMENT D

EQUIPMENT TABLE

Title V Operating Permit Renewal Application

Lost River Compressor Station, Facility ID No. 031-00002
Mathias, 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
E07	N/A	002-07*	Reciprocating Engine/Integral Compressor; Clark TLA-8; 2 Cycle, Lean Burn	2,700 hp	1969
E08	N/A	002-08*	Reciprocating Engine/Integral Compressor; Clark TLA-8; 2 Cycle, Lean Burn	2,700 hp	1969
E09	N/A	002-09*	Reciprocating Engine/Integral Compressor; Clark TLA-8; 2 Cycle, Lean Burn	2,700 hp	1970
E10	N/A	002-10*	Reciprocating Engine/Integral Compressor; Clark TLAD-10; 2 Cycle, Lean Burn	4,640 hp	1991
G3	N/A	002-12*	Reciprocating Engine/Generator Waukesha VGF-P48GL; 4 Cycle, Lean Burn	1,063 hp	2008
E11	OC1	002-13*	Reciprocating Engine/Integral Compressor; Caterpillar G3616; 4 Cycle, Lean Burn	4,735 hp	2008
T01	N/A	003-01*	Combustion Turbine/Compressor; Solar; Taurus 70 Turbine	9,236 hp @ 59°F 11,557 hp @ 0°F	2013
T02	N/A	003-02*	Combustion Turbine/Compressor; Solar; Taurus 70 Turbine	9,236 hp @ 59°F 11,557 hp @ 0°F	2013
T03	N/A	003-03*	Combustion Turbine/Compressor; Solar; Mars 100 Turbine	15,067 hp @ 32°F	2017
T04	N/A	003-04*	Combustion Turbine/Compressor; Solar; Mars 100 Turbine	15,067 hp @ 32°F	2017
BLR2	N/A	001-03*	Wastewater Evaporator Boiler	0.195 mmBtu/hr	1997
HTR2	N/A	001-04*	Fuel Gas Heater	0.75 mmBtu/hr	2013
HTR3	N/A	001-05*	Fuel Gas Heater	0.25 mmBtu/hr	2013
HTR4	N/A	001-07*	Fuel Gas Heater	0.50 mmBtu/hr	2017
SH1	N/A	001-06*	Catalytic Space Heaters (40)	2.88 mmBtu/hr (TOTAL)	2013
SH2	N/A	001-08*	Catalytic Space Heaters (26)	1.34 mmBtu/hr (TOTAL)	2017
SH3	N/A	001-09*	Catalytic Space Heaters (22)	0.66 mmBtu/hr (TOTAL)	2013

¹For 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

Lost River Compressor Station, Facility ID No. 031-00002
Mathias, 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: 002-07	Emission unit name: Reciprocating Engine/Integral Compressor	List any control devices associated with this emission unit: NA
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Provide a description of the emission unit (type, method of operation, design parameters, etc.):
2-cycle, lean burn

Manufacturer: Clark	Model number: TLA-8	Serial number: NA
-------------------------------	-------------------------------	-----------------------------

Construction date: NA	Installation date: 1969	Modification date(s): NA
---------------------------------	-----------------------------------	------------------------------------

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 2,700 hp

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

Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes, is it? <input type="checkbox"/> Indirect Fired <input checked="" type="checkbox"/> Direct Fired
--	---

Maximum design heat input and/or maximum horsepower rating: 2,700 hp	Type and Btu/hr rating of burners: 7,400 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
19,588 scf/hr / 171,590,880 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

<i>Emissions Data</i>		
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
<p>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.).</p> <p>See Appendix A</p>		

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.

According to 40 CFR 63.6590(b)(3)(i) and 40 CFR 63.6600(c), this existing, non-emergency, SI 2SLB engine > 500 hp located at a major source of HAPs does not have any requirements under 40 CFR Part 63 Subpart ZZZZ because it was constructed prior to December 12, 2002.

45 C.S.R. 14, Permit R14-0013E

Condition 4.1.1 – Unit shall be installed, maintained, and operated so as to minimize any fugitive escape of pollutants and shall not exceed the listed design capacities

Condition 4.1.2 – The operation of these engines (002-07 – 002-09) shall not exceed the following maximum combined operating and emission limitations:

- a) The engines shall be limited to the maximum operating capacities as shown in Table 4.1.2(a)

Table 4.1.2(a)

Emission Unit ID	Maximum Rating (hp)	Total Combined Annual Operating Limit (bhp-hr/yr)
002-07	2,700	70,956,000
002-08	2,700	
002-09	2,700	

- b) Emissions released from the engines shall not exceed the maximum individual hourly and total combined annual emission limits set forth in Table 4.1.2(b)

Table 4.1.2(b)

Emission Point ID	Pollutant	Emission Limits	
		Hourly (g/hp-hr)	Total Combined Annual (ton/yr)
E07, E08, E09	NO _x	9.5	562.5
	CO	3.1	203.4

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.)

The emission unit shall track fuel usage and hours of operation in order to quantify annual emissions from this unit.

45 C.S.R. 14, Permit R14-0013E

Condition 4.2.1 – The permittee shall monitor and record the actual brake horsepower hours generated by each of the permitted engines. The records shall be maintained in a format that demonstrates compliance with the total maximum brake horsepower hour limits established in Condition 4.1.2.

Condition 4.2.2 – The permittee shall maintain records of the actual emissions calculated using the actual brake horsepower hour records of Condition 4.2.1 of this permit and the engine specific hourly emission factors. The hour emissions factors used to show compliance for engines E07 – E09 shall be 7.2 g/hp-hr NO_x and 2.6 g/hp-hr CO.

Condition 4.3.1 – The permittee shall conduct annual emissions testing for NOX and CO emissions released from E07 – E09 using portable analyzers. Upon utilization of the air-to-fuel ratio monitoring established in Condition 4.2.2 of this permit, periodic emissions testing shall be performed once every five (5) years. This periodic testing may be performed using portable emissions analyzers.

Condition 4.4.1 – Permittee shall keep records of monitoring information that include the following;

- Date, place, and time of sampling or measurements
- Date(s) analyses were performed
- Company or entity that performed analysis
- Analytical techniques or methods used
- Results of analysis
- Operating conditions existing at the time of sampling or measurement

Are you in compliance with all applicable requirements for this emission unit? 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: 002-08	Emission unit name: Reciprocating Engine/Integral Compressor	List any control devices associated with this emission unit: NA
---	--	---

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

Manufacturer: Clark	Model number: TLA-8	Serial number: NA
-------------------------------	-------------------------------	-----------------------------

Construction date: NA	Installation date: 1969	Modification date(s): NA
---------------------------------	-----------------------------------	------------------------------------

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 2,700 hp

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

Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes, is it? <input type="checkbox"/> Indirect Fired <input checked="" type="checkbox"/> Direct Fired
--	---

Maximum design heat input and/or maximum horsepower rating: 2,700 hp	Type and Btu/hr rating of burners: 7,400 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
19,588 scf/hr / 171,590,880 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

<i>Emissions Data</i>		
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	
	See Appendix A	
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	
<p>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.).</p> <p>See Appendix A</p>		

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.

According to 40 CFR 63.6590(b)(3)(i) and 40 CFR 63.6600(c), this existing, non-emergency, SI 2SLB engine > 500 hp located at a major source of HAPs does not have any requirements under 40 CFR Part 63 Subpart ZZZZ because it was constructed prior to December 12, 2002.

45 C.S.R. 14, Permit R14-0013E

Condition 4.1.1 – Unit shall be installed, maintained, and operated so as to minimize any fugitive escape of pollutants and shall not exceed the listed design capacities

Condition 4.1.2 – The operation of these engines (002-07 – 002-09) shall not exceed the following maximum combined operating and emission limitations:

- c) The engines shall be limited to the maximum operating capacities as shown in Table 4.1.2(a)

Table 4.1.2(a)

Emission Unit ID	Maximum Rating (hp)	Total Combined Annual Operating Limit (bhp-hr/yr)
002-07	2,700	70,956,000
002-08	2,700	
002-09	2,700	

- d) Emissions released from the engines shall not exceed the maximum individual hourly and total combined annual emission limits set forth in Table 4.1.2(b)

Table 4.1.2(b)

Emission Point ID	Pollutant	Emission Limits	
		Hourly (g/hp-hr)	Total Combined Annual (ton/yr)
E07, E08, E09	NO _x	9.5	562.5
	CO	3.1	203.4

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.)

The emission unit shall track fuel usage and hours of operation in order to quantify annual emissions from this unit.

45 C.S.R. 14, Permit R14-0013E

Condition 4.2.1 – The permittee shall monitor and record the actual brake horsepower hours generated by each of the permitted engines. The records shall be maintained in a format that demonstrates compliance with the total maximum brake horsepower hour limits established in Condition 4.1.2.

Condition 4.2.2 – The permittee shall maintain records of the actual emissions calculated using the actual brake horsepower hour records of Condition 4.2.1 of this permit and the engine specific hourly emission factors. The hour emissions factors used to show compliance for engines E07 – E09 shall be 7.2 g/hp-hr NO_x and 2.6 g/hp-hr CO.

Condition 4.3.1 – The permittee shall conduct annual emissions testing for NO_x and CO emissions released from E07 – E09 using portable analyzers. Upon utilization of the air-to-fuel ration monitoring established in Condition 4.2.2 of this permit, periodic emissions testing shall be performed once every five (5) years. This periodic testing may be performed using portable emissions analyzers.

Condition 4.4.1 – Permittee shall keep records of monitoring information that include the following;

- Date, place, and time of sampling or measurements
- Date(s) analyses were performed
- Company or entity that performed analysis
- Analytical techniques or methods used
- Results of analysis
- Operating conditions existing at the time of sampling or measurement

Are you in compliance with all applicable requirements for this emission unit? 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: 002-09	Emission unit name: Reciprocating Engine/Integral Compressor	List any control devices associated with this emission unit: NA
---	--	---

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

Manufacturer: Clark	Model number: TLA-8	Serial number: NA
-------------------------------	-------------------------------	-----------------------------

Construction date: NA	Installation date: 1970	Modification date(s): NA
---------------------------------	-----------------------------------	------------------------------------

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 2,700 hp

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

Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes, is it? <input type="checkbox"/> Indirect Fired <input checked="" type="checkbox"/> Direct Fired
--	---

Maximum design heat input and/or maximum horsepower rating: 2,700 hp	Type and Btu/hr rating of burners: 7,400 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
19,588 scf/hr / 171,590,880 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

<i>Emissions Data</i>		
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	
	See Appendix A	
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	
<p>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.).</p> <p>See Appendix A</p>		

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.

According to 40 CFR 63.6590(b)(3)(i) and 40 CFR 63.6600(c), this existing, non-emergency, SI 2SLB engine > 500 hp located at a major source of HAPs does not have any requirements under 40 CFR Part 63 Subpart ZZZZ because it was constructed prior to December 12, 2002.

45 C.S.R. 14, Permit R14-0013E

Condition 4.1.1 – Unit shall be installed, maintained, and operated so as to minimize any fugitive escape of pollutants and shall not exceed the listed design capacities

Condition 4.1.2 – The operation of these engines (002-07 – 002-09) shall not exceed the following maximum combined operating and emission limitations:

- e) The engines shall be limited to the maximum operating capacities as shown in Table 4.1.2(a)

Table 4.1.2(a)

Emission Unit ID	Maximum Rating (hp)	Total Combined Annual Operating Limit (bhp-hr/yr)
002-07	2,700	70,956,000
002-08	2,700	
002-09	2,700	

- f) Emissions released from the engines shall not exceed the maximum individual hourly and total combined annual emission limits set forth in Table 4.1.2(b)

Table 4.1.2(b)

Emission Point ID	Pollutant	Emission Limits	
		Hourly (g/hp-hr)	Total Combined Annual (ton/yr)
E07, E08, E09	NO _x	9.5	562.5
	CO	3.1	203.4

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.)

The emission unit shall track fuel usage and hours of operation in order to quantify annual emissions from this unit.

45 C.S.R. 14, Permit R14-0013E

Condition 4.2.1 – The permittee shall monitor and record the actual brake horsepower hours generated by each of the permitted engines. The records shall be maintained in a format that demonstrates compliance with the total maximum brake horsepower hour limits established in Condition 4.1.2.

Condition 4.2.2 – The permittee shall maintain records of the actual emissions calculated using the actual brake horsepower hour records of Condition 4.2.1 of this permit and the engine specific hourly emission factors. The hour emissions factors used to show compliance for engines E07 – E09 shall be 7.2 g/hp-hr NO_x and 2.6 g/hp-hr CO.

Condition 4.3.1 – The permittee shall conduct annual emissions testing for NO_x and CO emissions released from E07 – E09 using portable analyzers. Upon utilization of the air-to-fuel ration monitoring established in Condition 4.2.2 of this permit, periodic emissions testing shall be performed once every five (5) years. This periodic testing may be performed using portable emissions analyzers.

Condition 4.4.1 – Permittee shall keep records of monitoring information that include the following;

- Date, place, and time of sampling or measurements
- Date(s) analyses were performed
- Company or entity that performed analysis
- Analytical techniques or methods used
- Results of analysis
- Operating conditions existing at the time of sampling or measurement

Are you in compliance with all applicable requirements for this emission unit? 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: 002-10	Emission unit name: Reciprocating Engine/Integral Compressor	List any control devices associated with this emission unit: NA
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Provide a description of the emission unit (type, method of operation, design parameters, etc.):
2-cycle, lean burn

Manufacturer: Clark	Model number: TLAD-10	Serial number: NA
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Construction date: NA	Installation date: 1991	Modification date(s): NA
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Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 4,640 hp

Maximum Hourly Throughput: NA	Maximum Annual Throughput: NA	Maximum Operating Schedule: 8,760
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Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes, is it? <input type="checkbox"/> Indirect Fired <input checked="" type="checkbox"/> Direct Fired
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Maximum design heat input and/or maximum horsepower rating: 4,640 hp	Type and Btu/hr rating of burners: 8,500 Btu/hp-hr
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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
38,667 scf/hr / 338,722,920 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

<i>Emissions Data</i>		
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	
	See Appendix A	
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	
<p>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.).</p> <p>See Appendix A</p>		

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.

According to 40 CFR 63.6590(b)(3)(i) and 40 CFR 63.6600(c), this existing, non-emergency, SI 2SLB engine > 500 hp located at a major source of HAPs does not have any requirements under 40 CFR Part 63 Subpart ZZZZ because it was constructed prior to December 12, 2002.

45 C.S.R. 14, Permit R14-0013E

Condition 4.1.1 – Unit shall be installed, maintained, and operated so as to minimize any fugitive escape of pollutants and shall not exceed the listed design capacities

Condition 4.1.3.a – The unit shall be limited to maximum operating capacity as shown in Table 4.1.3(a).

Table 4.1.3(a)

Emission Unit ID	Maximum Rating (hp)
002-10	4,640

Condition 4.1.3.b – Emissions released from the engine shall not exceed the maximum hourly and annual emission limits set forth in Table 4.1.3(b)

Table 4.1.3(b)

Emission Point ID	Pollutant	Maximum Emission Rates		
		Emission Factor (g/hp-hr)	Hourly (lb/hr)	Annual (ton/yr)
E10	NO _x	2.0	20.5	89.6
	CO	2.1	22.5	98.5
	VOC	0.7	8.2	35.8
	SO ₂	0.003	0.1	0.2
	PM	0.19	1.9	8.3

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.)

The emission unit shall track fuel usage and hours of operation in order to quantify annual emissions from this unit.

Are you in compliance with all applicable requirements for this emission unit? 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: 002-12	Emission unit name: Reciprocating Engine/Generator	List any control devices associated with this emission unit: NA
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Provide a description of the emission unit (type, method of operation, design parameters, etc.):
4-cycle lean burn.

Manufacturer: Waukesha	Model number: VGF-P48GL	Serial number: NA
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Construction date: NA	Installation date: 2008	Modification date(s): NA
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Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 1,063 hp

Maximum Hourly Throughput: NA	Maximum Annual Throughput: NA	Maximum Operating Schedule: 500 hrs/yr
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Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes, is it? <input type="checkbox"/> Indirect Fired <input checked="" type="checkbox"/> Direct Fired
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Maximum design heat input and/or maximum horsepower rating: 1,063 hp	Type and Btu/hr rating of burners: 6,825 Btu/hp-hr
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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
7,113 scf/hr / 3,556,500 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

<i>Emissions Data</i>		
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
<p>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.).</p> <p>See Appendix A</p>		

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. § 63.6605 – Operating Requirements

40 C.F.R. § 63.6640(f) – Continuous Compliance Requirements

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

45 C.S.R. 14, Permit R14-0013E

Condition 4.1.7.a – Maximum emissions from the unit shall not exceed the limits given in the following table;

Pollutant	Hourly (lb/hr)	Annual (ton/yr)
CO	3.04	0.76
NO _x	4.68	1.17
VOC	0.61	0.15

Condition 4.1.7.b – The unit shall not operate in excess of 500 hours per year. Compliance with this limitation shall be determined using a twelve month rolling total.

Condition 4.1.7.c – The permittee shall maintain on site verification that the unit was manufactured prior to 1/1/2009.

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. § 63.6605 – Must comply with all emission, operating, and work practice standards at all times.

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. § 63.6645(c) – Submit the required initial notification no later than 120 days after becoming subject to the subpart

45 C.S.R. 14, Permit R14-0013E

Condition 4.2.5 – Permittee shall monitor and record the monthly and rolling twelve month hours of operation for the unit.

Condition 4.2.6.a – Permittee shall meet all applicable monitoring, compliance demonstration, source specific recording and reporting requirements as give under 40 CFR 63 Subpart ZZZZ specifically §§ 63.6595(a)(3), 63.6605, 63.6640

Condition 4.4.4 – Permittee shall meet all applicable record-keeping requirements as given under 40 CFR 63 Subpart ZZZZ.

Condition 4.5.1.a – Permittee shall meet all applicable reporting requirements as given under 40 CFR 63 Subpart ZZZZ, specifically § 63.6645

Are you in compliance with all applicable requirements for this emission unit? 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: 002-13	Emission unit name: Reciprocating Engine/Integral Compressor	List any control devices associated with this emission unit: OC1
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Provide a description of the emission unit (type, method of operation, design parameters, etc.):
4-cycle lean burn.

Manufacturer: Caterpillar	Model number: G3616	Serial number: NA
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Construction date: NA	Installation date: 2008	Modification date(s): NA
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Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 4,735 hp

Maximum Hourly Throughput: NA	Maximum Annual Throughput: NA	Maximum Operating Schedule: 8,760 hrs/yr
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Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes, is it? <input type="checkbox"/> Indirect Fired <input checked="" type="checkbox"/> Direct Fired
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Maximum design heat input and/or maximum horsepower rating: 4,735 hp	Type and Btu/hr rating of burners: 6,400 Btu/hp-hr
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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
29,710 scf/hr / 260,257,850 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

<i>Emissions Data</i>		
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
<p>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.).</p> <p>See Appendix A</p>		

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. 60 Subpart JJJJ

40 C.F.R. § 60.4233(e), 60.4234, and Table 1 (Line 5) – Operating Requirements

40 C.F.R. § 60.4243 – Compliance Requirements

40 C.F.R. § 60.4244 – Testing Requirements

40 C.F.R. § 60.4245 – Reporting Requirements

40 C.F.R. 63 Subpart ZZZZ

40 C.F.R. § 63.6600(b), Table 2a (Line 2) and Table 2b (Line 1) – Operating Requirements

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

40 C.F.R. §§ 63.6610, 63.6615, and 63.6620 – Testing Requirements

40 C.F.R. § 63.6625 – Monitoring Requirements

40 C.F.R. § 63.6630 – Initial Compliance Requirements

40 C.F.R. § 63.6640(a) and Table 6 (Line 7) – Continuous Compliance Requirements

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

40 C.F.R. § 63.6650 – Reporting Requirements

40 C.F.R. § 63.6660 – Recordkeeping Requirements

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

45 C.S.R. 14, Permit R14-0013E

Condition 4.1.1 – Unit shall be installed, maintained, and operated so as to minimize any fugitive escape of pollutants and shall not exceed the listed design capacities

Condition 4.1.4.a – The unit shall be limited to maximum operating capacity as shown in Table 4.1.4(a).

Table 4.1.4(a)

Emission Unit ID	Maximum Rating (hp)
002-13	4,735

Condition 4.1.4.b – Emissions released from the engine shall not exceed the maximum hourly and annual emission limits set forth in Table 4.1.4(b)

Table 4.1.4(b)

Emission Point ID	Pollutant	Maximum Emission Rates		
		Emission Factor (g/hp-hr)	Hourly (lb/hr)	Annual (ton/yr)
E11	NO _x	0.70	7.30	32.00
	CO	0.63	6.52	28.60
	VOC	0.16	1.70	7.42
	SO ₂	0.0024	0.02	0.11
	PM	0.034	0.40	1.60
	CH ₂ O	0.114	0.119	5.22

Condition 4.1.4.c – The permittee shall install, maintain, and operate an oxidation catalyst on the unit to reduce CO, VOC, and Formaldehyde emissions. The OC shall be utilized at all times the unit is in operation.

Condition 4.1.4.d – Pursuant to 40 CFR 63, Subpart ZZZZ, the permittee shall (1) reduce uncontrolled emissions by 93 percent or more; or (2) limit concentration of formaldehyde in the exhaust to 14 ppmvd or less at 15 percent O₂ [40 CFR § 63.6600 – Table 2a]

Condition 4.1.4.e – Pursuant to 40 CFR 63, Subpart ZZZZ, the permittee shall, with respect to the OC, (1) maintain the catalyst so that the pressure drop across the catalyst does not change by more than two inches of water at 100 percent load plus or minus 10 percent from the pressure drop across the catalyst that was measured during the initial performance test; and (2) maintain the temperature of the exhaust so that the catalyst inlet temperature is greater than or equal to 450°F and less than or equal to 1350°F [40 CFR § 63.6600 – Table 2b]

Condition 4.1.4.f – The permittee shall regularly inspect, maintain, and repair the unit and its OC to assure proper operation. The unit and OC shall be operated, maintained and serviced per manufacturer recommendations. Based on manufacturer recommendations, the permittee must either maintain on site spare parts for use in immediate repair or participate in a quick turnaround catalyst element cleaning/loaner program with a catalyst supplier.

Condition 4.1.4.g – The permittee shall comply with all applicable requirements of NSPS for Stationary ~~Compression Spark~~ Ignition Internal Combustion Engines specified in 40 CFR 60, Subpart JJJJ.

Condition 4.1.9 – The permittee shall, to the extent practicable, install, maintain, and operate all air pollution control equipment listed in Section 1 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.

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. 60 Subpart JJJJ

40 C.F.R. § 60.4233(e), 60.4234 and Table 1 (Line 5) – Unit shall comply with the emission standards set forth for NO_x (2.0 g/hp-hr), CO (4.0 g/hp-hr) and VOC (1.0 g/hp-hr) for the entire life of the engine.

40 C.F.R. § 60.4243(b)(ii) – Compliance;

- Permittee shall keep a maintenance plan for unit and a record of all maintenance conducted.
- Permittee shall also operate in a manner consistent with good air pollution control practice to minimize emissions.
- Permittee shall conduct an initial performance test and subsequent testing every 8,760 hours or three (3) years whichever comes first.

40 C.F.R. § 60.4244 – Owners/operators required to conduct performance tests shall do so by performing each test within 10 percent of 100 percent peak (or highest achievable) load. Owners/operators may not conduct performance tests during periods of startup, shutdown, or malfunction, as specified in §60.8(c). If your stationary SI internal combustion engine is non-operational, you do not need to startup the engine solely to conduct a performance test; however, you must conduct the performance test immediately upon startup of the engine. Owner/operators must conduct three separate test runs for each performance test required in this section, as specified in §60.8(f). Each test run must be conducted within 10 percent of 100 percent peak (or the highest achievable) load and last at least 1 hour.

40 C.F.R. § 60.4245(a) and (d) – Permittee shall keep records on maintenance conducted and hours of operation, and shall submit a copy of each performance test as conducted within 60 days after the test has been completed.

40 C.F.R. 63 Subpart ZZZZ

40 C.F.R § 63.6600(b) and Table 2a (Line 2) – Owner/operators of a new or reconstructed 4SLB stationary RICE with a site rating of more than 500 brake HP located at major source of HAP emissions shall either (1) reduce uncontrolled CO emissions by 93 percent; or (2) limit the concentration of formaldehyde in the exhaust to 14 ppmvd or less at 15 percent O₂

40 C.F.R § 63.6600(b) and Table 2b (Line 1) – Owner/operators of a new or reconstructed 4SLB stationary RICE with a site rating of greater than or equal to 250 brake HP located at major source of HAP emissions, with respect to the OC, shall (1) maintain the catalyst so that the pressure drop across the catalyst does not change by more than two inches of water at 100 percent load plus or minus 10 percent from the pressure drop across the catalyst that was measured during the initial performance test; and (2) maintain the temperature of the exhaust so that the catalyst inlet temperature is greater than or equal to 450°F and less than or equal to 1350°F

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

40 C.F.R. § 63.6615 and Table 3 (Line 1 or 3) – Limit the concentration of CO or formaldehyde in the stationary RICE exhaust and show compliance by conducting performance tests semiannually. After you have demonstrated compliance for two consecutive tests, you may reduce the frequency of subsequent performance tests to annually. If the results of any subsequent annual performance test indicate the stationary RICE is not in compliance with the CO or formaldehyde emission limitation, or you deviate from any of your operating limitations, you must resume semiannual performance tests.

40 C.F.R. § 63.6620 and Table 4 – Owner/operators shall conduct each performance test in tables 3 and 4 as they apply. Each performance test must be conducted according to the requirements that this subpart specifies in Table 4 to this subpart. The test must be conducted at any load condition within plus or minus 10 percent of 100 percent load for the stationary RICE.

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

40 C.F.R. § 63.6630 and Table 5 (Line 1 or 9) – Limit the concentration of CO or formaldehyde in the unit by using an oxidation catalyst or NSCR by showing the average formaldehyde concentration, corrected to 15 percent O₂, dry basis, from the three test runs is less than or equal to the CO or formaldehyde emission limitation; and installing a CPMS to continuously monitor catalyst inlet temperature according to the requirements in §63.6625(b); and recording the catalyst pressure drop and catalyst inlet temperature during the initial performance test.

40 C.F.R. § 63.6640(a) and Table 6 (Line 1 or 7) – Limit the concentration of CO or formaldehyde in the unit by using an oxidation catalyst or NSCR and (1) Conducting semiannual performance tests for formaldehyde to demonstrate that your emissions remain at or below the formaldehyde concentration limits; and (2) collecting the catalyst inlet temperature data according to §63.6625(b); and (3) reducing these data to 4-hour rolling averages; and (4) maintaining the 4-hour rolling averages within the operating limitations for the catalyst inlet temperature; and (5) measuring the pressure drop across the catalyst once per month and demonstrating that the pressure drop across the catalyst is within the operating limitation established during the performance test.

40 C.F.R. §§ 63.6645 and 63.6650 – Submit all the required notifications and reports

40 C.F.R. § 63.6655 (except (c), (e), and (f)) – Keep records of maintenance conducted, performance testing results and operating schedule on the RICE

40 C.F.R. § 63.6660 – Records retained for five (5) years and readily available for expeditious review

45 C.S.R. 14, Permit R14-0013E

Condition 4.2.6.b – Permittee shall meet all applicable monitoring, compliance demonstration, source specific recording and reporting requirements as give under 40 CFR 63 Subpart ZZZZ specifically §§ 63.6595(a)(3), 63.6600(b) (emission limits in Table 2a, item 2, and the operating limitations in Table 2b, item 1), 63.6605, 63.6635, and 63.6640 (Table 6)

Condition 4.2.6.c – Permittee shall meet all applicable monitoring, compliance demonstration, source specific recording and reporting requirements as give under 40 CFR 60 Subpart JJJJ specifically § 60.4233(e) & emission limits on Line 5 of Table 1 of 40 CFR 60 Subpart JJJJ, 40 CFR §§ 60.4234, 60.4243(b)(2)(ii), and 60.4246.

Condition 4.3.4.a – Permittee shall meet all applicable testing requirements as given under 40 CFR 63 Subpart ZZZZ, specifically 63.6610(a) (Table 4), 63.6615 (Table 3, items 1 and 3), 63.6620, 63.6625 ((a), (b) and (h)), 63.6630 (Table 5).

Condition 4.3.4.b – Permittee shall meet all applicable testing requirements as given under 40 CFR 60 Subpart JJJJ, specifically 40 CFR § 60.4244.

Condition 4.4.1 – Permittee shall keep records of monitoring information that include the following;

- Date, place, and time of sampling or measurements
- Date(s) analyses were performed
- Company or entity that performed analysis
- Analytical techniques or methods used
- Results of analysis
- Operating conditions existing at the time of sampling or measurement

Condition 4.4.2 – For all air pollution control equipment listed in Section 1, the permittee shall maintain accurate records of all required pollution control equipment inspection and/or preventative maintenance procedures.

Condition 4.4.3 – For all air pollution control equipment listed in Section 1, 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;

- Equipment involved
- Steps taken to minimize emissions during the event
- The duration of the event

- The estimated increase in emissions during the event
- The cause of the malfunction
- Steps taken to correct the malfunction
- Any changes or modifications to equipment or procedures that would help prevent future recurrences of the malfunction

Condition 4.4.4 – Permittee shall meet all applicable record-keeping requirements as given under 40 CFR 60 Subpart JJJJ and 40 CFR 63 Subpart ZZZZ.

Condition 4.5.1.b – Permittee shall meet all applicable reporting requirements as given under 40 CFR 63 Subpart ZZZZ, specifically § 63.6645, 63.6655 (except (c), (e), and (f)), and 63.6650 (except (g)).

Condition 4.5.1.b – Permittee shall meet all applicable reporting requirements as given under 40 CFR 60 Subpart JJJJ, specifically 40 CFR § 60.4245

Are you in compliance with all applicable requirements for this emission unit? 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: 003-01	Emission unit name: Combustion Turbine/Compressor	List any control devices associated with this emission unit: NA
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Provide a description of the emission unit (type, method of operation, design parameters, etc.):
Combustion Turbine/Compressor

Manufacturer: Solar	Model Number: Taurus 70	Serial Number: NA
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Construction Date: NA	Installation Date: 2013	Modification Date(s): NA
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Design Capacity (examples: furnaces - tons/hr, tanks - gallons):
9,236 hp at 59° F
11,557 hp 0° F

Maximum Hourly Throughput: NA	Maximum Annual Throughput: NA	Maximum Operating Schedule: NA
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Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes, is it? <input type="checkbox"/> Indirect Fired <input checked="" type="checkbox"/> Direct Fired
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Maximum design heat input and/or maximum horsepower rating: 9,236 hp at 59° F 11,557 hp 0° F / 83.88 MMBtu/hr	Type and Btu/hr rating of burners: 7,258 Btu/hp-hr at 0° F
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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
82,236 scf/hr / 720,387,360 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

<i>Emissions Data</i>		
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
<p>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.).</p> <p>See Appendix A</p>		

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. 60 Subpart KKKK

40 C.F.R. § 60.4305(a) – Applicability

40 C.F.R. § 60.4320, 60.4330(a) and Table 1 (Line 3 & 12) – Operating Requirements

40 C.F.R. § 60.4333(a) – General Requirements

40 C.F.R. § 60.4340(a) and 60.4400 – Continuous Compliance Requirements

40 C.F.R. § 60.4360, 60.4365, and 60.4370(b) – Monitoring Requirements

40 C.F.R. § 60.4375 and 60.4395 – Reporting Requirements

40 C.F.R. 63 Subpart YYYY

40 C.F.R. § 63.6095(d) – Compliance Requirements

40 C.F.R. § 63.6145(a) and (c) – Notification Requirements

45 C.S.R. 14, Permit R14-0013E

Condition 4.1.5.a – The unit shall be limited to the maximum operating capacity as shown in the table;

Emission Unit ID	Maximum Turbine Rating (hp)
003-01	9,236 @ 59°F 11,557 @ 0°F

Condition 4.1.5.b – Emissions released from the unit shall not exceed the maximum individual hourly (per operation mode) and total combined annual emission limits set forth in the following table;

Emission Point ID	Pollutant	Maximum Emission Rates					
		Individual Hourly (lb/hr)					Combined Annual (ton/yr)
		Normal Load	Low Temp	Very Low Temp	Low Load	Startup / Shutdown	
T01, T02	NO _x	5.04	15.00	42.84	24.56	2.40	47.57
	CO	5.12	21.73	32.60	1,708.23	214.60	103.01
	VOC	0.73	1.55	1.55	24.40	3.05	7.36
	SO ₂	4.70	4.70	4.70	4.70	4.70	0.52
	PM	0.61	0.61	0.61	0.61	0.61	5.38
	CO ₂ e	10,904	10,904	10,904	10,904	10,904	95,518
	Formaldehyde	0.06	0.06	0.06	0.06	0.06	0.52

Condition 4.1.5.c – The unit shall be equipped with SoLoNO_x lean premixed combustion technology to ensure uniform air/fuel mixture and to prevent formation of NO_x

Condition 4.1.5.d – Pursuant to 40 CFR 60, Subpart KKKK, the permittee must meet the following requirements

- Meet the emission limits for NO_x specified in Table 1 to this subpart
- If your turbine is located in a continental area, you must comply with either paragraph (a)(1), (a)(2), or (a)(3) of this section
 - You must not cause to be discharged into the atmosphere from the unit any gases which contain SO₂ in excess of 110 ng/J (0.90 lb/MWh) gross output;
 - You must not burn in the unit any fuel which contains total potential sulfur emissions in excess of 26 ng SO₂/J (0.060 lb SO₂/mmBtu) heat input. If your unit simultaneously fires multiple fuels, each fuel must meet this requirement

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. 60 Subpart KKKK

40 C.F.R. § 60.4320 and Table 1 (Line 2 or Line 12) – Unit must meet NO_x emission standards; 100 ppm at 15% O₂ or 960 ng/J of useful output (5.5 lb/MWh) while at or above 75% peak load. At less than 75% peak load or less than 0 degrees F, the NO_x emission standard is 150 ppm at 15% O₂ or 1,100 ng/J of useful output (4.7 lb/MWh).

40 C.F.R. § 60.4330(a)(2) – Unit shall not burn any fuel which contains total potential sulfur emissions in excess of 0.06 lb/MMBtu heat input

40 C.F.R. § 60.4333(a) – Must operate and maintain unit and associated equipment in a manner consistent with good engineering practices

40 C.F.R. § 60.4340(a) and 60.4400 – Conduct initial performance test within 180 days of startup or within 60 days of achieving maximum load operation, whichever comes first. Subsequent testing shall be conducted on an annual basis no more than fourteen (14) months following previous test. There are two test methodologies that shall be used in conducting the performance testing; (i) – measure NO_x concentration in PPM using EPA Method 7E or EPA Method 20, or (ii) – measure NO_x and diluent gas concentrations using either EPA Methods 3A or 7E, or Method 20.

40 C.F.R. § 60.4360 – Monitor sulfur content of fuel being fired to turbine

40 C.F.R. § 60.4365 – Permittee can elect to not monitor sulfur content being fired to turbine if fuel is demonstrated to not exceed potential sulfur emissions of 0.06 lb SO₂/mmBtu

40 C.F.R. § 60.4370(b) – If you elect not to demonstrate sulfur content using options in §60.4365, and the fuel is supplied without intermediate bulk storage, the sulfur content value of the gaseous fuel must be determined and recorded once per unit operating day.

40 C.F.R. 63 Subpart YYYY

40 C.F.R. § 63.6095(d) – *Stay of Standards for Gas-Fired Subcategories*; New or Reconstructed stationary combustion turbines as defined by this subpart need not comply with any requirements other than those set forth in § 63.6145 until EPA takes final action.

40 C.F.R. § 63.6145(a) and (c) – Submit the required initial notification for new or reconstructed stationary combustion turbines no later than 120 days after becoming subject to the subpart

45 C.S.R. 14, Permit R14-0013E

Condition 4.2.3 – The permittee shall calculate and record on a monthly and rolling twelve month basis, the emissions of each pollutant limited under Table 4.1.5(c) generated by units 003-01 and 003-02. The calculations shall be based on the emission factors used in the permit applications R14-0013E and the following information

- Monitor and record the number of hours the units operate at normal load operations, low temperature operations, very low temperature operations and low load operations
- Monitor and record the number of startup/shutdowns of each unit

Condition 4.2.6.d – Permittee shall meet all applicable monitoring, compliance demonstration, source specific recording and reporting requirements as give under 40 CFR 63 Subpart KKKK specifically §§ 60.4300; 60.4305; 60.4320 (NO_x – Table 1 (Line 3); 60.4330(a)(2)(SO₂); 60.4333(a); 60.4340(a) (NO_x annual tests); 60.4360 (sulfur content monitoring); 60.4365(a); 60.4370(b).

Condition 4.3.2 – In addition to the NO_x performance testing as required under Subpart KKKK, within 60 days after achieving full load, but not later than 180 days after initial startup, and at such times thereafter as may be required by the Director, the permittee shall conduct, or have conducted, a performance test on each unit to determine compliance with the “normal load” CO emission limit specified under Table 4.1.5(b) and (c) and in accordance with 3.3.1. The permittee shall use an appropriate EPA approved test method as given under 40 CFR 60 Appendix A and approved in writing by the Director in a protocol submitted pursuant to 3.3.1(c). The testing shall take place with the engines are operating at “normal load” as defined under 4.2.3(a) and 4.2.4(a).

Condition 4.3.4.c – Permittee shall meet all applicable testing requirements as given under 40 CFR 60 Subpart KKKK specifically 40 CFR § 60.4400.

Condition 4.4.1 – Permittee shall keep records of monitoring information that include the following;

- Date, place, and time of sampling or measurements

- Date(s) analyses were performed
- Company or entity that performed analysis
- Analytical techniques or methods used
- Results of analysis
- Operating conditions existing at the time of sampling or measurement

Condition 4.4.4 – Permittee shall meet all applicable record-keeping requirements as given under 40 CFR 60 Subpart KKKK.

Condition 4.5.1.d – Permittee shall meet all applicable reporting requirements as given under 40 CFR 60 Subpart KKKK, specifically § 60.4375; 60.4395

Are you in compliance with all applicable requirements for this emission unit? 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: 003-02	Emission unit name: Combustion Turbine/Compressor	List any control devices associated with this emission unit: NA
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Provide a description of the emission unit (type, method of operation, design parameters, etc.):
Combustion Turbine/Compressor

Manufacturer: Solar	Model Number: Taurus 70	Serial Number: NA
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Construction Date: NA	Installation Date: 2013	Modification Date(s): NA
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Design Capacity (examples: furnaces - tons/hr, tanks - gallons):

9,236 hp at 59° F
11,557 hp 0° F

Maximum Hourly Throughput: NA	Maximum Annual Throughput: NA	Maximum Operating Schedule: NA
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Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes, is it? <input type="checkbox"/> Indirect Fired <input checked="" type="checkbox"/> Direct Fired
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Maximum design heat input and/or maximum horsepower rating: 9,236 hp at 59° F 11,557 hp 0° F / 83.88 MMBtu/hr	Type and Btu/hr rating of burners: 7,258 Btu/hp-hr at 0° F
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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
82,236 scf/hr / 720,387,360 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	
<p>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.).</p> <p>See Appendix A</p>			

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. 60 Subpart KKKK

40 C.F.R. § 60.4305(a) – Applicability

40 C.F.R. § 60.4320, 60.4330(a) and Table 1 (Line 3 & 12) – Operating Requirements

40 C.F.R. § 60.4333(a) – General Requirements

40 C.F.R. § 60.4340(a) and 60.4400 – Continuous Compliance Requirements

40 C.F.R. § 60.4360, 60.4365, and 60.4370(b) – Monitoring Requirements

40 C.F.R. § 60.4375 and 60.4395 – Reporting Requirements

40 C.F.R. 63 Subpart YYYY

40 C.F.R. § 63.6095(d) – Compliance Requirements

40 C.F.R. § 63.6145(a) and (c) – Notification Requirements

45 C.S.R. 14, Permit R14-0013E

Condition 4.1.5.a – The unit shall be limited to the maximum operating capacity as shown in the table;

Emission Unit ID	Maximum Turbine Rating (hp)
003-02	9,236 @ 59°F 11,557 @ 0°F

Condition 4.1.5.b – Emissions released from the unit shall not exceed the maximum individual hourly (per operation mode) and total combined annual emission limits set forth in the following table;

Emission Point ID	Pollutant	Maximum Emission Rates					
		Individual Hourly (lb/hr)					Combined Annual (ton/yr)
		Normal Load	Low Temp	Very Low Temp	Low Load	Startup / Shutdown	
T01, T02	NO _x	5.04	15.00	42.84	24.56	2.40	47.57
	CO	5.12	21.73	32.60	1,708.23	214.60	103.01
	VOC	0.73	1.55	1.55	24.40	3.05	7.36
	SO ₂	4.70	4.70	4.70	4.70	4.70	0.52
	PM	0.61	0.61	0.61	0.61	0.61	5.38
	CO ₂ e	10,904	10,904	10,904	10,904	10,904	95,518
	Formaldehyde	0.06	0.06	0.06	0.06	0.06	0.52

Condition 4.1.5.c – The unit shall be equipped with SoLoNO_x lean premixed combustion technology to ensure uniform air/fuel mixture and to prevent formation of NO_x

Condition 4.1.5.d – Pursuant to 40 CFR 60, Subpart KKKK, the permittee must meet the following requirements

- Meet the emission limits for NO_x specified in Table 1 to this subpart
- If your turbine is located in a continental area, you must comply with either paragraph (a)(1), (a)(2), or (a)(3) of this section
 - You must not cause to be discharged into the atmosphere from the unit any gases which contain SO₂ in excess of 110 ng/J (0.90 lb/MWh) gross output;
 - You must not burn in the unit any fuel which contains total potential sulfur emissions in excess of 26 ng SO₂/J (0.060 lb SO₂/mmBtu) heat input. If your unit simultaneously fires multiple fuels, each fuel must meet this requirement

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. 60 Subpart KKKK

40 C.F.R. § 60.4320 and Table 1 (Line 2 or Line 12) – Unit must meet NO_x emission standards; 100 ppm at 15% O₂ or 960 ng/J of useful output (5.5 lb/MWh) while at or above 75% peak load. At less than 75% peak load or less than 0 degrees F, the NO_x emission standard is 150 ppm at 15% O₂ or 1,100 ng/J of useful output (4.7 lb/MWh).

40 C.F.R. § 60.4330(a)(2) – Unit shall not burn any fuel which contains total potential sulfur emissions in excess of 0.06 lb/MMBtu heat input

40 C.F.R. § 60.4333(a) – Must operate and maintain unit and associated equipment in a manner consistent with good engineering practices

40 C.F.R. § 60.4340(a) and 60.4400 – Conduct initial performance test within 180 days of startup or within 60 days of achieving maximum load operation, whichever comes first. Subsequent testing shall be conducted on an annual basis no more than fourteen (14) months following previous test. There are two test methodologies that shall be used in conducting the performance testing; (i) – measure NO_x concentration in PPM using EPA Method 7E or EPA Method 20, or (ii) – measure NO_x and diluent gas concentrations using either EPA Methods 3A or 7E, or Method 20.

40 C.F.R. § 60.4360 – Monitor sulfur content of fuel being fired to turbine

40 C.F.R. § 60.4365 – Permittee can elect to not monitor sulfur content being fired to turbine if fuel is demonstrated to not exceed potential sulfur emissions of 0.06 lb SO₂/mmBtu

40 C.F.R. § 60.4370(b) – If you elect not to demonstrate sulfur content using options in §60.4365, and the fuel is supplied without intermediate bulk storage, the sulfur content value of the gaseous fuel must be determined and recorded once per unit operating day.

40 C.F.R. 63 Subpart YYYY

40 C.F.R. § 63.6095(d) – *Stay of Standards for Gas-Fired Subcategories*; New or Reconstructed stationary combustion turbines as defined by this subpart need not comply with any requirements other than those set forth in § 63.6145 until EPA takes final action.

40 C.F.R. § 63.6145(a) and (c) – Submit the required initial notification for new or reconstructed stationary combustion turbines no later than 120 days after becoming subject to the subpart

45 C.S.R. 14, Permit R14-0013E

Condition 4.2.3 – The permittee shall calculate and record on a monthly and rolling twelve month basis, the emissions of each pollutant limited under Table 4.1.5(c) generated by units 003-01 and 003-02. The calculations shall be based on the emission factors used in the permit applications R14-0013E and the following information

- Monitor and record the number of hours the units operate at normal load operations, low temperature operations, very low temperature operations and low load operations
- Monitor and record the number of startup/shutdowns of each unit

Condition 4.2.6.d – Permittee shall meet all applicable monitoring, compliance demonstration, source specific recording and reporting requirements as give under 40 CFR 63 Subpart KKKK specifically §§ 60.4300; 60.4305; 60.4320 (NO_x – Table 1 (Line 3); 60.4330(a)(2)(SO₂); 60.4333(a); 60.4340(a) (NO_x annual tests); 60.4360 (sulfur content monitoring); 60.4365(a); 60.4370(b).

Condition 4.3.2 – In addition to the NO_x performance testing as required under Subpart KKKK, within 60 days after achieving full load, but not later than 180 days after initial startup, and at such times thereafter as may be required by the Director, the permittee shall conduct, or have conducted, a performance test on each unit to determine compliance with the “normal load” CO emission limit specified under Table 4.1.5(b) and (c) and in accordance with 3.3.1. The permittee shall use an appropriate EPA approved test method as given under 40 CFR 60 Appendix A and approved in writing by the Director in a protocol submitted pursuant to 3.3.1(c). The testing shall take place with the engines are operating at “normal load” as defined under 4.2.3(a) and 4.2.4(a).

Condition 4.3.4.c – Permittee shall meet all applicable testing requirements as given under 40 CFR 60 Subpart KKKK specifically 40 CFR § 60.4400.

Condition 4.4.1 – Permittee shall keep records of monitoring information that include the following;

- Date, place, and time of sampling or measurements

- Date(s) analyses were performed
- Company or entity that performed analysis
- Analytical techniques or methods used
- Results of analysis
- Operating conditions existing at the time of sampling or measurement

Condition 4.4.4 – Permittee shall meet all applicable record-keeping requirements as given under 40 CFR 60 Subpart KKKK.

Condition 4.5.1.d – Permittee shall meet all applicable reporting requirements as given under 40 CFR 60 Subpart KKKK, specifically § 60.4375; 60.4395

Are you in compliance with all applicable requirements for this emission unit? 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: 003-03	Emission unit name: Combustion Turbine/Compressor	List any control devices associated with this emission unit: NA
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Provide a description of the emission unit (type, method of operation, design parameters, etc.):
Combustion Turbine/Compressor

Manufacturer: Solar	Model Number: Mars 100	Serial Number: NA
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Construction Date: NA	Installation Date: 2017	Modification Date(s): NA
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Design Capacity (examples: furnaces - tons/hr, tanks - gallons):
15,067 hp at 32° F

Maximum Hourly Throughput: NA	Maximum Annual Throughput: NA	Maximum Operating Schedule: NA
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Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes, is it? <input type="checkbox"/> Indirect Fired <input checked="" type="checkbox"/> Direct Fired
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Maximum design heat input and/or maximum horsepower rating: 15,067 hp at 32° F / 116.08 MMBtu/hr	Type and Btu/hr rating of burners: 7,704 Btu/hp-hr
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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
126,318 scf/hr / 1,106,545,680 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

<i>Emissions Data</i>		
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
<p>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.).</p> <p>See Appendix A</p>		

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. 60 Subpart KKKK

40 C.F.R. § 60.4305(a) – Applicability

40 C.F.R. § 60.4320, 60.4330(a) and Table 1 (Line 3 and 12) – Operating Requirements

40 C.F.R. § 60.4333(a) – General Requirements

40 C.F.R. § 60.4340(a) and 60.4400 – Continuous Compliance Requirements

40 C.F.R. § 60.4360, 60.4365, and 60.4370(b) – Monitoring Requirements

40 C.F.R. § 60.4375 and 60.4395 – Reporting Requirements

40 C.F.R. 63 Subpart YYYY

40 C.F.R. § 63.6095(d) – Compliance Requirements

40 C.F.R. § 63.6145(a) and (c) – Notification Requirements

45 C.S.R. 14, Permit R14-0013E

Condition 4.1.5.a – The unit shall be limited to the maximum operating capacity as shown in the table;

Emission Unit ID	Maximum Turbine Rating (hp)
003-03	15,067 @ 32°F

Condition 4.1.5.b – Emissions released from the unit shall not exceed the maximum individual hourly (per operation mode) and total combined annual emission limits set forth in the following table;

Emission Point ID	Pollutant	Maximum Emission Rates				
		Individual Hourly (lb/hr)				Combined Annual (ton/yr)
		Normal Load	Low Temp	Low Load	Startup / Shutdown	
T03, T04	NO _x	6.96	21.16	16.10	3.10	64.52
	CO	7.07	30.37	653.41	272.70	96.29
	VOC	0.81	1.75	7.47	3.12	7.62
	SO ₂	7.36	7.36	7.36	7.36	0.81
	PM	0.85	0.85	0.85	0.85	7.45
	CO ₂ e	15,087	15,087	15,087	15,087	132,159
	Formaldehyde	0.09	0.09	0.09	0.09	0.80

Condition 4.1.5.c – The unit shall be equipped with SoLoNO_x lean premixed combustion technology to ensure uniform air/fuel mixture and to prevent formation of NO_x

Condition 4.1.5.d – Pursuant to 40 CFR 60, Subpart KKKK, the permittee must meet the following requirements

- Meet the emission limits for NO_x specified in Table 1 to this subpart
- If your turbine is located in a continental area, you must comply with either paragraph (a)(1), (a)(2), or (a)(3) of this section
 - You must not cause to be discharged into the atmosphere from the unit any gases which contain SO₂ in excess of 110 ng/J (0.90 lb/MWh) gross output;
 - You must not burn in the unit any fuel which contains total potential sulfur emissions in excess of 26 ng SO₂/J (0.060 lb SO₂/mmBtu) heat input. If your unit simultaneously fires multiple fuels, each fuel must meet this requirement

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. 60 Subpart KKKK

40 C.F.R. § 60.4320 and Table 1 (Line 2 or Line 12) – Unit must meet NO_x emission standards; 100 ppm at 15% O₂ or 960 ng/J of useful output (5.5 lb/MWh) while at or above 75% peak load. At less than 75% peak load or less than 0 degrees F, the NO_x emission standard is 150 ppm at 15% O₂ or 1,100 ng/J of useful output (4.7 lb/MWh).

40 C.F.R. § 60.4330(a)(2) – Unit shall not burn any fuel which contains total potential sulfur emissions in excess of 0.06 lb/MMBtu heat input

40 C.F.R. § 60.4333(a) – Must operate and maintain unit and associated equipment in a manner consistent with good engineering practices

40 C.F.R. § 60.4340(a) and 60.4400 – Conduct initial performance test within 180 days of startup or within 60 days of achieving maximum load operation, whichever comes first. Subsequent testing shall be conducted on an annual basis no more than fourteen (14) months following previous test. There are two test methodologies that shall be used in conducting the performance testing; (i) – measure NO_x concentration in PPM using EPA Method 7E or EPA Method 20, or (ii) – measure NO_x and diluent gas concentrations using either EPA Methods 3A or 7E, or Method 20.

40 C.F.R. § 60.4360 – Monitor sulfur content of fuel being fired to turbine

40 C.F.R. § 60.4365 – Permittee can elect to not monitor sulfur content being fired to turbine if fuel is demonstrated to not exceed potential sulfur emissions of 0.06 lb SO₂/mmBtu

40 C.F.R. § 60.4370(b) – If you elect not to demonstrate sulfur content using options in §60.4365, and the fuel is supplied without intermediate bulk storage, the sulfur content value of the gaseous fuel must be determined and recorded once per unit operating day.

40 C.F.R. 63 Subpart YYYY

40 C.F.R. § 63.6095(d) – *Stay of Standards for Gas-Fired Subcategories*; New or Reconstructed stationary combustion turbines as defined by this subpart need not comply with any requirements other than those set forth in § 63.6145 until EPA takes final action.

40 C.F.R. § 63.6145(a) and (c) – Submit the required initial notification for new or reconstructed stationary combustion turbines no later than 120 days after becoming subject to the subpart

45 C.S.R. 14, Permit R14-0013E

Condition 4.2.4 – The permittee shall calculate and record on a monthly and rolling twelve month basis, the emissions of each pollutant limited under Table 4.1.5(c) generated by units 003-03 and 003-04. The calculations shall be based on the emission factors used in the permit applications R14-0013E and the following information

- Monitor and record the number of hours the units operate at normal load operations, low temperature operations, and low load operations
- Monitor and record the number of startup/shutdowns of each unit

Condition 4.2.6.d – Permittee shall meet all applicable monitoring, compliance demonstration, source specific recording and reporting requirements as give under 40 CFR 63 Subpart KKKK specifically §§ 60.4300; 60.4305; 60.4320 (NO_x – Table 1 (Line 3); 60.4330(a)(2)(SO₂); 60.4333(a); 60.4340(a) (NO_x annual tests); 60.4360 (sulfur content monitoring); 60.4365(a); 60.4370(b).

Condition 4.3.2 – In addition to the NO_x performance testing as required under Subpart KKKK, within 60 days after achieving full load, but not later than 180 days after initial startup, and at such times thereafter as may be required by the Director, the permittee shall conduct, or have conducted, a performance test on each unit to determine compliance with the “normal load” CO emission limit specified under Table 4.1.5(b) and (c) and in accordance with 3.3.1. The permittee shall use an appropriate EPA approved test method as given under 40 CFR 60 Appendix A and approved in writing by the Director in a protocol submitted pursuant to 3.3.1(c). The testing shall take place with the engines are operating at “normal load” as defined under 4.2.3(a) and 4.2.4(a).

Condition 4.3.3 – In addition to the NO_x performance testing as required under Subpart KKKK, within 60 days after achieving full load, but not later than 180 days after initial startup, and at such times thereafter as may be required by the Director, the permittee shall conduct, or have conducted, a performance test on one of the units to determine compliance with the PM emission limit (including condensables) specified under Table 4.1.5(c) and in accordance with 3.3.1. The permittee shall use an appropriate EPA approved test method for PM including condensables. The permittee shall submit a testing protocol pursuant to 3.3.1(c). The testing shall take place with the engines are operating at “normal load” as defined under 4.2.3(a) and 4.2.4(a).

Condition 4.3.4.c – Permittee shall meet all applicable testing requirements as given under 40 CFR 60 Subpart KKKK specifically 40 CFR § 60.4400.

Condition 4.4.1 – Permittee shall keep records of monitoring information that include the following;

- Date, place, and time of sampling or measurements
- Date(s) analyses were performed
- Company or entity that performed analysis
- Analytical techniques or methods used
- Results of analysis
- Operating conditions existing at the time of sampling or measurement

Condition 4.4.4 – Permittee shall meet all applicable record-keeping requirements as given under 40 CFR 60 Subpart KKKK.

Condition 4.5.1.d – Permittee shall meet all applicable reporting requirements as given under 40 CFR 60 Subpart KKKK, specifically § 60.4375; 60.4395

Are you in compliance with all applicable requirements for this emission unit? 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: 003-04	Emission unit name: Combustion Turbine/Compressor	List any control devices associated with this emission unit: NA
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Provide a description of the emission unit (type, method of operation, design parameters, etc.):
Combustion Turbine/Compressor

Manufacturer: Solar	Model Number: Mars 100	Serial Number: NA
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Construction Date: NA	Installation Date: 2017	Modification Date(s): NA
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Design Capacity (examples: furnaces - tons/hr, tanks - gallons):
15,067 hp at 32° F

Maximum Hourly Throughput: NA	Maximum Annual Throughput: NA	Maximum Operating Schedule: NA
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Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes, is it? <input type="checkbox"/> Indirect Fired <input checked="" type="checkbox"/> Direct Fired
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Maximum design heat input and/or maximum horsepower rating: 15,067 hp at 32° F / 116.08 MMBtu/hr	Type and Btu/hr rating of burners: 7,704 Btu/hp-hr
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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
126,318 scf/hr / 1,106,545,680 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

<i>Emissions Data</i>		
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
<p>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.).</p> <p>See Appendix A</p>		

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. 60 Subpart KKKK

- 40 C.F.R. § 60.4305(a) – Applicability
- 40 C.F.R. § 60.4320, 60.4330(a) and Table 1 (Line 3 & 12) – Operating Requirements
- 40 C.F.R. § 60.4333(a) – General Requirements
- 40 C.F.R. § 60.4340(a) and 60.4400 – Continuous Compliance Requirements
- 40 C.F.R. § 60.4360, 60.4365, and 60.4370(b) – Monitoring Requirements
- 40 C.F.R. § 60.4375 and 60.4395 – Reporting Requirements

40 C.F.R. 63 Subpart YYYY

- 40 C.F.R. § 63.6095(d) – Compliance Requirements
- 40 C.F.R. § 63.6145(a) and (c) – Notification Requirements

45 C.S.R. 14, Permit R14-0013E

Condition 4.1.5.a – The unit shall be limited to the maximum operating capacity as shown in the table;

Emission Unit ID	Maximum Turbine Rating (hp)
003-04	15,067 @ 32°F

Condition 4.1.5.b – Emissions released from the unit shall not exceed the maximum individual hourly (per operation mode) and total combined annual emission limits set forth in the following table;

Emission Point ID	Pollutant	Maximum Emission Rates				
		Individual Hourly (lb/hr)				Combined Annual (ton/yr)
		Normal Load	Low Temp	Low Load	Startup / Shutdown	
T03, T04	NO _x	6.96	21.16	16.10	3.10	64.52
	CO	7.07	30.37	653.41	272.70	96.29
	VOC	0.81	1.75	7.47	3.12	7.62
	SO ₂	7.36	7.36	7.36	7.36	0.81
	PM	0.85	0.85	0.85	0.85	7.45
	CO ₂ e	15,087	15,087	15,087	15,087	132,159
	Formaldehyde	0.09	0.09	0.09	0.09	0.80

Condition 4.1.5.c – The unit shall be equipped with SoLoNO_x lean premixed combustion technology to ensure uniform air/fuel mixture and to prevent formation of NO_x

Condition 4.1.5.d – Pursuant to 40 CFR 60, Subpart KKKK, the permittee must meet the following requirements

- Meet the emission limits for NO_x specified in Table 1 to this subpart
- If your turbine is located in a continental area, you must comply with either paragraph (a)(1), (a)(2), or (a)(3) of this section
 - You must not cause to be discharged into the atmosphere from the unit any gases which contain SO₂ in excess of 110 ng/J (0.90 lb/MWh) gross output;
 - You must not burn in the unit any fuel which contains total potential sulfur emissions in excess of 26 ng SO₂/J (0.060 lb SO₂/mmBtu) heat input. If your unit simultaneously fires multiple fuels, each fuel must meet this requirement

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. 60 Subpart KKKK

40 C.F.R. § 60.4320 and Table 1 (Line 2 or Line 12) – Unit must meet NO_x emission standards; 100 ppm at 15% O₂ or 960 ng/J of useful output (5.5 lb/MWh) while at or above 75% peak load. At less than 75% peak load or less than 0 degrees F, the NO_x emission standard is 150 ppm at 15% O₂ or 1,100 ng/J of useful output (4.7 lb/MWh).

40 C.F.R. § 60.4330(a)(2) – Unit shall not burn any fuel which contains total potential sulfur emissions in excess of 0.06 lb/MMBtu heat input

40 C.F.R. § 60.4333(a) – Must operate and maintain unit and associated equipment in a manner consistent with good engineering practices

40 C.F.R. § 60.4340(a) and 60.4400 – Conduct initial performance test within 180 days of startup or within 60 days of achieving maximum load operation, whichever comes first. Subsequent testing shall be conducted on an annual basis no more than fourteen (14) months following previous test. There are two test methodologies that shall be used in conducting the performance testing; (i) – measure NO_x concentration in PPM using EPA Method 7E or EPA Method 20, or (ii) – measure NO_x and diluent gas concentrations using either EPA Methods 3A or 7E, or Method 20.

40 C.F.R. § 60.4360 – Monitor sulfur content of fuel being fired to turbine

40 C.F.R. § 60.4365 – Permittee can elect to not monitor sulfur content being fired to turbine if fuel is demonstrated to not exceed potential sulfur emissions of 0.06 lb SO₂/mmBtu

40 C.F.R. § 60.4370(b) – If you elect not to demonstrate sulfur content using options in §60.4365, and the fuel is supplied without intermediate bulk storage, the sulfur content value of the gaseous fuel must be determined and recorded once per unit operating day.

40 C.F.R. 63 Subpart YYYY

40 C.F.R. § 63.6095(d) – *Stay of Standards for Gas-Fired Subcategories*; New or Reconstructed stationary combustion turbines as defined by this subpart need not comply with any requirements other than those set forth in § 63.6145 until EPA takes final action.

40 C.F.R. § 63.6145(a) and (c) – Submit the required initial notification for new or reconstructed stationary combustion turbines no later than 120 days after becoming subject to the subpart

45 C.S.R. 14, Permit R14-0013E

Condition 4.2.4 – The permittee shall calculate and record on a monthly and rolling twelve month basis, the emissions of each pollutant limited under Table 4.1.5(c) generated by units 003-03 and 003-04. The calculations shall be based on the emission factors used in the permit applications R14-0013E and the following information

- Monitor and record the number of hours the units operate at normal load operations, low temperature operations, and low load operations
- Monitor and record the number of startup/shutdowns of each unit

Condition 4.2.6.d – Permittee shall meet all applicable monitoring, compliance demonstration, source specific recording and reporting requirements as give under 40 CFR 63 Subpart KKKK specifically §§ 60.4300; 60.4305; 60.4320 (NO_x – Table 1 (Line 3); 60.4330(a)(2)(SO₂); 60.4333(a); 60.4340(a) (NO_x annual tests); 60.4360 (sulfur content monitoring); 60.4365(a); 60.4370(b).

Condition 4.3.2 – In addition to the NO_x performance testing as required under Subpart KKKK, within 60 days after achieving full load, but not later than 180 days after initial startup, and at such times thereafter as may be required by the Director, the permittee shall conduct, or have conducted, a performance test on each unit to determine compliance with the “normal load” CO emission limit specified under Table 4.1.5(b) and (c) and in accordance with 3.3.1. The permittee shall use an appropriate EPA approved test method as given under 40 CFR 60 Appendix A and approved in writing by the Director in a protocol submitted pursuant to 3.3.1(c). The testing shall take place with the engines are operating at “normal load” as defined under 4.2.3(a) and 4.2.4(a).

Condition 4.3.3 – In addition to the NO_x performance testing as required under Subpart KKKK, within 60 days after achieving full load, but not later than 180 days after initial startup, and at such times thereafter as may be required by the Director, the permittee shall conduct, or have conducted, a performance test on one of the units to determine compliance with the PM emission limit (including condensables) specified under Table 4.1.5(c) and in accordance with 3.3.1. The permittee shall use an appropriate EPA approved test method for PM including condensables. The permittee shall submit a testing protocol pursuant to 3.3.1(c). The testing shall take place with the engines are operating at “normal load” as defined under 4.2.3(a) and 4.2.4(a).

Condition 4.3.4.c – Permittee shall meet all applicable testing requirements as given under 40 CFR 60 Subpart KKKK specifically 40 CFR § 60.4400.

Condition 4.4.1 – Permittee shall keep records of monitoring information that include the following;

- Date, place, and time of sampling or measurements
- Date(s) analyses were performed
- Company or entity that performed analysis
- Analytical techniques or methods used
- Results of analysis
- Operating conditions existing at the time of sampling or measurement

Condition 4.4.4 – Permittee shall meet all applicable record-keeping requirements as given under 40 CFR 60 Subpart KKKK.

Condition 4.5.1.d – Permittee shall meet all applicable reporting requirements as given under 40 CFR 60 Subpart KKKK, specifically § 60.4375; 60.4395

Are you in compliance with all applicable requirements for this emission unit? 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: 001-03	Emission unit name: Wastewater Evaporator Boiler	List any control devices associated with this emission unit: NA
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Provide a description of the emission unit (type, method of operation, design parameters, etc.):
Wastewater Evaporator Boiler

Manufacturer: NA	Model number: NA	Serial number: NA
Construction date: NA	Installation date: 1997	Modification date(s): NA

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 0.195 mmBtu/hr

Maximum Hourly Throughput: NA	Maximum Annual Throughput: NA	Maximum Operating Schedule: 8,760
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Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes, is it? <input checked="" type="checkbox"/> Indirect Fired <input type="checkbox"/> Direct Fired
Maximum design heat input and/or maximum horsepower rating: 0.195 mmBtu/hr	Type and Btu/hr rating of burners: 0.195 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
190.6 scf/hr / 1,670,000 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		1,020 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	
<p>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.).</p> <p>See Appendix A</p>			

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

40 C.F.R. 63 Subpart DDDDD

40 CFR § 63.7500 and Table 3 (Lines 1 & 4) – Operating Requirements

40 CFR § 63.7505 – General Requirements

40 CFR § 63.7510(e), 63.7530(e), and (f) – Initial Compliance Requirements

40 CFR § 63.7515(d) – Subsequent Testing & Tune Up Requirements

40 CFR § 63.7540(a)(12) – Continuous Compliance Requirements

40 CFR § 63.7545(e) – Notification Requirements

40 CFR § 63.7550 – Reporting Requirements

40 CFR § 63.7555 and 63.7560 – Recordkeeping Requirements

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

40 C.F.R. 63 Subpart DDDDD

40 CFR § 63.7500(a)(1), (e) and Table 3 (Line 1) – Conduct a tune-up of the unit every five (5) years

40 CFR § 63.7500(a)(1) and Table 3 (Line 4) – Conduct a onetime energy assessment of the unit

40 CFR § 63.7505 – Must be in compliance with emission limits, work practice standards, and operating limits at all times

40 CFR § 63.7510(e) – Initial tune-up and onetime energy assessment of unit must be completed by January 31, 2016.

40 CFR § 63.7515(d) and 63.7540(a)(12) – Subsequent tune-ups of the unit must be conducted every five (5) years

40 CFR § 63.7530(e) and (f) – The owner/operator of the unit shall submit the Notification of Compliance Status containing both a signed certification saying the energy assessment was completed according to Table 3 (Line 4) and the results of the initial compliance demonstration

40 CFR § 63.7545(e) – The Notification of Compliance Status report shall be submitted by March 31, 2016 and shall contain information specified by (e)(1) through (e)(8)

40 CFR § 63.7550(b)(5) – Submit the first and subsequent compliance reports according to the dates specified for Title V Semi-Annual Reporting.

40 CFR § 63.7550(c) – Compliance reports must contain information specified in (c)(5)(i) through (c)(5)(iii), (c)(5)(xiv) and (c)(5)(xvii)

40 CFR § 63.7555 – Maintain records of notifications and reports submitted to show compliance

40 CFR § 63.7560 – Maintain records in a form suitable and readily available for expeditious review for five (5) years.

Are you in compliance with all applicable requirements for this emission unit? 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: 001-04	Emission unit name: Fuel Gas Heater	List any control devices associated with this emission unit: NA
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Provide a description of the emission unit (type, method of operation, design parameters, etc.):
Fuel Gas Heater

Manufacturer: NA	Model number: NA	Serial number: NA
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Construction date: NA	Installation date: 2013	Modification date(s): NA
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Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 0.75 mmBtu/hr

Maximum Hourly Throughput: NA	Maximum Annual Throughput: NA	Maximum Operating Schedule: 8,760
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Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes, is it? <input checked="" type="checkbox"/> Indirect Fired <input type="checkbox"/> Direct Fired
--	---

Maximum design heat input and/or maximum horsepower rating: 0.75 mmBtu/hr	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
735.2 scf/hr / 6,440,000 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		1,020 Btu/scf

<i>Emissions Data</i>		
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
<p>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.).</p> <p>See Appendix A</p>		

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

40 C.F.R. 63 Subpart DDDDD

40 CFR § 63.7500 and Table 3 (Line 1) – Operating Requirements

40 CFR § 63.7505 – General Requirements

40 CFR § 63.7510(g), and 63.7530(f) – Initial Compliance Requirements

40 CFR § 63.7515(d) – Subsequent Testing & Tune Up Requirements

40 CFR § 63.7540(a)(12) – Continuous Compliance Requirements

40 CFR § 63.7545 – Notification Requirements

40 CFR § 63.7550 – Reporting Requirements

40 CFR § 63.7555 and 63.7560 – Recordkeeping Requirements

45 C.S.R. 14, Permit R14-0013E

Condition 4.1.6.a – Maximum emissions from the unit shall not exceed the limits given in the following table;

Pollutant	Hourly (lb/hr)	Annual (ton/yr)
CO	0.06	0.27
NO _x	0.07	0.32

Condition 4.1.6.g – As the annual emission limits given in the table are based on operating 8,760 hours/year, there is no limit on the annual hours of operation or fuel usage of the unit

Condition 4.1.6.h – No person shall cause, suffer, allow, or permit emission of smoke and/or PM into the open air from any fuel burning unit which is greater than ten (10) percent opacity based on a six minute block average.

Condition 4.1.8.a – The unit shall be designed and constructed with a maximum design heat input of 0.75 mmBtu/hr.

Condition 4.1.8.b – For the purpose of complying with Subpart DDDDD of Part 63, the permittee shall perform a tune-up on the heater in accordance with 40 CFR § 63.7540(a)(12). The first tune-up shall be completed no later than 61 months after initial startup and thereafter once every 61 months. If the unit is not in operation at the time of the required tune-up, the tune-up must be conducted within thirty (30) calendar days of startup. Such tune ups shall consist of the following;

- As applicable, inspect the burner, and clean or replace any components of the burner as necessary (permittee may delay the burner inspection until the next scheduled unit shutdown, but inspected at least once every 72 months). At units where entry into a piece of process equipment or into a storage vessel is required to complete the tune up inspections, inspections are required only during planned entries into the storage vessel or process equipment;
- Inspect the flame pattern, as applicable, and adjust the burner as necessary to optimized the flame pattern. The adjustment should be consistent with the manufacturer’s specs, if applicable;
- Inspect the system controlling the air to fuel ratio, as applicable, and ensure that it is correctly calibrated and functioning properly.
- Optimize total emissions of CO. This optimization should be consistent with the manufacturer’s specs, if available, and with any NOX requirement to which the unit is subject; and
- Measure the concentrations in the effluent stream of CO in ppm by volume, and oxygen in volume percent, before and after the adjustments are made (measurements may be either on a dry or wet basis, as long as it is the same basis before and after the adjustments are made). Measurements may be taken using a portable CO analyzer.

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

40 C.F.R. 63 Subpart DDDDD

40 CFR § 63.7500(a)(1), (e) and Table 3 (Line 1) – Conduct a tune-up of the unit every five (5) years

40 CFR § 63.7505 – Must be in compliance with emission limits, work practice standards, and operating limits at all times

40 CFR § 63.7510(g) – Must demonstrate initial compliance no later than 61 months after April 1, 2013 or upon initial startup, whichever is later

40 CFR § 63.7515(d) and 63.7540(a)(12) – Subsequent tune-ups of the unit must be conducted every five (5) years

40 CFR § 63.7530(f) – The owner/operator of the unit shall submit the Notification of Compliance Status containing the results of the initial compliance demonstration

40 CFR § 63.7545(c) – Submit the required initial notification no later than 15 days after becoming subject to the subpart

40 CFR § 63.7545(e) – The Notification of Compliance Status report shall be submitted no later than 60 days after initial compliance demonstration and shall contain information specified by (e)(1) through (e)(8)

40 CFR § 63.7550(b)(5) – Submit the first and subsequent compliance reports according to the dates specified for Title V Semi-Annual Reporting.

40 CFR § 63.7550(c) – Compliance reports must contain information specified in (c)(5)(i) through (c)(5)(iii), (c)(5)(xiv) and (c)(5)(xvii)

40 CFR § 63.7555 – Maintain records of notifications and reports submitted to show compliance

40 CFR § 63.7560 – Maintain records in a form suitable and readily available for expeditious review for five (5) years.

45 C.S.R. 14, Permit R14-0013E

Condition 4.4.1 – Permittee shall keep records of monitoring information that include the following;

- Date, place, and time of sampling or measurements
- Date(s) analyses were performed
- Company or entity that performed analysis
- Analytical techniques or methods used
- Results of analysis
- Operating conditions existing at the time of sampling or measurement

Condition 4.4.5 – Permittee shall keep the following records in accordance with 40 CFR § 63.7575. This includes but is not limited to the following information during the tune up as required by Condition 4.8.1.b and 40 CFR § 63.7540.

- Concentrations of CO in the effluent stream in ppm by volume, and oxygen in volume percent, measured at high fire or typical operating load, before and after the tune up of the boiler or process heater.
- A description of any corrective actions taken as part of the tune up.

Condition 4.5.2 – Permittee shall submit “5 year compliance reports” for the unit electronically using CEDRI that is accessed through the EPA’s CDX. However if the reporting form is not available in CEDRI at the time the report is due the permittee shall submit the report to the Administrator and Director using the addresses listed in Condition 3.5.3. The first compliance report shall be submitted no later than five years after initial startup of the unit and the first date ending on Jan 31.. Subsequent reports must be submitted once every five years afterwards. Such reports shall contain information specified in (c)(5)(i) through (c)(5)(iv), and (c)(5)(xiv) which are;

- Permittee and facility name, and address;
- Process unit information emission limitations, and operating limitations;
- Date of report and beginning and ending dates of the reporting period;
- Include the date of the most recent tune up for each boiler; and
- Include the date of the most recent burner inspection if it was not done on a 5 year period and was delayed until the next scheduled or unscheduled unit shutdown.

Are you in compliance with all applicable requirements for this emission unit? 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: 001-05	Emission unit name: Fuel Gas Heater	List any control devices associated with this emission unit: NA
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Provide a description of the emission unit (type, method of operation, design parameters, etc.):
Fuel Gas Heater

Manufacturer: NA	Model number: NA	Serial number: NA
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Construction date: NA	Installation date: 2013	Modification date(s): NA
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Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 0.25 mmBtu/hr

Maximum Hourly Throughput: NA	Maximum Annual Throughput: NA	Maximum Operating Schedule: 8,760
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Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes, is it? <input checked="" type="checkbox"/> Indirect Fired <input type="checkbox"/> Direct Fired
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Maximum design heat input and/or maximum horsepower rating: 0.25 mmBtu/hr	Type and Btu/hr rating of burners: 0.25 mmBtu/hr
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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
245.4 scf/hr / 2,150,000 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		1,020 Btu/scf

<i>Emissions Data</i>		
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
<p>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.).</p> <p>See Appendix A</p>		

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

40 C.F.R. 63 Subpart DDDDD

40 CFR § 63.7500 and Table 3 (Line 1) – Operating Requirements

40 CFR § 63.7505 – General Requirements

40 CFR § 63.7510(g), and 63.7530(f) – Initial Compliance Requirements

40 CFR § 63.7515(d) – Subsequent Testing & Tune Up Requirements

40 CFR § 63.7540(a)(12) – Continuous Compliance Requirements

40 CFR § 63.7545 – Notification Requirements

40 CFR § 63.7550 – Reporting Requirements

40 CFR § 63.7555 and 63.7560 – Recordkeeping Requirements

45 C.S.R. 14, Permit R14-0013E

Condition 4.1.6.b – Maximum emissions from the unit shall not exceed the limits given in the following table;

Pollutant	Hourly (lb/hr)	Annual (ton/yr)
CO	0.02	0.09
NO _x	0.02	0.11

Condition 4.1.6.g – As the annual emission limits given in the table are based on operating 8,760 hours/year, there is no limit on the annual hours of operation or fuel usage of the unit

Condition 4.1.6.h – No person shall cause, suffer, allow, or permit emission of smoke and/or PM into the open air from any fuel burning unit which is greater than ten (10) percent opacity based on a six minute block average.

Condition 4.1.8.a – The unit shall be designed and constructed with a maximum design heat input of 0.25 mmBtu/hr.

Condition 4.1.8.b – For the purpose of complying with Subpart DDDDD of Part 63, the permittee shall perform a tune-up on the heater in accordance with 40 CFR § 63.7540(a)(12). The first tune-up shall be completed no later than 61 months after initial startup and thereafter once every 61 months. If the unit is not in operation at the time of the required tune-up, the tune-up must be conducted within thirty (30) calendar days of startup. Such tune ups shall consist of the following;

- As applicable, inspect the burner, and clean or replace any components of the burner as necessary (permittee may delay the burner inspection until the next scheduled unit shutdown, but inspected at least once every 72 months). At units where entry into a piece of process equipment or into a storage vessel is required to complete the tune up inspections, inspections are required only during planned entries into the storage vessel or process equipment;
- Inspect the flame pattern, as applicable, and adjust the burner as necessary to optimized the flame pattern. The adjustment should be consistent with the manufacturer’s specs, if applicable;
- Inspect the system controlling the air to fuel ratio, as applicable, and ensure that it is correctly calibrated and functioning properly.
- Optimize total emissions of CO. This optimization should be consistent with the manufacturer’s specs, if available, and with any NOX requirement to which the unit is subject; and
- Measure the concentrations in the effluent stream of CO in ppm by volume, and oxygen in volume percent, before and after the adjustments are made (measurements may be either on a dry or wet basis, as long as it is the same basis before and after the adjustments are made). Measurements may be taken using a portable CO analyzer.

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

40 C.F.R. 63 Subpart DDDDD

40 CFR § 63.7500(a)(1), (e) and Table 3 (Line 1) – Conduct a tune-up of the unit every five (5) years

40 CFR § 63.7505 – Must be in compliance with emission limits, work practice standards, and operating limits at all times

40 CFR § 63.7510(g) – Must demonstrate initial compliance no later than 61 months after April 1, 2013 or upon initial startup, whichever is later

40 CFR § 63.7515(d) and 63.7540(a)(12) – Subsequent tune-ups of the unit must be conducted every five (5) years

40 CFR § 63.7530(f) – The owner/operator of the unit shall submit the Notification of Compliance Status containing the results of the initial compliance demonstration

40 CFR § 63.7545(c) – Submit the required initial notification no later than 15 days after becoming subject to the subpart

40 CFR § 63.7545(e) – The Notification of Compliance Status report shall be submitted no later than 60 days after initial compliance demonstration and shall contain information specified by (e)(1) through (e)(8)

40 CFR § 63.7550(b)(5) – Submit the first and subsequent compliance reports according to the dates specified for Title V Semi-Annual Reporting.

40 CFR § 63.7550(c) – Compliance reports must contain information specified in (c)(5)(i) through (c)(5)(iii), (c)(5)(xiv) and (c)(5)(xvii)

40 CFR § 63.7555 – Maintain records of notifications and reports submitted to show compliance

40 CFR § 63.7560 – Maintain records in a form suitable and readily available for expeditious review for five (5) years.

45 C.S.R. 14, Permit R14-0013E

Condition 4.4.1 – Permittee shall keep records of monitoring information that include the following;

- Date, place, and time of sampling or measurements
- Date(s) analyses were performed
- Company or entity that performed analysis
- Analytical techniques or methods used
- Results of analysis
- Operating conditions existing at the time of sampling or measurement

Condition 4.4.5 – Permittee shall keep the following records in accordance with 40 CFR § 63.7575. This includes but is not limited to the following information during the tune up as required by Condition 4.8.1.b and 40 CFR § 63.7540.

- Concentrations of CO in the effluent stream in ppm by volume, and oxygen in volume percent, measured at high fire or typical operating load, before and after the tune up of the boiler or process heater.
- A description of any corrective actions taken as part of the tune up.

Condition 4.5.2 – Permittee shall submit “5 year compliance reports” for the unit electronically using CEDRI that is accessed through the EPA’s CDX. However if the reporting form is not available in CEDRI at the time the report is due the permittee shall submit the report to the Administrator and Director using the addresses listed in Condition 3.5.3. The first compliance report shall be submitted no later than five years after initial startup of the unit and the first date ending on Jan 31.. Subsequent reports must be submitted once every five years afterwards. Such reports shall contain information specified in (c)(5)(i) through (c)(5)(iv), and (c)(5)(xiv) which are;

- Permittee and facility name, and address;
- Process unit information emission limitations, and operating limitations;
- Date of report and beginning and ending dates of the reporting period;
- Include the date of the most recent tune up for each boiler; and
- Include the date of the most recent burner inspection if it was not done on a 5 year period and was delayed until the next scheduled or unscheduled unit shutdown.

Are you in compliance with all applicable requirements for this emission unit? 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: 001-07	Emission unit name: Fuel Gas Heater	List any control devices associated with this emission unit: NA
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Provide a description of the emission unit (type, method of operation, design parameters, etc.):
Fuel Gas Heater

Manufacturer: NA	Model number: NA	Serial number: NA
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Construction date: NA	Installation date: 2017	Modification date(s): NA
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Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 0.50 mmBtu/hr

Maximum Hourly Throughput: NA	Maximum Annual Throughput: NA	Maximum Operating Schedule: 8,760
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Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes, is it? <input checked="" type="checkbox"/> Indirect Fired <input type="checkbox"/> Direct Fired
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Maximum design heat input and/or maximum horsepower rating: 0.50 mmBtu/hr	Type and Btu/hr rating of burners: 0.50 mmBtu/hr
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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
489.7 scf/hr / 4,290,000 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		1,020 Btu/scf

<i>Emissions Data</i>		
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
<p>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.).</p> <p>See Appendix A</p>		

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

40 C.F.R. 63 Subpart DDDDD

40 CFR § 63.7500 and Table 3 (Line 1) – Operating Requirements

40 CFR § 63.7505 – General Requirements

40 CFR § 63.7510(g), and 63.7530(f) – Initial Compliance Requirements

40 CFR § 63.7515(d) – Subsequent Testing & Tune Up Requirements

40 CFR § 63.7540(a)(12) – Continuous Compliance Requirements

40 CFR § 63.7545 – Notification Requirements

40 CFR § 63.7550 – Reporting Requirements

40 CFR § 63.7555 and 63.7560 – Recordkeeping Requirements

45 C.S.R. 14, Permit R14-0013E

Condition 4.1.6.c – Maximum emissions from the unit shall not exceed the limits given in the following table;

Pollutant	Hourly (lb/hr)	Annual (ton/yr)
CO	0.04	0.18
NO _x	0.05	0.21

Condition 4.1.6.g – As the annual emission limits given in the table are based on operating 8,760 hours/year, there is no limit on the annual hours of operation or fuel usage of the unit

Condition 4.1.6.h – No person shall cause, suffer, allow, or permit emission of smoke and/or PM into the open air from any fuel burning unit which is greater than ten (10) percent opacity based on a six minute block average.

Condition 4.1.8.a – The unit shall be designed and constructed with a maximum design heat input of 0.50 mmBtu/hr.

Condition 4.1.8.b – For the purpose of complying with Subpart DDDDD of Part 63, the permittee shall perform a tune-up on the heater in accordance with 40 CFR § 63.7540(a)(12). The first tune-up shall be completed no later than 61 months after initial startup and thereafter once every 61 months. If the unit is not in operation at the time of the required tune-up, the tune-up must be conducted within thirty (30) calendar days of startup. Such tune ups shall consist of the following;

- As applicable, inspect the burner, and clean or replace any components of the burner as necessary (permittee may delay the burner inspection until the next scheduled unit shutdown, but inspected at least once every 72 months). At units where entry into a piece of process equipment or into a storage vessel is required to complete the tune up inspections, inspections are required only during planned entries into the storage vessel or process equipment;
- Inspect the flame pattern, as applicable, and adjust the burner as necessary to optimized the flame pattern. The adjustment should be consistent with the manufacturer’s specs, if applicable;
- Inspect the system controlling the air to fuel ratio, as applicable, and ensure that it is correctly calibrated and functioning properly.
- Optimize total emissions of CO. This optimization should be consistent with the manufacturer’s specs, if available, and with any NOX requirement to which the unit is subject; and
- Measure the concentrations in the effluent stream of CO in ppm by volume, and oxygen in volume percent, before and after the adjustments are made (measurements may be either on a dry or wet basis, as long as it is the same basis before and after the adjustments are made). Measurements may be taken using a portable CO analyzer.

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

40 C.F.R. 63 Subpart DDDDD

40 CFR § 63.7500(a)(1), (e) and Table 3 (Line 1) – Conduct a tune-up of the unit every five (5) years

40 CFR § 63.7505 – Must be in compliance with emission limits, work practice standards, and operating limits at all times

40 CFR § 63.7510(g) – Must demonstrate initial compliance no later than 61 months after April 1, 2013 or upon initial startup, whichever is later

40 CFR § 63.7515(d) and 63.7540(a)(12) – Subsequent tune-ups of the unit must be conducted every five (5) years

40 CFR § 63.7530(f) – The owner/operator of the unit shall submit the Notification of Compliance Status containing the results of the initial compliance demonstration

40 CFR § 63.7545(c) – Submit the required initial notification no later than 15 days after becoming subject to the subpart

40 CFR § 63.7545(e) – The Notification of Compliance Status report shall be submitted no later than 60 days after initial compliance demonstration and shall contain information specified by (e)(1) through (e)(8)

40 CFR § 63.7550(b)(5) – Submit the first and subsequent compliance reports according to the dates specified for Title V Semi-Annual Reporting.

40 CFR § 63.7550(c) – Compliance reports must contain information specified in (c)(5)(i) through (c)(5)(iii), (c)(5)(xiv) and (c)(5)(xvii)

40 CFR § 63.7555 – Maintain records of notifications and reports submitted to show compliance

40 CFR § 63.7560 – Maintain records in a form suitable and readily available for expeditious review for five (5) years.

45 C.S.R. 14, Permit R14-0013E

Condition 4.4.1 – Permittee shall keep records of monitoring information that include the following;

- Date, place, and time of sampling or measurements
- Date(s) analyses were performed
- Company or entity that performed analysis
- Analytical techniques or methods used
- Results of analysis
- Operating conditions existing at the time of sampling or measurement

Condition 4.4.5 – Permittee shall keep the following records in accordance with 40 CFR § 63.7575. This includes but is not limited to the following information during the tune up as required by Condition 4.8.1.b and 40 CFR § 63.7540.

- Concentrations of CO in the effluent stream in ppm by volume, and oxygen in volume percent, measured at high fire or typical operating load, before and after the tune up of the boiler or process heater.
- A description of any corrective actions taken as part of the tune up.

Condition 4.5.2 – Permittee shall submit “5 year compliance reports” for the unit electronically using CEDRI that is accessed through the EPA’s CDX. However if the reporting form is not available in CEDRI at the time the report is due the permittee shall submit the report to the Administrator and Director using the addresses listed in Condition 3.5.3. The first compliance report shall be submitted no later than five years after initial startup of the unit and the first date ending on Jan 31.. Subsequent reports must be submitted once every five years afterwards. Such reports shall contain information specified in (c)(5)(i) through (c)(5)(iv), and (c)(5)(xiv) which are;

- Permittee and facility name, and address;
- Process unit information emission limitations, and operating limitations;
- Date of report and beginning and ending dates of the reporting period;
- Include the date of the most recent tune up for each boiler; and
- Include the date of the most recent burner inspection if it was not done on a 5 year period and was delayed until the next scheduled or unscheduled unit shutdown.

Are you in compliance with all applicable requirements for this emission unit? 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: 001-06	Emission unit name: Catalytic Space Heaters	List any control devices associated with this emission unit: NA
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Provide a description of the emission unit (type, method of operation, design parameters, etc.):
40 Catalytic Space Heaters

Manufacturer: NA	Model number: NA	Serial number: NA
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Construction date: NA	Installation date: 2013	Modification date(s): NA
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Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 2.88 mmBtu/hr (TOTAL)

Maximum Hourly Throughput: NA	Maximum Annual Throughput: NA	Maximum Operating Schedule: 8,760
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Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes, is it? <input type="checkbox"/> Indirect Fired <input checked="" type="checkbox"/> Direct Fired
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Maximum design heat input and/or maximum horsepower rating: 2.88 mmBtu/hr (TOTAL)	Type and Btu/hr rating of burners: 2.88 mmBtu/hr (TOTAL)
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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
2,823 scf/hr / 24,730,000 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		1,020 Btu/scf

<i>Emissions Data</i>		
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
<p>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.).</p> <p>See Appendix A</p>		

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 C.S.R. 14, Permit R14-0013E

Condition 4.1.6.d – Maximum emissions from the unit shall not exceed the limits given in the following table (Both hourly and annual limits are aggregate limits for all 40 catalytic heaters);

Pollutant	Hourly (lb/hr)	Annual (ton/yr)
CO	0.24	1.04
NO _x	0.28	1.24

Condition 4.1.6.g – As the annual emission limits given in the table are based on operating 8,760 hours/year, there is no limit on the annual hours of operation or fuel usage of the unit

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.*)

NA

Are you in compliance with all applicable requirements for this emission unit? 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: 001-08	Emission unit name: Catalytic Space Heaters	List any control devices associated with this emission unit: NA
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Provide a description of the emission unit (type, method of operation, design parameters, etc.):
26 Catalytic Space Heaters

Manufacturer: NA	Model number: NA	Serial number: NA
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Construction date: NA	Installation date: 2017	Modification date(s): NA
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Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 1.34 mmBtu/hr (TOTAL)

Maximum Hourly Throughput: NA	Maximum Annual Throughput: NA	Maximum Operating Schedule: 8,760
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Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes, is it? <input type="checkbox"/> Indirect Fired <input checked="" type="checkbox"/> Direct Fired
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Maximum design heat input and/or maximum horsepower rating: 1.34 mmBtu/hr (TOTAL)	Type and Btu/hr rating of burners: 1.34 mmBtu/hr (TOTAL)
---	--

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
1,313 scf/hr / 11,510,000 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		1,020 Btu/scf

<i>Emissions Data</i>		
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
<p>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.).</p> <p>See Appendix A</p>		

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 C.S.R. 14, Permit R14-0013E

Condition 4.1.6.e – Maximum emissions from the unit shall not exceed the limits given in the following table (Both hourly and annual limits are aggregate limits for all 26 catalytic heaters);

Pollutant	Hourly (lb/hr)	Annual (ton/yr)
CO	0.11	0.48
NO _x	0.13	0.57

Condition 4.1.6.g – As the annual emission limits given in the table are based on operating 8,760 hours/year, there is no limit on the annual hours of operation or fuel usage of the unit

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.)

NA

Are you in compliance with all applicable requirements for this emission unit? 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: 001-09	Emission unit name: Catalytic Space Heaters	List any control devices associated with this emission unit: NA
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Provide a description of the emission unit (type, method of operation, design parameters, etc.):
22 Catalytic Space Heaters

Manufacturer: NA	Model number: NA	Serial number: NA
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Construction date: NA	Installation date: 2013	Modification date(s): NA
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Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 0.66 mmBtu/hr (TOTAL)

Maximum Hourly Throughput: NA	Maximum Annual Throughput: NA	Maximum Operating Schedule: 8,760
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Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes, is it? <input type="checkbox"/> Indirect Fired <input checked="" type="checkbox"/> Direct Fired
--	---

Maximum design heat input and/or maximum horsepower rating: 0.66 mmBtu/hr (TOTAL)	Type and Btu/hr rating of burners: 0.66 mmBtu/hr (TOTAL)
---	--

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
647.3 scf/hr / 5,670,000 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		1,020 Btu/scf

<i>Emissions Data</i>		
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
<p>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.).</p> <p>See Appendix A</p>		

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 C.S.R. 14, Permit R14-0013E

Condition 4.1.6.f – Maximum emissions from the unit shall not exceed the limits given in the following table (Both hourly and annual limits are aggregate limits for all 22 catalytic heaters);

Pollutant	Hourly (lb/hr)	Annual (ton/yr)
CO	0.05	0.24
NO _x	0.06	0.28

Condition 4.1.6.g – As the annual emission limits given in the table are based on operating 8,760 hours/year, there is no limit on the annual hours of operation or fuel usage of the unit

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.)

NA.

Are you in compliance with all applicable requirements for this emission unit? 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

**Lost River Compressor Station, Facility ID No. 031-00002
Mathias, 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

**Lost River Compressor Station, Facility ID No. 031-00002
Mathias, 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: OC1	List all emission units associated with this control device. 002-13
---	---

Manufacturer: NA	Model number: NA	Installation date: 2008
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Type of Air Pollution Control Device:

<input type="checkbox"/> Baghouse/Fabric Filter	<input type="checkbox"/> Venturi Scrubber	<input type="checkbox"/> Multiclone
<input type="checkbox"/> Carbon Bed Adsorber	<input type="checkbox"/> Packed Tower Scrubber	<input type="checkbox"/> Single Cyclone
<input type="checkbox"/> Carbon Drum(s)	<input type="checkbox"/> Other Wet Scrubber	<input type="checkbox"/> Cyclone Bank
<input type="checkbox"/> Catalytic Incinerator	<input type="checkbox"/> Condenser	<input type="checkbox"/> Settling Chamber
<input type="checkbox"/> Thermal Incinerator	<input type="checkbox"/> Flare	<input checked="" type="checkbox"/> Other (describe) <u>Oxidation Catalyst</u>
<input type="checkbox"/> Wet Plate Electrostatic Precipitator	<input type="checkbox"/> 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	80%	75%
VOC	80%	75%
Formaldehyde	80%	77%

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

Exhaust Flow Rate: 12,784 scfm
 Exhaust Catalytic Inlet Temperature: 869 °F

Stack Dimensions: 42' x 3.33'

Is this device subject to the CAM requirements of 40 C.F.R. 64? Yes 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.

Maintain the catalyst so that the pressure drop across the catalyst does not change by more than two inches of water at 100 percent load plus or minus 10 percent from the pressure drop across the catalyst that was measured during the initial performance test; and maintain the temperature of the exhaust so that the catalyst inlet temperature is greater than or equal to 450°F and less than or equal to 1350°F

Conduct performance tests atleast semiannually at any load condition within plus or minus 10 percent of 100 percent load for the unit

Keep records of maintenance conducted and operating schedule on the RICE

ATTACHMENT H

COMPLIANCE ASSURANCE MONITORING FORM (NOT APPLICABLE)

Title V Operating Permit Renewal Application

**Lost River Compressor Station, Facility ID No. 031-00002
Mathias, 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

Lost River Compressor Station, Facility ID No. 031-00002
Mathias, 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 - Lost River Compressor Station**

Criteria Pollutants

Proposed PTE - Criteria Pollutants

Source	PM	PM10	PM2.5	SO2	NOx	CO	VOC	CO2e
Engines (ton/yr)	35.408	35.408	35.408	1.798	797.364	530.556	89.841	294178.150
Heaters/Boilers/Reboilers (ton/yr)	0.215	0.215	0.215	0.020	2.823	2.372	0.155	3369.710
Storage Tanks (ton/yr)	-	-	-	-	-	-	1.680	-
Fugitives (ton/yr)	-	-	-	-	-	-	1.010	23.476
Blowdown Venting (ton/yr)	-	-	-	-	-	-	35.329	22673.121
Total Emissions (ton/yr)	35.623	35.623	35.623	1.818	800.187	532.928	128.015	320244.456
Total Emissions (lb/hr)	8.133	8.133	8.133	0.415	182.691	121.673	29.227	73115.173

Hazardous Air Pollutants (HAPs)

Proposed PTE - HAPs

Source	Acetaldehyde	Benzene	Toluene	Ethylbenzene	Xylene	n-Hexane	Formaldehyde	Total HAPs
Engines (ton/yr)	4.5804	0.9270	0.7268	0.1146	0.2658	0.3412	30.625	44.762
Heaters/Boilers/Reboilers (ton/yr)	-	0.0001	0.0001	-	-	0.0508	0.002	0.053
Storage Tanks (ton/yr)	-	-	-	-	-	-	-	0.000
Fugitives (ton/yr)	-	-	-	-	-	-	-	0.000
Blowdown Venting (ton/yr)	-	-	-	-	-	-	-	0.000
Total Emissions (ton/yr)	4.580	0.927	0.727	0.115	0.266	0.392	30.627	44.816
Total Emissions (lb/hr)	1.046	0.212	0.166	0.026	0.061	0.089	6.992	10.232

Table 2. Reciprocating Engine / Integral Compressor Emissions (E07 - E09)
Clark TLA-8; 2SLB
Columbia Gas Transmission - Lost River 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	4.83E-02 lb/MMBtu (1)	0.97 (a)	4.83E-02 lb/MMBtu (1)	4.23 (c)
SO ₂	20.0 grains S / 100 ft ³ (2)	1.12 (e)	0.25 grains S / 100 ft ³ (2)	0.06 (f)
NO _x	9.50E+00 g/hp-hr (3)	56.55 (b)	7.19E+00 g/hp-hr (3)	187.50 (d)
CO	3.10E+00 g/hp-hr (3)	18.45 (b)	2.60E+00 g/hp-hr (3)	67.80 (d)
VOC	1.20E-01 lb/MMBtu (1)	2.40 (a)	1.20E-01 lb/MMBtu (1)	10.50 (c)
Hazardous Air Pollutants				
1,1,2,2-Tetrachloroethane	6.63E-05 lb/MMBtu (1)	0.001 (a)	6.63E-05 lb/MMBtu (1)	0.006 (c)
1,1,2-Trichloroethane	5.27E-05 lb/MMBtu (1)	0.001 (a)	5.27E-05 lb/MMBtu (1)	0.005 (c)
1,3-Butadiene	8.20E-04 lb/MMBtu (1)	0.016 (a)	8.20E-04 lb/MMBtu (1)	0.072 (c)
1,3-Dichloropropene	4.38E-05 lb/MMBtu (1)	0.001 (a)	4.38E-05 lb/MMBtu (1)	0.004 (c)
2-Methylnaphthalene	2.14E-05 lb/MMBtu (1)	0.000 (a)	2.14E-05 lb/MMBtu (1)	0.002 (c)
2,2,4-Trimethylpentane	8.46E-04 lb/MMBtu (1)	0.017 (a)	8.46E-04 lb/MMBtu (1)	0.074 (c)
Acetaldehyde	7.76E-03 lb/MMBtu (1)	0.155 (a)	7.76E-03 lb/MMBtu (1)	0.679 (c)
Acrolein	7.78E-03 lb/MMBtu (1)	0.155 (a)	7.78E-03 lb/MMBtu (1)	0.681 (c)
Benzene	1.94E-03 lb/MMBtu (1)	0.039 (a)	1.94E-03 lb/MMBtu (1)	0.170 (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)	0.001 (a)	6.07E-05 lb/MMBtu (1)	0.005 (c)
Chlorobenzene	4.44E-05 lb/MMBtu (1)	0.001 (a)	4.44E-05 lb/MMBtu (1)	0.004 (c)
Chloroform	4.71E-05 lb/MMBtu (1)	0.001 (a)	4.71E-05 lb/MMBtu (1)	0.004 (c)
Ethylbenzene	1.08E-04 lb/MMBtu (1)	0.002 (a)	1.08E-04 lb/MMBtu (1)	0.009 (c)
Ethylene Dibromide	7.34E-05 lb/MMBtu (1)	0.001 (a)	7.34E-05 lb/MMBtu (1)	0.006 (c)
Formaldehyde	5.52E-02 lb/MMBtu (1)	1.103 (a)	5.52E-02 lb/MMBtu (1)	4.831 (c)
Methanol	2.48E-03 lb/MMBtu (1)	0.050 (a)	2.48E-03 lb/MMBtu (1)	0.217 (c)
Methylene Chloride	1.47E-04 lb/MMBtu (1)	0.003 (a)	1.47E-04 lb/MMBtu (1)	0.013 (c)
n-Hexane	4.45E-04 lb/MMBtu (1)	0.009 (a)	4.45E-04 lb/MMBtu (1)	0.039 (c)
Naphthalene	9.63E-05 lb/MMBtu (1)	0.002 (a)	9.63E-05 lb/MMBtu (1)	0.008 (c)
PAH (POM)	1.34E-04 lb/MMBtu (1)	0.003 (a)	1.34E-04 lb/MMBtu (1)	0.012 (c)
Phenol	4.21E-05 lb/MMBtu (1)	0.001 (a)	4.21E-05 lb/MMBtu (1)	0.004 (c)
Styrene	5.48E-05 lb/MMBtu (1)	0.001 (a)	5.48E-05 lb/MMBtu (1)	0.005 (c)
Toluene	9.63E-04 lb/MMBtu (1)	0.019 (a)	9.63E-04 lb/MMBtu (1)	0.084 (c)
Vinyl Chloride	2.47E-05 lb/MMBtu (1)	0.000 (a)	2.47E-05 lb/MMBtu (1)	0.002 (c)
Xylenes	2.68E-04 lb/MMBtu (1)	0.005 (a)	2.68E-04 lb/MMBtu (1)	0.023 (c)
Total HAP		1.589		6.959
Greenhouse Gas Emissions				
CO ₂	116.89 lb/MMBtu (4)	2335.44 (a)	116.89 lb/MMBtu (4)	10229.24 (c)
CH ₄	2.2E-03 lb/MMBtu (4)	0.04 (a)	2.2E-03 lb/MMBtu (4)	0.19 (c)
N ₂ O	2.2E-04 lb/MMBtu (4)	0.00 (a)	2.2E-04 lb/MMBtu (4)	0.02 (c)
CO ₂ e ^(g)	-	2337.86	-	10239.82

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 (g/hp-hr) * Engine Power Output (hp) * (lb/453.6g)

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 (g/hp-hr) * Engine Power Output (hp) * Annual Hours of operation (hr/yr) * (1ton/2000lbs) * (lb/453.6g)

SO₂ Emissions - If emission factor note 2 is used, use calculations (e) and (f) for hourly and annual emissions, respectively.

(e) Maximum Hourly Emissions SO₂ Calculation (lb/hr) = (20.0 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)

(f) Annual Emissions SO₂ Calculation (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) =	2013
Engine Power Output (hp) =	2,700
Number of Engines =	3
Average BSFC (BTU/HP-hr) =	7,400 (5)
Heat Content Natural Gas(Btu/scf) =	1,020.0 (6)
Fuel Throughput (ft ³ /hr) =	19,588.2 (7)
PTE Hours of Operation =	1

ANNUAL EMISSION INPUTS	
Engine Power Output (kW) =	2013
Engine Power Output (hp) =	2,700
Number of Engines =	3
Average BSFC (BTU/HP-hr) =	7,400 (5)
Heat Content Natural Gas(Btu/scf) =	1,020.0 (6)
Fuel Throughput (ft ³ /hr) =	19,588.2 (7)
PTE Hours of Operation =	8,760

(g) CO₂ equivalent = [(CO₂ emissions)*(GWP_{CO2})]+[(CH₄ emissions)*(GWP_{CH4})]+[(N₂O emissions)*(GWP_{N2O})]
 Global Warming Potential (GWP)

CO ₂	1	(8)
CH ₄	25	(8)
N ₂ O	298	(8)

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) AP-42, Chapter 5.3, Section 5.3.1

(3) WV NSR Permit, R14-0013E, Condition 4.1.2.b - Table 4.1.2(b)

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

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

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

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

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

Table 3. Reciprocating Engine / Integral Compressor Emissions (E10)
Clark TLAD-10; 2SLB
Columbia Gas Transmission - Lost River 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	1.86E-01 g/hp-hr (1)	1.90 (b)	1.85E-01 g/hp-hr (1)	8.30 (d)
SO ₂	9.78E-03 g/hp-hr (1)	0.10 (b)	4.46E-03 g/hp-hr (1)	0.20 (d)
NO _x	2.00E+00 g/hp-hr (1)	20.50 (b)	2.00E+00 g/hp-hr (1)	89.60 (d)
CO	2.20E+00 g/hp-hr (1)	22.50 (b)	2.20E+00 g/hp-hr (1)	98.50 (d)
VOC	8.02E-01 g/hp-hr (1)	8.20 (b)	7.99E-01 g/hp-hr (1)	35.80 (d)
Hazardous Air Pollutants				
1,1,2,2-Tetrachloroethane	6.63E-05 lb/MMBtu (2)	0.003 (a)	6.63E-05 lb/MMBtu (2)	0.011 (c)
1,1,2-Trichloroethane	5.27E-05 lb/MMBtu (2)	0.002 (a)	5.27E-05 lb/MMBtu (2)	0.009 (c)
1,3-Butadiene	8.20E-04 lb/MMBtu (2)	0.032 (a)	8.20E-04 lb/MMBtu (2)	0.142 (c)
1,3-Dichloropropene	4.38E-05 lb/MMBtu (2)	0.002 (a)	4.38E-05 lb/MMBtu (2)	0.008 (c)
2-Methylnaphthalene	2.14E-05 lb/MMBtu (2)	0.001 (a)	2.14E-05 lb/MMBtu (2)	0.004 (c)
2,2,4-Trimethylpentane	8.46E-04 lb/MMBtu (2)	0.033 (a)	8.46E-04 lb/MMBtu (2)	0.146 (c)
Acetaldehyde	7.76E-03 lb/MMBtu (2)	0.306 (a)	7.76E-03 lb/MMBtu (2)	1.341 (c)
Acrolein	7.78E-03 lb/MMBtu (2)	0.307 (a)	7.78E-03 lb/MMBtu (2)	1.344 (c)
Benzene	1.94E-03 lb/MMBtu (2)	0.077 (a)	1.94E-03 lb/MMBtu (2)	0.335 (c)
Biphenyl	3.95E-06 lb/MMBtu (2)	0.000 (a)	3.95E-06 lb/MMBtu (2)	0.001 (c)
Carbon Tetrachloride	6.07E-05 lb/MMBtu (2)	0.002 (a)	6.07E-05 lb/MMBtu (2)	0.010 (c)
Chlorobenzene	4.44E-05 lb/MMBtu (2)	0.002 (a)	4.44E-05 lb/MMBtu (2)	0.008 (c)
Chloroform	4.71E-05 lb/MMBtu (2)	0.002 (a)	4.71E-05 lb/MMBtu (2)	0.008 (c)
Ethylbenzene	1.08E-04 lb/MMBtu (2)	0.004 (a)	1.08E-04 lb/MMBtu (2)	0.019 (c)
Ethylene Dibromide	7.34E-05 lb/MMBtu (2)	0.003 (a)	7.34E-05 lb/MMBtu (2)	0.013 (c)
Formaldehyde	5.52E-02 lb/MMBtu (2)	2.177 (a)	5.52E-02 lb/MMBtu (2)	9.536 (c)
Methanol	2.48E-03 lb/MMBtu (2)	0.098 (a)	2.48E-03 lb/MMBtu (2)	0.428 (c)
Methylene Chloride	1.47E-04 lb/MMBtu (2)	0.006 (a)	1.47E-04 lb/MMBtu (2)	0.025 (c)
n-Hexane	4.45E-04 lb/MMBtu (2)	0.018 (a)	4.45E-04 lb/MMBtu (2)	0.077 (c)
Naphthalene	9.63E-05 lb/MMBtu (2)	0.004 (a)	9.63E-05 lb/MMBtu (2)	0.017 (c)
PAH (POM)	1.34E-04 lb/MMBtu (2)	0.005 (a)	1.34E-04 lb/MMBtu (2)	0.023 (c)
Phenol	4.21E-05 lb/MMBtu (2)	0.002 (a)	4.21E-05 lb/MMBtu (2)	0.007 (c)
Styrene	5.48E-05 lb/MMBtu (2)	0.002 (a)	5.48E-05 lb/MMBtu (2)	0.009 (c)
Toluene	9.63E-04 lb/MMBtu (2)	0.038 (a)	9.63E-04 lb/MMBtu (2)	0.166 (c)
Vinyl Chloride	2.47E-05 lb/MMBtu (2)	0.001 (a)	2.47E-05 lb/MMBtu (2)	0.004 (c)
Xylenes	2.68E-04 lb/MMBtu (2)	0.011 (a)	2.68E-04 lb/MMBtu (2)	0.046 (c)
Total HAP		3.136		13.737
Greenhouse Gas Emissions				
CO ₂	116.89 lb/MMBtu (3)	4610.11 (a)	116.89 lb/MMBtu (3)	20192.26 (c)
CH ₄	2.2E-03 lb/MMBtu (3)	0.09 (a)	2.2E-03 lb/MMBtu (3)	0.38 (c)
N ₂ O	2.2E-04 lb/MMBtu (3)	0.01 (a)	2.2E-04 lb/MMBtu (3)	0.04 (c)
CO ₂ e ^(e)	-	4614.87	-	20213.13

Calculations:

Maximum Hourly Emissions - If emission factor note 2 or 3 is used, use calculation (a). If emission factor note 1 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 (g/hp-hr) * Engine Power Output (hp) * (lb/453.6g)

Annual Emissions - If emission factor note 2 or 3 is used, use calculation (c). If emission factor note 1 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 (g/hp-hr) * Engine Power Output (hp) * Annual Hours of operation (hr/yr) * (1ton/2000lbs) * (lb/453.6g)

MAXIMUM HOURLY EMISSION INPUTS	
Engine Power Output (kW) =	3460
Engine Power Output (hp) =	4,640
Number of Engines =	1
Average BSFC (BTU/HP-hr) =	8,500 (4)
Heat Content Natural Gas(Btu/scf) =	1,020.0 (5)
Fuel Throughput (ft3/hr) =	38,666.7 (6)
PTE Hours of Operation =	1

ANNUAL EMISSION INPUTS	
Engine Power Output (kW) =	3460
Engine Power Output (hp) =	4,640
Number of Engines =	1
Average BSFC (BTU/HP-hr) =	8,500 (4)
Heat Content Natural Gas(Btu/scf) =	1,020.0 (5)
Fuel Throughput (ft3/hr) =	38,666.7 (6)
PTE Hours of Operation =	8,760

(e) CO₂ equivalent = [(CO₂ emissions)*(GWP_{CO2})]+[(CH₄ emissions)*(GWP_{CH4})]+[(N₂O emissions)*(GWP_{N2O})]
 Global Warming Potential (GWP)

CO ₂	1	(7)
CH ₄	25	(7)
N ₂ O	298	(7)

Notes:

(1) WV NSR Permit, R14-0013E, Condition 4.1.3.b - Table 4.1.3(b)

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

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

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

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

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

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

Table 4. Reciprocating Engine / Integral Compressor Emissions (E11)
Caterpillar G3616; 4SLB
Columbia Gas Transmission - Lost River 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	3.4E-02 g/hp-hr	(1)	0.36 (b)	3.4E-02 g/hp-hr	(1)	1.57 (d)
SO ₂	2.4E-03 g/hp-hr	(1)	0.03 (b)	2.4E-03 g/hp-hr	(1)	0.11 (d)
NO _x	7.0E-01 g/hp-hr	(1)	7.30 (b)	7.0E-01 g/hp-hr	(1)	32.00 (d)
CO	6.3E-01 g/hp-hr	(1)	6.53 (b)	6.3E-01 g/hp-hr	(1)	28.60 (d)
VOC	1.6E-01 g/hp-hr	(1)	1.70 (b)	1.6E-01 g/hp-hr	(1)	7.42 (d)
Hazardous Air Pollutants						
1,1,2,2-Tetrachloroethane	4.00E-05 lb/MMBtu	(2)	0.001 (a)	4.00E-05 lb/MMBtu	(2)	0.005 (c)
1,1,2-Trichloroethane	3.18E-05 lb/MMBtu	(2)	0.001 (a)	3.18E-05 lb/MMBtu	(2)	0.004 (c)
1,3-Butadiene	2.67E-04 lb/MMBtu	(2)	0.008 (a)	2.67E-04 lb/MMBtu	(2)	0.035 (c)
1,3-Dichloropropene	2.64E-05 lb/MMBtu	(2)	0.001 (a)	2.64E-05 lb/MMBtu	(2)	0.004 (c)
2-Methylnaphthalene	3.32E-05 lb/MMBtu	(2)	0.001 (a)	3.32E-05 lb/MMBtu	(2)	0.004 (c)
2,2,4-Trimethylpentane	2.50E-05 lb/MMBtu	(2)	0.001 (a)	2.50E-05 lb/MMBtu	(2)	0.003 (c)
Acetaldehyde	8.36E-03 lb/MMBtu	(2)	0.253 (a)	8.36E-03 lb/MMBtu	(2)	1.110 (c)
Acrolein	5.14E-03 lb/MMBtu	(2)	0.156 (a)	5.14E-03 lb/MMBtu	(2)	0.682 (c)
Benzene	4.40E-04 lb/MMBtu	(2)	0.013 (a)	4.40E-04 lb/MMBtu	(2)	0.058 (c)
Biphenyl	2.12E-03 lb/MMBtu	(2)	0.064 (a)	2.12E-03 lb/MMBtu	(2)	0.281 (c)
Carbon Tetrachloride	3.67E-05 lb/MMBtu	(2)	0.001 (a)	3.67E-05 lb/MMBtu	(2)	0.005 (c)
Chlorobenzene	3.04E-05 lb/MMBtu	(2)	0.001 (a)	3.04E-05 lb/MMBtu	(2)	0.004 (c)
Chloroform	2.85E-05 lb/MMBtu	(2)	0.001 (a)	2.85E-05 lb/MMBtu	(2)	0.004 (c)
Ethylbenzene	3.97E-05 lb/MMBtu	(2)	0.001 (a)	3.97E-05 lb/MMBtu	(2)	0.005 (c)
Ethylene Dibromide	4.43E-05 lb/MMBtu	(2)	0.001 (a)	4.43E-05 lb/MMBtu	(2)	0.006 (c)
Formaldehyde	1.14E-01 g/hp-hr	(1)	1.190 (b)	1.14E-01 g/hp-hr	(1)	5.212 (d)
Methanol	2.50E-03 lb/MMBtu	(2)	0.076 (a)	2.50E-03 lb/MMBtu	(2)	0.332 (c)
Methylene Chloride	2.00E-05 lb/MMBtu	(2)	0.001 (a)	2.00E-05 lb/MMBtu	(2)	0.003 (c)
n-Hexane	1.11E-03 lb/MMBtu	(2)	0.034 (a)	1.11E-03 lb/MMBtu	(2)	0.147 (c)
Naphthalene	7.44E-05 lb/MMBtu	(2)	0.002 (a)	7.44E-05 lb/MMBtu	(2)	0.010 (c)
PAH (POM)	2.69E-05 lb/MMBtu	(2)	0.001 (a)	2.69E-05 lb/MMBtu	(2)	0.004 (c)
Phenol	1.04E-05 lb/MMBtu	(2)	0.000 (a)	1.04E-05 lb/MMBtu	(2)	0.001 (c)
Styrene	2.36E-05 lb/MMBtu	(2)	0.001 (a)	2.36E-05 lb/MMBtu	(2)	0.003 (c)
Toluene	4.08E-04 lb/MMBtu	(2)	0.012 (a)	4.08E-04 lb/MMBtu	(2)	0.054 (c)
Vinyl Chloride	1.49E-05 lb/MMBtu	(2)	0.000 (a)	1.49E-05 lb/MMBtu	(2)	0.002 (c)
Xylenes	1.84E-04 lb/MMBtu	(2)	0.006 (a)	1.84E-04 lb/MMBtu	(2)	0.024 (c)
Total HAP			1.827			8.004
Greenhouse Gas Emissions						
CO ₂	116.89 lb/MMBtu	(3)	3542.21 (a)	116.89 lb/MMBtu	(3)	15514.87 (c)
CH ₄	2.2E-03 lb/MMBtu	(3)	0.07 (a)	2.2E-03 lb/MMBtu	(3)	0.29 (c)
N ₂ O	2.2E-04 lb/MMBtu	(3)	0.01 (a)	2.2E-04 lb/MMBtu	(3)	0.03 (c)
CO ₂ e ^(e)	-	-	3545.87	-	-	15530.90

Calculations:

Maximum Hourly Emissions - If emission factor note 2 or 3 is used, use calculation (a). If emission factor note 1 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 (g/hp-hr) * Engine Power Output (hp) * (lb/453.6g)

Annual Emissions - If emission factor note 2 or 3 is used, use calculation (c). If emission factor note 1 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 (g/hp-hr) * Engine Power Output (hp) * Annual Hours of operation (hr/yr) * (1ton/2000lbs) * (lb/453.6g)

MAXIMUM HOURLY EMISSION INPUTS	
Engine Power Output (kW) =	3531
Engine Power Output (hp) =	4,735
Number of Engines =	1
Average BSFC (BTU/HP-hr) =	6,400 (4)
Heat Content Natural Gas(Btu/scf) =	1,020.0 (5)
Fuel Throughput (ft3/hr) =	29,709.8 (6)
PTE Hours of Operation =	1

ANNUAL EMISSION INPUTS	
Engine Power Output (kW) =	3531
Engine Power Output (hp) =	4,735
Number of Engines =	1
Average BSFC (BTU/HP-hr) =	6,400 (4)
Heat Content Natural Gas(Btu/scf) =	1,020.0 (5)
Fuel Throughput (ft3/hr) =	29,709.8 (6)
PTE Hours of Operation =	8,760

(e) CO₂ equivalent = [(CO₂ emissions)*(GWP_{CO2})]+[(CH₄ emissions)*(GWP_{CH4})]+[(N₂O emissions)*(GWP_{N2O})]
 Global Warming Potential (GWP)

CO ₂	1	(7)
CH ₄	25	(7)
N ₂ O	298	(7)

Notes:

(1) WV NSR Permit, R14-0013E, Condition 4.1.4.b - Table 4.1.4(b)

(2) 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.

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

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

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

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

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

**Table 5. Reciprocating Engine / Generator Emissions (G3)
Waukesha VGF-P48GL; 4SLB
Columbia Gas Transmission - Lost River Compressor Station**

Pollutant	Emission Factor	PTE (lb/hr)	PTE (ton/yr)
Criteria Pollutants			
PM/PM10/PM2.5	9.98E-03 lb/MMBtu (1)	0.072 (a)	0.018 (c)
SO ₂ (Hourly)	20.0 grains S / 100 ft ² (2)	0.406 (e)	-
SO ₂ (Annual)	0.25 grains S / 100 ft ³ (2)	-	0.001 (f)
NO _x	2.00E+00 g/hp-hr (3)	4.69 (b)	1.17 (d)
CO	1.30E+00 g/hp-hr (3)	3.05 (b)	0.76 (d)
VOC	2.60E-01 g/hp-hr (3)	0.61 (b)	0.15 (d)
Hazardous Air Pollutants			
1,1,2,2-Tetrachloroethane	4.00E-05 lb/MMBtu (1)	0.000 (a)	0.000 (c)
1,1,2-Trichloroethane	3.18E-05 lb/MMBtu (1)	0.000 (a)	0.000 (c)
1,3-Butadiene	2.67E-04 lb/MMBtu (1)	0.002 (a)	0.000 (c)
1,3-Dichloropropene	2.64E-05 lb/MMBtu (1)	0.000 (a)	0.000 (c)
2-Methylnaphthalene	3.32E-05 lb/MMBtu (1)	0.000 (a)	0.000 (c)
2,2,4-Trimethylpentane	2.50E-05 lb/MMBtu (1)	0.000 (a)	0.000 (c)
Acetaldehyde	8.36E-03 lb/MMBtu (1)	0.061 (a)	0.015 (c)
Acrolein	5.14E-03 lb/MMBtu (1)	0.037 (a)	0.009 (c)
Benzene	4.40E-04 lb/MMBtu (1)	0.003 (a)	0.001 (c)
Carbon Tetrachloride	3.67E-05 lb/MMBtu (1)	0.000 (a)	0.000 (c)
Chlorobenzene	3.04E-05 lb/MMBtu (1)	0.000 (a)	0.000 (c)
Chloroform	2.85E-05 lb/MMBtu (1)	0.000 (a)	0.000 (c)
Ethylbenzene	3.97E-05 lb/MMBtu (1)	0.000 (a)	0.000 (c)
Ethylene Dibromide	4.43E-05 lb/MMBtu (1)	0.000 (a)	0.000 (c)
Formaldehyde	1.90E-01 g/hp-hr (3)	0.445 (a)	0.111 (c)
Methanol	2.50E-03 lb/MMBtu (1)	0.018 (a)	0.005 (c)
Methylene Chloride	2.00E-05 lb/MMBtu (1)	0.000 (a)	0.000 (c)
n-Hexane	1.11E-03 lb/MMBtu (1)	0.008 (a)	0.002 (c)
Naphthalene	7.44E-05 lb/MMBtu (1)	0.001 (a)	0.000 (c)
PAH (POM)	2.69E-05 lb/MMBtu (1)	0.000 (a)	0.000 (c)
Phenanthrene	1.04E-05 lb/MMBtu (1)	0.000 (a)	0.000 (c)
Phenol	2.40E-05 lb/MMBtu (1)	0.000 (a)	0.000 (c)
Styrene	2.36E-05 lb/MMBtu (1)	0.000 (a)	0.000 (c)
Toluene	4.08E-04 lb/MMBtu (1)	0.003 (a)	0.001 (c)
Vinyl Chloride	1.49E-05 lb/MMBtu (1)	0.000 (a)	0.000 (c)
Xylenes	1.84E-04 lb/MMBtu (1)	0.001 (a)	0.000 (c)
Total HAPs		0.583	0.146
Greenhouse Gas Emissions			
CO ₂	116.89 lb/MMBtu (4)	848.03 (a)	212.01 (c)
CH ₄	2.2E-03 lb/MMBtu (4)	0.02 (a)	0.00 (c)
N ₂ O	2.2E-04 lb/MMBtu (4)	0.00 (a)	0.00 (c)
CO ₂ e ^(g)	-	848.90	212.23

Calculations:

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 (g/hp-hr) * Engine Power Output (hp) * (lb/453.6g)

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 (g/hp-hr) * Engine Power Output (hp) * Annual Hours of operation (hr/yr) * (1ton/2000lbs) * (lb/453.6g)

SO₂ Emissions - If emission factor note 2 is used, use calculations (e) and (f) for hourly and annual emissions, respectively.

(e) Maximum Hourly Emissions SO₂ Calculation (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 Calculation (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) =	793
Engine Power Output (hp) =	1,063
Number of Engines Operating at a Time =	1
Average BSFC (BTU/HP-hr) =	6,825 (5)
Heat Content Natural Gas(Btu/scf) =	1,020.0 (6)
Fuel Throughput (ft ³ /hr) =	7,112.7 (7)
PTE Hours of Operation =	500

(g) CO₂ equivalent = [(CO₂ emissions)*(GWP_{CO₂})]+[(CH₄ emissions)*(GWP_{CH₄})]+[(N₂O emissions)*(GWP_{N₂O})]
Global Warming Potential (GWP)

CO ₂	1	(8)
CH ₄	25	(8)
N ₂ O	298	(8)

Notes:

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

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

(3) Emission factors supplied from manufacturer's specification sheets

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

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

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

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

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

Table 6a. Combustion Turbine/Compressor Emissions (T01-T02)
Solar; Taurus 70
Columbia Gas Transmission - Lost River Compressor Station

Normal Load Operations (@ 0° F & > 50%)				Hours of Operation (hrs/yr)		8456		
Pollutant	Maximum Hourly Emissions			Annual Emissions				
	Emission Factor	PTE per Engine (lb/hr)		Emission Factor	PTE per Engine (tons/yr)			
Criteria Pollutants								
NOx	4.36E-04 lb/hp-hr	(3)	5.04	(b)	4.36E-04 lb/hp-hr	(3)	21.31	(d)
CO	4.43E-04 lb/hp-hr	(3)	5.12	(b)	4.43E-04 lb/hp-hr	(3)	21.65	(d)
VOC	6.32E-05 lb/hp-hr	(3)	0.73	(b)	6.32E-05 lb/hp-hr	(3)	3.09	(d)

Low Temperature Operations (0°F > Temp > -20°F)				Hours of Operation (hrs/yr)		240		
Pollutant	Maximum Hourly Emissions			Annual Emissions				
	Emission Factor	PTE per Engine (lb/hr)		Emission Factor	PTE per Engine (tons/yr)			
Criteria Pollutants								
NOx	1.30E-03 lb/hp-hr	(3)	15.00	(b)	1.30E-03 lb/hp-hr	(3)	1.80	(d)
CO	1.88E-03 lb/hp-hr	(3)	21.73	(b)	1.88E-03 lb/hp-hr	(3)	2.61	(d)
VOC	1.34E-04 lb/hp-hr	(3)	1.55	(b)	1.34E-04 lb/hp-hr	(3)	0.19	(d)

Very Low Temperature Operations (Temp < -20° F)				Hours of Operation (hrs/yr)		16		
Pollutant	Maximum Hourly Emissions			Annual Emissions				
	Emission Factor	PTE per Engine (lb/hr)		Emission Factor	PTE per Engine (tons/yr)			
Criteria Pollutants								
NOx	3.71E-03 lb/hp-hr	(3)	42.84	(b)	3.71E-03 lb/hp-hr	(3)	0.34	(d)
CO	2.82E-03 lb/hp-hr	(3)	32.60	(b)	2.82E-03 lb/hp-hr	(3)	0.26	(d)
VOC	1.34E-04 lb/hp-hr	(3)	1.55	(b)	1.34E-04 lb/hp-hr	(3)	0.01	(d)

Low Load Operations (<50%)				Hours of Operation (hrs/yr)		12		
Pollutant	Maximum Hourly Emissions			Annual Emissions				
	Emission Factor	PTE per Engine (lb/hr)		Emission Factor	PTE per Engine (tons/yr)			
Criteria Pollutants								
NOx	2.13E-03 lb/hp-hr	(3)	24.56	(b)	2.13E-03 lb/hp-hr	(3)	0.15	(d)
CO	1.48E-01 lb/hp-hr	(3)	1708.23	(b)	1.48E-01 lb/hp-hr	(3)	10.25	(d)
VOC	2.11E-03 lb/hp-hr	(3)	24.40	(b)	2.11E-03 lb/hp-hr	(3)	0.15	(d)

Startup / Shutdown Cycles				Hours of Operation (hrs/yr)		36		
Pollutant	Maximum Hourly Emissions			Annual Emissions				
	Emission Factor	PTE per Engine (lb/hr)		Emission Factor	PTE per Engine (tons/yr)			
Criteria Pollutants								
NOx	2.08E-04 lb/event	(3)	2.40	(b)	2.08E-04 lb/event	(3)	0.19	(d)
CO	1.86E-02 lb/event	(3)	214.60	(b)	1.86E-02 lb/event	(3)	16.74	(d)
VOC	2.68E-04 lb/event	(3)	3.10	(b)	2.68E-04 lb/event	(3)	0.24	(d)

Summarization of Operating Mode Emissions				Hours of Operation (hrs/yr)		8760		
Pollutant	Maximum Hourly Emissions			Annual Emissions				
	Emission Factor	PTE per Engine (lb/hr)		Emission Factor	PTE per Engine (tons/yr)			
Criteria Pollutants								
NOx	4.70E-04 lb/hp-hr		5.43	(b)	4.70E-04 lb/hp-hr		23.79	(d)
CO	1.02E-03 lb/hp-hr		11.76	(b)	1.02E-03 lb/hp-hr		51.50	(d)
VOC	7.26E-05 lb/hp-hr		0.84	(b)	7.26E-05 lb/hp-hr		3.67	(d)

**Table 6b. Combustion Turbine/Compressor Emissions (T01-T02)
Solar; Taurus 70
Columbia Gas Transmission - Lost River 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	6.60E-03 lb/MMBtu (1)	0.61 (a)	6.60E-03 lb/MMBtu (1)	2.69 (c)
SO ₂	20.0 grains S / 100 ft ³ (2)	4.69 (e)	0.25 grains S / 100 ft ³ (2)	0.26 (f)
Hazardous Air Pollutants				
1,3-Butadiene	4.30E-07 lb/MMBtu (4)	0.000 (a)	4.30E-07 lb/MMBtu (4)	0.000 (c)
Acetaldehyde	4.00E-05 lb/MMBtu (4)	0.004 (a)	4.00E-05 lb/MMBtu (4)	0.016 (c)
Acrolein	6.40E-06 lb/MMBtu (4)	0.001 (a)	6.40E-06 lb/MMBtu (4)	0.003 (c)
Benzene	1.20E-05 lb/MMBtu (4)	0.001 (a)	1.20E-05 lb/MMBtu (4)	0.005 (c)
Ethylbenzene	3.20E-05 lb/MMBtu (4)	0.003 (a)	3.20E-05 lb/MMBtu (4)	0.013 (c)
Formaldehyde	7.10E-04 lb/MMBtu (4)	0.066 (a)	7.10E-04 lb/MMBtu (4)	0.290 (c)
Naphthalene	1.30E-06 lb/MMBtu (4)	0.000 (a)	1.30E-06 lb/MMBtu (4)	0.001 (c)
PAH (POM)	2.20E-06 lb/MMBtu (4)	0.000 (a)	2.20E-06 lb/MMBtu (4)	0.001 (c)
Phenol	2.90E-05 lb/MMBtu (4)	0.003 (a)	2.90E-05 lb/MMBtu (4)	0.012 (c)
Toluene	1.30E-04 lb/MMBtu (4)	0.012 (a)	1.30E-04 lb/MMBtu (4)	0.053 (c)
Xylenes	6.40E-05 lb/MMBtu (4)	0.006 (a)	6.40E-05 lb/MMBtu (4)	0.026 (c)
Total HAP		0.096		0.419
Greenhouse Gas Emissions				
CO ₂	116.89 lb/MMBtu (5)	10883.261 (a)	116.89 lb/MMBtu (5)	47668.68 (c)
CH ₄	2.2E-03 lb/MMBtu (5)	0.205 (a)	2.2E-03 lb/MMBtu (5)	0.90 (c)
N ₂ O	2.2E-04 lb/MMBtu (5)	0.021 (a)	2.2E-04 lb/MMBtu (5)	0.09 (c)
CO ₂ e ^(g)	-	10894.509	-	47717.95

Calculations:

Maximum Hourly Emissions - If emission factor note 1, 4 or 5 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) * HHV Total Heat Input @ 0°F (mmBtu/hr)

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

Annual Emissions - If emission factor note 1, 4 or 5 is used, use calculation (c). If emission factor note 3 is used, use calculation (d).

(c) Annual emissions (tons/yr) = Emission factor (lb/MMBtu) * HHV Total Heat Input @ 0°F (mmBtu/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)

SO₂ Emissions - If emission factor note 2 is used, use calculations (e) and (f) for hourly and annual emissions, respectively.

(e) Maximum Hourly Emissions SO₂ Calculation (lb/hr) = (20.0 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)

(f) Annual Emissions SO₂ Calculation (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) =	8618
Engine Power Output (hp) @ 0°F =	11,557
Average BSFC (BTU/HP-hr) @ 0°F =	7,258 (6)
LHV Total Heat Input (mmBtu/hr) @ 0°F =	83.88 (7)
HHV Total Heat Input (mmBtu/hr) @ 0°F =	93.11 (8)
Fuel Throughput (ft ³ /hr) @ 0°F =	82,236.0 (9)
HHV Heat Content Natural Gas(Btu/scf) =	1,020 (10)
Number of Engines =	2
PTE Hours of Operation =	1

ANNUAL EMISSION INPUTS	
Engine Power Output (kW) =	8618
Engine Power Output (hp) @ 0°F =	11,557
Average BSFC (BTU/HP-hr) @ 0°F =	7,258 (6)
LHV Total Heat Input (mmBtu/hr) @ 0°F =	83.88 (7)
HHV Total Heat Input (mmBtu/hr) @ 0°F =	93.11 (8)
Fuel Throughput (ft ³ /hr) @ 0°F =	82,236.0 (9)
HHV Heat Content Natural Gas(Btu/scf) =	1,020 (10)
Number of Engines =	2
PTE Hours of Operation =	8,760

(g) CO₂ equivalent = [(CO₂ emissions)*(GWP_{CO2})]+[(CH₄ emissions)*(GWP_{CH4})]+[(N₂O emissions)*(GWP_{N2O})]
Global Warming Potential (GWP)

CO ₂	1	(11)
CH ₄	25	(11)
N ₂ O	298	(11)

Notes:

(1) AP-42, Chapter 3.1, Table 3.1-2a - Emission Factors for Criteria Pollutants and Greenhouse Gases from Stationary Gas Turbines (4/00)

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

(3) Emissions supplied from vendor data

(4) AP-42, Chapter 3.1, Table 3.1-3 - Emission Factors for Hazardous Air Pollutants from Natural Gas-Fired Stationary Gas Turbines (4/00)

(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) Low Heat Value (LHV) Total Heat Input = Power (HP) * BSFC (BTU/hp-hr) / (1000000BTU/mmBtu)

(8) High Heat Value (HHV) Total Heat Input = LHV * 1.11

(9) Fuel throughput = HHV Total Heat Input (mmBtu/hr) * (1000000Btu/mmBtu) / Heat Content (Btu/scf)

(10) Value obtained from AP-42, Chapter 3.1, Table 3.1-2a, footnote c

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

Table 7a. Combustion Turbine/Compressor Emissions (T03-T04)
Solar; Mars 100
Columbia Gas Transmission - Lost River Compressor Station

Normal Load Operations (@ 32° F & > 50%)				Hours of Operation (hrs/yr)		8483
Pollutant	Maximum Hourly Emissions			Annual Emissions		
	Emission Factor	PTE per Engine (lb/hr)		Emission Factor	PTE per Engine (tons/yr)	
Criteria Pollutants						
NOx	4.62E-04 lb/hp-hr (4)	6.96 (b)		4.62E-04 lb/hp-hr (4)	29.52 (d)	
CO	4.69E-04 lb/hp-hr (4)	7.07 (b)		4.69E-04 lb/hp-hr (4)	29.99 (d)	
VOC	5.38E-05 lb/hp-hr (4)	0.81 (b)		5.38E-05 lb/hp-hr (4)	3.44 (d)	
Low Temperature Operations (0°F > Temp > -20°F)				Hours of Operation (hrs/yr)		240
Pollutant	Maximum Hourly Emissions			Annual Emissions		
	Emission Factor	PTE per Engine (lb/hr)		Emission Factor	PTE per Engine (tons/yr)	
Criteria Pollutants						
NOx	1.40E-03 lb/hp-hr (4)	21.16 (b)		1.40E-03 lb/hp-hr (4)	2.54 (d)	
CO	2.04E-03 lb/hp-hr (4)	30.67 (b)		2.04E-03 lb/hp-hr (4)	3.68 (d)	
VOC	1.16E-04 lb/hp-hr (4)	1.75 (b)		1.16E-04 lb/hp-hr (4)	0.21 (d)	
Low Load Operations (<50%)				Hours of Operation (hrs/yr)		8
Pollutant	Maximum Hourly Emissions			Annual Emissions		
	Emission Factor	PTE per Engine (lb/hr)		Emission Factor	PTE per Engine (tons/yr)	
Criteria Pollutants						
NOx	1.07E-03 lb/hp-hr (4)	16.10 (b)		1.07E-03 lb/hp-hr (4)	0.06 (d)	
CO	4.34E-02 lb/hp-hr (4)	653.41 (b)		4.34E-02 lb/hp-hr (4)	2.61 (d)	
VOC	4.96E-04 lb/hp-hr (4)	7.47 (b)		4.96E-04 lb/hp-hr (4)	0.03 (d)	
Startup / Shutdown Cycles				Hours of Operation (hrs/yr)		29
Pollutant	Maximum Hourly Emissions			Annual Emissions		
	Emission Factor	PTE per Engine (lb/hr)		Emission Factor	PTE per Engine (tons/yr)	
Criteria Pollutants						
NOx	2.06E-04 lb/hp-hr (4)	3.10 (b)		2.06E-04 lb/hp-hr (4)	0.13 (d)	
CO	1.81E-02 lb/hp-hr (4)	272.70 (b)		1.81E-02 lb/hp-hr (4)	11.86 (d)	
VOC	2.07E-04 lb/hp-hr (4)	3.12 (b)		2.07E-04 lb/hp-hr (4)	0.14 (d)	
Summarization of Operating Mode Emissions				Hours of Operation (hrs/yr)		8760
Pollutant	Maximum Hourly Emissions			Annual Emissions		
	Emission Factor	PTE per Engine (lb/hr)		Emission Factor	PTE per Engine (tons/yr)	
Criteria Pollutants						
NOx	4.62E-04 lb/hp-hr (1)	6.96 (b)		4.89E-04 lb/hp-hr	32.26 (d)	
CO	4.69E-04 lb/hp-hr (1)	7.07 (b)		7.30E-04 lb/hp-hr	48.14 (d)	
VOC	5.38E-05 lb/hp-hr (1)	0.81 (b)		5.78E-05 lb/hp-hr	3.81 (d)	

Table 7b. Combustion Turbine/Compressor Emissions (T03-T04)
Solar; Mars 100
Columbia Gas Transmission - Lost River 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	6.60E-03 lb/MMBtu (2)	0.85 (a)	6.60E-03 lb/MMBtu (2)	3.72 (c)
SO ₂	20 grains S / 100 ft ³ (3)	7.21 (e)	0.25 grains S / 100 ft ³ (3)	0.39 (f)
Hazardous Air Pollutants				
1,3-Butadiene	4.30E-07 lb/MMBtu (5)	0.000 (a)	4.30E-07 lb/MMBtu (5)	0.000 (c)
Acetaldehyde	4.00E-05 lb/MMBtu (5)	0.005 (a)	4.00E-05 lb/MMBtu (5)	0.023 (c)
Acrolein	6.40E-06 lb/MMBtu (5)	0.001 (a)	6.40E-06 lb/MMBtu (5)	0.004 (c)
Benzene	1.20E-05 lb/MMBtu (5)	0.002 (a)	1.20E-05 lb/MMBtu (5)	0.007 (c)
Ethylbenzene	3.20E-05 lb/MMBtu (5)	0.004 (a)	3.20E-05 lb/MMBtu (5)	0.018 (c)
Formaldehyde	7.10E-04 lb/MMBtu (5)	0.091 (a)	7.10E-04 lb/MMBtu (5)	0.401 (c)
Naphthalene	1.30E-06 lb/MMBtu (5)	0.000 (a)	1.30E-06 lb/MMBtu (5)	0.001 (c)
PAH (POM)	2.20E-06 lb/MMBtu (5)	0.000 (a)	2.20E-06 lb/MMBtu (5)	0.001 (c)
Phenol	2.90E-05 lb/MMBtu (5)	0.004 (a)	2.90E-05 lb/MMBtu (5)	0.016 (c)
Toluene	1.30E-04 lb/MMBtu (5)	0.017 (a)	1.30E-04 lb/MMBtu (5)	0.073 (c)
Xylenes	6.40E-05 lb/MMBtu (5)	0.008 (a)	6.40E-05 lb/MMBtu (5)	0.036 (c)
Total HAP		0.132		0.580
Greenhouse Gas Emissions				
CO ₂	116.89 lb/MMBtu (6)	15060.52 (a)	116.89 lb/MMBtu (6)	65965.09 (c)
CH ₄	2.2E-03 lb/MMBtu (6)	0.28 (a)	2.2E-03 lb/MMBtu (6)	1.24 (c)
N ₂ O	2.2E-04 lb/MMBtu (6)	0.03 (a)	2.2E-04 lb/MMBtu (6)	0.12 (c)
CO ₂ e ^(g)	-	15076.09	-	66033.27

Calculations:

Maximum Hourly Emissions - If emission factor note 1, 4 or 5 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) * HHV Total Heat Input (mmBtu/hr)

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

Annual Emissions - If emission factor note 1, 4 or 5 is used, use calculation (c). If emission factor note 3 is used, use calculation (d).

(c) Annual emissions (tons/yr) = Emission factor (lb/MMBtu) * HHV Total Heat Input (mmBtu/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)

SO₂ Emissions - If emission factor note 3 is used, use calculations (e) and (f) for hourly and annual emissions, respectively.

(e) Maximum Hourly Emissions SO₂ Calculation (lb/hr) = (20.0 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)

(f) Annual Emissions SO₂ Calculation (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) =	11235
Engine Power Output (hp) =	15,067
Average BSFC (BTU/HP-hr) =	7,704 (7)
HHV Heat Content Natural Gas(Btu/scf) =	1,020.0 (8)
LHV Total Heat Input (mmBtu/hr) =	116.08 (9)
HHV Total Heat Input (mmBtu/hr) =	128.84 (10)
Fuel Throughput (ft ³ /hr) =	126,318.18 (11)
Number of Engines =	2
PTE Hours of Operation =	1

ANNUAL EMISSION INPUTS	
Engine Power Output (kW) =	11235
Engine Power Output (hp) =	15,067
Average BSFC (BTU/HP-hr) =	7,704 (7)
HHV Heat Content Natural Gas(Btu/scf) =	1,020.0 (8)
LHV Total Heat Input (mmBtu/hr) =	116.08 (9)
HHV Total Heat Input (mmBtu/hr) =	128.84 (10)
Fuel Throughput (ft ³ /hr) =	126,318.18 (11)
Number of Engines =	2
PTE Hours of Operation =	8,760

(g) CO₂ equivalent = [(CO₂ emissions)*(GWP_{CO2})]+[(CH₄ emissions)*(GWP_{CH4})]+[(N₂O emissions)*(GWP_{N2O})]
 Global Warming Potential (GWP)

CO ₂	1	(12)
CH ₄	25	(12)
N ₂ O	298	(12)

Notes:

- AP-42, Chapter 3.1, Table 3.1-2a - Emission Factors for Criteria Pollutants and Greenhouse Gases from Stationary Gas Turbines (4/00)
- AP-42, Chapter 5.3, Section 5.3.1
- Emissions supplied from vendor data
- AP-42, Chapter 3.1, Table 3.1-3 - Emission Factors for Hazardous Air Pollutants from Natural Gas-Fired Stationary Gas Turbines (4/00)
- Emission factors are from 40 CFR 98, Subpart C, Table C-1 and C-2.
- Fuel consumption from manufacturer's specification sheet.
- Low Heat Value (LHV) Total Heat Input = Power (HP) * BSFC (BTU/hp-hr) / (1000000BTU/mmBtu)
- High Heat Value (HHV) Total Heat Input = LHV * 1.11
- Fuel throughput = HHV Total Heat Input (mmBtu/hr) * (1000000Btu/mmBtu) / Heat Content (Btu/scf)
- Value obtained from AP-42, Chapter 3.1, Table 3.1-2a, footnote c
- Global Warming Potentials obtained from 40 CFR 98, Subpart A, Table A-1

Table 8. Wastewater Evaporator Boiler Emissions (BL2)
Unknown Make; Model
Columbia Gas Transmission - Lost River Compressor Station

Pollutant	Emission Factor	PTE (lb/hr)	PTE (ton/yr)
Criteria Pollutants			
PM/PM10/PM2.5	7.6 lb/MMcf (1)	0.00 (a)	0.01 (b)
SO ₂ (Hourly)	20 grains S / 100ft ³ (5)	0.01 (e)	-
SO ₂ (Annual)	0.25 grains S / 100ft ³ (5)	-	0.00 (f)
NO _x	100 lb/MMcf (2)	0.02 (a)	0.08 (a)
CO	84 lb/MMcf (2)	0.02 (a)	0.07 (a)
VOC	5.5 lb/MMcf (1)	0.00 (a)	0.00 (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)	0.002 (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	0.002
Greenhouse Gas Emissions			
CO ₂	116.89 lb/MMBtu (6)	22.79 (c)	99.83 (d)
CH ₄	2.2E-03 lb/MMBtu (6)	0.00 (c)	0.00 (d)
N ₂ O	2.2E-04 lb/MMBtu (6)	0.00 (c)	0.00 (d)
CO ₂ e ^(g)	-	22.82	99.94

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)

SO₂

- (e) Hourly Emissions SO₂ Calculation (lb/hr) = (20 grain S/100ft³) * Fuel throughput (MMft³/yr) * (1000000ft³/MMft³) / 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 Calculation (ton/yr) = (0.25 grain S/100ft³) * Fuel throughput (MMft³/yr) * (1000000ft³/MMft³) * (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) =	0.195
Number of Units =	1
Hours of Operation (hr/yr) =	8760
MMBTU/MMcf =	1020
PTE Fuel Use (MMft ³ /yr) =	1.67

- (g) CO₂ equivalent = [(CO₂ emissions)*(GWP_{CO2})]+[(CH₄ emissions)*(GWP_{CH4})]+[(N₂O emissions)*(GWP_{N2O})]
 Global Warming Potential (GWP)

CO ₂	1	(7)
CH ₄	25	(7)
N ₂ O	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 9. Fuel Gas Heater Emissions (H2)
Unknown Make; Model
Columbia Gas Transmission - Lost River Compressor Station**

Pollutant	Emission Factor	PTE (lb/hr)	PTE (ton/yr)
Criteria Pollutants			
PM/PM10/PM2.5	7.6 lb/MMcf (1)	0.01 (a)	0.02 (b)
SO ₂ (Hourly)	20 grains S / 100ft ³ (5)	0.04 (e)	-
SO ₂ (Annual)	0.25 grains S / 100ft ³ (5)	-	0.00 (f)
NOx	100 lb/MMcf (2)	0.07 (a)	0.32 (a)
CO	84 lb/MMcf (2)	0.06 (a)	0.27 (a)
VOC	5.5 lb/MMcf (1)	0.00 (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 ₂ O	2.2E-04 lb/MMBtu (6)	0.00 (c)	0.00 (d)
CO ₂ e ^(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/yr) * Hours of operation (hr/yr) * (1ton/2000lbs)

SO₂

- (e) Hourly Emissions SO₂ Calculation (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 Calculation (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 Units =	1
Hours of Operation (hr/yr) =	8760
MMBTu/MMcf =	1020
PTE Fuel Use (MMcf/yr) =	6.44

- (g) CO₂ equivalent = [(CO₂ emissions)*(GWP_{CO2})]+[(CH₄ emissions)*(GWP_{CH4})]+[(N₂O emissions)*(GWP_{N2O})]
 Global Warming Potential (GWP)

CO ₂	1	(7)
CH ₄	25	(7)
N ₂ O	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 10. Fuel Gas Heater Emissions (H3)
Unknown Make; Model
Columbia Gas Transmission - Lost River Compressor Station**

Pollutant	Emission Factor	PTE (lb/hr)	PTE (ton/yr)
Criteria Pollutants			
PM/PM10/PM2.5	7.6 lb/MMcf (1)	0.00 (a)	0.01 (b)
SO ₂ (Hourly)	20 grains S / 100ft ³ (5)	0.01 (e)	-
SO ₂ (Annual)	0.25 grains S / 100ft ³ (5)	-	0.00 (f)
NOx	100 lb/MMcf (2)	0.02 (a)	0.11 (a)
CO	84 lb/MMcf (2)	0.02 (a)	0.09 (a)
VOC	5.5 lb/MMcf (1)	0.00 (a)	0.01 (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)	0.002 (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	0.002
Greenhouse Gas Emissions			
CO ₂	116.89 lb/MMBtu (6)	29.22 (c)	127.99 (d)
CH ₄	2.2E-03 lb/MMBtu (6)	0.00 (c)	0.00 (d)
N ₂ O	2.2E-04 lb/MMBtu (6)	0.00 (c)	0.00 (d)
CO ₂ e ^(g)	-	29.25	128.13

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)

SO₂

(e) Hourly Emissions SO₂ Cacluation (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 Cacluation (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) =	0.25
Number of Units =	1
Hours of Operation (hr/yr) =	8760
MMBTU/MMcf =	1020
PTE Fuel Use (MMft ³ /yr) =	2.15

(g) CO₂ equivalent = [(CO₂ emissions)*(GWP_{CO2})]+[(CH₄ emissions)*(GWP_{CH4})]+[(N₂O emissions)*(GWP_{N2O})]
Global Warming Potential (GWP)

CO ₂	1	(7)
CH ₄	25	(7)
N ₂ O	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 11. Fuel Gas Heater Emissions (H4)
Unknown Make; Model
Columbia Gas Transmission - Lost River Compressor Station

Pollutant	Emission Factor	PTE (lb/hr)	PTE (ton/yr)
Criteria Pollutants			
PM/PM10/PM2.5	7.6 lb/MMcf (1)	0.00 (a)	0.02 (b)
SO ₂ (Hourly)	20 grains S / 100ft ³ (5)	0.03 (e)	-
SO ₂ (Annual)	0.25 grains S / 100ft ³ (5)	-	0.00 (f)
NOx	100 lb/MMcf (2)	0.05 (a)	0.21 (a)
CO	84 lb/MMcf (2)	0.04 (a)	0.18 (a)
VOC	5.5 lb/MMcf (1)	0.00 (a)	0.01 (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)	0.004 (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	0.004
Greenhouse Gas Emissions			
CO ₂	116.89 lb/MMBtu (6)	58.44 (c)	255.99 (d)
CH ₄	2.2E-03 lb/MMBtu (6)	0.00 (c)	0.00 (d)
N ₂ O	2.2E-04 lb/MMBtu (6)	0.00 (c)	0.00 (d)
CO ₂ e ^(a)	-	58.50	256.25

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)

SO₂

- (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)

Fuel Use (MMBtu/hr) =	0.5
Number of Units =	1
Hours of Operation (hr/yr) =	8760
MMBtu/MMcf =	1020
PTE Fuel Use (MMft ³ /yr) =	4.29

- (g) CO₂ equivalent = [(CO₂ emissions)*(GWP_{CO2})]+[(CH₄ emissions)*(GWP_{CH4})]+[(N₂O emissions)*(GWP_{N2O})]
 Global Warming Potential (GWP)

CO ₂	1	(7)
CH ₄	25	(7)
N ₂ O	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 12. Space Heater Emissions (SH1)
40 Catalytic Space Heaters
Columbia Gas Transmission - Lost River Compressor Station**

Pollutant	Emission Factor	PTE (lb/hr)	PTE (ton/yr)
Criteria Pollutants			
PM/PM10/PM2.5	7.6 lb/MMcf (1)	0.02 (a)	0.09 (b)
SO ₂ (Hourly)	20 grains S / 100ft ³ (5)	0.16 (e)	-
SO ₂ (Annual)	0.25 grains S / 100ft ³ (5)	-	0.01 (f)
NOx	100 lb/MMcf (2)	0.28 (a)	1.24 (b)
CO	84 lb/MMcf (2)	0.24 (a)	1.04 (b)
VOC	5.5 lb/MMcf (1)	0.02 (a)	0.07 (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)	0.001 (b)
Hexane	1.80E+00 lb/MMcf (4)	0.01 (a)	0.022 (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	0.023
Greenhouse Gas Emissions			
CO ₂	116.89 lb/MMBtu (6)	336.64 (c)	1474.49 (d)
CH ₄	2.2E-03 lb/MMBtu (6)	0.01 (c)	0.03 (d)
N ₂ O	2.2E-04 lb/MMBtu (6)	0.00 (c)	0.00 (d)
CO ₂ e ^(g)	-	336.99	1476.01

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/yr) * Hours of operation (hr/yr) * (1ton/2000lbs)

SO₂

(e) Hourly Emissions SO₂ Calculation (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 Calculation (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) =	2.88
Number of Units =	40
Hours of Operation (hr/yr) =	8760
MMBtu/MMcf =	1020
PTE Fuel Use (MMft ³ /yr) =	24.73

(g) CO₂ equivalent = [(CO₂ emissions)*(GWP_{CO2})]+[(CH₄ emissions)*(GWP_{CH4})]+[(N₂O emissions)*(GWP_{N2O})]
Global Warming Potential (GWP)

CO ₂	1	(7)
CH ₄	25	(7)
N ₂ O	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 13. Space Heater Emissions (SH2)
26 Catalytic Space Heaters
Columbia Gas Transmission - Lost River Compressor Station**

Pollutant	Emission Factor	PTE (lb/hr)	PTE (ton/yr)
Criteria Pollutants			
PM/PM10/PM2.5	7.6 lb/MMcf (1)	0.01 (a)	0.04 (b)
SO ₂ (Hourly)	20 grains S / 100ft ³ (5)	0.07 (e)	-
SO ₂ (Annual)	0.25 grains S / 100ft ³ (5)	-	0.00 (f)
NOx	100 lb/MMcf (2)	0.13 (a)	0.58 (b)
CO	84 lb/MMcf (2)	0.11 (a)	0.48 (b)
VOC	5.5 lb/MMcf (1)	0.01 (a)	0.03 (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)	0.010 (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	0.011
Greenhouse Gas Emissions			
CO ₂	116.89 lb/MMBtu (6)	156.63 (c)	686.05 (d)
CH ₄	2.2E-03 lb/MMBtu (6)	0.00 (c)	0.01 (d)
N ₂ O	2.2E-04 lb/MMBtu (6)	0.00 (c)	0.00 (d)
CO ₂ e ^(g)	-	156.79	686.75

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)

SO₂

- (e) Hourly Emissions SO₂ Calculation (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 Calculation (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) =	1.34
Number of Units =	26
Hours of Operation (hr/yr)=	8760
MMBtu/MMcf=	1020
PTE Fuel Use (MMft ³ /yr) =	11.51

- (g) CO₂ equivalent = [(CO₂ emissions)*(GWP_{CO2})]+[(CH₄ emissions)*(GWP_{CH4})]+[(N₂O emissions)*(GWP_{N2O})]
 Global Warming Potential (GWP)

CO ₂	1	(7)
CH ₄	25	(7)
N ₂ O	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 14. Space Heater Emissions (SH3)
22 Catalytic Space Heaters
Columbia Gas Transmission - Lost River Compressor Station**

Pollutant	Emission Factor	PTE (lb/hr)	PTE (ton/yr)
Criteria Pollutants			
PM/PM10/PM2.5	7.6 lb/MMcf (1)	0.00 (a)	0.02 (b)
SO ₂ (Hourly)	20 grains S / 100ft ³ (5)	0.04 (e)	-
SO ₂ (Annual)	0.25 grains S / 100ft ³ (5)	-	0.00 (f)
NO _x	100 lb/MMcf (2)	0.06 (a)	0.28 (b)
CO	84 lb/MMcf (2)	0.05 (a)	0.24 (b)
VOC	5.5 lb/MMcf (1)	0.00 (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)	0.005 (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	0.005
Greenhouse Gas Emissions			
CO ₂	116.89 lb/MMBtu (6)	77.15 (c)	337.90 (d)
CH ₄	2.2E-03 lb/MMBtu (6)	0.00 (c)	0.01 (d)
N ₂ O	2.2E-04 lb/MMBtu (6)	0.00 (c)	0.00 (d)
CO ₂ e ^(g)	-	77.23	338.25

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/yr) * Hours of operation (hr/yr) * (1ton/2000lbs)

SO₂

(e) Hourly Emissions SO₂ Calculation (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 Calculation (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) =	0.66
Number of Units =	22
Hours of Operation (hr/yr) =	8760
MMBtu/MMcf =	1020
PTE Fuel Use (MMft ³ /yr) =	5.67

(g) CO₂ equivalent = [(CO₂ emissions)*(GWP_{CO2})]+[(CH₄ emissions)*(GWP_{CH4})]+[(N₂O emissions)*(GWP_{N2O})]
Global Warming Potential (GWP)

CO ₂	1	(7)
CH ₄	25	(7)
N ₂ O	298	(7)

Notes:

- (1) AP-42, Chapter 1.4, Table 1.4-3. Emission Factors for Sulfur Dioxide from Natural Gas Combustion, July 1998.
- (2) AP-42, Chapter 1.4, Table 1.4-4. Emission Factors For Metals From Natural Gas Combustion, July 1998.
- (3) AP-42, Chapter 1.4, Table 1.4-3. Emission Factors for Speciated Organic Compounds from Natural Gas Combustion, July 1998.
- (4) AP-42, Chapter 5.3, Section 5.3.1
- (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 15. Tank Emissions
Columbia Gas Transmission - Lost River 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)
A01	1000	Glycol	None	0.78	1.75E-04	(1)	0.05	0.000	0.000
A02	2000	Glycol	None	1.57	1.58E-04	(1)	0.09	0.000	0.000
A03	3300	Glycol	None	2.58	1.59E-04	(1)	0.15	0.000	0.000
A05	5000	Pipeline Liquids	None	3.91	1.17E+00	(2)	1674.29	0.191	0.837
A06	5000	Pipeline Liquids	None	3.91	1.17E+00	(2)	1674.29	0.191	0.837
A07	4000	Used Oil	None	3.13	1.89E-03	(1)	2.16	0.000	0.001
A12	5000	Wastewater Mixture	None	3.91	1.91E-03	(1)	2.73	0.000	0.001
A13	3600	Glycol	None	2.82	1.65E-04	(1)	0.17	0.000	0.000
A14	3600	Glycol	None	2.82	1.65E-04	(1)	0.17	0.000	0.000
B04	1500	Water Mixture	None	1.17	1.91E-03	(1)	0.82	0.000	0.000
B05	3000	Lube Oil	None	2.35	1.89E-03	(1)	1.62	0.000	0.001
B06	7000	Lube Oil	None	5.48	1.90E-03	(1)	3.80	0.000	0.002
Totals							3360.33	0.38	1.68

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 16. Fugitive Leak Emissions
Columbia Gas Transmission - Lost River Compressor Station**

Pollutant	Emission Factor	PTE ^(a) Gas Service (tons/yr)
Valves	9.9E-03 lb/hr/source (1)	28.11
Low Bleed Pneumatic Valves	9.9E-03 lb/hr/source (1)	0.48
Flanges	8.6E-04 lb/hr/source (1)	8.53
Connector	4.4E-04 lb/hr/source (1)	4.38
Other Points in Gas Service	1.9E-02 lb/hr/source (1)	8.99
Total Gas Released	- -	50.49
Total VOC Released (gas service)	(b)	1.01
Calculations:	CO2e	23.48

(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 2 wt % VOC⁽³⁾

Number of Components in Gas Service

Valves=	647	(2)
Low Bleed Pneumatic Valves=	11	(2)
Connectors=	2,265	(2)
Other Points in Gas Service =	48	(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 compressor stations located in close proximity to the site

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

**Table 17. Centrifugal Compressor Venting Emissions
Solar; Taurus 70 (T01-T02)
Columbia Gas Transmission - Lost River Compressor Station**

Number of Pneumatic Actuators:	15	per turbine		
Pneumatic Actuator Vent Rate:	3	scf/hr/actuator	45	scf/hr/turbine
Number of Startup/Shutdown Cycles	156	per yr		
Pneumatic Starter Emissions per Startup	14,688	scf/event/turbine		
Blowdown Emissions per Shutdown	84,856	scf/event/turbine		
Number of Turbines	2			
Number of Dry Seals	2	per turbine		
Dry Seal Vent Rate	0.5	scf/min/seal	60	scf/hr/turbine
Annual Operating Hours	8760			

Component	Emission Rate								
	Total	CH ₄ ⁽²⁾	CO ₂ ⁽²⁾	CH ₄ ⁽⁵⁾	CO ₂ ⁽⁵⁾	CH ₄	CO ₂	CO _{2e}	VOC ⁽⁶⁾
Continuous During Operation	scf/hr	scf/hr	scf/hr	lb/hr	lb/hr	ton/yr	ton/yr	ton/yr	ton/yr
Pneumatic Actuator (Total for Number of units)	90.00	83.93	0.89	3.54	0.10	15.53	0.45	388.63	0.61
Dry Seals (Total for number of units)	120.00	111.90	1.19	4.73	0.14	20.70	0.60	518.17	0.81
Intermittent During Startup/Shutdown	scf/event	scf/event	scf/event	lb/event	lb/event	ton/yr	ton/yr	ton/yr	ton/yr
Pneumatic Starter (Total for Number of Units) ⁽¹⁾	2.94E+04	2.74E+04	290.82	1157.09	33.65	90.25	2.63	2.26E+03	3.52
Blowdowns (Total for Number of Units) ^(1,5)	1.70E+05	1.58E+05	1680.15	6684.75	194.43	521.41	15.17	1.31E+04	20.34
	Total							16216.17	25.27

1. Emission rates per event instead of per hour
2. CH₄ and CO₂ emission rates based on 93.25 vol % CH₄ and 0.99 vol % CO₂ in natural gas
3. Conversion based on Densities of GHG as provided in 40 CFR 98.233(v) [density CH₄ - 0.0192 kg/scf ; CO₂ - 0.0526 kg/scf]
4. Based on 40 CFR 98 Subpart A Global Warming Potentials
5. Conservative estimate based on 1 blowdown per shutdown. It is not expected that a blowdown will occur after each shutdown.
6. Based on a 0.039 ration of VOC to methane as calculated from gas composition.

**Table 18. Centrifugal Compressor Venting Emissions
Solar; Mars 100 (T03-T04)**

Columbia Gas Transmission - Lost River Compressor Station

Number of Pneumatic Actuators:	7	per turbine		
Pneumatic Actuator Vent Rate:	3	scf/hr/actuator	21	scf/hr/turbine
Number of Startup/Shutdown Cycles	87	per yr		
Pneumatic Starter Emissions per Startup	0	scf/event/turbine		
Blowdown Emissions per Shutdown	67,126	scf/event/turbine		
Number of Turbines	2			
Number of Dry Seals	2	per turbine		
Dry Seal Vent Rate	0.5	scf/min/seal	60	scf/hr/turbine
Annual Operating Hours	8760			

Component	Emission Rate								
	Total	CH ₄ ⁽²⁾	CO ₂ ⁽²⁾	CH ₄ ⁽³⁾	CO ₂ ⁽³⁾	CH ₄	CO ₂	CO _{2e}	VOC ⁽⁶⁾
Continuous During Operation	scf/hr	scf/hr	scf/hr	lb/hr	lb/hr	ton/yr	ton/yr	ton/yr	ton/yr
Pneumatic Actuator (Total for Number of units)	42.00	39.17	0.42	1.65	0.05	7.25	0.21	181.36	0.28
Dry Seals (Total for number of units)	120.00	111.90	1.19	4.73	0.14	20.70	0.60	518.17	0.81
Intermittent During Startup/Shutdown	scf/event	scf/event	scf/event	lb/event	lb/event	ton/yr	ton/yr	ton/yr	ton/yr
Pneumatic Starter (Total for Number of Units) ⁽¹⁾	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
Blowdowns (Total for Number of Units) ^(1,5)	1.34E+05	1.25E+05	1329.09	5288.03	153.80	230.03	6.69	5.76E+03	8.97
						Total		6456.94862	10.06

1. Emission rates per event instead of per hour
2. CH₄ and CO₂ emission rates based on 93.25 vol % CH₄ and 0.99 vol % CO₂ in natural gas
3. Conversion based on Densities of GHG as provided in 40 CFR 98.233(v) [density CH₄ - 0.0192 kg/scf ; CO₂ - 0.0526 kg/scf]
4. Based on 40 CFR 98 Subpart A Global Warming Potentials
5. Conservative estimate based on 1 blowdown per shutdown. It is not expected that a blowdown will occur after each shutdown.
6. Based on a 0.039 ration of VOC to methane as calculated from gas composition.

APPENDIX B

PROPOSED PERMIT LANGUAGE

Title V Operating Permit Renewal Application

**Lost River Compressor Station, Facility ID No. 031-00002
Mathias, 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**

*Earl Ray Tomblin
Governor*

*Randy C. Huffman
Cabinet Secretary*

Permit to Operate



*Pursuant to
Title V
of the Clean Air Act*

Issued to:
**Columbia Gas Transmission, LLC
Lost River Compressor Station
R30-03100002-2016**

*William F. Durham
Director*

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

Permit Number: **R30-03100002-2016**
Permittee: **Columbia Gas Transmission, LLC**
Facility Name: **Lost River Compressor Station**
Permittee Mailing Address: **5151 San Felipe St., Suite 2400**
Houston, TX 77056

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.

Facility Location:	Mathias, Hardy County, West Virginia
Facility Mailing Address:	Route 20, Box 70, Mathias, WV 26812
Telephone Number:	(304) 924-7937
Type of Business Entity:	LLC
Facility Description:	Natural Gas Transmission Facility
SIC Codes:	4922
UTM Coordinates:	685.5 km Easting • 4,305.1 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.

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.

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2.0.	General Conditions.....	4
3.0.	Facility-Wide Requirements and Permit Shield.....	13

Source-specific Requirements

4.0.	<u>Miscellaneous Indirect Natural Gas Heaters and Boilers less than 10 MMBtu/hr</u>	
5.0.	<u>40 C.F.R. 63, Subpart ZZZZ MACT Requirements for Emergency SI RICE at Major HAP Sources</u>	
6.0.	<u>40 C.F.R. 63, Subpart DDDDD MACT Requirements for Boiler(s)</u>	
7.0.	<u>40 C.F.R. 60, Subpart JJJJ NSPS Requirements for SI > 500 Hp</u>	
8.0.	<u>40 C.F.R. 60, Subpart KKKK NSPS Requirements for Turbines</u>	
9.0.	<u>45 CSR 13 NSR Permit Requirements, R14-0013</u>	
10.0.	<u>40 C.F.R. 63, Subpart ZZZZ MACT Requirements for New 4SLB SI RICE > 500 Hp at Major HAP Sources</u>	

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

1.1 Emission Units

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Design Capacity	Control Device
002-07*	E07	Reciprocating Engine/Integral Compressor; Clark TLA-8; 2 Cycle, Lean Burn	1969	2,700 hp	N/A
002-08*	E08	Reciprocating Engine/Integral Compressor; Clark TLA-8; 2 Cycle, Lean Burn	1969	2,700 hp	N/A
002-09*	E09	Reciprocating Engine/Integral Compressor; Clark TLA-8; 2 Cycle, Lean Burn	1970	2,700 hp	N/A
002-10*	E10	Reciprocating Engine/Integral Compressor; Clark TLAD-10; 2 Cycle, Lean Burn	1991	4,640 hp	N/A
002-12*	G3	Reciprocating Engine/Generator Waukesha VGF-P48GL; 4 Cycle, Lean Burn	2008	1,063 hp	N/A
002-13*	E11	Reciprocating Engine/Integral Compressor; Caterpillar G3616; 4 Cycle, Lean Burn	2008	4,735 hp	OC1
003-01*	T01	Combustion Turbine/Compressor; Solar; Taurus 70 Turbine	2013	9,236 hp @ 59°F 11,557 hp @ 0°F	NA
003-02*	T02	Combustion Turbine/Compressor; Solar; Taurus 70 Turbine	2013	9,236 hp @ 59°F 11,557 hp @ 0°F	N/A
003-03*	T03	Combustion Turbine/Compressor; Solar; Mars 100 Turbine	2017	15,067 hp @ 32°F	N/A
003-04*	T04	Combustion Turbine/Compressor; Solar; Mars 100 Turbine	2017	15,067 hp @ 32°F	N/A
001-03*	BLR2	Wastewater Evaporator Boiler	1997	0.195 mmBtu/hr	N/A
001-04*	HTR2	Fuel Gas Heater	2013	0.75 mmBtu/hr	N/A
001-05*	HTR3	Fuel Gas Heater	2013	0.25 mmBtu/hr	N/A
001-07*	HTR4	Fuel Gas Heater	2017	0.50 mmBtu/hr	N/A
001-06*	SH1	Catalytic Space Heaters (40)	2013	2.88 mmBtu/hr (TOTAL)	N/A
001-08*	SH2	Catalytic Space Heaters (26)	2017	1.34 mmBtu/hr (TOTAL)	N/A

001-09*	SH3	Catalytic Space Heaters (22)	2013	0.66 mmBtu/hr (TOTAL)	N/A
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* All equipment is fueled exclusively with pipeline quality natural gas.

1.2. 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
R14-0013E	05/11/2016

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	NSPS	New Source Performance Standards
CBI	Confidential Business Information	PM	Particulate Matter
CEM	Continuous Emission Monitor	PM₁₀	Particulate Matter less than 10µm in diameter
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	psi	Pounds per Square Inch
DAQ	Division of Air Quality	SIC	Standard Industrial Classification
DEP	Department of Environmental Protection	SIP	State Implementation Plan
FOIA	Freedom of Information Act	SO₂	Sulfur Dioxide
HAP	Hazardous Air Pollutant	TAP	Toxic Air Pollutant
HON	Hazardous Organic NESHAP	TPY	Tons per Year
HP	Horsepower	TRS	Total Reduced Sulfur
lbs/hr or lb/hr	Pounds per Hour	TSP	Total Suspended Particulate
LDAR	Leak Detection and Repair	USEPA	United States Environmental Protection Agency
m	Thousand	UTM	Universal Transverse Mercator
MACT	Maximum Achievable Control Technology	VEE	Visual Emissions Evaluation
mm	Million	VOC	Volatile Organic Compounds
mmBtu/hr	Million British Thermal Units per Hour		
mmft³/hr or mmcf/hr	Million Cubic Feet Burned per Hour		
NA or N/A	Not Applicable		
NAAQS	National Ambient Air Quality Standards		
NESHAPS	National Emissions Standards for Hazardous Air Pollutants		
NO_x	Nitrogen Oxides		

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	<i>To Prevent and Control the Discharge of Air Pollutants into the Open Air Which Cause or Contributes to an Objectionable Odor or Odors:</i> 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	<i>To Prevent and Control Air Pollution from the Emission of Sulfur Oxides:</i> The sulfur requirement for fuel burning units do not apply to indirect combustion sources at this site because there are no units with design heat inputs above 10 MMBtu/hr. Therefore they are exempt in accordance with 45CSR§10-10.1
45CSR21	<i>To Prevent and Control Air Pollution from the Emission of Volatile Organic Compounds:</i> This facility is not located in one of the subject counties defined by this Rule: Wood, Wayne, Putnam, Kanawha, or Cabell.
45CSR27	<i>To Prevent and Control the Emissions of Toxic Air Pollutants:</i> 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 III	<i>Standards of Performance for Stationary Compression Ignition Internal Combustion Engines:</i> There are no compression ignition engines at this facility.
40 C.F.R. Part 60 Subpart OOOO	<i>Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution for which Construction, Modification, or Reconstruction Commenced after August 23, 2011 and on or before September 18, 2015.</i> The Storage Vessel requirements defined for transmission sources were evaluated and found to not be affected sources under this subpart because they were all constructed, modified, or reconstructed after August 23, 2011
40 C.F.R. Part 60 Subpart OOOOa	<i>Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification, or Reconstruction Commenced after September 18, 2015.</i> 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 [40CFR§60.5365a]

40 C.F.R. Part 60 Subpart Dc	Standards of Performance for Steam Generating Units: The boiler at this facility is less than 10 MMBtu/hr design heat capacity, which is below the applicability criteria stated in [40CFR60.40c(a)].
40 C.F.R. Part 60 Subpart K and Ka	Standards of Performance for Petroleum Liquid Storage Vessels. All tanks at the station are below the applicability criteria of 40,000 gallons in capacity as stated in [40CFR60.110a(a)]
40 C.F.R. Part 60 Subpart Kb	Standards of Performance for Petroleum Liquid Storage Vessels. All tanks at the station are between 75 m ³ (19,813 gallons) and 151 m ³ (39,890 gallons) in capacity storing a liquid with a maximum true vapor pressure less than 15 kPa (112.5 mmHg). Therefore, they are exempt from this subpart as stated in the applicability criteria of [40CFR§§60.110b(a) and (b)]
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 GG	The provisions of this subpart are not applicable because the turbines were installed after the applicability dates and are therefore subject to NSPS KKKK
40 C.F.R. Part 63 Subpart YYYY	The provisions of this subpart are not applicable because although turbines have been installed at this Major HAP source the control requirements of this regulation for natural gas fired units was stayed by USEPA.
40 C.F.R. Part 63 Subpart HHH	National Emission Standards for Hazardous Air Pollutants From Natural Gas Transmission and Storage Facilities. The Transmission Station is not subject to Subpart HHH since there are no affected dehydration units utilized at this site.
40 C.F.R. Part 64 CAM	The compliance assurance monitoring provisions of Part 64 are not applicable due there being no add-on controls at this facility. [40CFR§64.2(a)(2)]

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(s): (001-03, 001-04, 001-05, 001-07)]
[Emission Point ID(s): (BLR2, HTR2, HTR3, HTR4)]

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§30-5.1.c.]

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 MACT Requirements for New Emergency Reciprocating Internal Combustion SI RICE Engine(s) > 500 HP at Major HAP Sources [Emission Unit ID (002-12)]

5.1 Limitations and Standards

5.1.1. 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 CFR §63.6605]

5.1.2. 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.

[40 C.F.R. § 63.6640(f)]

5.2. Monitoring Requirements

5.2.1. N/A

5.3. Testing Requirements

5.3.1. N/A

5.4. Recordkeeping Requirements

5.4.1. N/A

5.5. Reporting Requirements

5.5.1. If you own or operate an emergency stationary RICE with a site rating of more than 100 brake HP that operates or is contractually obligated to be available for more than 15 hours per calendar year for the purposes specified in §63.6640(f)(2)(ii) and (iii) or that operates for the purpose specified in §63.6640(f)(4)(ii), you must submit an annual report according to the requirements in paragraphs (h)(1) through (3) of this section.

(1) The report must contain the following information:

(i) Company name and address where the engine is located.

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

(iii) Engine site rating and model year.

(iv) Latitude and longitude of the engine in decimal degrees reported to the fifth decimal place.

(v) Hours operated for the purposes specified in §63.6640(f)(2)(ii) and (iii), including the date, start time, and end time for engine operation for the purposes specified in §63.6640(f)(2)(ii) and (iii).

(vi) Number of hours the engine is contractually obligated to be available for the purposes specified in §63.6640(f)(2)(ii) and (iii).

(vii) Hours spent for operation for the purpose specified in §63.6640(f)(4)(ii), including the date, start time, and end time for engine operation for the purposes specified in §63.6640(f)(4)(ii). The report must also identify the entity that dispatched the engine and the situation that necessitated the dispatch of the engine.

(viii) If there were no deviations from the fuel requirements in §63.6604 that apply to the engine (if any), a statement that there were no deviations from the fuel requirements during the reporting period.

(ix) If there were deviations from the fuel requirements in §63.6604 that apply to the engine (if any), information on the number, duration, and cause of deviations, and the corrective action taken.

- (2) The first annual report must cover the calendar year 2015 and must be submitted no later than March 31, 2016. Subsequent annual reports for each calendar year must be submitted no later than March 31 of the following calendar year.
- (3) The annual report must be submitted electronically using the subpart specific reporting form in the Compliance and Emissions Data Reporting Interface (CEDRI) that is accessed through EPA's Central Data Exchange (CDX) (www.epa.gov/cdx). However, if the reporting form specific to this subpart is not available in CEDRI at the time that the report is due, the written report must be submitted to the Administrator at the appropriate address listed in §63.13.

[40 CFR §63.6650(h)]

- 5.5.2. If you are required to submit an Initial Notification but are otherwise not affected by the requirements of this subpart, in accordance with §63.6590(b), your notification should include the information in §63.9(b)(2)(i) through (v), and a statement that your stationary RICE has no additional requirements and explain the basis of the exclusion (for example, that it operates exclusively as an emergency stationary RICE if it has a site rating of more than 500 brake HP located at a major source of HAP emissions).

[40 CFR §63.6645(f)]

5.6. Compliance Plan

- 5.6.1 N/A

**6.0 40 C.F.R. 63, Subpart DDDDD MACT Requirements for Boiler(s) and Process Heater(s)
 [Emission Point ID(s): (BLR2, HTR2, HTR3, HTR4)]**

6.1. Limitations and Standards

6.1.1. Subpart DDDDD applies to new, reconstructed, and existing affected sources as described in paragraphs (a)(1) and (2) of this section.

(1) The affected source of this subpart is the collection at a major source of all existing industrial, commercial, and institutional boilers and process heaters within a subcategory as defined in §63.7575.

[40 CFR §63.7490(a)(1)]

6.1.2. If you have an existing boiler or process heater, you must comply with this subpart no later than January 31, 2016, except as provided in §63.6(i).

[40 CFR §63.7495(b), Emission Unit (BLR2)]

6.1.3. The boiler and process heater covered by this permit must meet the requirements in paragraphs (a)(1) and (3) of this section as follows, except as provided in paragraphs (b), through (e) of this section. You must meet these requirements at all times the affected unit is operating, except as provided in paragraph (f) of this section.

(1) You must meet the work practice standard in Table 3, Items 1, 2, and 4, except as provided under §63.7522

(2) If the unit is . . .	The permittee must meet the following . . .
1. A new or existing boiler or process heater with a continuous oxygen trim system that maintains an optimum air to fuel ratio, or a heat input capacity of less than or equal to 5 million Btu per hour in any of the following subcategories: unit designed to burn gas 1; unit designed to burn gas 2 (other); or unit designed to burn light liquid, or a limited use boiler or process heater	Conduct a tune-up of the boiler or process heater every 5 years as specified in §63.7540.
4. An existing boiler or process heater located at a major source facility, not including limited use units	Must have a one-time energy assessment performed by a qualified energy assessor. An energy assessment completed on or after January 1, 2008, that meets or is amended to meet the energy assessment requirements in this table, satisfies the energy assessment requirement. A facility that operated under an energy management program developed according to the ENERGY STAR guidelines for energy management or compatible with ISO 50001 for at least one year between January 1, 2008 and the compliance date specified in §63.7495 that includes the affected units also satisfies the energy assessment requirement. The energy assessment must include the following with extent of the evaluation for items a. to e. appropriate for the on-site technical hours listed in §63.7575:
	a. A visual inspection of the boiler or process heater system.
	b. An evaluation of operating characteristics of the boiler or process heater systems, specifications of

	energy using systems, operating and maintenance procedures, and unusual operating constraints.
	c. An inventory of major energy use systems consuming energy from affected boilers and process heaters and which are under the control of the boiler/process heater owner/operator.
	d. A review of available architectural and engineering plans, facility operation and maintenance procedures and logs, and fuel usage.
	e. A review of the facility's energy management program and provide recommendations for improvements consistent with the definition of energy management program, if identified.

Note: Item 4 of the Table applies to process heater [BLR2] only, due to it being classified as an existing unit.

- (3) At all times, you must operate and maintain any affected source (as defined in §63.7490), including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator that 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 CFR§63.7500(a)(1) and (3)]

- 6.1.4. Boilers and process heaters in the units designed to burn gas 1 fuels subcategory with a heat input capacity of less than or equal to 5 million Btu per hour must complete a tune-up every 5 years as specified in §63.7540. Boilers and process heaters in the units designed to burn gas 1 fuels subcategory are not subject to the emission limits in Tables 1 and 2 or 11 through 13 to this subpart, or the operating limits in Table 4 to this subpart.

[40 CFR§63.7500(e)]

- 6.1.5. Reserved
- 6.1.6. For existing affected sources (as defined in §63.7490), you must complete an initial tune-up by following the procedures described in §63.7540(a)(10)(i) through (vi) no later than the compliance date specified in §63.7495, except as specified in paragraph (j) of this section. You must complete the one-time energy assessment specified in Table 3 to this subpart no later than the compliance date specified in §63.7495 (January 31, 2016).

[40 CFR§63.7510(e), Emission Unit (BLR2)]

- 6.1.7. The permittee must conduct the tune-up while burning the type of fuel (or fuels in case of units that routinely burn a mixture) that provided the majority of the heat input to the boiler or process heater over the 12 months prior to the tune-up.
- a. As applicable, inspect the burner, and clean or replace any components of the burner as necessary (you may perform the burner inspection any time prior to the tune-up or delay the burner inspection until the next scheduled unit shutdown). Units that produce electricity for sale may delay the burner inspection until the first outage, not to exceed 36 months from the previous inspection. At units where entry into a piece of process equipment or into a storage vessel is required to complete the tune-up inspections, inspections are required only during planned entries into the storage vessel or process equipment;

- b. Inspect the flame pattern, as applicable, and adjust the burner as necessary to optimize the flame pattern. The adjustment should be consistent with the manufacturer's specifications, if available;
- c. Inspect the system controlling the air-to-fuel ratio, as applicable, and ensure that it is correctly calibrated and functioning properly (you may delay the inspection until the next scheduled unit shutdown). Units that produce electricity for sale may delay the inspection until the first outage, not to exceed 36 months from the previous inspection;
- d. Optimize total emissions of CO. This optimization should be consistent with the manufacturer's specifications, if available, and with any NOX requirement to which the unit is subject;
- e. Measure the concentrations in the effluent stream of CO in parts per million, by volume, and oxygen in volume percent, before and after the adjustments are made (measurements may be either on a dry or wet basis, as long as it is the same basis before and after the adjustments are made). Measurements may be taken using a portable CO analyzer; and
- f. Maintain on-site and submit, if requested by the Administrator, a report containing the following information:
 1. The concentrations of CO in the effluent stream in parts per million by volume, and oxygen in volume percent, measured at high fire or typical operating load, before and after the tune-up of the boiler or process heater;
 2. A description of any corrective actions taken as a part of the tune-up; and
 3. The type and amount of fuel used over the 12 months prior to the tune-up, but only if the unit was physically and legally capable of using more than one type of fuel during that period. Units sharing a fuel meter may estimate the fuel used by each unit.

[45CSR34; 40 CFR§63.7540(a)(10)]

- 6.1.8. If the permittee's boiler or process heater has a continuous oxygen trim system that maintains an optimum air to fuel ratio, or a heat input capacity of less than or equal to 5 million Btu per hour and the unit is in the units designed to burn gas 1; units designed to burn gas 2 (other); or units designed to burn light liquid subcategories, or meets the definition of limited-use boiler or process heater in 40CFR§63.7575, the permittee must conduct a tune-up of the boiler or process heater every 5 years as specified in condition 6.1.5 to demonstrate continuous compliance. The permittee may delay the burner inspection specified in condition 6.1.5.a until the next scheduled or unscheduled unit shutdown, but the permittee must inspect each burner at least once every 72 months. If an oxygen trim system is utilized on a unit without emission standards to reduce the tune-up frequency to once every 5 years, set the oxygen level no lower than the oxygen concentration measured during the most recent tune-up.

[45CSR34; 40 CFR§63.7540(a)(12)]

6.2. Monitoring Requirements

- 6.2.1. Reserved

6.3. Testing Requirements

- 6.3.1. If you are required to meet an applicable tune-up work practice standard, you must conduct an annual, biennial, or 5-year performance tune-up according to §63.7540(a)(10), (11), or (12), respectively. Each annual tune-up specified in §63.7540(a)(10) must be no more than 13 months after the previous tune-up. Each biennial tune-up specified in §63.7540(a)(11) must be conducted no more than 25 months after the previous tune-up. Each 5-year tune-up specified in §63.7540(a)(12) must be conducted no more than 61 months after the previous tune-up. For a new or reconstructed affected source (as defined in §63.7490), the first annual, biennial, or 5-year tune-up must be no later than 13 months, 25 months, or 61 months, respectively, after April 1, 2013 or the initial startup of the new or reconstructed affected source, whichever is later.
[40 CFR§63.7515(d)]

6.4. Recordkeeping Requirements

- 6.4.1. The permittee must keep a copy of each notification and report that you submitted to comply with 40 C.F.R. 63, Subpart DDDDD, including all documentation supporting any Initial Notification or Notification of Compliance Status or semiannual compliance report that you submitted, according to the requirements in 40CFR§63.10(b)(2)(xiv).
[45CSR34; 40 CFR§63.7555(a)(1)]
- 6.4.2. The permittee shall maintain records as follows:
- a. Records must be in a form suitable and readily available for expeditious review, according to 40CFR§63.10(b)(1).
 - b. As specified in 40CFR§63.10(b)(1), the permittee must keep each record for 5 years following the date of each occurrence, measurement, maintenance, corrective action, report, or record.
 - c. The permittee must keep each record on site, or they must be accessible from on site (for example, through a computer network), for at least 2 years after the date of each occurrence, measurement, maintenance, corrective action, report, or record, according to 40CFR§63.10(b)(1). The permittee may keep the records off site for the remaining 3 years.

[45CSR34; 40 CFR§63.7560]

6.5. Reporting Requirements

- 6.5.1 The permittee shall demonstrate initial compliance by including with the Notification of Compliance Status a signed certification that either the energy assessment was completed according to Table 3 to this subpart, and that the assessment is an accurate depiction of your facility at the time of the assessment, or that the maximum number of on-site technical hours specified in the definition of energy assessment applicable to the facility has been expended.

You must submit the Notification of Compliance Status containing the results of the initial compliance demonstration according to the requirements in §63.7545(e).
[40 CFR§63.7530(e) and (f)](H1)

6.5.2. If you are required to conduct an initial compliance demonstration as specified in §63.7530, you must submit a Notification of Compliance Status according to §63.9(h)(2)(ii). For the initial compliance demonstration for each boiler or process heater, you must submit the Notification of Compliance Status, including all performance test results and fuel analyses, before the close of business on the 60th day following the completion of all performance test and/or other initial compliance demonstrations for all boiler or process heaters at the facility according to §63.10(d)(2). The Notification of Compliance Status report must contain all the information specified in paragraphs (e)(1) through (8) of this section, as applicable. If you are not required to conduct an initial compliance demonstration as specified in §63.7530(a), the Notification of Compliance Status must only contain the information specified in paragraphs (e)(1) and (8) of this section and must be submitted within 60 days of the compliance date specified at §63.7495(b).

(1) A description of the affected unit(s) including identification of which subcategories the unit is in, the design heat input capacity of the unit, a description of the add-on controls used on the unit to comply with this subpart, description of the fuel(s) burned, including whether the fuel(s) were a secondary material determined by you or the EPA through a petition process to be a non-waste under §241.3 of this chapter, whether the fuel(s) were a secondary material processed from discarded non-hazardous secondary materials within the meaning of §241.3 of this chapter, and justification for the selection of fuel(s) burned during the compliance demonstration.

(8) In addition to the information required in §63.9(h)(2), your notification of compliance status must include the following certification(s) of compliance, as applicable, and signed by a responsible official:

(i) “This facility completed the required initial tune-up for all of the boilers and process heaters covered by 40 CFR part 63 subpart DDDDD at this site according to the procedures in §63.7540(a)(10)(i) through (vi).”

(ii) “This facility has had an energy assessment performed according to §63.7530(e).”

(iii) Except for units that burn only natural gas, refinery gas, or other gas 1 fuel, or units that qualify for a statutory exemption as provided in section 129(g)(1) of the Clean Air Act, include the following: “No secondary materials that are solid waste were combusted in any affected unit.”

[40 CFR§§63.7545(e)(1) & (8)]

6.5.3. Unless the EPA Administrator has approved a different schedule for submission of reports under §63.10(a), you must submit each report, according to paragraph (h) of this section, by the date in Table 9 to this subpart and according to the requirements in paragraphs (b)(1) through (4) of this section. For units that are subject only to a requirement to conduct subsequent annual, biennial, or 5-year tune-up according to §63.7540(a)(10), (11), or (12), respectively, and not subject to emission limits or Table 4 operating limits, you may submit only an annual, biennial, or 5-year compliance report, as applicable, as specified in paragraphs (b)(1) through (4) of this section, instead of a semi-annual compliance report.

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

[40 CFR§63.7550(b)(5)]

6.6. Compliance Plan

6.6.1 N/A

7.0 40 C.F.R. 60, Subpart JJJJ Requirements for SI > 500 Hp [Emission Unit ID: (002-13)]

7.1 Limitations and Standards

- 7.1.1. (a) The provisions of this subpart are applicable to manufacturers, owners, and operators of stationary spark ignition (SI) internal combustion engines (ICE) as specified in paragraphs (a)(1) through (6) of this section. For the purposes of this subpart, the date that construction commences is the date the engine is ordered by the owner or operator
- (4) Owners and operators of stationary SI ICE that commence construction after June 12, 2006, where the stationary SI ICE are manufactured:
- (i) On or after July 1, 2007, for engines with a maximum engine power greater than or equal to 500 HP (except lean burn engines with a maximum engine power greater than or equal to 500 HP and less than 1,350 HP);
- [40 CFR§ 60.4230(a)(4)(i)]**
- 7.1.2. (e) Owners and operators of stationary SI ICE with a maximum engine power greater than or equal to 75 KW (100 HP) (except gasoline and rich burn engines that use LPG) must comply with the emission standards in Table 1 to this subpart for their stationary SI ICE.

NSPS JJJJ –Limits	NOx	CO	VOC
Standard (g/Hp hr) or	2.0	4.0	1.0
ppm _{vd} @ 15% O ₂	160	540	86

Owners and operators of stationary SI ICE must operate and maintain stationary SI ICE that achieve the emission standards as required in §60.4233 over the entire life of the engine.

[40 CFR§ 60.4233(e), 60.4234, and 45CSR13 Permit R14-0013E, Condition 4.1.4(g)]

- 7.1.3. (b) If you are an owner or operator of a stationary SI internal combustion engine and must comply with the emission standards specified in §60.4233(d) or (e), you must demonstrate compliance according to one of the methods specified in paragraphs (b)(1) and (2) of this section.
- (2) Purchasing a non-certified engine and demonstrating compliance with the emission standards specified in §60.4233(d) or (e) and according to the requirements specified in §60.4244, as applicable, and according to paragraphs (b)(2)(i) and (ii) of this section.
- (ii) If you are an owner or operator of a stationary SI internal combustion engine greater than 500 HP, you must keep a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, you must conduct an initial performance test and conduct subsequent performance testing every 8,760 hours or 3 years, whichever comes first, thereafter to demonstrate compliance.
- [40 C.F.R. §60.4243(b)(2)(ii)]**

7.2. Monitoring Requirements

- 7.2.1. None

7.3. Testing Requirements

- 7.3.1. Owners and operators of stationary SI ICE who conduct performance tests must follow the procedures in paragraphs (a) through (f) of this section.
- (a) Each performance test must be conducted within 10 percent of 100 percent peak (or the highest achievable) load and according to the requirements in §60.8 and under the specific conditions that are specified by Table 2 to this subpart.

- (b) You may not conduct performance tests during periods of startup, shutdown, or malfunction, as specified in §60.8(c). If your stationary SI internal combustion engine is non-operational, you do not need to start up the engine solely to conduct a performance test; however, you must conduct the performance test immediately upon startup of the engine.
- (c) You must conduct three separate test runs for each performance test required in this section, as specified in §60.8(f). Each test run must be conducted within 10 percent of 100 percent peak (or the highest achievable) load and last at least 1 hour.

[40 C.F.R. §60.4244]

7.4. Recordkeeping Requirements

- 7.4.1. (a) Owners and operators of all stationary SI ICE must keep records of the information in paragraphs (a)(1) through (4) of this section.
 - (1) All notifications submitted to comply with this subpart and all documentation supporting any notification.
 - (2) Maintenance conducted on the engine.
 - (4) If the stationary SI internal combustion engine is not a certified engine or is a certified engine operating in a non-certified manner and subject to §60.4243(a)(2), documentation that the engine meets the emission standards.

[40 CFR §60.4245(a)]

7.5. Reporting Requirements

- 7.5.1. (c) Owners and operators of stationary SI ICE greater than or equal to 500 HP that have not been certified by an engine manufacturer to meet the emission standards in §60.4231 must submit an initial notification as required in §60.7(a)(1). The notification must include the information in paragraphs (c)(1) through (5) of this section.
 - (1) Name and address of the owner or operator;
 - (2) The address of the affected source;
 - (3) Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement;
 - (4) Emission control equipment; and
 - (5) Fuel used.

[40 CFR §60.4245(c)]

- 7.5.2. (d) Owners and operators of stationary SI ICE that are subject to performance testing must submit a copy of each performance test as conducted in §60.4244 within 60 days after the test has been completed. Performance test reports using EPA Method 18, EPA Method 320, or ASTM D6348-03 (incorporated by reference—see 40 CFR 60.17) to measure VOC require reporting of all QA/QC data. For Method 18, report results from sections 8.4 and 11.1.1.4; for Method 320, report results from sections 8.6.2, 9.0, and 13.0; and for ASTM D6348-03 report results of all QA/QC procedures in Annexes 1-7.

[40 CFR §60.4245(d)]

7.6. Compliance Plan

- 7.6.1 N/A

8.0 40 C.F.R. 60, Subpart KKKK Requirements for Turbines [Emission Unit IDs: (003-01, 003-02, 003-03, 003-04)]

8.1 Limitations and Standards

- 8.1.1. NO_x emissions from the Turbines shall not exceed 25 ppm at 15% O₂ (or an alternative limit of 150 ng/J of useful output) when operating at or above a 75% peak load. NO_x emissions from the Solar Turbines shall not exceed 150 ppm at 15% O₂ (or an alternative limit of 1,100 ng/J of useful output) when operating below 75% peak load.
[40 C.F.R. §60.4320]
- 8.1.2. The Turbines shall only burn fuel with a total potential SO₂ emission rate of less than 0.06 lb/MMBTU.
[40 C.F.R. §60.4330(a)(2)]
- 8.1.3. You must operate and maintain your stationary combustion turbine, air pollution control equipment, and monitoring equipment in a manner consistent with good air pollution control practices for minimizing emissions at all times including during startup, shutdown, and malfunction.
[40 C.F.R. § 60.4333(a)]
- 8.1.4. (a) If you are not using water or steam injection to control NO_x emissions, you must perform annual performance tests in accordance with §60.4400 to demonstrate continuous compliance. If the NO_x emission result from the performance test is less than or equal to 75 percent of the NO_x emission limit for the turbine, you may reduce the frequency of subsequent performance tests to once every 2 years (no more than 26 calendar months following the previous performance test). If the results of any subsequent performance test exceed 75 percent of the NO_x emission limit for the turbine, you must resume annual performance tests.
[40 C.F.R. § 60.4340)]
- 8.1.5. You must monitor the total sulfur content of the fuel being fired in the turbines, except as provided in §60.4365.
[40 C.F.R. § 60.4360]

8.2. Monitoring Requirements

- 8.2.1. You may elect not to monitor the total sulfur content of the fuel combusted in the turbine, if the fuel is demonstrated not to exceed potential sulfur emissions of 26 ng SO₂/J (0.060 lb SO₂/MMBtu) heat input for units located in continental areas. You must use the following sources of information to make the required demonstration:
- (a) The fuel quality characteristics in a current, valid purchase contract, tariff sheet or transportation contract for the fuel, specifying that the maximum total sulfur content for natural gas use in continental areas is 20 grains of sulfur or less per 100 standard cubic feet, has potential sulfur emissions of less than less than 26 ng SO₂/J (0.060 lb SO₂/MMBtu) heat input for continental areas; or

[40 C.F.R. § 60.4365]

8.3. Testing Requirements

- 8.3.1. Within 180 days of startup or within 60 days of achieving maximum load operation (whichever occurs first), the permittee will perform testing to determine compliance with 6.1.1 of this permit.
[40 CFR§ 60.4400(a)]

8.4. Recordkeeping Requirements

8.4.1. N/A

8.5. Reporting Requirements

8.5.1. For each affected unit required to continuously monitor parameters or emissions, or to periodically determine the fuel sulfur content under this subpart, you must submit reports of excess emissions and monitor downtime, in accordance with §60.7(c). Excess emissions must be reported for all periods of unit operation, including start-up, shutdown, and malfunction.

[40 CFR §60.4375(a)]

8.5.2. For each affected unit that performs annual performance tests in accordance with §60.4340(a), you must submit a written report of the results of each performance test before the close of business on the 60th day following the completion of the performance test.

[40 CFR §60.4375(b)]

8.6. Compliance Plan

8.6.1 N/A

9.0 45 CSR 14, PSD Permit Requirements, R14-0013

[Emission Unit IDs: (002-07, 002-08, 002-09, 002-10, 002-12, 002-13, 003-01, 003-02, 003-03, 003-04, 001-03, 001-04, 001-05, 001-07, 001-06, 001-08, 001-09)]

9.1. Limitations and Standards

9.1.1. Only those emission units as identified in Table 1.0 are authorized by this permit. In accordance with the information filed in Permit Applications R14-0013E, the emission units identified under Table 1.0 of this permit shall be installed, maintained, and operated so as to minimize any fugitive escape of pollutants and shall not exceed the listed design capacities.

[45CSR14, Permit Number R14-0013, Condition 4.1.1]

9.1.2. The facility shall employ three (3) Clark TLA-8 natural-gas fired compressor engines. The operation of these engines shall not exceed the following maximum combined operating and emission limitations:

a. The engines shall be limited to the maximum operating capacities as shown in Table 9.1.2(a).

Table 9.1.2(a)

Engine No. -Source ID-	Maximum Engine Rating ⁽¹⁾ (hp)	Total Combined Annual Operating Limit (bhp-hr/yr)
No.7 -002-07-	2,700	70,956,000
No.8 -002-08-	2,700	
No.9 -002-09-	2,700	

(1) Maximum rating based on standard operating conditions. Under ambient operating conditions (less than 40F), the maximum peak rating of each engine is 3,015 horsepower.

b. Emissions released from the engines shall not exceed the maximum individual hourly and total combined annual emission limits set forth in Table 9.1.2(b).

Table 9.1.2(b)

Emission Point ID	Pollutant	Emission Limits	
		Individual Hourly (glhp-hr)	Total Combined Annual (tons/yr)
E07,E08,E09	NOx	9.5	562.5
	CO	3.1	203.4

[45CSR14, Permit Number R14-0013, Condition 4.1.2]

9.1.3. The facility shall employ one (1) Clark TLAD-10 natural-gas fired compressor engine. The operation of this engine shall not exceed the following maximum operating and emission limitations:

- a. The engines shall be limited to the maximum operating capacities as shown in Table 9.1.3(a).

Table 9.1.3(a)

Engine No. -Source ID-	Maximum Engine Rating (hp)
No.10 - 002-10-	4,640

- b. Emissions released from the engine shall not exceed the maximum hourly and annual emission limits set forth in Table 9.1.3(b).

Table 9.1.3(b)

Emission PointID	Pollutant	Emission Factor (glhp-hr)	Maximum Emission Rates	
			Hourly (lb/hr)	Annual (ton/yr)
E10	NOx	2.0	20.5	89.6
	CO	2.1	22.5	98.5
	VOC	0.7	8.2	35.8
	SO ₂	0.003	0.1	0.2
	PM ₁₀	0.19	1.9	8.3

(1) All particulate matter emissions assumed to be less than PM2.5. Includes condensables.

[45CSR14, Permit Number R14-0013, Condition 4.1.3]

9.1.4. The facility shall employ one (1) Caterpillar G3616 natural-gas fired compressor engine. The operation of this engine shall not exceed the following maximum operating and emission limitations:

- a. The engine shall be limited to the maximum operating capacities as shown in Table 9.1.4(a).

Table 9.1.4(a)

Engine No. -Source ID-	Maximum Engine Rating (hp)
No. 11 - 002-13-	4,735

- b. Emissions released from the engine shall not exceed the maximum hourly and annual emission limits set forth in Table 9.1.4(b).

Table 4.1.4(b)

Emission PointID	Pollutant	Emission Factor (glhp-hr)	Maximum Emission Rates	
			Hourly Qb/hr	Annual (tonlyr)
E11	NOx	0.70	7.30	32.00
	CO	0.63	6.52	28.60
	VOC	0.16	1.70	7.42
	SOz	0.0024	0.02	0.11
	PM(1)	0.034	0.40	1.60
	Formaldehyde	0.114	1.19	5.22

(1) All particulate matter emissions assumed to be less than *PM_{2.5}*. Includes condensables.

- c. The permittee shall install, maintain and operate an oxidation catalyst on engine E11 to reduce CO, VOC, and formaldehyde emissions. The oxidation catalyst shall be utilized at all times the engine is operating.
- d. Pursuant to 40 CFR 63, Subpart ZZZZ, the permittee shall:
 - (1) Reduce uncontrolled CO emissions by 93 percent or more; or
 - (2) Limit concentration of formaldehyde in the exhaust to 14 ppmvd or less at 15 percent *O₂*.
[40 CFR §63.6600 - Table 2a]
- e. Pursuant to 40 CFR 63, Subpart ZZZZ, the permittee shall, with respect to the oxidation catalyst:
 - (1) Maintain the catalyst so that the pressure drop across the catalyst does not change by more than two inches of water at 100 percent load plus or minus 10 percent from the pressure drop across the catalyst that was measured during the initial performance test; and
 - (2) Maintain the temperature of the exhaust so that the catalyst inlet temperature is greater than or equal to 450°F and less than or equal to 1350°F.
[40 CFR §63.6600- Table 2b]
- f. The permittee shall regularly inspect, maintain, and repair engine E11 and its oxidation catalyst to assure proper operation. The engine and the oxidation catalyst shall be operated, maintained and serviced per manufacturer recommendations. Based on manufacturer recommendations, the permittee must either maintain on-site spare parts for use in immediate repair or participate in a quick turn-around catalyst element cleaning/loaner program with a catalyst supplier.
- g. The permittee shall comply with all applicable requirements of NSPS for Stationary Compression Ignition Internal Combustion Engines specified in 40 CFR Part 60, Subpart JJJJ.

[45CSR14, Permit Number R14-0013, Condition 4.1.4]

9.1.5. The facility shall employ two (2) Solar Taurus 70 and two (2) Solar Mars 100 natural-gas fired turbines. The operation of these turbines shall not exceed the following maximum operating and emission limitations:

a. The turbines shall be limited to the maximum operating capacities as shown in Table 9.1.5(a).

Table 9.1.5(a)

Turbine No. -Source ID-	Maximum Turbine Rating (hp)
No.1 -003-01-	9,236 hp@ 59°F 11,557 hp@ O°F
No.2 -003-02-	9,236 hp@ 59°F 11,557 hp@ O°F
No.3 -003-03-	15,067 hp@ 32°F
No.4 -003-04-	15,067 hp@ 32°F

b. Emissions released from the turbines shall not exceed the maximum individual hourly (per operation mode) and total combined annual emission limits set forth in Table 9.1.5(b) and (c).

Table 9.1.5(b)

Emission Point ID	Pollutant	Maximum Emission Rates					
		Individual Hourly (lb/hr)<l)					Combined Annual (ton/yr)
		Normal Load	Low Temp	Very Low Temp	Low-Load	Startup/Shutdown (t)	
TO1, T02	NOx	5.04	15.00	42.84	24.56	2.40	47.57
	CO	5.12	21.73	32.60	1,708.23	214.60	103.91
	VOC	0.73	1.55	1.55	24.40	3.05	7.36
	SO2	4.70	4.70	4.70	4.70	4.70	0.52
	PM^{2.5}	0.61	0.61	0.61	0.61	0.61	5.38
	CO2e	10,904	10,904	10,904	10,904	10,904	95,518
	Formaldehyde	0.06	0.06	0.06	0.06	0.06	0.52

- (1) Operating modes are defined under 4.2.3(a). Startup/shutdown emissions are per cycle and not lb/hr.
- (2) All particulate matter emissions assumed to be less than PM2.5. Includes condensables.

Table 4.1.5(c)

Emission Point ID	Pollutant	Maximum Emission Rates					Combined Annual (ton/yr)
		Individual Hourly (lb/hr)(l)				Startup/Shutdown ⇄	
		Normal Load	Low Temp	Low-Load	Startup/Shutdown ⇄		
T03, T04	NOx	6.96	21.16	16.10	3.10	64.52	
	CO	7.07	30.67	653.41	272.70	96.29	
	VOC	0.81	1.75	7.47	3.12	7.62	
	SO2	7.36	7.36	7.36	7.36	0.81	
	PM _{2.5}	0.85	0.85	0.85	0.85	7.45	
	CO _{2e}	15,087	15,087	15,087	15,087	132,159	
	Formaldehyde	0.09	0.09	0.09	0.09	0.80	

- (1) Operating modes are defined under 9.2.4(a). Startup/shutdown emissions are per cycle and not lb/hr.
- (2) All particulate matter emissions assumed to be less than PM_{2.5}. Includes condensables.

- c. Each Turbine shall be equipped with SoLoNO_xTM lean-premixed combustion technology to ensure uniform air/fuel mixture and to prevent formation of NO_x.
- d. Pursuant to 40 CFR 60, Subpart KKKK, the permittee meet the following requirements:
 - (1) You must meet the emission limits for NO_x specified in Table 1 to this subpart. [40 CFR § 60.4320]
 - (2) If your turbine is located in a continental area, you must comply with either paragraph (a)(1), (a)(2), or (a)(3) of this section.
 - (i) You must not cause to be discharged into the atmosphere from the subject stationary combustion turbine any gases which contain SO₂ in excess of 110 nanograms per Joule (ng/J) (0.90 pounds per megawatt-hour (lb/MWh)) gross output;
 - (ii) You must not burn in the subject stationary combustion turbine any fuel which contains total potential sulfur emissions in excess of 26 ng SO₂ /J (0.060 lb SO₂ /MMBtu) heat input. If your turbine simultaneously fires multiple fuels, each fuel must meet this requirement. [40 CFR § 60.4330]

[45CSR14, Permit Number R14-0013, Condition 4.1.5]

9.1.6. The Fuel Heaters (001--04, 001-05, 001-07) and the Catalytic Heaters (001-06, 001-08, 001-09) shall operate according to the following requirements:

- a. The maximum emissions from Fuel Heater 001-04 shall not exceed the limits given in the following table;

Table 9.1.6(a): Fuel Heater 001-04 Emission Limits

Pollutant	Hourly (lb/hr)	Annual (ton/yr)
CO	0.06	0.27
NOx	0.07	0.32

- b. The maximum emissions from Fuel Heater 001-05 shall not exceed the limits given in the following table;

Table 9.1.6(b): Fuel Heater 001-05 Emission Limits

Pollutant	Hourly (lblr)	Annual (ton/yr)
CO	0.02	0.09
NOx	0.02	0.11

- c. The maximum emissions from Fuel Heater 001-07 shall not exceed the limits given in the following table;

Table 9.1.6(c): Fuel Heater 001-07 Emission Limits

Pollutant	Hourly (lblr)	Annual (ton/yr)
CO	0.04	0.18
NOx	0.05	0.21

- d. The maximum emissions from the Catalytic Heaters (001-06) shall not exceed the limits given in the following table;

Table 9.1.6(d): Catalytic Heaters (001-06) Emission Limits⁽¹⁾

Pollutant	Hourly (lb/hr)	Annual (ton/yr)
CO	0.24	1.04
NOx	0.28	1.24

(1) Both hourly and annual limits are aggregate limits for all 40 Catalytic Heaters.

- e. The maximum emissions from the Catalytic Heaters (001-08) shall not exceed the limits given in the following table;

Table 9.1.6(e): Catalytic Heaters (001-08) Emission Limits

Pollutant	Hourly (lb/hr)	Annual (ton/yr)
CO	0.11	0.48
NO _x	0.13	0.57

(1) Both hourly and annual limits are aggregate limits for all 26 Catalytic Heaters.

- f. The maximum emissions from the Catalytic Heaters (001-09) shall not exceed the limits given in the following table;

Table 9.1.6(f): Catalytic Heaters (001-09) Emission Limits

Pollutant	Hourly (lb/hr)	Annual (ton/yr)
CO	0.05	0.24
NO _x	0.06	0.28

(1) Both hourly and annual limits are aggregate limits for all 22 Catalytic Heaters.

- g. As the annual emission limits given in Table 9.1.6(a-f) are based on operating 8,760 hours/year, there is no limit on the annual hours of operation or fuel usage of the Fuel Heaters or the Catalytic Heaters.
- h. 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.]

[45CSR14, Permit Number R14-0013, Condition 4.1.6]

- 9.1.7. The Waukesha VGF48GL Emergency Generator (002-12) shall operate according to the following requirements:

- a. The maximum emissions from 002-12 shall not exceed the limits given in the following table;

Table 9.1.7(a): Emergency Generator 002-12 Emission Limits

Pollutant	Hourly (lb/hr)	Annual (ton/yr)
CO	3.04	0.76
NO _x	4.68	1.17
VOC	0.61	0.15

- b. The Emergency Generator shall not operate in excess of 500 hours per year. Compliance with the Maximum Yearly Operation Limitation shall be determined using a twelve month rolling total. A twelve month rolling total shall mean the sum of the hours of operation at any given time during the previous twelve consecutive calendar months. [45CSR§13-5.11.]
- c. The permittee shall maintain on-site verification that the Emergency Generator was manufactured prior to January 1, 2009.

9.1.8. The following conditions and requirements are specific to Heaters {HTR2, HTR3, HTR4):

- a. Heaters (HTR2, HTR3, HTR4) shall be designed and constructed with a maximum design heat input of 0.75 MMBtu/hr, 0.25 MMBTU/hr and 0.50 MMBTU/hr respectively. The condition satisfies compliance with the limitation of 45 CSR §2-3.1.
[45 CSR 2A-3.1.a.]
- b. For the purpose of complying with Subpart DDDDD of Part 63 as Gas 1 units, the permittee shall perform a tune-up on each heater in accordance with 40 CFR §63.7540(a)(12). The first tune-up shall be completed no later than 61 months after initial start-up of the heater, and thereafter once every 61 months. If the unit is not operating on the required date for a tune-up, the tune-up must be conducted within 30 calendar days of startup. Such tune-ups shall consist of the following:
 - i. As applicable, inspect the burner, and clean or replace any components of the burner as necessary (permittee may delay the burner inspection until the next scheduled unit shutdown, but inspected at least once every 72 months). At units where entry into a piece of process equipment or into a storage vessel is required to complete the tune-up inspections, inspections are required only during planned entries into the storage vessel or process equipment;
 - ii. Inspect the flame pattern, as applicable, and adjust the burner as necessary to optimize the flame pattern. The adjustment should be consistent with the manufacturer's specifications, if available;
 - iii. Inspect the system controlling the air-to-fuel ratio, as applicable, and ensure that it is correctly calibrated and functioning properly (permittee may delay the inspection until the next scheduled unit shutdown);
 - iv. Optimize total emissions of CO. This optimization should be consistent with the manufacturer's specifications, if available, and with any NOx requirement to which the unit is subject; and
 - v. Measure the concentrations in the effluent stream of CO in parts per million, by volume, and oxygen in volume percent, before and after the adjustments are made (measurements may be either on a dry or wet basis, as long as it is the same basis before and after the adjustments are made). Measurements may be taken using a portable CO analyzer;
[40 CFR §§63.7540(a)(10), (12), and (13)]

[45CSR14, Permit Number R14-0013, Condition 4.1.8]

9.1.9. 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.]

[45CSR14, Permit Number R14-0013, Condition 4.1.9]

9.2. Monitoring, Compliance Demonstration, Source-Specific Recording and Reporting Requirements

- 9.2.1. For the purpose of determining compliance with the operating limits set forth in Section 9.1.2. of this permit, the permittee shall monitor and record the actual brake horsepower-hours generated by each of the permitted engines. The records shall be maintained in a format that demonstrates compliance with the total maximum brake-horsepower hour limits established in Section 9.1.2. of this permit.

[45CSR14, Permit Number R14-0013, Condition 4.2.1]

- 9.2.2. For the purpose of demonstrating compliance with the annual emission limits set forth in Section 4.1 of this permit, the permittee shall maintain records of the actual emissions calculated using the actual brake-horsepower hour records of Section 9.2.1 of this permit and the engine specific hourly emission factors. The hourly emission factors used to show compliance for engines E07 - E09 shall be 7.2 g-NOx/bhp-hr and 2.6 g-CO/bhp-hr.

[45CSR14, Permit Number R14-0013, Condition 4.2.2]

- 9.2.3. The permittee shall calculate and record, on a monthly and rolling twelve month basis, the emissions of each pollutant limited under Table 9.1.5(b) generated by turbines 003-01 and 003-02. The calculation shall be based on the emission factors used in permit application R14-0013E and the following information:

- a. The permittee shall monitor and record the number of hours that the turbines 003-01 and 003-02 operate in the following operational modes:

- (1) Normal: 50% Load and 10F; (2)
Low Temp: < 10F-20F;
(3) Very Low Temp: < -20F; and
(4) Low-Load: < 50% Load.

- b. The permittee shall monitor and record the number of startup/shutdowns of each turbine;

[45CSR14, Permit Number R14-0013, Condition 4.2.3]

- 9.2.4. The permittee shall calculate and record, on a monthly and rolling twelve month basis, the emissions of each pollutant limited under Table 9.1.5(c) generated by turbines 003-03 and 003-04. The calculation shall be based on the emission factors used in permit application R14-0013E and the following information:

- a. The permittee shall monitor and record the number of hours that the turbines 003-03 and 003-04 operate in the following operational modes:

- (1) Normal: >50% Load and 0F; (2)
Low Temp: < 0F; and
(3) Low-Load: < 50% Load.

- b. The permittee shall monitor and record the number of startup/shutdowns of each turbine;

[45CSR14, Permit Number R14-0013, Condition 4.2.4]

- 9.2.5. For the purposes of demonstrating compliance with the maximum usage limits set forth in

9.1.7(b), the permittee shall monitor and record the monthly and rolling twelve month hours of operation of the emergency generator.

[45CSR14, Permit Number R14-0013, Condition 4.2.5]

- 9.2.6. The permittee shall meet all applicable Monitoring, Compliance Demonstration, Source-Specific Recording and Reporting Requirements as given under 40 CFR 60 Subpart JJJJ, 40 CFR 60, Subpart KKKK and 40 CFR 63, Subpart ZZZZ.
- a. 40 C.F.R. 63 Subpart ZZZZ, specifically 40 C.F.R. §§ 63.6595(a)(3), 63.6605, 63.6640. [G3]
 - b. 40 C.F.R. 63 Subpart ZZZZ, specifically 40 C.F.R. §§ 63.6595(a)(3), 63.6600(b) (emission limits in Table 2a, item 2, and the operating limitations in Table 2b, item 1), 63.6605, 63.6635, 63.6640 (Table 6). [E11]
 - c. 40 C.F.R. 60 Subpart JJJJ, specifically 40 C.F.R. § 60.4233(e) & emission limits on Line 5 of Table 1 of 40 C.F.R. 60 Subpart JJJJ, 40 C.F.R. §§ 60.4234, 60.4243(b)(2)(ii), 60.4246. [E11]
 - d. 40 C.F.R. 60 Subpart KKKK, specifically 40 C.F.R. §§60.4300; 60.4305; 60.4320 (NO_x - Table 1, 3rd line: "New turbine firing natural gas"); 60.4330(a)(2)(S02); 60.4333(a); 60.4340(a)(NO_x annual tests); 60.4360 (sulfur content monitoring); 60.4365(a); 60.4370(b). [T01-T04]

[45CSR14, Permit Number R14-0013, Condition 4.2.6]

9.3. Testing Requirements

- 9.3.1. For the purpose of demonstrating compliance with the hourly emission limits set forth in Section 9.1.2. of this permit, the permittee shall conduct annual emissions testing for NO_x and CO emissions released from engines No.7 through No. 9 (emission points E07 through E09) using portable emissions analyzers.

Upon utilization of the air-to-fuel ratio monitoring established in Section 9.2.2. of permit R14-0013E, periodic emissions testing shall be performed once every five (5) years. This periodic testing may be performed using portable emissions analyzers.

[45CSR14, Permit Number R14-0013, Condition 4.3.1]

- 9.3.2. In addition to the NO_x performance testing as required under 40 CFR 60, Subpart KKKK, within 60 days after achieving full load, but not later than 180 days after initial startup, and at such times thereafter as may be required by the Director, the permittee shall conduct, or have conducted, a performance test on each turbine to determine compliance with the "normal load" CO emission limit specified under Table 9.1.5(b) and (c) and in accordance with 3.3.1. The permittee shall use an appropriate EPA-approved test method as given under 40 CFR 60, Appendix A and approved in writing by the Director in a protocol submitted pursuant to 3.3.1(c). The testing shall take place while the engines are operating at "normal load" as defined under 9.2.3(a) and 9.2.4(a).

[45CSR14, Permit Number R14-0013, Condition 4.3.2]

- 9.3.3. In addition to the NO_x performance testing as required under 40 CFR 60, Subpart KKKK, within 60 days after achieving full load, but not later than 180 days after initial startup, and at such times thereafter as may be required by the Director, the permittee shall conduct, or have conducted, a performance test on one (1) of the Solar Mars turbines (T03,T04) to determine compliance with the particulate matter emission limit (including condensables) specified under Table 9.1.5(c) and in

accordance with 3.3.1. of R14-0013. The permittee shall use an appropriate EPA-approved test method for particulate matter including condensables. The permittee shall submit a testing protocol pursuant to 3.3.1(c). The testing shall take place while the engines are operating at "normal load" as defined under 9.2.3(a) and 9.2.4(a).

[45CSR14, Permit Number R14-0013, Condition 4.3.3]

- 9.3.4. The permittee shall meet all applicable testing requirements as given under 40 CFR 60 Subpart JJJJ, 40 CFR 60, Subpart KKKK and 40 CFR 63, Subpart ZZZZ.
- a. 40 C.F.R. 63 Subpart ZZZZ, specifically 63.6610 (a) (Table 4), 63.6615 (Table 3, items 1 and 3), 63.6620, 63.6625 ((a), (b) and (h)), 63.6630 (Table 5). **(EII)**
 - b. 40 C.F.R. 60 Subpart JJJJ, specifically 40 C.F.R. § 60.4244. **(EII)**
 - c. 40 C.F.R. 60 Subpart KKKK., specifically 40 C.F.R. § 60.4400. **(TOI-T04)**

[45CSR14, Permit Number R14-0013, Condition 4.3.4]

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.

[45CSR14, Permit Number R14-0013, Condition 4.4.1]

- 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.

[45CSR14, Permit Number R14-0013, Condition 4.4.2]

- 9.4.3. **Record of Malfunctions of Air Pollution Control Equipment.** For all air pollution control equipment listed in Section 1.0 of R14-0013, 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.

[45CSR14, Permit Number R14-0013, Condition 4.4.3]

- 9.4.4. The permittee shall meet all applicable record-keeping requirements as given under 40 CFR 60 Subpart JJJJ, 40 CFR 60, Subpart KKKK and 40 CFR 63, Subpart ZZZZ.

[45CSR14, Permit Number R14-0013, Condition 4.4.4]

- 9.4.5. The permittee shall keep the following records in accordance with 40CFR§63.7555. This includes but is not limited to the following information during the tune up as required in Condition 4.1.8.b. and 40 CFR §63.7540:

- a. The concentrations of CO in the effluent stream in parts per million by volume, and oxygen in volume percent, measured at high fire or typical operating load, before and after the tune-up of the boiler or process heater.
- b. A description of any corrective actions taken as a part of the tune-up. [40 CFR §§63.7540(a)(10)(vi) and 63.7555]

[45CSR14, Permit Number R14-0013, Condition 4.4.5]

9.5. Reporting Requirements

- 9.5.1. The permittee shall meet all applicable reporting requirements as given under 40 CFR 60 Subpart JJJJ, 40 CFR 60, Subpart KKKK and 40 CFR 63, Subpart ZZZZ.

- a. 40 C.F.R. 63 Subpart ZZZZ, specifically 40 C.F.R. 63 Subpart ZZZZ, specifically 40 C.F.R. § 63.6645(t). [G3]
- b. 40 C.F.R. 63 Subpart ZZZZ, specifically 63.6645, 63.6655 (except (c), (e),(t)), 63.6650 (except (g)). [E11]
- c. 40 C.F.R. 60 Subpart JJJJ, specifically 40 C.F.R. § 60.4245. [E11]
- d. 40 C.F.R. 60 Subpart KKKK, specifically 40 C.F.R. § 60.4375; 60.4395. [T01-T04]

[45CSR14, Permit Number R14-0013, Condition 4.5.1]

- 9.5.2. The permittee shall submit "5-year Compliance Reports" for Heaters (HTR2, HTR3, HTR4) electronically using CEDRI that is accessed through the EPA's Center Data Exchange (CDX) (www.eoa.gov/cdx). However, if the reporting form for this report is not available in CEDRI at the time the report is due, the permittee shall submit the report to the Administrator and Director using the

addresses listed in Condition 3.5.3. The first compliance report shall be submitted no later than five years after the initial start-up of the unit and the first date ending on January 31. Subsequent reports shall be submitted once every five years afterwards. Such reports shall contain the information specified in 40 CFR §§63.7550(c)(5) (i) through (iv) and (xiv) which are:

- a. Permittee and facility name, and address;
- b. Process unit information emission limitations, and operating limitations;
- c. Date of report and beginning and ending dates of the reporting period;
- d. Include the date of the most recent tune-up for each boiler; and
- e. Include the date of the most recent burner inspection **if** it was not done on a 5-year period and was delayed until the next scheduled or unscheduled unit shutdown.

The permittee shall maintain records of such reports in accordance with Condition 3.4.1 of R14-0013.

[40CFR §§63.7550(b), (b)(1), (c)(1), & (c)(5)(i) through (iii) and (xiv), and (h)(3)]

[45CSR14, Permit Number R14-0013, Condition 4.5.2]

10.0 40 C.F.R. 63, Subpart ZZZZ MACT Requirements for New Reciprocating Internal Combustion SI RICE Engine(s) > 500 HP at Major HAP Sources [Emission Unit ID: (002-13)]

10.1 Limitations and Standards

10.1.1. If you own or operate a new or reconstructed 4SLB stationary RICE with a site rating of more than 500 brake HP located at major source of HAP emissions, you must comply with the emission limitations in Table 2a to this subpart and the operating limitations in Table 2b to this subpart which apply to you.

Subpart ZZZZ, Table 2a.

For each ...	You must meet the following emission limitations except during periods of startup	During periods of startup you must.....
2. 4SLB stationary RICE	a. Reduce CO emissions by 93 percent or more; or b. Limit concentration of formaldehyde in the stationary RICE exhaust to 14 ppmvd or less at 15 percent O ₂	Minimize the engine's time spent at idle and minimize the engine's startup time at startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations apply. ¹

Subpart ZZZZ, Table 2b.

For Each	You must meet the following operating limitations, except during period of startup
1. New and reconstructed 2SLB and CI stationary RICE >500 HP located at a major source of HAP emissions and <u>new and reconstructed 4SLB stationary RICE ≥250 HP located at a major source of HAP emissions complying with the requirement to reduce CO emissions and using an oxidation catalyst; and</u> New and reconstructed 2SLB and CI stationary RICE >500 HP located at a major source of HAP emissions and <u>new and reconstructed 4SLB stationary RICE ≥250 HP located at a major source of HAP emissions complying with the requirement to limit the concentration of formaldehyde in the stationary RICE exhaust and using an oxidation catalyst.</u>	a. maintain your catalyst so that the pressure drop across the catalyst does not change by more than 2 inches of water at 100 percent load plus or minus 10 percent from the pressure drop across the catalyst that was measured during the initial performance test; and b. maintain the temperature of your stationary RICE exhaust so that the catalyst inlet temperature is greater than or equal to 450 °F and less than or equal to 1350 °F. ¹

[40 CFR §63.6600, Table 2a and 2b; 45CSR14, R14-00013E, Condition 4.1.4.d & e]

10.1.2 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 CFR §63.6605]

10.1.3. 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)]

10.2. Monitoring Requirements

10.2.1. You must demonstrate initial compliance with each emission limitation, operating limitation, and other requirement that applies to you according to Table 5 of this subpart.

For each . . .	Complying with the requirement to . . .	You have demonstrated initial compliance if . . .
1. <u>New or reconstructed non-emergency 2SLB stationary RICE >500 HP located at a major source of HAP, new or reconstructed non-emergency 4SLB stationary RICE ≥250 HP located at a major source of HAP, non-emergency stationary CI RICE >500 HP located at a major source of HAP, and existing non-emergency stationary CI RICE >500 HP located at an area source of HAP</u>	a. Reduce CO emissions and using oxidation catalyst, and using a CPMS	i. The average reduction of emissions of CO determined from the initial performance test achieves the required CO percent reduction; and ii. You have installed a CPMS to continuously monitor catalyst inlet temperature according to the requirements in §63.6625(b); and iii. You have recorded the catalyst pressure drop and catalyst inlet temperature during the initial performance test.
9. <u>New or reconstructed non-emergency stationary RICE >500 HP located at a major source of HAP, new or reconstructed non-emergency 4SLB stationary RICE 250≤HP≤500 located at a major source of HAP, and existing non-emergency 4SRB stationary RICE</u>	a. Limit the concentration of formaldehyde in the stationary RICE exhaust and using oxidation catalyst or NSCR	i. The average formaldehyde concentration, corrected to 15 percent O ₂ , dry basis, from the three test runs is less than or equal to the formaldehyde

<p>>500 HP located at a major source of HAP</p>		<p>emission limitation; and ii. You have installed a CPMS to continuously monitor catalyst inlet temperature according to the requirements in §63.6625(b); and</p>
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During the initial performance test, you must establish each operating limitation in Tables 1b and 2b of this subpart that applies to you.

You must submit the Notification of Compliance Status containing the results of the initial compliance demonstration according to the requirements in §63.6645.

[40 C.F.R. § 63.6630(a), (b), (c)]

10.2.2. 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 (6) 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)(ii) 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.

[40 C.F.R. § 63.6625(b)]

10.2.3. (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 . . .
1. New or reconstructed non-emergency 2SLB stationary RICE >500 HP located at a major source of HAP, new or reconstructed non-emergency 4SLB stationary RICE ≥250 HP located at a major source of HAP, and new or reconstructed non-emergency CI stationary RICE >500 HP located at a major source of HAP	a. Reduce CO emissions and using an oxidation catalyst, and using a CPMS	i. Conducting semiannual performance tests for CO to demonstrate that the required CO percent reduction is achieved ^a ; and ii. Collecting the catalyst inlet temperature data according to §63.6625(b); and iii. Reducing these data to 4-hour rolling averages; and
		iv. Maintaining the 4-hour rolling averages within the operating limitations for the catalyst inlet temperature; and
		v. Measuring the pressure drop across the catalyst once per month and demonstrating that the pressure drop across the catalyst is within the operating limitation established during the performance test.
7. New or reconstructed non-emergency stationary RICE >500 HP located at a major source of HAP and new or reconstructed non-emergency 4SLB stationary RICE 250≤HP≤500 located at a major source of HAP	a. Limit the concentration of formaldehyde in the stationary RICE exhaust and using oxidation catalyst or NSCR	i. Conducting semiannual performance tests for formaldehyde to demonstrate that your emissions remain at or below the formaldehyde concentration limits; and ii. Collecting the catalyst inlet temperature data according to §63.6625(b); and
		iii. Reducing these data to 4-hour rolling averages; and
		iv. Maintaining the 4-hour rolling averages within the operating limitations for the catalyst inlet temperature; and
		v. Measuring the pressure drop across the catalyst once per month and demonstrating that the pressure drop across the catalyst is within the

		operating limitation established during the performance test.
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(b) You must report each instance in which you did not meet each emission limitation or operating limitation in Tables 1a and 1b, Tables 2a and 2b, Table 2c, and Table 2d to this subpart that apply to you. These instances are deviations from the emission and operating limitations in this subpart. These deviations must be reported according to the requirements in §63.6650. If you change your catalyst, you must reestablish the values of the operating parameters measured during the initial performance test. When you reestablish the values of your operating parameters, you must also conduct a performance test to demonstrate that you are meeting the required emission limitation applicable to your stationary RICE.

[40 C.F.R. § 63.6640(a) and (b), Table 6]

- 10.2.3. (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(a), (b), (c)]

10.3. Testing Requirements

10.3.1. If you own or operate a stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions you are subject to the requirements of this section.

(a) You must conduct the initial performance test or other initial compliance demonstrations in Table 4 of subpart ZZZZ that apply to you within 180 days after the compliance date that is specified for you stationary RICE in 63.6595 and according to the provisions in 63.7(a)(2).

[40 C.F.R. § 63.6610(a), Table 4]

10.3.2. If you must comply with the emission limitations and operating limitations, you must conduct subsequent performance test as specified in Table 3 of subpart ZZZZ.

For each . . .	Complying with the requirement to . . .	You must . . .
1. New or reconstructed 2SLB stationary RICE >500 HP located at major sources; new or reconstructed 4SLB stationary RICE ≥250 HP located at major sources; and new or reconstructed CI stationary RICE >500 HP located at major sources	Reduce CO emissions and not using a CEMS	Conduct subsequent performance tests semiannually. ¹

¹After you have demonstrated compliance for two consecutive tests, you may reduce the frequency of subsequent performance tests to annually. If the results of any subsequent annual performance test indicate the stationary RICE is not in

compliance with the CO or formaldehyde emission limitation, or you deviate from any of your operating limitations, you must resume semiannual performance tests.

[40 C.F.R. § 63.6615, Table 3]

- 10.3.3. You must conduct each performance test in Tables 3 and 4 of subpart ZZZZ that apply to you according to the procedures defined with 63.6620.

Each performance test must be conducted according to the requirements that this subpart specifies in Table 4 to this subpart. If you own or operate a non-operational stationary RICE that is subject to performance testing, you do not need to start up the engine solely to conduct the performance test. Owners and operators of a non-operational engine can conduct the performance test when the engine is started up again. The test must be conducted at any load condition within plus or minus 10 percent of 100 percent load for the stationary RICE listed in paragraphs (b)(1) through (4) of this section.

- (2) New non-emergency 4SLB stationary RICE with a site rating of greater than or equal to 250 brake HP located at a major source of HAP emissions.

You must conduct three separate test runs for each performance test required in this section, as specified in §63.7(e)(3). Each test run must last at least 1 hour, unless otherwise specified in this subpart.

The engine percent load during a performance test must be determined by documenting the calculations, assumptions, and measurement devices used to measure or estimate the percent load in a specific application. A written report of the average percent load determination must be included in the notification of compliance status. The following information must be included in the written report: the engine model number, the engine manufacturer, the year of purchase, the manufacturer's site-rated brake horsepower, the ambient temperature, pressure, and humidity during the performance test, and all assumptions that were made to estimate or calculate percent load during the performance test must be clearly explained. If measurement devices such as flow meters, kilowatt meters, beta analyzers, stain gauges, etc. are used, the model number of the measurement device, and an estimate of its accurate in percentage of true value must be provided.

[40 C.F.R. § 63.6620(a), (b), (d) and (i)]

10.4. Recordkeeping Requirements

- 10.4.1. (a) If you must comply with the emission and operating limitations, you must keep the records described in paragraphs (a)(1) through (a)(5), (b)(1) through (b)(3) and (c) of this section.
- (1) A copy of each notification and report that you submitted to comply with this subpart, including all documentation supporting any Initial Notification or Notification of Compliance Status that you submitted, according to the requirement in §63.10(b)(2)(xiv).
 - (2) Records of the occurrence and duration of each malfunction of operation (*i.e.*, process equipment) or the air pollution control and monitoring equipment.
 - (3) Records of performance tests and performance evaluations as required in §63.10(b)(2)(viii).
 - (4) Records of all required maintenance performed on the air pollution control and monitoring equipment.
 - (5) Records of actions taken during periods of malfunction to minimize emissions in accordance with §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.

- (b) For each CEMS or CPMS, you must keep the records listed in paragraphs (b)(1) through (3) of this section.
 - (1) Records described in §63.10(b)(2)(vi) through (xi).
 - (2) Previous (*i.e.*, superseded) versions of the performance evaluation plan as required in §63.8(d)(3).
 - (3) Requests for alternatives to the relative accuracy test for CEMS or CPMS as required in §63.8(f)(6)(i), if applicable.
- (d) 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 C.F.R. § 63.6655(a), (b), (d)]

- 10.4.1. (a) Your records must be in a form suitable and readily available for expeditious review according to §63.10(b)(1).
- (b) As specified in §63.10(b)(1), you must keep each record for 5 years following the date of each occurrence, measurement, maintenance, corrective action, report, or record.
- (c) You must keep each record readily accessible in hard copy or electronic form for at least 5 years after the date of each occurrence, measurement, maintenance, corrective action, report, or record, according to §63.10(b)(1).

[40 C.F.R. § 63.6660(a), (b), (c)]

10.5. Reporting Requirements

- 10.5.1. (a) You must submit all of the notifications in §§63.7(b) and (c), 63.8(e), (f)(4) and (f)(6), 63.9(b) through (e), and (g) and (h) that apply to you by the dates specified if you own or operate any of the following:
 - (4) A new or reconstructed 4SLB stationary RICE with a site rating of greater than or equal to 250 HP located at a major source of HAP emissions.
- (g) If you are required to conduct a performance test, you must submit a Notification of Intent to conduct a performance test at least 60 days before the performance test is scheduled to begin as required in §63.7(b)(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).
 - (2) For each initial compliance demonstration required in Table 5 to this subpart that includes a performance test conducted according to the requirements in Table 3 to this subpart, you must submit the Notification of Compliance Status, including the performance test results, before the close of business on the 60th day following the completion of the performance test according to §63.10(d)(2).

[40 CFR §63.6645(a), (g), (h)]

10.5.2. (a) 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 . . .
1. Existing non-emergency, non-black start stationary RICE 100≤HP≤500 located at a major source of HAP; existing non-emergency, non-black start stationary CI RICE >500 HP located at a major source of HAP; existing non-emergency 4SRB stationary RICE >500 HP located at a major source of HAP; existing non-emergency, non-black start stationary CI RICE >300 HP located at an area source of HAP; <u>new or reconstructed non-emergency stationary RICE >500 HP located at a major source of HAP</u> ; and new or reconstructed non-emergency 4SLB stationary RICE 250≤HP≤500 located at a major source of HAP	Compliance report	a. If there are no deviations from any emission limitations or operating limitations that apply to you, a statement that there were no deviations from the emission limitations or operating limitations during the reporting period. If there were no periods during which the CMS, including CEMS and CPMS, was out-of-control, as specified in §63.8(c)(7), a statement that there were not periods during which the CMS was out-of-control during the reporting period; or	i. Semiannually according to the requirements in §63.6650(b)(1)-(5) for engines that are not limited use stationary RICE subject to numerical emission limitations; and ii. Annually according to the requirements in §63.6650(b)(6)-(9) for engines that are limited use stationary RICE subject to numerical emission limitations.
		b. If you had a deviation from any emission limitation or operating limitation during the reporting period, the information in §63.6650(d). If there were periods during which the CMS, including CEMS and CPMS, was out-of-control, as specified in §63.8(c)(7), the information in §63.6650(e); or	i. Semiannually according to the requirements in §63.6650(b).
		c. If you had a malfunction during the reporting period, the information in §63.6650(c)(4).	i. Semiannually according to the requirements in §63.6650(b).

(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.

(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.

(8) For annual Compliance reports, each subsequent Compliance report must cover the annual reporting period from January 1 through December 31.

(9) For annual Compliance reports, each subsequent Compliance report must be postmarked or delivered no later than January 31.

(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(a), (b), (c), (d), (e), (f)]

10.6. Compliance Plan

10.6.1 N/A

APPENDIX C

ELECTRONIC SUBMITTAL

Title V Operating Permit Renewal Application

**Lost River Compressor Station, Facility ID No. 031-00002
Mathias, West Virginia**

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

April 2017

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

Identification

User Identification:	Lost River - A01 - Glycol Tank
City:	Mathias
State:	West Virginia
Company:	Columbia Pipeline Group
Type of Tank:	Horizontal Tank
Description:	Lost River 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

Meteorological Data used in Emissions Calculations: Washington Dulles AP, District of Columbia (Avg Atmospheric Pressure = 14.67 psia)

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

Lost River - A01 - Glycol Tank - Horizontal Tank
Mathias, West Virginia

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Propylene glycol	All	60.23	51.60	68.87	56.07	0.0010	0.0006	0.0015	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)

Lost River - A01 - Glycol Tank - Horizontal Tank
Mathias, West Virginia

Annual Emission Calculations	
Standing Losses (lb):	0.0268
Vapor Space Volume (cu ft):	90.3583
Vapor Density (lb/cu ft):	0.0000
Vapor Space Expansion Factor:	0.0624
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):	519.9045
Daily Average Ambient Temp. (deg. F):	53.8250
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	515.7350
Tank Paint Solar Absorptance (Shell):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,208.4167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0624
Daily Vapor Temperature Range (deg. R):	34.5433
Daily Vapor Pressure Range (psia):	0.0009
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):	0.0015
Daily Avg. Liquid Surface Temp. (deg R):	519.9045
Daily Min. Liquid Surface Temp. (deg R):	511.2687
Daily Max. Liquid Surface Temp. (deg R):	528.5403
Daily Ambient Temp. Range (deg. R):	22.6000
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):	
Working Losses (lb):	0.0208
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):	0.0476

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

Emissions Report for: Annual

Lost River - A01 - Glycol Tank - Horizontal Tank
Mathias, West Virginia

Components	Losses(lbs)		
	Working Loss	Breathing Loss	Total Emissions
Propylene glycol	0.02	0.03	0.05

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

Identification

User Identification:	Lost River - A02 - Glycol Tank
City:	Mathias
State:	West Virginia
Company:	Columbia Pipeline Group
Type of Tank:	Horizontal Tank
Description:	Lost River Compressor Station

Tank Dimensions

Shell Length (ft):	10.50
Diameter (ft):	5.75
Volume (gallons):	2,000.00
Turnovers:	0.00
Net Throughput(gal/yr):	24,000.00
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

Meteorological Data used in Emissions Calculations: Washington Dulles AP, District of Columbia (Avg Atmospheric Pressure = 14.67 psia)

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

Lost River - A02 - Glycol Tank - Horizontal Tank
Mathias, West Virginia

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Propylene glycol	All	60.23	51.60	68.87	56.07	0.0010	0.0006	0.0015	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)

Lost River - A02 - Glycol Tank - Horizontal Tank
Mathias, West Virginia

Annual Emission Calculations	
Standing Losses (lb):	0.0515
Vapor Space Volume (cu ft):	173.6662
Vapor Density (lb/cu ft):	0.0000
Vapor Space Expansion Factor:	0.0624
Vented Vapor Saturation Factor:	0.9999
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	173.6662
Tank Diameter (ft):	5.7500
Effective Diameter (ft):	8.7699
Vapor Space Outage (ft):	2.8750
Tank Shell Length (ft):	10.5000
Vapor Density	
Vapor Density (lb/cu ft):	0.0000
Vapor Molecular Weight (lb/lb-mole):	76.1100
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0010
Daily Avg. Liquid Surface Temp. (deg. R):	519.9045
Daily Average Ambient Temp. (deg. F):	53.8250
Ideal Gas Constant R (psia cu ft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	515.7350
Tank Paint Solar Absorptance (Shell):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,208.4167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0624
Daily Vapor Temperature Range (deg. R):	34.5433
Daily Vapor Pressure Range (psia):	0.0009
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):	0.0015
Daily Min. Liquid Surface Temp. (deg R):	511.2687
Daily Max. Liquid Surface Temp. (deg R):	528.5403
Daily Ambient Temp. Range (deg. R):	22.6000
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):	2.8750
Working Losses (lb):	
Working Losses (lb):	0.0415
Vapor Molecular Weight (lb/lb-mole):	76.1100
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0010
Annual Net Throughput (gal/yr.):	24,000.0000
Annual Turnovers:	0.0000
Turnover Factor:	1.0000
Tank Diameter (ft):	5.7500
Working Loss Product Factor:	1.0000
Total Losses (lb):	0.0930

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

Emissions Report for: Annual

Lost River - A02 - Glycol Tank - Horizontal Tank
Mathias, West Virginia

Components	Losses(lbs)		
	Working Loss	Breathing Loss	Total Emissions
Propylene glycol	0.04	0.05	0.09

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

Identification

User Identification:	Lost River - A03 - Glycol Tank
City:	Mathias
State:	West Virginia
Company:	Columbia Pipeline Group
Type of Tank:	Horizontal Tank
Description:	Lost River Compressor Station

Tank Dimensions

Shell Length (ft):	12.50
Diameter (ft):	6.75
Volume (gallons):	3,300.00
Turnovers:	0.00
Net Throughput(gal/yr):	39,600.00
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

Meteorological Data used in Emissions Calculations: Washington Dulles AP, District of Columbia (Avg Atmospheric Pressure = 14.67 psia)

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

Lost River - A03 - Glycol Tank - Horizontal Tank
Mathias, West Virginia

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Propylene glycol	All	60.23	51.60	68.87	56.07	0.0010	0.0006	0.0015	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)

Lost River - A03 - Glycol Tank - Horizontal Tank
Mathias, West Virginia

Annual Emission Calculations	
Standing Losses (lb):	0.0845
Vapor Space Volume (cu ft):	284.9101
Vapor Density (lb/cu ft):	0.0000
Vapor Space Expansion Factor:	0.0624
Vented Vapor Saturation Factor:	0.9998
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	284.9101
Tank Diameter (ft):	6.7500
Effective Diameter (ft):	10.3675
Vapor Space Outage (ft):	3.3750
Tank Shell Length (ft):	12.5000
Vapor Density	
Vapor Density (lb/cu ft):	0.0000
Vapor Molecular Weight (lb/lb-mole):	76.1100
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0010
Daily Avg. Liquid Surface Temp. (deg. R):	519.9045
Daily Average Ambient Temp. (deg. F):	53.8250
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	515.7350
Tank Paint Solar Absorptance (Shell):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,208.4167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0624
Daily Vapor Temperature Range (deg. R):	34.5433
Daily Vapor Pressure Range (psia):	0.0009
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):	0.0015
Daily Min. Liquid Surface Temp. (deg R):	511.2687
Daily Max. Liquid Surface Temp. (deg R):	528.5403
Daily Ambient Temp. Range (deg. R):	22.6000
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9998
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0010
Vapor Space Outage (ft):	3.3750
Working Losses (lb):	
Working Losses (lb):	0.0685
Vapor Molecular Weight (lb/lb-mole):	76.1100
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0010
Annual Net Throughput (gal/yr.):	39,600.0000
Annual Turnovers:	0.0000
Turnover Factor:	1.0000
Tank Diameter (ft):	6.7500
Working Loss Product Factor:	1.0000
Total Losses (lb):	0.1530

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

Emissions Report for: Annual

Lost River - A03 - Glycol Tank - Horizontal Tank
Mathias, West Virginia

Components	Losses(lbs)		
	Working Loss	Breathing Loss	Total Emissions
Propylene glycol	0.07	0.08	0.15

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

Identification

User Identification:	Lost River - A05 & A06 - Pipeline Liquids Tank
City:	Mathias
State:	West Virginia
Company:	Columbia Pipeline Group
Type of Tank:	Horizontal Tank
Description:	Lost River Compressor Station

Tank Dimensions

Shell Length (ft):	12.00
Diameter (ft):	8.50
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

Meteorological Data used in Emissions Calculations: Washington Dulles AP, District of Columbia (Avg Atmospheric Pressure = 14.67 psia)

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

Lost River - A05 & A06 - Pipeline Liquids Tank - Horizontal Tank
Mathias, West Virginia

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Gasoline (RVP 10)	All	60.23	51.60	68.87	56.07	5.2094	4.3943	6.1414	66.0000			92.00	Option 4: RVP=10, ASTM Slope=3

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

Lost River - A05 & A06 - Pipeline Liquids Tank - Horizontal Tank
Mathias, West Virginia

Annual Emission Calculations	
Standing Losses (lb):	1,098.3637
Vapor Space Volume (cu ft):	433.7199
Vapor Density (lb/cu ft):	0.0616
Vapor Space Expansion Factor:	0.2447
Vented Vapor Saturation Factor:	0.4601
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	433.7199
Tank Diameter (ft):	8.5000
Effective Diameter (ft):	11.3990
Vapor Space Outage (ft):	4.2500
Tank Shell Length (ft):	12.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0616
Vapor Molecular Weight (lb/lb-mole):	66.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	5.2094
Daily Avg. Liquid Surface Temp. (deg. R):	519.9045
Daily Average Ambient Temp. (deg. F):	53.8250
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	515.7350
Tank Paint Solar Absorptance (Shell):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,208.4167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.2447
Daily Vapor Temperature Range (deg. R):	34.5433
Daily Vapor Pressure Range (psia):	1.7471
Breather Vent Press. Setting Range (psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	5.2094
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	4.3943
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	6.1414
Daily Avg. Liquid Surface Temp. (deg R):	519.9045
Daily Min. Liquid Surface Temp. (deg R):	511.2687
Daily Max. Liquid Surface Temp. (deg R):	528.5403
Daily Ambient Temp. Range (deg. R):	22.6000
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.4601
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	5.2094
Vapor Space Outage (ft):	4.2500
Working Losses (lb):	
Working Losses (lb):	491.1678
Vapor Molecular Weight (lb/lb-mole):	66.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	5.2094
Annual Net Throughput (gal/yr.):	60,000.0000
Annual Turnovers:	0.0000
Turnover Factor:	1.0000
Tank Diameter (ft):	8.5000
Working Loss Product Factor:	1.0000
Total Losses (lb):	1,589.5315

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

Emissions Report for: Annual

Lost River - A05 & A06 - Pipeline Liquids Tank - Horizontal Tank
Mathias, West Virginia

Components	Losses(lbs)		
	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 10)	491.17	1,098.36	1,589.53

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

Identification

User Identification:	Lost River - A07 - Used Oil Tank
City:	Mathias
State:	West Virginia
Company:	Columbia Pipeline Group
Type of Tank:	Horizontal Tank
Description:	Lost River Compressor Station

Tank Dimensions

Shell Length (ft):	10.00
Diameter (ft):	8.25
Volume (gallons):	4,000.00
Turnovers:	0.00
Net Throughput(gal/yr):	48,000.00
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

Meteorological Data used in Emissions Calculations: Washington Dulles AP, District of Columbia (Avg Atmospheric Pressure = 14.67 psia)

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

Lost River - A07 - Used Oil Tank - Horizontal Tank
Mathias, West Virginia

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Distillate fuel oil no. 2	All	60.23	51.60	68.87	56.07	0.0066	0.0048	0.0087	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009

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

Lost River - A07 - Used Oil Tank - Horizontal Tank
Mathias, West Virginia

Annual Emission Calculations	
Standing Losses (lb):	1.1875
Vapor Space Volume (cu ft):	340.4851
Vapor Density (lb/cu ft):	0.0002
Vapor Space Expansion Factor:	0.0626
Vented Vapor Saturation Factor:	0.9986
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	340.4851
Tank Diameter (ft):	8.2500
Effective Diameter (ft):	10.2516
Vapor Space Outage (ft):	4.1250
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):	0.0066
Daily Avg. Liquid Surface Temp. (deg. R):	519.9045
Daily Average Ambient Temp. (deg. F):	53.8250
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	515.7350
Tank Paint Solar Absorptance (Shell):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,208.4167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0626
Daily Vapor Temperature Range (deg. R):	34.5433
Daily Vapor Pressure Range (psia):	0.0039
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0066
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0048
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0087
Daily Avg. Liquid Surface Temp. (deg R):	519.9045
Daily Min. Liquid Surface Temp. (deg R):	511.2687
Daily Max. Liquid Surface Temp. (deg R):	528.5403
Daily Ambient Temp. Range (deg. R):	22.6000
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9986
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0066
Vapor Space Outage (ft):	4.1250
Working Losses (lb):	
Working Losses (lb):	0.9744
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0066
Annual Net Throughput (gal/yr.):	48,000.0000
Annual Turnovers:	0.0000
Turnover Factor:	1.0000
Tank Diameter (ft):	8.2500
Working Loss Product Factor:	1.0000
Total Losses (lb):	2.1620

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

Emissions Report for: Annual

Lost River - A07 - Used Oil Tank - Horizontal Tank
Mathias, West Virginia

Components	Losses(lbs)		
	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	0.97	1.19	2.16

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

Identification

User Identification:	Lost River - A12 - Wastewater Mixture Tank
City:	Mathias
State:	West Virginia
Company:	Columbia Pipeline Group
Type of Tank:	Horizontal Tank
Description:	Lost River Compressor Station

Tank Dimensions

Shell Length (ft):	12.00
Diameter (ft):	8.50
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

Meteorological Data used in Emissions Calculations: Washington Dulles AP, District of Columbia (Avg Atmospheric Pressure = 14.67 psia)

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

Lost River - A12 - Wastewater Mixture Tank - Horizontal Tank
Mathias, West Virginia

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Distillate fuel oil no. 2	All	60.23	51.60	68.87	56.07	0.0066	0.0048	0.0087	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009

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

Lost River - A12 - Wastewater Mixture Tank - Horizontal Tank
Mathias, West Virginia

Annual Emission Calculations	
Standing Losses (lb):	1.5127
Vapor Space Volume (cu ft):	433.7199
Vapor Density (lb/cu ft):	0.0002
Vapor Space Expansion Factor:	0.0626
Vented Vapor Saturation Factor:	0.9985
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	433.7199
Tank Diameter (ft):	8.5000
Effective Diameter (ft):	11.3990
Vapor Space Outage (ft):	4.2500
Tank Shell Length (ft):	12.0000
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):	0.0066
Daily Avg. Liquid Surface Temp. (deg. R):	519.9045
Daily Average Ambient Temp. (deg. F):	53.8250
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	515.7350
Tank Paint Solar Absorptance (Shell):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,208.4167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0626
Daily Vapor Temperature Range (deg. R):	34.5433
Daily Vapor Pressure Range (psia):	0.0039
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0066
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0048
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0087
Daily Avg. Liquid Surface Temp. (deg R):	519.9045
Daily Min. Liquid Surface Temp. (deg R):	511.2637
Daily Max. Liquid Surface Temp. (deg R):	528.5403
Daily Ambient Temp. Range (deg. R):	22.6000
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9985
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0066
Vapor Space Outage (ft):	4.2500
Working Losses (lb):	
Working Losses (lb):	1.2180
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0066
Annual Net Throughput (gal/yr.):	60,000.0000
Annual Turnovers:	0.0000
Turnover Factor:	1.0000
Tank Diameter (ft):	8.5000
Working Loss Product Factor:	1.0000
Total Losses (lb):	2.7307

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

Emissions Report for: Annual

Lost River - A12 - Wastewater Mixture Tank - Horizontal Tank
Mathias, West Virginia

Components	Losses(lbs)		
	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	1.22	1.51	2.73

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

Identification

User Identification:	Lost River - A13 & A14 - Glycol Tank
City:	Mathias
State:	West Virginia
Company:	Columbia Pipeline Group
Type of Tank:	Horizontal Tank
Description:	Lost River Compressor Station

Tank Dimensions

Shell Length (ft):	14.50
Diameter (ft):	6.50
Volume (gallons):	3,600.00
Turnovers:	0.00
Net Throughput(gal/yr):	43,200.00
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

Meteorological Data used in Emissions Calculations: Washington Dulles AP, District of Columbia (Avg Atmospheric Pressure = 14.67 psia)

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

Lost River - A13 & A14 - Glycol Tank - Horizontal Tank
Mathias, West Virginia

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Propylene glycol	All	60.23	51.60	68.87	56.07	0.0010	0.0006	0.0015	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)

Lost River - A13 & A14 - Glycol Tank - Horizontal Tank
Mathias, West Virginia

Annual Emission Calculations	
Standing Losses (lb):	0.0909
Vapor Space Volume (cu ft):	306.4679
Vapor Density (lb/cu ft):	0.0000
Vapor Space Expansion Factor:	0.0624
Vented Vapor Saturation Factor:	0.9998
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	306.4679
Tank Diameter (ft):	6.5000
Effective Diameter (ft):	10.9574
Vapor Space Outage (ft):	3.2500
Tank Shell Length (ft):	14.5000
Vapor Density	
Vapor Density (lb/cu ft):	0.0000
Vapor Molecular Weight (lb/lb-mole):	76.1100
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0010
Daily Avg. Liquid Surface Temp. (deg. R):	519.9045
Daily Average Ambient Temp. (deg. F):	53.8250
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	515.7350
Tank Paint Solar Absorptance (Shell):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,208.4167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0624
Daily Vapor Temperature Range (deg. R):	34.5433
Daily Vapor Pressure Range (psia):	0.0009
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):	0.0015
Daily Min. Liquid Surface Temp. (deg R):	511.2687
Daily Max. Liquid Surface Temp. (deg R):	528.5403
Daily Ambient Temp. Range (deg. R):	22.6000
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9998
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0010
Vapor Space Outage (ft):	3.2500
Working Losses (lb):	
Working Losses (lb):	0.0747
Vapor Molecular Weight (lb/lb-mole):	76.1100
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0010
Annual Net Throughput (gal/yr.):	43,200.0000
Annual Turnovers:	0.0000
Turnover Factor:	1.0000
Tank Diameter (ft):	6.5000
Working Loss Product Factor:	1.0000
Total Losses (lb):	0.1656

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

Emissions Report for: Annual

Lost River - A13 & A14 - Glycol Tank - Horizontal Tank
Mathias, West Virginia

Components	Losses(lbs)		
	Working Loss	Breathing Loss	Total Emissions
Propylene glycol	0.07	0.09	0.17

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

Identification

User Identification:	Lost River - B04 - Water Mixture Tank
City:	Mathias
State:	West Virginia
Company:	Columbia Pipeline Group
Type of Tank:	Horizontal Tank
Description:	Lost River Compressor Station

Tank Dimensions

Shell Length (ft):	10.50
Diameter (ft):	5.00
Volume (gallons):	1,500.00
Turnovers:	0.00
Net Throughput(gal/yr):	18,000.00
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

Meteorological Data used in Emissions Calculations: Washington Dulles AP, District of Columbia (Avg Atmospheric Pressure = 14.67 psia)

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

Lost River - B04 - Water Mixture Tank - Horizontal Tank
Mathias, West Virginia

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Distillate fuel oil no. 2	All	60.23	51.60	68.87	56.07	0.0066	0.0048	0.0087	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009

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

Lost River - B04 - Water Mixture Tank - Horizontal Tank
Mathias, West Virginia

Annual Emission Calculations	
Standing Losses (lb):	0.4583
Vapor Space Volume (cu ft):	131.3166
Vapor Density (lb/cu ft):	0.0002
Vapor Space Expansion Factor:	0.0626
Vented Vapor Saturation Factor:	0.9991
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	131.3166
Tank Diameter (ft):	5.0000
Effective Diameter (ft):	8.1780
Vapor Space Outage (ft):	2.5000
Tank Shell Length (ft):	10.5000
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):	0.0066
Daily Avg. Liquid Surface Temp. (deg. R):	519.9045
Daily Average Ambient Temp. (deg. F):	53.8250
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	515.7350
Tank Paint Solar Absorptance (Shell):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,208.4167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0626
Daily Vapor Temperature Range (deg. R):	34.5433
Daily Vapor Pressure Range (psia):	0.0039
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0066
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0048
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0087
Daily Avg. Liquid Surface Temp. (deg R):	519.9045
Daily Min. Liquid Surface Temp. (deg R):	511.2687
Daily Max. Liquid Surface Temp. (deg R):	528.5403
Daily Ambient Temp. Range (deg. R):	22.6000
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9991
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0066
Vapor Space Outage (ft):	2.5000
Working Losses (lb):	
Working Losses (lb):	0.3654
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0066
Annual Net Throughput (gal/yr.):	18,000.0000
Annual Turnovers:	0.0000
Turnover Factor:	1.0000
Tank Diameter (ft):	5.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	0.8237

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

Emissions Report for: Annual

Lost River - B04 - Water Mixture Tank - Horizontal Tank
Mathias, West Virginia

Components	Losses(lbs)		
	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	0.37	0.46	0.82

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

Identification

User Identification:	Lost River - B05 - Lube Oil Tank
City:	Mathias
State:	West Virginia
Company:	Columbia Pipeline Group
Type of Tank:	Horizontal Tank
Description:	Lost River Compressor Station

Tank Dimensions

Shell Length (ft):	12.00
Diameter (ft):	6.50
Volume (gallons):	3,000.00
Turnovers:	0.00
Net Throughput(gal/yr):	36,000.00
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

Meteorological Data used in Emissions Calculations: Washington Dulles AP, District of Columbia (Avg Atmospheric Pressure = 14.67 psia)

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

Lost River - B05 - Lube Oil Tank - Horizontal Tank
Mathias, West Virginia

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Distillate fuel oil no. 2	All	60.23	51.60	68.87	56.07	0.0066	0.0048	0.0087	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009

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

Lost River - B05 - Lube Oil Tank - Horizontal Tank
Mathias, West Virginia

Annual Emission Calculations	
Standing Losses (lb):	0.8849
Vapor Space Volume (cu ft):	253.6286
Vapor Density (lb/cu ft):	0.0002
Vapor Space Expansion Factor:	0.0626
Vented Vapor Saturation Factor:	0.9989
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	253.6286
Tank Diameter (ft):	6.5000
Effective Diameter (ft):	9.9681
Vapor Space Outage (ft):	3.2500
Tank Shell Length (ft):	12.0000
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):	0.0066
Daily Avg. Liquid Surface Temp. (deg. R):	519.9045
Daily Average Ambient Temp. (deg. F):	53.8250
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	515.7350
Tank Paint Solar Absorptance (Shell):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,208.4167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0626
Daily Vapor Temperature Range (deg. R):	34.5433
Daily Vapor Pressure Range (psia):	0.0039
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0066
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0048
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0087
Daily Avg. Liquid Surface Temp. (deg R):	519.9045
Daily Min. Liquid Surface Temp. (deg R):	511.2637
Daily Max. Liquid Surface Temp. (deg R):	528.5403
Daily Ambient Temp. Range (deg. R):	22.6000
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9989
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0066
Vapor Space Outage (ft):	3.2500
Working Losses (lb):	
Working Losses (lb):	0.7308
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0066
Annual Net Throughput (gal/yr.):	36,000.0000
Annual Turnovers:	0.0000
Turnover Factor:	1.0000
Tank Diameter (ft):	6.5000
Working Loss Product Factor:	1.0000
Total Losses (lb):	1.6157

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

Emissions Report for: Annual

Lost River - B05 - Lube Oil Tank - Horizontal Tank
Mathias, West Virginia

Components	Losses(lbs)		
	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	0.73	0.88	1.62

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

Identification

User Identification:	Lost River - B06 - Lube Oil Tank
City:	Mathias
State:	West Virginia
Company:	Columbia Pipeline Group
Type of Tank:	Horizontal Tank
Description:	Lost River Compressor Station

Tank Dimensions

Shell Length (ft):	12.00
Diameter (ft):	10.00
Volume (gallons):	7,000.00
Turnovers:	0.00
Net Throughput(gal/yr):	84,000.00
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

Meteorological Data used in Emissions Calculations: Washington Dulles AP, District of Columbia (Avg Atmospheric Pressure = 14.67 psia)

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

Lost River - B06 - Lube Oil Tank - Horizontal Tank
Mathias, West Virginia

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Distillate fuel oil no. 2	All	60.23	51.60	68.87	56.07	0.0066	0.0048	0.0087	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009

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

Lost River - B06 - Lube Oil Tank - Horizontal Tank
Mathias, West Virginia

Annual Emission Calculations	
Standing Losses (lb):	2.0931
Vapor Space Volume (cu ft):	600.3043
Vapor Density (lb/cu ft):	0.0002
Vapor Space Expansion Factor:	0.0626
Vented Vapor Saturation Factor:	0.9983
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	600.3043
Tank Diameter (ft):	10.0000
Effective Diameter (ft):	12.3639
Vapor Space Outage (ft):	5.0000
Tank Shell Length (ft):	12.0000
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):	0.0066
Daily Avg. Liquid Surface Temp. (deg. R):	519.9045
Daily Average Ambient Temp. (deg. F):	53.8250
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	515.7350
Tank Paint Solar Absorptance (Shell):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,208.4167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0626
Daily Vapor Temperature Range (deg. R):	34.5433
Daily Vapor Pressure Range (psia):	0.0039
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0066
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0048
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0087
Daily Avg. Liquid Surface Temp. (deg R):	519.9045
Daily Min. Liquid Surface Temp. (deg R):	511.2687
Daily Max. Liquid Surface Temp. (deg R):	528.5403
Daily Ambient Temp. Range (deg. R):	22.6000
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9983
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0066
Vapor Space Outage (ft):	5.0000
Working Losses (lb):	
Working Losses (lb):	1.7052
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0066
Annual Net Throughput (gal/yr.):	84,000.0000
Annual Turnovers:	0.0000
Turnover Factor:	1.0000
Tank Diameter (ft):	10.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	3.7984

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

Emissions Report for: Annual

Lost River - B06 - Lube Oil Tank - Horizontal Tank
Mathias, West Virginia

Components	Losses(lbs)		
	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	1.71	2.09	3.80

