



global environmental solutions

Columbia Gas Transmission, LLC

Seneca Compressor Station

Facility ID No. 071-00008

Seneca Rocks, West Virginia

Title V Operating Permit Renewal Application

SLR Ref: 116.01272.00031

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, reading "Chris Boggess".

---

Chris Boggess  
Associate Engineer

A handwritten signature in blue ink, reading "Jesse Hanshaw".

---

Jesse Hanshaw, P.E.  
Principal Engineer

# CONTENTS

---

## ATTACHMENTS

APPLICATION FOR PERMIT

ATTACHMENT A .....	AREA MAP
ATTACHMENT B .....	PLOT PLAN
ATTACHMENT C .....	PROCESS FLOW DIAGRAM
ATTACHMENT D .....	EQUIPMENT TABLE
ATTACHMENT E .....	EMISSION UNIT FORM(S)
ATTACHMENT F .....	SCHEDULE OF COMPLIANCE FORM (SEE NOTE)
ATTACHMENT G .....	AIR POLLUTION CONTROL DEVICE FORM (SEE NOTE)
ATTACHMENT H....	COMPLIANCE ASSURANCE MONITORING FORM (SEE NOTE)

APPENDIX A	SUPPORTING CALCULATIONS
APPENDIX B	PROPOSED PERMIT LANGUAGE
APPENDIX C	ELECTRONIC SUBMITTAL

### Notes:

- ATTACHMENT F – N/A – Source is in compliance with all facility wide requirements
- ATTACHMENT G – N/A – No control devices utilized at the facility
- ATTACHMENT H – N/A – No CAM plan requirements at the facility

# **APPLICATION FOR PERMIT**

## **Title V Operating Permit Renewal Application**

**Seneca Compressor Station, Facility ID No. 071-00008  
Seneca Rocks, 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 sections: 1. Name of Applicant (Columbia Gas Transmission, LLC), 2. Facility Name (Seneca Compressor Station), 3. DAQ Plant ID No. (071-00008), 4. Federal Employer ID No. (31-0802435-30), 5. Permit Application Type (Permit Renewal), 6. Type of Business Entity (LLC), 7. Is the Applicant the: (Both), 8. Number of onsite employees (Less than ten), 9. Governmental Code (Privately owned), 10. Business Confidentiality Claims (No).

<b>11. Mailing Address</b>		
<b>Street or P.O. Box:</b> 5151 San Felipe St., Suite 2400		
<b>City:</b> Houston	<b>State:</b> TX	<b>Zip:</b> 77056
<b>Telephone Number:</b> (713) 386 3701		<b>Fax Number:</b> (304) 357-2770

<b>12. Facility Location</b>		
<b>Street:</b> State Route 28	<b>City:</b> Seneca Rocks	<b>County:</b> Pendleton
<b>UTM Easting:</b> 640.906 km	<b>UTM Northing:</b> 4,301.210 km	<b>Zone:</b> <input checked="" type="checkbox"/> 17 or <input type="checkbox"/> 18
<b>Directions:</b> Traveling U.S. Route 33 East from Elkins turn left at the intersection with State Route 28. Proceed approximately 2 miles to the station which is located on the left.		
<b>Portable Source?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
<b>Is facility located within a nonattainment area?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<b>If yes, for what air pollutants?</b>	
<b>Is facility located within 50 miles of another state?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<b>If yes, name the affected state(s).</b> Maryland Virginia	
<b>Is facility located within 100 km of a Class I Area<sup>1</sup>?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<b>If yes, name the area(s).</b> Dolly Sods Wilderness, WV Otter Creek Wilderness, WV	
<b>If no, do emissions impact a Class I Area<sup>1</sup>?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
<sup>1</sup> 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.		

<b>13. Contact Information</b>		
<b>Responsible Official:</b> Timothy Chenoweth		<b>Title:</b> Manager of Operations
<b>Street or P.O. Box:</b> 67 Ward Rd		
<b>City:</b> Elkins	<b>State:</b> WV	<b>Zip:</b> 26241
<b>Telephone Number:</b> (304) 567 2554	<b>Fax Number:</b> (304) 357-2770	
<b>E-mail address:</b> timothy_chenoweth@transcanada.com		
<b>Environmental Contact:</b> Lacey Ivey		<b>Title:</b> Principal Air
<b>Street or P.O. Box:</b> 201 Energy Parkway, Suite 100		
<b>City:</b> Lafayette	<b>State:</b> LA	<b>Zip:</b> 70508
<b>Telephone Number:</b> (337) 241-6086	<b>Fax Number:</b>	
<b>E-mail address:</b> lacey_ivey@transcanada.com		
<b>Application Preparer:</b> Jesse Hanshaw		<b>Title:</b> Principal Engineer
<b>Company:</b> SLR International Corporation		
<b>Street or P.O. Box:</b> 8 Capitol St., Suite 300		
<b>City:</b> Charleston	<b>State:</b> WV	<b>Zip:</b> 25301
<b>Telephone Number:</b> (681) 205-8949	<b>Fax Number:</b> (681) 205-8969	
<b>E-mail address:</b> 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.**

Seneca 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 one (1) 13,750 hp General Electric; 3132R Frame 3 turbine engine, two (2) 7,491 hp, Solar; Taurus 60-7800S turbine engines, one (1) 1,557 hp, Solar; Saturn 10-1400 turbine engine, one (1) 15,432 hp Solar; Mars 100-15000S turbine engine, one (1) 10,613 hp Solar; Taurus 70 Turbine engine, one (1) 880 hp, Waukesha VGF-L36GL; 4SLB reciprocating engine/generator, two (2) 0.5 mmBtu/hr fuel gas heaters, and one (1) 0.25 mmBtu/hr process heater. The station also utilizes a number of De minimus storage vessels.

- 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**

<b>18. Applicable Requirements Summary</b>	
Instructions: Mark all applicable requirements.	
<input checked="" type="checkbox"/> SIP	<input type="checkbox"/> FIP
<input checked="" type="checkbox"/> Minor source NSR (45CSR13)	<input type="checkbox"/> PSD (45CSR14)
<input checked="" type="checkbox"/> NESHAP (45CSR34)	<input type="checkbox"/> Nonattainment NSR (45CSR19)
<input checked="" type="checkbox"/> Section 111 NSPS	<input 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 <sub>x</sub> Annual Trading Program (45CSR39)	<input type="checkbox"/> CAIR NO <sub>x</sub> Ozone Season Trading Program (45CSR40)
<input type="checkbox"/> CAIR SO <sub>2</sub> Trading Program (45CSR41)	

<b>19. Non Applicability Determinations</b>
<p><b>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.</b></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 fuel gas heaters 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 75m<sup>3</sup> (19,813 gallons) in capacity as specified in 60.110b(a)

40 CFR 60 Subpart GG – *Standards of Performance for Stationary Gas Turbines*: The provisions of this subpart are not applicable because the turbines were installed after the applicability dates and are therefore, subject to NSPS KKKK. The only exception is the GE Frame 3 Turbine (ID 03704) which was installed in 1981, but as a relocated unit originally purchased in 1971. Therefore, the unit is not considered a new construction or modification in accordance with the General Provisions, 40CFR§60.14(e)(6).

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

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

40 CFR 64 – *Compliance Assurance Monitoring (CAM)*: There are no add-on controls at this facility; 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**.





**Section 3: Facility-Wide Emissions**

<b>23. Facility-Wide Emissions Summary [Tons per Year]</b>	
Criteria Pollutants	Potential Emissions
Carbon Monoxide (CO)	371.47
Nitrogen Oxides (NO <sub>x</sub> )	314.12
Lead (Pb)	-
Particulate Matter (PM <sub>2.5</sub> ) <sup>1</sup>	21.02
Particulate Matter (PM <sub>10</sub> ) <sup>1</sup>	21.02
Total Particulate Matter (TSP)	21.02
Sulfur Dioxide (SO <sub>2</sub> )	1.32
Volatile Organic Compounds (VOC)	66.72
Hazardous Air Pollutants <sup>2</sup>	Potential Emissions
Benzene	0.02
Toluene	0.20
Ethylbenzene	0.05
Xylene	0.10
n-Hexane	0.04
Formaldehyde	1.40
Acetaldehyde	0.08
Total HAPs	2.35
Regulated Pollutants other than Criteria and HAP	Potential Emissions
CO <sub>2e</sub>	251,785.4

<sup>1</sup>PM<sub>2.5</sub> and PM<sub>10</sub> are components of TSP.  
<sup>2</sup>For HAPs that are also considered PM or VOCs, emissions should be included in both the HAPs section and the Criteria Pollutants section.

**Section 4: Insignificant Activities**

<b>24. Insignificant Activities (Check all that apply)</b>	
<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 <sub>2</sub> 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<sub>x</sub>, SO<sub>2</sub>, 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>0.85</td> </tr> <tr> <td>A02</td> <td>0.075</td> <td>658.86</td> </tr> <tr> <td>A03</td> <td>0.000</td> <td>0.24</td> </tr> <tr> <td>A04</td> <td>0.172</td> <td>1508.57</td> </tr> <tr> <td>A05</td> <td>0.172</td> <td>1508.57</td> </tr> <tr> <td>A13</td> <td>0.011</td> <td>92.10</td> </tr> <tr> <td><b>Totals</b></td> <td><b>0.43</b></td> <td><b>3769.19</b></td> </tr> </tbody> </table>	<i>Emission Point</i>	<i>VOC Emissions (lb/hr)</i>	<i>VOC Emissions (lb/yr)</i>	A01	0.000	0.85	A02	0.075	658.86	A03	0.000	0.24	A04	0.172	1508.57	A05	0.172	1508.57	A13	0.011	92.10	<b>Totals</b>	<b>0.43</b>	<b>3769.19</b>
<i>Emission Point</i>	<i>VOC Emissions (lb/hr)</i>	<i>VOC Emissions (lb/yr)</i>																							
A01	0.000	0.85																							
A02	0.075	658.86																							
A03	0.000	0.24																							
A04	0.172	1508.57																							
A05	0.172	1508.57																							
A13	0.011	92.10																							
<b>Totals</b>	<b>0.43</b>	<b>3769.19</b>																							
<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.																								
<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.																								

<b>24. Insignificant Activities (Check all that apply)</b>	
<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.
<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**

<b>25. Equipment Table</b>
Fill out the <b>Title V Equipment Table</b> and provide it as <b>ATTACHMENT D</b> .
<b>26. Emission Units</b>
For each emission unit listed in the <b>Title V Equipment Table</b> , fill out and provide an <b>Emission Unit Form</b> as <b>ATTACHMENT E</b> .
For each emission unit not in compliance with an applicable requirement, fill out a <b>Schedule of Compliance Form</b> as <b>ATTACHMENT F</b> .
<b>27. Control Devices</b>
For each control device listed in the <b>Title V Equipment Table</b> , fill out and provide an <b>Air Pollution Control Device Form</b> as <b>ATTACHMENT G</b> .
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 <b>Compliance Assurance Monitoring (CAM) Form(s)</b> for CAM applicability. Fill out and provide these forms, if applicable, for each Pollutant Specific Emission Unit (PSEU) as <b>ATTACHMENT H</b> .

**Section 6: Certification of Information**

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

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

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

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

**b. Compliance Certification**

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

**Responsible official (type or print)**

Name: Timothy Chenoweth

Title: Manager of Operations

**Responsible official's signature:**

Signature:  Signature Date: 4-6-17  
 (Must be signed and dated in blue ink)

**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/daq](http://www.dep.wv.gov/daq), requested by phone (304) 926-0475, and/or obtained through the mail.*

# **ATTACHMENT A**

## **AREA MAP**

### **Title V Operating Permit Renewal Application**

**Seneca Compressor Station, Facility ID No. 071-00008  
Seneca Rocks, West Virginia**

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

April 2017



CPG - Seneca Compressor Station

GPS Coordinates of Sites:

Lat: 38.84767, Long: -79.37626

UTM Coordinates of Sites:

Easting: 640.906 km, Northing: 4,301.210 km, Zone: 17

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

Report

Title V Operating Permit Renewal Application  
Seneca Compressor Station (ID No. 071-00008)

Drawing

Attachment A - Area Map

Date: July 2016

Drawn By: CLB

Project: 116.01272.00031



# **ATTACHMENT B**

## **PLOT PLAN**

### **Title V Operating Permit Renewal Application**

**Seneca Compressor Station, Facility ID No. 071-00008  
Seneca Rocks, West Virginia**

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

April 2017



**ATTACHMENT C**

**PROCESS FLOW DIAGRAM**

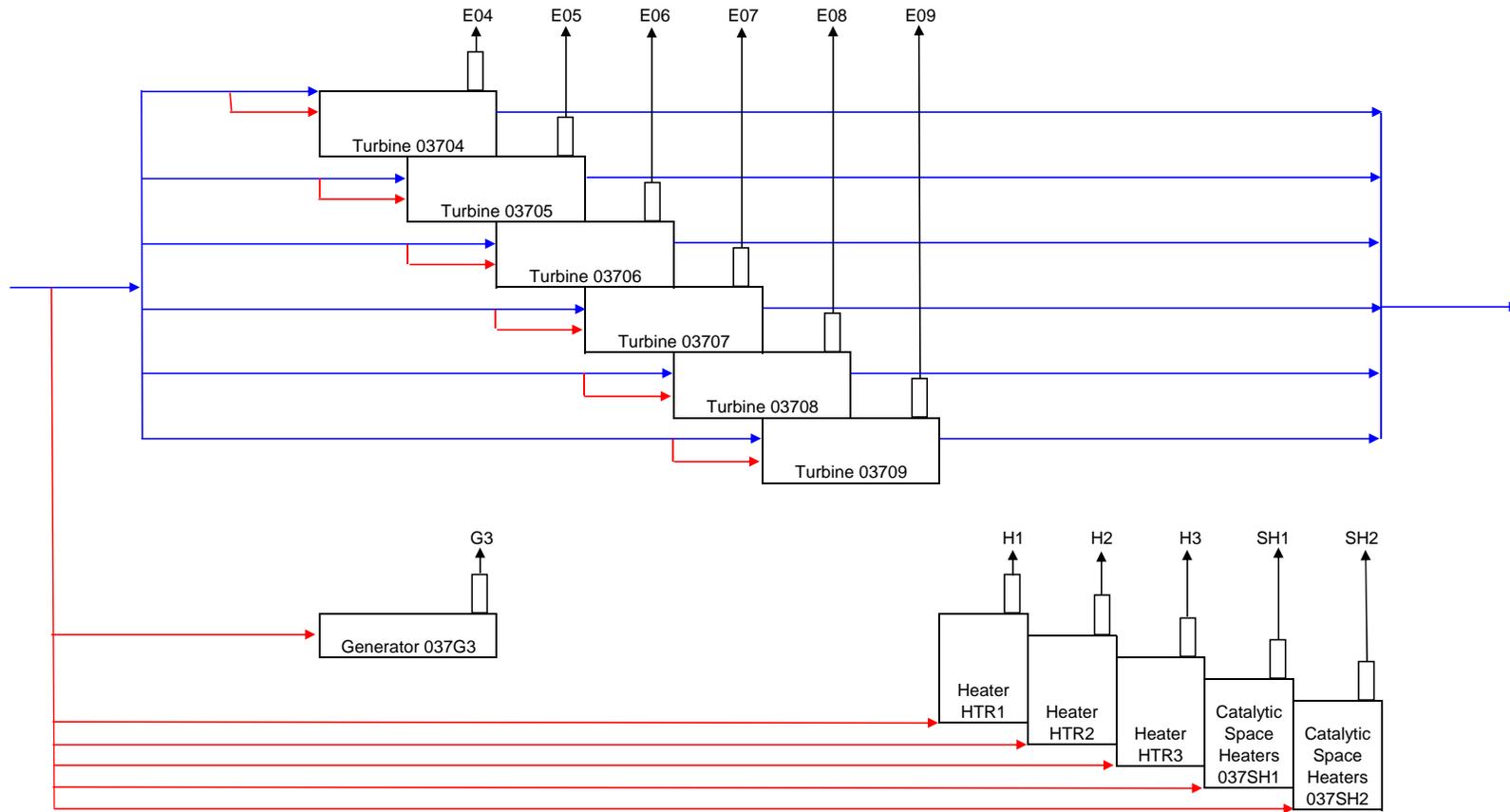
**Title V Operating Permit Renewal Application**

**Seneca Compressor Station, Facility ID No. 071-00008**  
**Seneca Rocks, West Virginia**

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

April 2017

**ATTACHMENT C  
SENECA COMPRESSOR STATION PROCESS FLOW DIAGRAM**



— Transmission Gas Stream  
 — Fuel Gas  
 — Emission Stream

**ATTACHMENT D**

**EQUIPMENT TABLE**

**Title V Operating Permit Renewal Application**

**Seneca Compressor Station, Facility ID No. 071-00008**  
**Seneca Rocks, 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 <sup>1</sup>	Control Device <sup>1</sup>	Emission Unit ID <sup>1</sup>	Emission Unit Description	Design Capacity	Year Installed/ Modified
E04	N/A	03704*	Turbine Engine/Centrifugal Compressor; General Electric; 3132R Frame 3	13,750 hp	1981
E05	N/A	03705*	Turbine Engine/Centrifugal Compressor; Solar; Taurus 60-7800S	7,491 hp	2008
E06	N/A	03706*	Turbine Engine/Centrifugal Compressor; Solar; Taurus 60-7800S	7,491 hp	2008
E07	N/A	03707*	Combustion Turbine/Compressor; Solar; Saturn 10-1400	1,557 hp @ 30°F 1,333 hp @ 50°F	2013
E08	N/A	03708*	Combustion Turbine/Compressor; Solar; Mars 100-15000S	15,432 hp @ 30°F 13,814 hp @ 50°F	2013
E09	N/A	03709*	Combustion Turbine/Compressor; Solar; Taurus 70 Turbine	10,613 hp @ 32°F	2017
G3	N/A	037G3*	Reciprocating Engine/Generator Waukesha VGF-L36GL; 4 Cycle, Lean Burn	880 hp	2013
H1	N/A	HTR1*	Fuel Gas Heater; ETI; Model # SB18-18	0.5 mmBtu/hr	2008
H2	N/A	HTR2*	Fuel Gas Heater; ETI; Model # SB18-18	0.5 mmBtu/hr	2013
H3	N/A	HTR3*	Process Heater; Unknown Make/Model	0.25 mmBtu/hr	2017
037SH1	N/A	SH1*	Catalytic Space Heaters (36)	2.592 mmBtu/hr (TOTAL)	2013
037SH2	N/A	SH2*	Catalytic Space Heaters (23)	1.12 mmBtu/hr (TOTAL)	2017

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

\*This equipment burns pipeline quality natural gas only.

**ATTACHMENT E**

**EMISSION UNIT FORM(S)**

**Title V Operating Permit Renewal Application**

**Seneca Compressor Station, Facility ID No. 071-00008**  
**Seneca Rocks, West Virginia**

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

April 2017

## ATTACHMENT E - Emission Unit Form

***Emission Unit Description***

<b>Emission unit ID number:</b> 03704	<b>Emission unit name:</b> Turbine Engine/Centrifugal Compressor	<b>List any control devices associated with this emission unit:</b> NA
--	---	---

**Provide a description of the emission unit (type, method of operation, design parameters, etc.):**  
Turbine Engine/Centrifugal Compressor.

<b>Manufacturer:</b> General Electric	<b>Model number:</b> 3132R Frame 3	<b>Serial number:</b> NA
--	---------------------------------------	-----------------------------

<b>Construction date:</b> 1971	<b>Installation date:</b> 1981	<b>Modification date(s):</b> NA
-----------------------------------	-----------------------------------	------------------------------------

**Design Capacity (examples: furnaces - tons/hr, tanks - gallons):**  
22,000 hp (Maximum Hourly Design Rating as specified in WV NSR Permit, R13-2715F)  
13,750 hp (Average Annual Design Rating)

<b>Maximum Hourly Throughput:</b> NA	<b>Maximum Annual Throughput:</b> NA	<b>Maximum Operating Schedule:</b> 8,760
---	---	---

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

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

<b>Maximum design heat input and/or maximum horsepower rating:</b> 22,000 hp (Maximum Hourly Design Rating as specified in WV NSR Permit, R13-2715F) 13,750 hp (Average Annual Design Rating) 126.5 MMBtu/hr	<b>Type and Btu/hr rating of burners:</b> 9,200 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  
198,430 scf/hr / 1,086.42 MMscf/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 <sub>x</sub> )		
Lead (Pb)		
Particulate Matter (PM <sub>2.5</sub> )		
Particulate Matter (PM <sub>10</sub> )		
Total Particulate Matter (TSP)		
Sulfur Dioxide (SO <sub>2</sub> )		
Volatile Organic Compounds (VOC)		
Hazardous Air Pollutants		
	PPH	TPY
	See Appendix A	
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
<p><b>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.).</b></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 60.330(b), 40 CFR 60.4305(a) and 40 CFR 63.6080 this existing, stationary turbine located at an area source of HAPs does not have any specific applicable requirements other than to submit a certified emission statement in accordance with Title V permit condition 3.5.4 and an annual emission inventory according to Title V permit condition 3.1.6.

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 document its operating schedule 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**

<b>Emission unit ID number:</b> 03705	<b>Emission unit name:</b> Turbine Engine/Centrifugal Compressor	<b>List any control devices associated with this emission unit:</b> NA
--	---	---

**Provide a description of the emission unit (type, method of operation, design parameters, etc.):**  
Turbine Engine/Centrifugal Compressor

<b>Manufacturer:</b> Solar	<b>Model Number:</b> Taurus 60-7800S	<b>Serial Number:</b> NA
<b>Construction Date:</b> NA	<b>Installation Date:</b> 2008	<b>Modification Date(s):</b> NA

**Design Capacity (examples: furnaces - tons/hr, tanks - gallons):**  
7,491 hp (as defined in R13-2715F)  
7,915 hp @ Normal Load Conditions

<b>Maximum Hourly Throughput:</b> NA	<b>Maximum Annual Throughput:</b> NA	<b>Maximum Operating Schedule:</b> NA
---	---	--

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

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

<b>Maximum design heat input and/or maximum horsepower rating:</b> 7,491 hp (as defined in R13-2715F) 7,915 hp @ Normal Load Conditions / 62.16 MMBtu/hr	<b>Type and Btu/hr rating of burners:</b> 7,854 Btu/hp-hr @ Normal Load Conditions
--	---

**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  
67,650 scf/hr / 592.6 mmscf/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 <sub>x</sub> )		
Lead (Pb)		
Particulate Matter (PM <sub>2.5</sub> )		
Particulate Matter (PM <sub>10</sub> )		
Total Particulate Matter (TSP)		
Sulfur Dioxide (SO <sub>2</sub> )		
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><b>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.).</b></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 Line 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. 13, Permit R13-2715F**

Condition 4.1.1 – Emissions from the unit shall not exceed the following;

	NO <sub>x</sub>	CO	VOC	SO <sub>2</sub>	PM <sub>10</sub>	CH <sub>2</sub> O
	tpy	tpy	tpy	tpy	tpy	tpy
E05	18.79	50.5	14.15	0.21	1.96	0.21

Condition 4.1.2 – The unit shall combust only pipeline quality natural gas which contains a maximum of 20 grains of sulfur per 100 scf.

Condition 4.1.3 – The unit shall consume no more than the following amounts of natural gas;

	Natural Gas Consumption	
	ft <sup>3</sup> /hr	scf/yr
E05	75916	6.00 x 10 <sup>8</sup>

Condition 4.1.4 – Emissions from the unit shall not exceed the following;

Operating Parameter	E05
<b>NO<sub>x</sub></b>	
Full Load @ 30°F	25ppm <sub>v</sub> @ 15% O <sub>2</sub> (3.8 lb/hr)
Low Temp (<0 to -20°F)	11.0 lb/hr
Very Low Temp (<-20°F)	31.6 lb/hr
Low Load (<50%)	10.3 lb/hr
Startup/Shutdown	3.9 lb/cycle
<b>CO</b>	
Full Load @ 30°F	3.9 lb/hr
Low Temp (<0 to -20°F)	15.9 lb/hr
Very Low Temp (<-20°F)	24.1 lb/hr
Low Load (<50%)	196.5 lb/hr
Startup/Shutdown	72.0 lb/cycle
<b>VOC</b>	
Full Load @ 30°F	0.2 lb/hr
Low Temp (<0 to -20°F)	0.5 lb/hr
Very Low Temp (<-20°F)	0.7 lb/hr
Low Load (<50%)	1.5 lb/hr
Startup/Shutdown	196.5 lb/cycle

SO <sub>x</sub>	
Full Load @ 30°F	0.5 lb/hr
Low Load (<50%)	0.3 lb/hr
Startup/Shutdown	0.05 lb/hr
PM <sub>10</sub>	
Full Load @ 30°F	0.5 lb/hr
Low Load (<50%)	0.3 lb/hr
Startup/Shutdown	0.3 lb/hr

Condition 4.1.18 – Permittee shall install, maintain, and operate all above ground piping, valves, pumps, etc. that service lines in the transport of potential sources of regulated air pollutants to prevent any substantive fugitive escape of regulated air pollutants. Any above ground piping, valves, pumps, etc. that shows signs of excess wear and that have a reasonable potential for substantive fugitive emissions of regulated air pollutants shall be repaired or replaced as needed.

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 3 and Line 12) – Unit must meet NO<sub>x</sub> emission standards; 25 ppm at 15% O<sub>2</sub> or 150 ng/J of useful output at and above 75% peak load. At less than 75% peak load or less than 0 degrees F, the NO<sub>x</sub> emission standard is 150 ppm at 15% O<sub>2</sub> 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<sub>x</sub> concentration in PPM using EPA Method 7E or EPA Method 20, or (ii) – measure NO<sub>x</sub> 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 SO<sub>2</sub>/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. 13, Permit R13-2715F**

Condition 4.2.1 – In order to show compliance with the NO<sub>x</sub> emission limits contained in 4.1.1 and 4.1.4 of this permit, the permittee must perform an initial and annual performance test in accordance with § 60.4400 to demonstrate continuous compliance. If the NO<sub>x</sub> emission result from the performance test is less than or equal to 75% of the NO<sub>x</sub> emission limit for the unit, the permittee may reduce the frequency of the subsequent performance test to once every 2 years (no more than 26 calendar months following the previous test). If the results of any subsequent test exceed 75% of the NO<sub>x</sub> emission limit for the turbine, the permittee must resume annual performance tests. The initial performance test shall be conducted within 60 days after achieving full load operation or within 180 days of startup whichever comes first

Condition 4.2.2 – In order to show compliance with the CO emissions limits contained in 4.1.1 and 4.1.4 of this permit the permittee shall perform initial and periodic performance tests on each turbine using EPA approved methods (or alternative methods approved by the Director). Said testing shall be performed while the turbines are operating at normal conditions, within 25% of full load or at the highest achievable load (and while ambient temperatures are above 0°F). The initial performance test shall be conducted within 180 days of startup. Subsequent testing shall be conducted at least every 5 years.

Condition 4.3.1 – Permittee shall keep records of monitoring information that includes the following;

- Date, place as defined in this permit and time of sampling or measurements;
- Date(s) analyses were performed;
- Company or entity that performed analyses;
- Analytical techniques or methods used;
- Results of analyses; and
- Operating conditions existing at the time of sampling or measurement.

Condition 4.3.3 – In order to demonstrate compliance with condition 4.1.3 of this permit, the permittee shall monitor and record the amount of natural gas consumed by each piece of equipment.

Condition 4.3.4 – In order to demonstrate compliance with conditions 4.1.1 and 4.1.4 of this permit the permittee will monitor and record the following;

- Monthly operating hour at normal dry low NO<sub>x</sub> (DLN) conditions (>50% of rated load and ambient temperatures of > 0°F)
- Monthly operating hours at low load (<50% load)
- Monthly operating hours at low ambient temperatures (<0°F to -20°F)
- Monthly operating hours at very low temperatures (<-20°F)
- Monthly operating hours of startup and shutdown cycles
- Monthly total operating hours of the unit

Condition 4.3.5 – The monthly records required by condition 4.3.4 of this permit shall be used to calculate monthly emissions for each regulated pollutant (P<sub>X</sub>) using the following equation for the unit;

$$P_T = DLN P_X * DLN \text{ hours} + LL P_X * LL \text{ hours} + LT P_X * LT \text{ hours} + VLT P_X * VLT \text{ hours} + SS P_X * SS \text{ Cycles}$$

Where PT is the total tons of emissions for the month, DLN P<sub>X</sub>, LL P<sub>X</sub>, LT P<sub>X</sub>, VLT P<sub>X</sub>, and SS P<sub>X</sub> are the unit emission rates for pollutant X during normal DLN, low load, low temperature, very low temperature, and startup/shutdown operation, respectively. DLN hours, LL hours, LT hours, VLT hours, and SS hours are the unit monthly operating hours at DLN, low load, low temperature, very low temperature and startup/shutdown conditions, respectively.

Condition 4.3.7 – At the end of each month, the monthly emissions will be calculated for the preceding 12 months to determine compliance with the annual emission limits.

Condition 4.3.10 – In order to determine compliance with the fuel sulfur limits of 4.1.6 of this permit, the permittee shall monitor the fuel sulfur content of the natural gas combusted by the unit and calculate and record the rolling total twelve (12) month average of sulfur content of the natural gas combusted in the source. In lieu of onsite monitoring, the permittee may use data contained in a valid purchase contract, tariff sheet, transportation contract, or other reasonable documentation to determine the fuel sulfur content.

Condition 4.4.1 – The permittee shall comply with all applicable reporting requirements of 40 CFR Subpart 60 KKKK.

Condition 4.4.2 – Any deviation(s) from the allowable natural gas consumption limits of condition 4.1.7 shall be reported in writing to the Director of the DAQ as soon as practicable, but in any case ten (10) calendar days of the occurrence and shall include at least the following information, the extent of the deviation, the cause or suspected cause of the deviation(s), and any corrective measures taken or planned.

Condition 4.4.3 – Any deviation(s) from the allowable emission limits of conditions 4.1.5 and 4.1.8 shall be reported in writing to the Director of the DAQ as soon as practicable, but in any case ten (10) calendar days of the occurrence and shall include at least the following information, the extent of the deviation, the cause or suspected cause of the deviation(s), and any corrective measures taken or planned.

**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***

<b>Emission unit ID number:</b> 03706	<b>Emission unit name:</b> Turbine Engine / Centrifugal Compressor	<b>List any control devices associated with this emission unit:</b> NA
--	---	---

**Provide a description of the emission unit (type, method of operation, design parameters, etc.):**  
Turbine Engine / Centrifugal Compressor

<b>Manufacturer:</b> Solar	<b>Model Number:</b> Taurus 60-7800S	<b>Serial Number:</b> NA
-------------------------------	---	-----------------------------

<b>Construction Date:</b> NA	<b>Installation Date:</b> 2008	<b>Modification Date(s):</b> NA
---------------------------------	-----------------------------------	------------------------------------

**Design Capacity (examples: furnaces - tons/hr, tanks - gallons):**  
7,491 hp (as defined in R13-2715F)  
7,915 hp @ Normal Load Conditions

<b>Maximum Hourly Throughput:</b> NA	<b>Maximum Annual Throughput:</b> NA	<b>Maximum Operating Schedule:</b> NA
---	---	--

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

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

<b>Maximum design heat input and/or maximum horsepower rating:</b> 7,491 hp (as defined in R13-2715F) 7,915 hp @ Normal Load Conditions / 62.16 MMBtu/hr	<b>Type and Btu/hr rating of burners:</b> 7,854 Btu/hp-hr @ Normal Load Conditions
--	---

**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  
67,650 scf/hr / 592.6 mmscf/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

<b>Emissions Data</b>			
Criteria Pollutants	Potential Emissions		
	PPH	TPY	
Carbon Monoxide (CO)	See Appendix A		
Nitrogen Oxides (NO <sub>x</sub> )			
Lead (Pb)			
Particulate Matter (PM <sub>2.5</sub> )			
Particulate Matter (PM <sub>10</sub> )			
Total Particulate Matter (TSP)			
Sulfur Dioxide (SO <sub>2</sub> )			
Volatile Organic Compounds (VOC)			
Hazardous Air Pollutants			
	PPH	TPY	
	See Appendix A		
Regulated Pollutants other than Criteria and HAP	Potential Emissions		
	PPH	TPY	
<p><b>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.).</b></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 Line 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. 13, Permit R13-2715F**

Condition 4.1.1 – Emissions from the unit shall not exceed the following;

	NO <sub>x</sub>	CO	VOC	SO <sub>2</sub>	PM <sub>10</sub>	CH <sub>2</sub> O
	tpy	tpy	tpy	tpy	tpy	tpy
E06	18.79	50.5	14.15	0.21	1.96	0.21

Condition 4.1.2 – The unit shall combust only pipeline quality natural gas which contains a maximum of 20 grains of sulfur per 100 scf.

Condition 4.1.3 – The unit shall consume no more than the following amounts of natural gas;

	Natural Gas Consumption	
	ft <sup>3</sup> /hr	scf/yr
E06	75916	6.00 x 10 <sup>8</sup>

Condition 4.1.4 – Emissions from the unit shall not exceed the following;

Operating Parameter	E06
<b>NO<sub>x</sub></b>	
Full Load @ 30°F	25ppm <sub>v</sub> @ 15% O <sub>2</sub> (3.8 lb/hr)
Low Temp (<0 to -20°F)	11.0 lb/hr
Very Low Temp (<-20°F)	31.6 lb/hr
Low Load (<50%)	10.3 lb/hr
Startup/Shutdown	3.9 lb/cycle
<b>CO</b>	
Full Load @ 30°F	3.9 lb/hr
Low Temp (<0 to -20°F)	15.9 lb/hr
Very Low Temp (<-20°F)	24.1 lb/hr
Low Load (<50%)	196.5 lb/hr
Startup/Shutdown	72.0 lb/cycle
<b>VOC</b>	
Full Load @ 30°F	0.2 lb/hr
Low Temp (<0 to -20°F)	0.5 lb/hr
Very Low Temp (<-20°F)	0.7 lb/hr
Low Load (<50%)	1.5 lb/hr
Startup/Shutdown	196.5 lb/cycle

SO <sub>x</sub>	
Full Load @ 30°F	0.5 lb/hr
Low Load (<50%)	0.3 lb/hr
Startup/Shutdown	0.05 lb/hr
PM <sub>10</sub>	
Full Load @ 30°F	0.5 lb/hr
Low Load (<50%)	0.3 lb/hr
Startup/Shutdown	0.3 lb/hr

Condition 4.1.18 – Permittee shall install, maintain, and operate all above ground piping, valves, pumps, etc. that service lines in the transport of potential sources of regulated air pollutants to prevent any substantive fugitive escape of regulated air pollutants. Any above ground piping, valves, pumps, etc. that shows signs of excess wear and that have a reasonable potential for substantive fugitive emissions of regulated air pollutants shall be repaired or replaced as needed.

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 3 and Line 12) – Unit must meet NO<sub>x</sub> emission standards; 25 ppm at 15% O<sub>2</sub> or 150 ng/J of useful output at and above 75% peak load. At less than 75% peak load or less than 0 degrees F, the NO<sub>x</sub> emission standard is 150 ppm at 15% O<sub>2</sub> 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<sub>x</sub> concentration in PPM using EPA Method 7E or EPA Method 20, or (ii) – measure NO<sub>x</sub> 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 SO<sub>2</sub>/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. 13, Permit R13-2715F**

Condition 4.2.1 – In order to show compliance with the NO<sub>x</sub> emission limits contained in 4.1.1 and 4.1.4 of this permit, the permittee must perform an initial and annual performance test in accordance with § 60.4400 to demonstrate continuous compliance. If the NO<sub>x</sub> emission result from the performance test is less than or equal to 75% of the NO<sub>x</sub> emission limit for the unit, the permittee may reduce the frequency of the subsequent performance test to once every 2 years (no more than 26 calendar months following the previous test). If the results of any subsequent test exceed 75% of the NO<sub>x</sub> emission limit for the turbine, the permittee must resume annual performance tests. The initial performance test shall be conducted within 60 days after achieving full load operation or within 180 days of startup whichever comes first

Condition 4.2.2 – In order to show compliance with the CO emissions limits contained in 4.1.1 and 4.1.4 of this permit the permittee shall perform initial and periodic performance tests on each turbine using EPA approved methods (or alternative methods approved by the Director). Said testing shall be performed while the turbines are operating at normal conditions, within 25% of full load or at the highest achievable load (and while ambient temperatures are above 0°F). The initial performance test shall be conducted within 180 days of startup. Subsequent testing shall be conducted at least every 5 years.

Condition 4.3.1 – Permittee shall keep records of monitoring information that includes the following;

- Date, place as defined in this permit and time of sampling or measurements;
- Date(s) analyses were performed;
- Company or entity that performed analyses;
- Analytical techniques or methods used;
- Results of analyses; and
- Operating conditions existing at the time of sampling or measurement.

Condition 4.3.3 – In order to demonstrate compliance with condition 4.1.3 of this permit, the permittee shall monitor and record the amount of natural gas consumed by each piece of equipment.

Condition 4.3.4 – In order to demonstrate compliance with conditions 4.1.1 and 4.1.4 of this permit the permittee will monitor and record the following;

- Monthly operating hour at normal dry low NO<sub>x</sub> (DLN) conditions (>50% of rated load and ambient temperatures of > 0°F)
- Monthly operating hours at low load (<50% load)
- Monthly operating hours at low ambient temperatures (<0°F to -20°F)
- Monthly operating hours at very low temperatures (<-20°F)
- Monthly operating hours of startup and shutdown cycles
- Monthly total operating hours of the unit

Condition 4.3.5 – The monthly records required by condition 4.3.4 of this permit shall be used to calculate monthly emissions for each regulated pollutant (P<sub>X</sub>) using the following equation for the unit;

$$P_T = DLN P_X * DLN \text{ hours} + LL P_X * LL \text{ hours} + LT P_X * LT \text{ hours} + VLT P_X * VLT \text{ hours} + SS P_X * SS \text{ Cycles}$$

Where PT is the total tons of emissions for the month, DLN P<sub>X</sub>, LL P<sub>X</sub>, LT P<sub>X</sub>, VLT P<sub>X</sub>, and SS P<sub>X</sub> are the unit emission rates for pollutant X during normal DLN, low load, low temperature, very low temperature, and startup/shutdown operation, respectively. DLN hours, LL hours, LT hours, VLT hours, and SS hours are the unit monthly operating hours at DLN, low load, low temperature, very low temperature and startup/shutdown conditions, respectively.

Condition 4.3.7 – At the end of each month, the monthly emissions will be calculated for the preceding 12 months to determine compliance with the annual emission limits.

Condition 4.3.10 – In order to determine compliance with the fuel sulfur limits of 4.1.6 of this permit, the permittee shall monitor the fuel sulfur content of the natural gas combusted by the unit and calculate and record the rolling total twelve (12) month average of sulfur content of the natural gas combusted in the source. In lieu of onsite monitoring, the permittee may use data contained in a valid purchase contract, tariff sheet, transportation contract, or other reasonable documentation to determine the fuel sulfur content.

Condition 4.4.1 – The permittee shall comply with all applicable reporting requirements of 40 CFR Subpart 60 KKKK.

Condition 4.4.2 – Any deviation(s) from the allowable natural gas consumption limits of condition 4.1.7 shall be reported in writing to the Director of the DAQ as soon as practicable, but in any case ten (10) calendar days of the occurrence and shall include at least the following information, the extent of the deviation, the cause or suspected cause of the deviation(s), and any corrective measures taken or planned.

Condition 4.4.3 – Any deviation(s) from the allowable emission limits of conditions 4.1.5 and 4.1.8 shall be reported in writing to the Director of the DAQ as soon as practicable, but in any case ten (10) calendar days of the occurrence and shall include at least the following information, the extent of the deviation, the cause or suspected cause of the deviation(s), and any corrective measures taken or planned.

**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**

<b>Emission unit ID number:</b> 03707	<b>Emission unit name:</b> Combustion Turbine/Compressor	<b>List any control devices associated with this emission unit:</b> NA
--	---	---

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

<b>Manufacturer:</b> Solar	<b>Model Number:</b> Saturn 10-1400	<b>Serial Number:</b> NA
<b>Construction Date:</b> NA	<b>Installation Date:</b> 2013	<b>Modification Date(s):</b> NA

**Design Capacity (examples: furnaces - tons/hr, tanks - gallons):**  
1,557 hp @ 30°F  
1,333 hp @ 50°F

<b>Maximum Hourly Throughput:</b> NA	<b>Maximum Annual Throughput:</b> NA	<b>Maximum Operating Schedule:</b> NA
---	---	--

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

<b>Does this emission unit combust fuel?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<b>If yes, is it?</b> <input type="checkbox"/> Indirect Fired <input checked="" type="checkbox"/> Direct Fired
<b>Maximum design heat input and/or maximum horsepower rating:</b> 1,557 hp @ 30°F / 15.82 MMBtu/hr 1,333 hp @ 50°F / 15.06 MMBtu/hr	<b>Type and Btu/hr rating of burners:</b> 10,160 Btu/hp-hr @ 30°F 11,301 Btu/hp-hr @ 50°F

**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  
17,215 scf/hr / 143.61 mmscf/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

<b><i>Emissions Data</i></b>		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	See Appendix A	
Nitrogen Oxides (NO <sub>x</sub> )		
Lead (Pb)		
Particulate Matter (PM <sub>2.5</sub> )		
Particulate Matter (PM <sub>10</sub> )		
Total Particulate Matter (TSP)		
Sulfur Dioxide (SO <sub>2</sub> )		
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><b>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.).</b></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 2 and Line 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. 13, Permit R13-2715F**

Condition 4.1.5 – Emissions from the unit shall not exceed the following;

	NO <sub>x</sub>		CO		VOC		SO <sub>2</sub>		PM/PM <sub>10</sub> /PM <sub>2.5</sub>		CO <sub>2e</sub>
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	tpy
E07	9.48	41.51	15.39	67.63	0.44	1.94	1.00	0.05	0.32	1.32	8,576

Condition 4.1.6 – The unit shall combust only pipeline quality natural gas which contains a maximum of 20 grains of sulfur per 100 scf and which contains a maximum of 0.25 grains of sulfur per 100 scf as averaged over a rolling period of 12 months

Condition 4.1.7 – The unit shall consume no more than the following amounts of natural gas;

	Natural Gas Consumption	
	ft <sup>3</sup> /hr	scf/yr
E07	17,216	143.61 x 10 <sup>6</sup>

Condition 4.1.8 – Emissions from the unit shall not exceed the following;

Operating Parameter	E07
<b>NO<sub>x</sub></b>	
Full Load @ 30°F	150ppm <sub>v</sub> @ 15% O <sub>2</sub> (9.48 lb/hr)
Low Temp (<0 to -20°F)	10.36 lb/hr
Very Low Temp (<-20°F)	10.36 lb/hr
Low Load (<50%)	5.67 lb/hr
Startup/Shutdown	1.44 lb/cycle
<b>CO</b>	
Full Load @ 30°F	15.39 lb/hr
Low Temp (<0 to -20°F)	16.82 lb/hr
Very Low Temp (<-20°F)	16.82 lb/hr
Low Load (<50%)	14.37 lb/hr
Startup/Shutdown	4.44 lb/cycle
<b>VOC</b>	
Full Load @ 30°F	0.44 lb/hr
Low Temp (<0 to -20°F)	0.48 lb/hr
Very Low Temp (<-20°F)	0.48 lb/hr
Low Load (<50%)	0.66 lb/hr
Startup/Shutdown	0.23 lb/cycle
<b>SO<sub>x</sub></b> (short term emission rate based on 20 gr S/100 scf)	

Full Load @ 30°F	1.00 lb/hr
Low Load (<50%)	1.00 lb/hr
Startup/Shutdown	1.00 lb/hr
<b>PM<sub>10</sub></b>	
Full Load @ 30°F	0.32 lb/hr
Low Load (<50%)	0.32 lb/hr
Startup/Shutdown	0.32 lb/hr

Condition 4.1.15 – NO<sub>x</sub> emissions from the unit shall not exceed 150 ppm at 15% O<sub>2</sub> (or an alternative limit of 1100 ng/J of useful output)

Condition 4.1.16 – The unit shall only burn fuel with a total potential SO<sub>2</sub> emission rate of 0.06 lb/MMBtu or less.

Condition 4.1.18 – Permittee shall install, maintain, and operate all above ground piping, valves, pumps, etc. that service lines in the transport of potential sources of regulated air pollutants to prevent any substantive fugitive escape of regulated air pollutants. Any above ground piping, valves, pumps, etc. that shows signs of excess wear and that have a reasonable potential for substantive fugitive emissions of regulated air pollutants shall be repaired or replaced as needed.

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<sub>x</sub> emission standards; 100 ppm at 15% O<sub>2</sub> 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<sub>x</sub> emission standard is 150 ppm at 15% O<sub>2</sub> 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<sub>x</sub> concentration in PPM using EPA Method 7E or EPA Method 20, or (ii) – measure NO<sub>x</sub> 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 SO<sub>2</sub>/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. 13, Permit R13-2715F**

Condition 4.2.1 – In order to show compliance with the NO<sub>x</sub> emission limits contained in 4.1.5 and 4.1.8 of this permit, the permittee must perform an initial and annual performance test in accordance with § 60.4400 to demonstrate continuous compliance. If the NO<sub>x</sub> emission result from the performance test is less than or equal to 75% of the NO<sub>x</sub> emission limit for the unit, the permittee may reduce the frequency of the subsequent performance test to once every 2 years (no more than 26 calendar months following the previous test). If the results of any subsequent test exceed 75% of the NO<sub>x</sub> emission limit for the turbine,

the permittee must resume annual performance tests. The initial performance test shall be conducted within 60 days after achieving full load operation or within 180 days of startup whichever comes first

Condition 4.2.2 – In order to show compliance with the CO emissions limits contained in 4.1.5 and 4.1.8 of this permit the permittee shall perform initial and periodic performance tests on each turbine using EPA approved methods (or alternative methods approved by the Director). Said testing shall be performed while the turbines are operating at normal conditions, within 25% of full load or at the highest achievable load (and while ambient temperatures are above 0°F). The initial performance test shall be conducted within 180 days of startup. Subsequent testing shall be conducted at least every 5 years.

Condition 4.3.1 – Permittee shall keep records of monitoring information that includes the following;

- Date, place as defined in this permit and time of sampling or measurements;
- Date(s) analyses were performed;
- Company or entity that performed analyses;
- Analytical techniques or methods used;
- Results of analyses; and
- Operating conditions existing at the time of sampling or measurement.

Condition 4.3.3 – In order to demonstrate compliance with condition 4.1.7 of this permit, the permittee shall monitor and record the amount of natural gas consumed by each piece of equipment.

Condition 4.3.4 – In order to demonstrate compliance with conditions 4.1.5 and 4.1.8 of this permit the permittee will monitor and record the following;

- Monthly operating hour at normal dry low NO<sub>x</sub> (DLN) conditions (>50% of rated load and ambient temperatures of > 0°F)
- Monthly operating hours at low load (<50% load)
- Monthly operating hours at low ambient temperatures (<0°F to -20°F)
- Monthly operating hours at very low temperatures (<-20°F)
- Monthly operating hours of startup and shutdown cycles
- Monthly total operating hours of the unit

Condition 4.3.5 – The monthly records required by condition 4.3.4 of this permit shall be used to calculate monthly emissions for each regulated pollutant (P<sub>x</sub>) using the following equation for the unit;

$$P_T = DLN P_X * DLN \text{ hours} + LL P_X * LL \text{ hours} + LT P_X * LT \text{ hours} + VLT P_X * VLT \text{ hours} + SS P_X * SS \text{ Cycles}$$

Where P<sub>T</sub> is the total tons of emissions for the month, DLN P<sub>x</sub>, LL P<sub>x</sub>, LT P<sub>x</sub>, VLT P<sub>x</sub>, and SS P<sub>x</sub> are the unit emission rates for pollutant X during normal DLN, low load, low temperature, very low temperature, and startup/shutdown operation, respectively. DLN hours, LL hours, LT hours, VLT hours, and SS hours are the unit monthly operating hours at DLN, low load, low temperature, very low temperature and startup/shutdown conditions, respectively.

Condition 4.3.7 – At the end of each month, the monthly emissions will be calculated for the preceding 12 months to determine compliance with the annual emission limits.

Condition 4.3.10 – In order to determine compliance with the fuel sulfur limits of 4.1.6 of this permit, the permittee shall monitor the fuel sulfur content of the natural gas combusted by the unit and calculate and record the rolling total twelve (12) month average of sulfur content of the natural gas combusted in the source. In lieu of onsite monitoring, the permittee may use data contained in a valid purchase contract, tariff sheet, transportation contract, or other reasonable documentation to determine the fuel sulfur content.

Condition 4.4.1 – The permittee shall comply with all applicable reporting requirements of 40 CFR Subpart 60 KKKK.

Condition 4.4.2 – Any deviation(s) from the allowable natural gas consumption limits of condition 4.1.7 shall be reported in writing to the Director of the DAQ as soon as practicable, but in any case ten (10) calendar days of the occurrence and shall include at least the following information, the extent of the deviation, the cause or suspected cause of the deviation(s), and any corrective measures taken or planned.

Condition 4.4.3 – Any deviation(s) from the allowable emission limits of conditions 4.1.5 and 4.1.8 shall be reported in writing to the Director of the DAQ as soon as practicable, but in any case ten (10) calendar days of the occurrence and shall include at least the following information, the extent of the deviation, the cause or suspected cause of the deviation(s), and any corrective measures taken or planned.

**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***

<b>Emission unit ID number:</b> 03708	<b>Emission unit name:</b> Combustion Turbine/Compressor	<b>List any control devices associated with this emission unit:</b> NA
--	---	---

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

<b>Manufacturer:</b> Solar	<b>Model Number:</b> Mars 100-15000S	<b>Serial Number:</b> NA
-------------------------------	---	-----------------------------

<b>Construction Date:</b> NA	<b>Installation Date:</b> 2013	<b>Modification Date(s):</b> NA
---------------------------------	-----------------------------------	------------------------------------

**Design Capacity (examples: furnaces - tons/hr, tanks - gallons):**  
15,432 hp @ 30°F  
13,814 hp @ 50°F

<b>Maximum Hourly Throughput:</b> NA	<b>Maximum Annual Throughput:</b> NA	<b>Maximum Operating Schedule:</b> NA
---	---	--

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

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

<b>Maximum design heat input and/or maximum horsepower rating:</b> 15,432 hp @ 30°F 13,814 hp @ 50°F / 107.6 MMBtu/hr	<b>Type and Btu/hr rating of burners:</b> 7,296 Btu/hp-hr @ 30°F 7,790 Btu/hp-hr @ 50°F
---	---

**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  
122,525 scf/hr / 1,025.85 mmscf/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

<b>Emissions Data</b>			
Criteria Pollutants	Potential Emissions		
	PPH	TPY	
Carbon Monoxide (CO)	See Appendix A		
Nitrogen Oxides (NO <sub>x</sub> )			
Lead (Pb)			
Particulate Matter (PM <sub>2.5</sub> )			
Particulate Matter (PM <sub>10</sub> )			
Total Particulate Matter (TSP)			
Sulfur Dioxide (SO <sub>2</sub> )			
Volatile Organic Compounds (VOC)			
Hazardous Air Pollutants			
	PPH	TPY	
	See Appendix A		
Regulated Pollutants other than Criteria and HAP	Potential Emissions		
	PPH	TPY	
<p><b>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.).</b></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 Line 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. 13, Permit R13-2715F**

Condition 4.1.5 – Emissions from the unit shall not exceed the following;

	NO <sub>x</sub>		CO		VOC		SO <sub>2</sub>		PM/PM <sub>10</sub> /PM <sub>2.5</sub>		CO <sub>2e</sub>
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	tpy
E08	6.76	31.83	6.85	63.02	0.79	3.88	7.14	0.37	2.25	9.42	61,264

Condition 4.1.6 – The unit shall combust only pipeline quality natural gas which contains a maximum of 20 grains of sulfur per 100 scf and which contains a maximum of 0.25 grains of sulfur per 100 scf as averaged over a rolling period of 12 months

Condition 4.1.7 – The unit shall consume no more than the following amounts of natural gas;

	Natural Gas Consumption	
	ft <sup>3</sup> /hr	scf/yr
E08	122,525	1,025.86 x 10 <sup>6</sup>

Condition 4.1.8 – Emissions from the unit shall not exceed the following;

Operating Parameter	E08
<b>NO<sub>x</sub></b>	
Full Load @ 30°F	25ppm <sub>v</sub> @ 15% O <sub>2</sub> (6.76 lb/hr)
Low Temp (<0 to -20°F)	20.58 lb/hr
Very Low Temp (<-20°F)	58.80 lb/hr
Low Load (<50%)	16.10 lb/hr
Startup/Shutdown	3.1 lb/cycle
<b>CO</b>	
Full Load @ 30°F	6.85 lb/hr
Low Temp (<0 to -20°F)	29.83 lb/hr
Very Low Temp (<-20°F)	44.74 lb/hr
Low Load (<50%)	653.4 lb/hr
Startup/Shutdown	272.7 lb/cycle
<b>VOC</b>	
Full Load @ 30°F	0.79 lb/hr
Low Temp (<0 to -20°F)	1.70 lb/hr
Very Low Temp (<-20°F)	1.70 lb/hr
Low Load (<50%)	7.47 lb/hr
Startup/Shutdown	3.12 lb/cycle
<b>SO<sub>x</sub></b> (short term emission rate based on 20 gr S/100 scf)	

Full Load @ 30°F	7.14 lb/hr
Low Load (<50%)	7.14 lb/hr
Startup/Shutdown	7.14 lb/hr
<b>PM<sub>10</sub></b>	
Full Load @ 30°F	2.25 lb/hr
Low Load (<50%)	2.25 lb/hr
Startup/Shutdown	2.25 lb/hr

Condition 4.1.14 – NO<sub>x</sub> emissions from the unit shall not exceed 25 ppm at 15% O<sub>2</sub> (or an alternative limit of 150 ng/J of useful output)

Condition 4.1.16 – The unit shall only burn fuel with a total potential SO<sub>2</sub> emission rate of 0.06 lb/MMBtu or less.

Condition 4.1.18 – Permittee shall install, maintain, and operate all above ground piping, valves, pumps, etc. that service lines in the transport of potential sources of regulated air pollutants to prevent any substantive fugitive escape of regulated air pollutants. Any above ground piping, valves, pumps, etc. that shows signs of excess wear and that have a reasonable potential for substantive fugitive emissions of regulated air pollutants shall be repaired or replaced as needed.

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 3 and Line 12) – Unit must meet NO<sub>x</sub> emission standards; 25 ppm at 15% O<sub>2</sub> or 150 ng/J of useful output at and above 75% peak load. At less than 75% peak load or less than 0 degrees F, the NO<sub>x</sub> emission standard is 150 ppm at 15% O<sub>2</sub> 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<sub>x</sub> concentration in PPM using EPA Method 7E or EPA Method 20, or (ii) – measure NO<sub>x</sub> 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 SO<sub>2</sub>/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. 13, Permit R13-2715F**

Condition 4.2.1 – In order to show compliance with the NO<sub>x</sub> emission limits contained in 4.1.5 and 4.1.8 of this permit, the permittee must perform an initial and annual performance test in accordance with § 60.4400 to demonstrate continuous compliance. If the NO<sub>x</sub> emission result from the performance test is less than or equal to 75% of the NO<sub>x</sub> emission limit for the unit, the permittee may reduce the frequency of the subsequent performance test to once every 2 years (no more than 26 calendar months following the previous test). If the results of any subsequent test exceed 75% of the NO<sub>x</sub> emission limit for the turbine,

the permittee must resume annual performance tests. The initial performance test shall be conducted within 60 days after achieving full load operation or within 180 days of startup whichever comes first

Condition 4.2.2 – In order to show compliance with the CO emissions limits contained in 4.1.5 and 4.1.8 of this permit the permittee shall perform initial and periodic performance tests on each turbine using EPA approved methods (or alternative methods approved by the Director). Said testing shall be performed while the turbines are operating at normal conditions, within 25% of full load or at the highest achievable load (and while ambient temperatures are above 0°F). The initial performance test shall be conducted within 180 days of startup. Subsequent testing shall be conducted at least every 5 years.

Condition 4.3.1 – Permittee shall keep records of monitoring information that includes the following;

- Date, place as defined in this permit and time of sampling or measurements;
- Date(s) analyses were performed;
- Company or entity that performed analyses;
- Analytical techniques or methods used;
- Results of analyses; and
- Operating conditions existing at the time of sampling or measurement.

Condition 4.3.3 – In order to demonstrate compliance with condition 4.1.7 of this permit, the permittee shall monitor and record the amount of natural gas consumed by each piece of equipment.

Condition 4.3.4 – In order to demonstrate compliance with conditions 4.1.5 and 4.1.8 of this permit the permittee will monitor and record the following;

- Monthly operating hour at normal dry low NO<sub>x</sub> (DLN) conditions (>50% of rated load and ambient temperatures of > 0°F)
- Monthly operating hours at low load (<50% load)
- Monthly operating hours at low ambient temperatures (<0°F to -20°F)
- Monthly operating hours at very low temperatures (<-20°F)
- Monthly operating hours of startup and shutdown cycles
- Monthly total operating hours of the unit

Condition 4.3.5 – The monthly records required by condition 4.3.4 of this permit shall be used to calculate monthly emissions for each regulated pollutant (P<sub>x</sub>) using the following equation for the unit;

$$P_T = DLN P_X * DLN \text{ hours} + LL P_X * LL \text{ hours} + LT P_X * LT \text{ hours} + VLT P_X * VLT \text{ hours} + SS P_X * SS \text{ Cycles}$$

Where P<sub>T</sub> is the total tons of emissions for the month, DLN P<sub>x</sub>, LL P<sub>x</sub>, LT P<sub>x</sub>, VLT P<sub>x</sub>, and SS P<sub>x</sub> are the unit emission rates for pollutant X during normal DLN, low load, low temperature, very low temperature, and startup/shutdown operation, respectively. DLN hours, LL hours, LT hours, VLT hours, and SS hours are the unit monthly operating hours at DLN, low load, low temperature, very low temperature and startup/shutdown conditions, respectively.

Condition 4.3.7 – At the end of each month, the monthly emissions will be calculated for the preceding 12 months to determine compliance with the annual emission limits.

Condition 4.3.10 – In order to determine compliance with the fuel sulfur limits of 4.1.6 of this permit, the permittee shall monitor the fuel sulfur content of the natural gas combusted by the unit and calculate and record the rolling total twelve (12) month average of sulfur content of the natural gas combusted in the source. In lieu of onsite monitoring, the permittee may use data contained in a valid purchase contract, tariff sheet, transportation contract, or other reasonable documentation to determine the fuel sulfur content.

Condition 4.4.1 – The permittee shall comply with all applicable reporting requirements of 40 CFR Subpart 60 KKKK.

Condition 4.4.2 – Any deviation(s) from the allowable natural gas consumption limits of condition 4.1.7 shall be reported in writing to the Director of the DAQ as soon as practicable, but in any case ten (10) calendar days of the occurrence and shall include at least the following information, the extent of the deviation, the cause or suspected cause of the deviation(s), and any corrective measures taken or planned.

Condition 4.4.3 – Any deviation(s) from the allowable emission limits of conditions 4.1.5 and 4.1.8 shall be reported in writing to the Director of the DAQ as soon as practicable, but in any case ten (10) calendar days of the occurrence and shall include at least the following information, the extent of the deviation, the cause or suspected cause of the deviation(s), and any corrective measures taken or planned.

**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**

<b>Emission unit ID number:</b> 03709	<b>Emission unit name:</b> Combustion Turbine/Compressor	<b>List any control devices associated with this emission unit:</b> NA
--	---	---

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

<b>Manufacturer:</b> Solar	<b>Model Number:</b> Taurus 70	<b>Serial Number:</b> NA
-------------------------------	-----------------------------------	-----------------------------

<b>Construction Date:</b> NA	<b>Installation Date:</b> 2017	<b>Modification Date(s):</b> NA
---------------------------------	-----------------------------------	------------------------------------

**Design Capacity (examples: furnaces - tons/hr, tanks - gallons):**  
10,613 hp at 32° F

<b>Maximum Hourly Throughput:</b> NA	<b>Maximum Annual Throughput:</b> NA	<b>Maximum Operating Schedule:</b> NA
---	---	--

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

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

<b>Maximum design heat input and/or maximum horsepower rating:</b> 10,613 hp at 32° F / 79.00 MMBtu/hr	<b>Type and Btu/hr rating of burners:</b> 7,444 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  
85,970 scf/hr / 753.1 mmscf/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

<b><i>Emissions Data</i></b>		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	See Appendix A	
Nitrogen Oxides (NO <sub>x</sub> )		
Lead (Pb)		
Particulate Matter (PM <sub>2.5</sub> )		
Particulate Matter (PM <sub>10</sub> )		
Total Particulate Matter (TSP)		
Sulfur Dioxide (SO <sub>2</sub> )		
Volatile Organic Compounds (VOC)		
Hazardous Air Pollutants		
	PPH	TPY
	See Appendix A	
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
<p><b>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.).</b></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 Line 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. 13, Permit R13-2715F**

Condition 4.1.5 – Emissions from the unit shall not exceed the following;

	NO <sub>x</sub>		CO		VOC		SO <sub>2</sub>		PM/PM <sub>10</sub> /PM <sub>2.5</sub>		CO <sub>2e</sub>
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	tpy
E09	4.74	22.80	4.81	91.80	0.55	3.22	5.01	0.27	0.58	2.53	44,975

Condition 4.1.6 – The unit shall combust only pipeline quality natural gas which contains a maximum of 20 grains of sulfur per 100 scf and which contains a maximum of 0.25 grains of sulfur per 100 scf as averaged over a rolling period of 12 months

Condition 4.1.7 – The unit shall consume no more than the following amounts of natural gas;

	Natural Gas Consumption	
	ft <sup>3</sup> /hr	scf/yr
E09	85,791	753.1 x 10 <sup>6</sup>

Condition 4.1.8 – Emissions from the unit shall not exceed the following;

Operating Parameter	E09
<b>NO<sub>x</sub></b>	
Full Load @ 32°F	15ppm <sub>v</sub> @ 15% O <sub>2</sub> (4.74 lb/hr)
Low Temp (<0°F)	14.21 lb/hr
Low Load (<50%)	14.45 lb/hr
Startup/Shutdown	1.90 lb/cycle
<b>CO</b>	
Full Load @ 32°F	4.81 lb/hr
Low Temp (<0 to -20°F)	20.59 lb/hr
Low Load (<50%)	586.42 lb/hr
Startup/Shutdown	166.50 lb/cycle
<b>VOC</b>	
Full Load @ 32°F	0.55 lb/hr
Low Temp (<0 to -20°F)	1.18 lb/hr
Low Load (<50%)	6.70 lb/hr
Startup/Shutdown	1.90 lb/cycle
<b>SO<sub>x</sub></b> (short term emission rate based on 20 gr S/100 scf)	
Full Load @ 32°F	5.01 lb/hr
Low Load (<50%)	5.01 lb/hr
Startup/Shutdown	5.01 lb/hr

PM <sub>10</sub>	
Full Load @ 32°F	0.58 lb/hr
Low Load (<50%)	0.58 lb/hr
Startup/Shutdown	0.58 lb/hr

Condition 4.1.14 – NO<sub>x</sub> emissions from the unit shall not exceed 25 ppm at 15% O<sub>2</sub> (or an alternative limit of 150 ng/J of useful output)

Condition 4.1.16 – The unit shall only burn fuel with a total potential SO<sub>2</sub> emission rate of 0.06 lb/MMBtu or less.

Condition 4.1.18 – Permittee shall install, maintain, and operate all above ground piping, valves, pumps, etc. that service lines in the transport of potential sources of regulated air pollutants to prevent any substantive fugitive escape of regulated air pollutants. Any above ground piping, valves, pumps, etc. that shows signs of excess wear and that have a reasonable potential for substantive fugitive emissions of regulated air pollutants shall be repaired or replaced as needed.

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 3 and Line 12) – Unit must meet NO<sub>x</sub> emission standards; 25 ppm at 15% O<sub>2</sub> or 150 ng/J of useful output at and above 75% peak load. At less than 75% peak load or less than 0 degrees F, the NO<sub>x</sub> emission standard is 150 ppm at 15% O<sub>2</sub> 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<sub>x</sub> concentration in PPM using EPA Method 7E or EPA Method 20, or (ii) – measure NO<sub>x</sub> 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 SO<sub>2</sub>/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. 13, Permit R13-2715F**

Condition 4.2.1 – In order to show compliance with the NO<sub>x</sub> emission limits contained in 4.1.5 and 4.1.8 of this permit, the permittee must perform an initial and annual performance test in accordance with § 60.4400 to demonstrate continuous compliance. If the NO<sub>x</sub> emission result from the performance test is less than or equal to 75% of the NO<sub>x</sub> emission limit for the unit, the permittee may reduce the frequency of the subsequent performance test to once every 2 years (no more than 26 calendar months following the previous test). If the results of any subsequent test exceed 75% of the NO<sub>x</sub> emission limit for the turbine, the permittee must resume annual performance tests. The initial performance test shall be conducted within 60 days after achieving full load operation or within 180 days of startup whichever comes first

Condition 4.2.2 – In order to show compliance with the CO emissions limits contained in 4.1.5 and 4.1.8 of this permit the

permittee shall perform initial and periodic performance tests on each turbine using EPA approved methods (or alternative methods approved by the Director). Said testing shall be performed while the turbines are operating at normal conditions, within 25% of full load or at the highest achievable load (and while ambient temperatures are above 0°F). The initial performance test shall be conducted within 180 days of startup. Subsequent testing shall be conducted at least every 5 years.

Condition 4.3.1 – Permittee shall keep records of monitoring information that includes the following;

- Date, place as defined in this permit and time of sampling or measurements;
- Date(s) analyses were performed;
- Company or entity that performed analyses;
- Analytical techniques or methods used;
- Results of analyses; and
- Operating conditions existing at the time of sampling or measurement.

Condition 4.3.3 – In order to demonstrate compliance with condition 4.1.7 of this permit, the permittee shall monitor and record the amount of natural gas consumed by each piece of equipment.

Condition 4.3.4 – In order to demonstrate compliance with conditions 4.1.5 and 4.1.8 of this permit the permittee will monitor and record the following;

- Monthly operating hour at normal dry low NO<sub>x</sub> (DLN) conditions (>50% of rated load and ambient temperatures of > 0°F)
- Monthly operating hours at low load (<50% load)
- Monthly operating hours at low ambient temperatures (<0°F to -20°F)
- Monthly operating hours at very low temperatures (<-20°F)
- Monthly operating hours of startup and shutdown cycles
- Monthly total operating hours of the unit

Condition 4.3.5 – The monthly records required by condition 4.3.4 of this permit shall be used to calculate monthly emissions for each regulated pollutant (P<sub>X</sub>) using the following equation for the unit;

$$P_T = DLN P_X * DLN \text{ hours} + LL P_X * LL \text{ hours} + LT P_X * LT \text{ hours} + VLT P_X * VLT \text{ hours} + SS P_X * SS \text{ Cycles}$$

Where P<sub>T</sub> is the total tons of emissions for the month, DLN P<sub>X</sub>, LL P<sub>X</sub>, LT P<sub>X</sub>, VLT P<sub>X</sub>, and SS P<sub>X</sub> are the unit emission rates for pollutant X during normal DLN, low load, low temperature, very low temperature, and startup/shutdown operation, respectively. DLN hours, LL hours, LT hours, VLT hours, and SS hours are the unit monthly operating hours at DLN, low load, low temperature, very low temperature and startup/shutdown conditions, respectively.

Condition 4.3.7 – At the end of each month, the monthly emissions will be calculated for the preceding 12 months to determine compliance with the annual emission limits.

Condition 4.3.10 – In order to determine compliance with the fuel sulfur limits of 4.1.6 of this permit, the permittee shall monitor the fuel sulfur content of the natural gas combusted by the unit and calculate and record the rolling total twelve (12) month average of sulfur content of the natural gas combusted in the source. In lieu of onsite monitoring, the permittee may use data contained in a valid purchase contract, tariff sheet, transportation contract, or other reasonable documentation to determine the fuel sulfur content.

Condition 4.4.1 – The permittee shall comply with all applicable reporting requirements of 40 CFR Subpart 60 KKKK.

Condition 4.4.2 – Any deviation(s) from the allowable natural gas consumption limits of condition 4.1.7 shall be reported in writing to the Director of the DAQ as soon as practicable, but in any case ten (10) calendar days of the occurrence and shall include at least the following information, the extent of the deviation, the cause or suspected cause of the deviation(s), and any corrective measures taken or planned.

Condition 4.4.3 – Any deviation(s) from the allowable emission limits of conditions 4.1.5 and 4.1.8 shall be reported in writing to the Director of the DAQ as soon as practicable, but in any case ten (10) calendar days of the occurrence and shall include at least the following information, the extent of the deviation, the cause or suspected cause of the deviation(s), and any corrective measures taken or planned.

**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**

<b>Emission unit ID number:</b> 037G3	<b>Emission unit name:</b> Reciprocating Engine/Generator	<b>List any control devices associated with this emission unit:</b> NA
--	--	---

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

<b>Manufacturer:</b> Waukesha	<b>Model number:</b> VGF-L36GL	<b>Serial number:</b> NA
----------------------------------	-----------------------------------	-----------------------------

<b>Construction date:</b> NA	<b>Installation date:</b> 2013	<b>Modification date(s):</b> NA
---------------------------------	-----------------------------------	------------------------------------

**Design Capacity (examples: furnaces - tons/hr, tanks - gallons):** 880 hp

<b>Maximum Hourly Throughput:</b> NA	<b>Maximum Annual Throughput:</b> NA	<b>Maximum Operating Schedule:</b> 500 hrs/yr
---	---	--

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

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

<b>Maximum design heat input and/or maximum horsepower rating:</b> 880 hp	<b>Type and Btu/hr rating of burners:</b> 7,757 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  
6,692 scf/hr / 3,346,000 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 <sub>x</sub> )		
Lead (Pb)		
Particulate Matter (PM <sub>2.5</sub> )		
Particulate Matter (PM <sub>10</sub> )		
Total Particulate Matter (TSP)		
Sulfur Dioxide (SO <sub>2</sub> )		
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><b>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.).</b></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 14) – Operating Requirements

40 C.F.R. § 60.4236(c) – Installation Requirements

40 C.F.R. § 60.4237(a) – Monitoring Requirements

40 C.F.R. § 60.4243(b), (d), (e) and (g) – Compliance Requirements

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

40 C.F.R. § 60.4245(a) and (b) – Reporting Requirements

**45 C.S.R. 13, Permit R13-2715F**

Condition 4.1.5 – Emissions from the unit shall not exceed the following;

	NO <sub>x</sub>		CO		VOC		SO <sub>2</sub>		PM/PM <sub>10</sub> /PM <sub>2.5</sub>		CO <sub>2e</sub>
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	tpy
G3	3.88	0.97	2.52	0.63	0.08	0.02	0.39	0.01	0.07	0.02	200

Condition 4.1.6 – The unit shall combust only pipeline quality natural gas which contains a maximum of 20 grains of sulfur per 100 scf and which contains a maximum of 0.25 grains of sulfur per 100 scf as averaged over a rolling period of 12 months

Condition 4.1.9 – The unit shall not operate more than 500 hours per year based on a rolling 12 month total.

Condition 4.1.13 – Emissions from the unit shall not exceed the following;

	NO <sub>x</sub>	CO	VOC
Standard (g/hp-hr)	2.0	4.0	1.0

Condition 4.1.18 – Permittee shall install, maintain, and operate all above ground piping, valves, pumps, etc. that service lines in the transport of potential sources of regulated air pollutants to prevent any substantive fugitive escape of regulated air pollutants. Any above ground piping, valves, pumps, etc. that shows signs of excess wear and that have a reasonable potential for substantive fugitive emissions of regulated air pollutants shall be repaired or replaced as needed.

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 14) – Unit shall comply with the emission standards set forth for NO<sub>x</sub> (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. § 60.4237(a) – Install a non-resettable meter to monitor hours of operation.

40 C.F.R. § 60.4243(b) – 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. § 60.4243(d) – Compliance/Operation;

- There is no time limit to operation of unit during emergency situations
- 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.
- 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 the previous paragraph

40 C.F.R. § 60.4243(e) – Permittee may operate unit using propane as alternative fuel solely during emergency operations for maximum 100 hours per calendar year.

40 C.F.R. § 60.4245(a) and (b) – Permittee shall keep records on maintenance conducted and hours of operation, both for emergency use and non-emergency use.

**45 C.S.R. 13, Permit R13-2715F**

Condition 4.3.1 – Permittee shall keep records of monitoring information that includes the following;

- Date, place as defined in this permit and time of sampling or measurements;
- Date(s) analyses were performed;
- Company or entity that performed analyses;
- Analytical techniques or methods used;
- Results of analyses; and
- Operating conditions existing at the time of sampling or measurement.

Condition 4.3.4 – In order to demonstrate compliance with conditions 4.1.5 of this permit the permittee will monitor and record the following;

- Monthly total operating hours of the unit

Condition 4.3.6 – The monthly records required by condition 4.3.4 of this permit shall be used to calculate monthly emissions for each regulated pollutant ( $P_X$ ) using the following equation for the unit;

$$P_T = P_X * \text{total monthly operating hours}$$

Where  $P_T$  is the total tons of emissions for the month, and  $P_X$  is the unit emission rate for pollutant X during normal operation.

Condition 4.3.7 – At the end of each month, the monthly emissions will be calculated for the preceding 12 months to determine compliance with the annual emission limits.

Condition 4.3.8 – In order to determine compliance with 4.1.9 of this permit, the permittee shall maintain monthly records of the number of hours of operation of the unit.

Condition 4.3.9 – The permittee shall keep a maintenance plan and records of conducted maintenance of the unit.

Condition 4.3.10 – In order to determine compliance with the fuel sulfur limits of 4.1.6 of this permit, the permittee shall monitor the fuel sulfur content of the natural gas combusted by the unit and calculate and record the rolling total twelve (12) month average of sulfur content of the natural gas combusted in the source. In lieu of onsite monitoring, the permittee may use data contained in a valid purchase contract, tariff sheet, transportation contract, or other reasonable documentation to determine the fuel sulfur content.

Condition 4.4.1 – The permittee shall comply with all applicable reporting requirements of 40 CFR 60 Subpart JJJJ.

Condition 4.4.4 – Any deviation(s) from the allowable hours of operation limits of condition 4.1.9 shall be reported in writing to the Director of the DAQ as soon as practicable, but in any case ten (10) calendar days of the occurrence and shall include at least the following information, the extent of the deviation, the cause or suspected cause of the deviation(s), and any corrective measures taken or planned.

**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**

<b>Emission unit ID number:</b> HTR1	<b>Emission unit name:</b> Fuel Gas Heater	<b>List any control devices associated with this emission unit:</b> NA
---	---	---

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

<b>Manufacturer:</b> ETI	<b>Model number:</b> SB18-18	<b>Serial number:</b> NA
-----------------------------	---------------------------------	-----------------------------

<b>Construction date:</b> NA	<b>Installation date:</b> 2008	<b>Modification date(s):</b> NA
---------------------------------	-----------------------------------	------------------------------------

**Design Capacity (examples: furnaces - tons/hr, tanks - gallons):**  
0.5 mmBtu/hr  
0.58 mmBtu/hr (as defined in R13-2715F)

<b>Maximum Hourly Throughput:</b> NA	<b>Maximum Annual Throughput:</b> NA	<b>Maximum Operating Schedule:</b> 8,760
---	---	---

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

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

<b>Maximum design heat input and/or maximum horsepower rating:</b> 0.5 mmBtu/hr 0.58 mmBtu/hr (as defined in R13-2715F)	<b>Type and Btu/hr rating of burners:</b> 0.5 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  
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

<b><i>Emissions Data</i></b>		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	See Appendix A	
Nitrogen Oxides (NO <sub>x</sub> )		
Lead (Pb)		
Particulate Matter (PM <sub>2.5</sub> )		
Particulate Matter (PM <sub>10</sub> )		
Total Particulate Matter (TSP)		
Sulfur Dioxide (SO <sub>2</sub> )		
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><b>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.).</b></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

**45 C.S.R. 13, Permit R13-2715F**

Condition 4.1.11 – 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 4.1.18 – Permittee shall install, maintain, and operate all above ground piping, valves, pumps, etc. that service lines in the transport of potential sources of regulated air pollutants to prevent any substantive fugitive escape of regulated air pollutants. Any above ground piping, valves, pumps, etc. that shows signs of excess wear and that have a reasonable potential for substantive fugitive emissions of regulated air pollutants shall be repaired or replaced as needed.

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

**45 C.S.R. 13, Permit R13-2715F**

Condition 4.4.5 – Any deviation(s) from the allowable visible emission requirement for any emission source discovered during observations using 40 CFR Part 60, Appendix A, Method 9 or 22 shall be reported in writing to the Director of the DAQ as soon as practicable, but in any case ten (10) calendar days of the occurrence and shall include at least the following information, the extent of the deviation, the cause or suspected cause of the deviation(s), and any corrective measures taken or planned.

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**

<b>Emission unit ID number:</b> HTR2	<b>Emission unit name:</b> Fuel Gas Heater	<b>List any control devices associated with this emission unit:</b> NA
---	---	---

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

<b>Manufacturer:</b> ETI	<b>Model number:</b> SB18-18	<b>Serial number:</b> NA
-----------------------------	---------------------------------	-----------------------------

<b>Construction date:</b> NA	<b>Installation date:</b> 2013	<b>Modification date(s):</b> NA
---------------------------------	-----------------------------------	------------------------------------

**Design Capacity (examples: furnaces - tons/hr, tanks - gallons):**  
0.5 mmBtu/hr  
0.85 mmBtu/hr (as defined in R13-2715F)

<b>Maximum Hourly Throughput:</b> NA	<b>Maximum Annual Throughput:</b> NA	<b>Maximum Operating Schedule:</b> 8,760
---	---	---

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

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

<b>Maximum design heat input and/or maximum horsepower rating:</b> 0.5 mmBtu/hr 0.85 mmBtu/hr (as defined in R13-2715F)	<b>Type and Btu/hr rating of burners:</b> 0.5 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  
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 <sub>x</sub> )		
Lead (Pb)		
Particulate Matter (PM <sub>2.5</sub> )		
Particulate Matter (PM <sub>10</sub> )		
Total Particulate Matter (TSP)		
Sulfur Dioxide (SO <sub>2</sub> )		
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><b>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.).</b></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

**45 C.S.R. 13, Permit R13-2715F**

Condition 4.1.5 – Emissions from the unit shall not exceed the following;

	NO <sub>x</sub>		CO		VOC		SO <sub>2</sub>		PM/PM <sub>10</sub> /PM <sub>2.5</sub>		CO <sub>2e</sub>
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	tpy
H2	0.08	0.37	0.07	0.31	0.01	0.02	0.05	0.01	0.01	0.03	436

Condition 4.1.10 – The MDHI of the unit shall not exceed 0.85 mmBtu/hr and shall only be fired by natural gas

Condition 4.1.11 – 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 4.1.18 – Permittee shall install, maintain, and operate all above ground piping, valves, pumps, etc. that service lines in the transport of potential sources of regulated air pollutants to prevent any substantive fugitive escape of regulated air pollutants. Any above ground piping, valves, pumps, etc. that shows signs of excess wear and that have a reasonable potential for substantive fugitive emissions of regulated air pollutants shall be repaired or replaced as needed.

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

**45 C.S.R. 13, Permit R13-2715F**

Condition 4.3.1 – Permittee shall keep records of monitoring information that includes the following;

- Date, place as defined in this permit and time of sampling or measurements;
- Date(s) analyses were performed;
- Company or entity that performed analyses;
- Analytical techniques or methods used;
- Results of analyses; and
- Operating conditions existing at the time of sampling or measurement.

Condition 4.3.4 – In order to demonstrate compliance with conditions 4.1.5 of this permit the permittee will monitor and record the following;

- Monthly total operating hours of the unit

Condition 4.3.6 – The monthly records required by condition 4.3.4 of this permit shall be used to calculate monthly emissions for each regulated pollutant (P<sub>X</sub>) using the following equation for the unit;

$$P_T = P_X * \text{total monthly operating hours}$$

Where P<sub>T</sub> is the total tons of emissions for the month, and P<sub>X</sub> is the unit emission rate for pollutant X during normal operation.

Condition 4.4.5 – Any deviation(s) from the allowable visible emission requirement for any emission source discovered during observations using 40 CFR Part 60, Appendix A, Method 9 or 22 shall be reported in writing to the Director of the DAQ as soon as practicable, but in any case ten (10) calendar days of the occurrence and shall include at least the following information, the extent of the deviation, the cause or suspected cause of the deviation(s), and any corrective measures taken or planned.

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***

<b>Emission unit ID number:</b> HTR3	<b>Emission unit name:</b> Process Heater	<b>List any control devices associated with this emission unit:</b> NA
---	--	---

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

<b>Manufacturer:</b> NA	<b>Model number:</b> NA	<b>Serial number:</b> NA
----------------------------	----------------------------	-----------------------------

<b>Construction date:</b> NA	<b>Installation date:</b> 2017	<b>Modification date(s):</b> NA
---------------------------------	-----------------------------------	------------------------------------

**Design Capacity (examples: furnaces - tons/hr, tanks - gallons):** 0.25 mmBtu/hr

<b>Maximum Hourly Throughput:</b> NA	<b>Maximum Annual Throughput:</b> NA	<b>Maximum Operating Schedule:</b> 8,760
---	---	---

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

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

<b>Maximum design heat input and/or maximum horsepower rating:</b> 0.25 mmBtu/hr	<b>Type and Btu/hr rating of burners:</b> 0.25 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  
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 <sub>x</sub> )		
Lead (Pb)		
Particulate Matter (PM <sub>2.5</sub> )		
Particulate Matter (PM <sub>10</sub> )		
Total Particulate Matter (TSP)		
Sulfur Dioxide (SO <sub>2</sub> )		
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><b>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.).</b></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

**45 C.S.R. 13, Permit R13-2715F**

Condition 4.1.5 – Emissions from the unit shall not exceed the following;

	NO <sub>x</sub>		CO		VOC		SO <sub>2</sub>		PM/PM <sub>10</sub> /PM <sub>2.5</sub>		CO <sub>2e</sub>
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	tpy
H3	0.02	0.11	0.02	0.09	0.01	0.01	0.01	0.01	0.01	0.01	128

Condition 4.1.10 – The MDHI of the unit shall not exceed 0.25 mmBtu/hr and shall only be fired by natural gas

Condition 4.1.11 – 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 4.1.18 – Permittee shall install, maintain, and operate all above ground piping, valves, pumps, etc. that service lines in the transport of potential sources of regulated air pollutants to prevent any substantive fugitive escape of regulated air pollutants. Any above ground piping, valves, pumps, etc. that shows signs of excess wear and that have a reasonable potential for substantive fugitive emissions of regulated air pollutants shall be repaired or replaced as needed.

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

**45 C.S.R. 13, Permit R13-2715F**

Condition 4.3.1 – Permittee shall keep records of monitoring information that includes the following;

- Date, place as defined in this permit and time of sampling or measurements;
- Date(s) analyses were performed;
- Company or entity that performed analyses;
- Analytical techniques or methods used;
- Results of analyses; and
- Operating conditions existing at the time of sampling or measurement.

Condition 4.3.4 – In order to demonstrate compliance with conditions 4.1.5 of this permit the permittee will monitor and record the following;

- Monthly total operating hours of the unit

Condition 4.3.6 – The monthly records required by condition 4.3.4 of this permit shall be used to calculate monthly emissions for each regulated pollutant (P<sub>X</sub>) using the following equation for the unit;

$$P_T = P_X * \text{total monthly operating hours}$$

Where P<sub>T</sub> is the total tons of emissions for the month, and P<sub>X</sub> is the unit emission rate for pollutant X during normal operation.

Condition 4.4.5 – Any deviation(s) from the allowable visible emission requirement for any emission source discovered during observations using 40 CFR Part 60, Appendix A, Method 9 or 22 shall be reported in writing to the Director of the DAQ as soon as practicable, but in any case ten (10) calendar days of the occurrence and shall include at least the following information, the extent of the deviation, the cause or suspected cause of the deviation(s), and any corrective measures taken or planned.

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***

<b>Emission unit ID number:</b> 037SH1	<b>Emission unit name:</b> Catalytic Space Heaters (36)	<b>List any control devices associated with this emission unit:</b> NA
---	--	---

**Provide a description of the emission unit (type, method of operation, design parameters, etc.):**  
Catalytic Space Heaters (36)

<b>Manufacturer:</b> NA	<b>Model number:</b> NA	<b>Serial number:</b> NA
----------------------------	----------------------------	-----------------------------

<b>Construction date:</b> NA	<b>Installation date:</b> 2013	<b>Modification date(s):</b> NA
---------------------------------	-----------------------------------	------------------------------------

**Design Capacity (examples: furnaces - tons/hr, tanks - gallons):** 2.592 mmBtu/hr TOTAL

<b>Maximum Hourly Throughput:</b> NA	<b>Maximum Annual Throughput:</b> NA	<b>Maximum Operating Schedule:</b> 8,760
---	---	---

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

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

<b>Maximum design heat input and/or maximum horsepower rating:</b> 2.592 mmBtu/hr TOTAL	<b>Type and Btu/hr rating of burners:</b> 2.592 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  
2,541.1 scf/hr / 22,260,000 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 <sub>x</sub> )		
Lead (Pb)		
Particulate Matter (PM <sub>2.5</sub> )		
Particulate Matter (PM <sub>10</sub> )		
Total Particulate Matter (TSP)		
Sulfur Dioxide (SO <sub>2</sub> )		
Volatile Organic Compounds (VOC)		
Hazardous Air Pollutants		
	PPH	TPY
	See Appendix A	
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
<p><b>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.).</b></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

**45 C.S.R. 13, Permit R13-2715F**

Condition 4.1.5 – Emissions from the unit shall not exceed the following;

	NO <sub>x</sub>		CO		VOC		SO <sub>2</sub>		PM/PM <sub>10</sub> /PM <sub>2.5</sub>		CO <sub>2e</sub>
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	tpy
SH1 (36)	0.25	1.11	0.21	0.93	0.02	0.06	0.15	0.01	0.02	0.08	1,329

Condition 4.1.11 – 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 4.1.12 – The MDHI of each of the 36 units shall not exceed 0.072 mmBtu/hr.

Condition 4.1.18 – Permittee shall install, maintain, and operate all above ground piping, valves, pumps, etc. that service lines in the transport of potential sources of regulated air pollutants to prevent any substantive fugitive escape of regulated air pollutants. Any above ground piping, valves, pumps, etc. that shows signs of excess wear and that have a reasonable potential for substantive fugitive emissions of regulated air pollutants shall be repaired or replaced as needed.

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

**45 C.S.R. 13, Permit R13-2715F**

Condition 4.3.1 – Permittee shall keep records of monitoring information that includes the following;

- Date, place as defined in this permit and time of sampling or measurements;
- Date(s) analyses were performed;
- Company or entity that performed analyses;
- Analytical techniques or methods used;
- Results of analyses; and
- Operating conditions existing at the time of sampling or measurement.

Condition 4.3.4 – In order to demonstrate compliance with conditions 4.1.5 of this permit the permittee will monitor and record the following;

- Monthly total operating hours of the unit

Condition 4.3.6 – The monthly records required by condition 4.3.4 of this permit shall be used to calculate monthly emissions for each regulated pollutant (P<sub>X</sub>) using the following equation for the unit;

$$P_T = P_X * \text{total monthly operating hours}$$

Where P<sub>T</sub> is the total tons of emissions for the month, and P<sub>X</sub> is the unit emission rate for pollutant X during normal operation.

Condition 4.4.5 – Any deviation(s) from the allowable visible emission requirement for any emission source discovered during observations using 40 CFR Part 60, Appendix A, Method 9 or 22 shall be reported in writing to the Director of the DAQ as soon as practicable, but in any case ten (10) calendar days of the occurrence and shall include at least the following information, the extent of the deviation, the cause or suspected cause of the deviation(s), and any corrective measures taken or planned.

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***

<b>Emission unit ID number:</b> 037SH2	<b>Emission unit name:</b> Catalytic Space Heaters (23)	<b>List any control devices associated with this emission unit:</b> NA
---	--	---

**Provide a description of the emission unit (type, method of operation, design parameters, etc.):**  
Catalytic Space Heaters (23)

<b>Manufacturer:</b> NA	<b>Model number:</b> NA	<b>Serial number:</b> NA
----------------------------	----------------------------	-----------------------------

<b>Construction date:</b> NA	<b>Installation date:</b> 2017	<b>Modification date(s):</b> NA
---------------------------------	-----------------------------------	------------------------------------

**Design Capacity (examples: furnaces - tons/hr, tanks - gallons):** 1.12 mmBtu/hr TOTAL

<b>Maximum Hourly Throughput:</b> NA	<b>Maximum Annual Throughput:</b> NA	<b>Maximum Operating Schedule:</b> 8,760
---	---	---

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

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

<b>Maximum design heat input and/or maximum horsepower rating:</b> 1.12 mmBtu/hr TOTAL	<b>Type and Btu/hr rating of burners:</b> 1.12 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  
1,098.2 scf/hr / 9,620,000 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 <sub>x</sub> )		
Lead (Pb)		
Particulate Matter (PM <sub>2.5</sub> )		
Particulate Matter (PM <sub>10</sub> )		
Total Particulate Matter (TSP)		
Sulfur Dioxide (SO <sub>2</sub> )		
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><b>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.).</b></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

**45 C.S.R. 13, Permit R13-2715F**

Condition 4.1.5 – Emissions from the unit shall not exceed the following;

	NO <sub>x</sub>		CO		VOC		SO <sub>2</sub>		PM/PM <sub>10</sub> /PM <sub>2.5</sub>		CO <sub>2e</sub>
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	tpy
SH2 (23)	0.11	0.48	0.09	0.40	0.01	0.03	0.06	0.01	0.01	0.04	574

Condition 4.1.11 – 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 4.1.12 – The MDHI of each of the 23 units shall not exceed 8 units @ 0.005 mmBtu/hr and 15 units @ 0.072 mmBtu/hr.

Condition 4.1.18 – Permittee shall install, maintain, and operate all above ground piping, valves, pumps, etc. that service lines in the transport of potential sources of regulated air pollutants to prevent any substantive fugitive escape of regulated air pollutants. Any above ground piping, valves, pumps, etc. that shows signs of excess wear and that have a reasonable potential for substantive fugitive emissions of regulated air pollutants shall be repaired or replaced as needed.

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

**45 C.S.R. 13, Permit R13-2715F**

Condition 4.3.1 – Permittee shall keep records of monitoring information that includes the following;

- Date, place as defined in this permit and time of sampling or measurements;
- Date(s) analyses were performed;
- Company or entity that performed analyses;
- Analytical techniques or methods used;
- Results of analyses; and
- Operating conditions existing at the time of sampling or measurement.

Condition 4.3.4 – In order to demonstrate compliance with conditions 4.1.5 of this permit the permittee will monitor and record the following;

- Monthly total operating hours of the unit

Condition 4.3.6 – The monthly records required by condition 4.3.4 of this permit shall be used to calculate monthly emissions for each regulated pollutant (P<sub>X</sub>) using the following equation for the unit;

$$P_T = P_X * \text{total monthly operating hours}$$

Where P<sub>T</sub> is the total tons of emissions for the month, and P<sub>X</sub> is the unit emission rate for pollutant X during normal operation.

Condition 4.4.5 – Any deviation(s) from the allowable visible emission requirement for any emission source discovered during observations using 40 CFR Part 60, Appendix A, Method 9 or 22 shall be reported in writing to the Director of the DAQ as soon as practicable, but in any case ten (10) calendar days of the occurrence and shall include at least the following information, the extent of the deviation, the cause or suspected cause of the deviation(s), and any corrective measures taken or planned.

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**

**Seneca Compressor Station, Facility ID No. 071-00008  
Seneca Rocks, West Virginia**

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

April 2017

**ATTACHMENT G**

**AIR POLLUTION CONTROL DEVICE FORM (NOT  
APPLICABLE)**

**Title V Operating Permit Renewal Application**

**Seneca Compressor Station, Facility ID No. 071-00008  
Seneca Rocks, West Virginia**

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

April 2017

## **ATTACHMENT H**

### **COMPLIANCE ASSURANCE MONITORING FORM (NOT APPLICABLE)**

#### **Title V Operating Permit Renewal Application**

**Seneca Compressor Station, Facility ID No. 071-00008  
Seneca Rocks, 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**

**Seneca Compressor Station, Facility ID No. 071-00008**  
**Seneca Rocks, 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 - Seneca Compressor Station**

**Criteria Pollutants**

**Proposed PTE - Criteria Pollutants**

Source	PM	PM10	PM2.5	SO2	NOx	CO	VOC	CO2e
Engines (ton/yr)	20.859	20.859	20.859	1.302	311.991	369.680	38.538	249218.854
Heaters/Boilers/Reboilers (ton/yr)	0.162	0.162	0.162	0.015	2.131	1.790	0.117	2543.042
Storage Tanks (ton/yr)	-	-	-	-	-	-	1.885	-
Fugitives (ton/yr)	-	-	-	-	-	-	26.178	23.476
<b>Total Emissions (ton/yr)</b>	<b>21.021</b>	<b>21.021</b>	<b>21.021</b>	<b>1.317</b>	<b>314.122</b>	<b>371.469</b>	<b>66.718</b>	<b>251785.372</b>
<b>Total Emissions (lb/hr)</b>	<b>4.799</b>	<b>4.799</b>	<b>4.799</b>	<b>0.301</b>	<b>71.717</b>	<b>84.810</b>	<b>15.232</b>	<b>57485.245</b>

**Hazardous Air Pollutants (HAPs)**

**Proposed PTE - HAPs**

Source	Acetaldehyde	Benzene	Toluene	Ethylbenzene	Xylene	n-Hexane	Formaldehyde	Total HAPs
Engines (ton/yr)	0.0757	0.0192	0.2002	0.0492	0.0985	0.0019	1.390	2.310
Heaters/Boilers/Reboilers (ton/yr)	-	0.0000	0.0001	-	-	0.0384	0.002	0.040
Storage Tanks (ton/yr)	-	-	-	-	-	-	-	0.000
Fugitives (ton/yr)	-	-	-	-	-	-	-	0.000
<b>Total Emissions (ton/yr)</b>	<b>0.076</b>	<b>0.019</b>	<b>0.200</b>	<b>0.049</b>	<b>0.099</b>	<b>0.040</b>	<b>1.392</b>	<b>2.350</b>
<b>Total Emissions (lb/hr)</b>	<b>0.017</b>	<b>0.004</b>	<b>0.046</b>	<b>0.011</b>	<b>0.022</b>	<b>0.009</b>	<b>0.318</b>	<b>0.537</b>

**Table 2. Turbine Engine / Centrifugal Compressor Emissions (E04)**  
**General Electric; 3132R Frame 3**  
**Columbia Gas Transmission - Seneca Compressor Station**

Pollutant	Maximum Hourly Emissions			Annual Emissions		
	Emission Factor	PTE per Engine (lb/hr)		Emission Factor	PTE per Engine (tons/yr)	
<b>Criteria Pollutants</b>						
PM/PM10/PM2.5	6.60E-03 lb/MMBtu (1)	1.34 (a)		6.60E-03 lb/MMBtu (1)	3.66 (c)	
SO <sub>2</sub>	20.0 grains S / 100 ft <sup>3</sup> (2)	11.33 (e)		0.25 grains S / 100 ft <sup>3</sup> (2)	0.39 (f)	
NO <sub>x</sub>	3.20E-01 lb/MMBtu (3)	64.77 (a)		3.20E-01 lb/MMBtu (3)	177.30 (c)	
CO	8.20E-02 lb/MMBtu (3)	16.60 (a)		8.20E-02 lb/MMBtu (3)	45.43 (c)	
VOC	2.10E-03 lb/MMBtu (1)	0.43 (a)		2.10E-03 lb/MMBtu (1)	1.16 (c)	
<b>Hazardous Air Pollutants</b>						
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)	0.008 (a)		4.00E-05 lb/MMBtu (4)	0.022 (c)	
Acrolein	6.40E-06 lb/MMBtu (4)	0.001 (a)		6.40E-06 lb/MMBtu (4)	0.004 (c)	
Benzene	1.20E-05 lb/MMBtu (4)	0.002 (a)		1.20E-05 lb/MMBtu (4)	0.007 (c)	
Ethylbenzene	3.20E-05 lb/MMBtu (4)	0.006 (a)		3.20E-05 lb/MMBtu (4)	0.018 (c)	
Formaldehyde	7.10E-04 lb/MMBtu (4)	0.144 (a)		7.10E-04 lb/MMBtu (4)	0.393 (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)	0.006 (a)		2.90E-05 lb/MMBtu (4)	0.016 (c)	
Toluene	1.30E-04 lb/MMBtu (4)	0.026 (a)		1.30E-04 lb/MMBtu (4)	0.072 (c)	
Xylenes	6.40E-05 lb/MMBtu (4)	0.013 (a)		6.40E-05 lb/MMBtu (4)	0.035 (c)	
<b>Total HAP</b>		<b>0.208</b>			<b>0.569</b>	
<b>Greenhouse Gas Emissions</b>						
CO <sub>2</sub>	116.89 lb/MMBtu (5)	23658.35 (a)		116.89 lb/MMBtu (5)	64764.74 (c)	
CH <sub>4</sub>	2.2E-03 lb/MMBtu (5)	0.45 (a)		2.2E-03 lb/MMBtu (5)	1.22 (c)	
N <sub>2</sub> O	2.2E-04 lb/MMBtu (5)	0.04 (a)		2.2E-04 lb/MMBtu (5)	0.12 (c)	
CO <sub>2</sub> e <sup>(g)</sup>	-	23682.80		-	64831.68	

**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) \* (1MMBtu/1000000 Btu) \* Engine Power Output (hp) \* Average BSFC (Btu/hp-hr)

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

**Annual Emissions - If emission factor note 1, 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) \* (1MMBtu/1000000Btu) \* Engine Power Output (hp) \* Average BSFC (Btu/hp-hr) \* Annual Hours of operation (hr/yr) \* (1ton/2000lbs)

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

**SO<sub>2</sub> Emissions - If emission factor note 2 is used, use calculations (e) and (f) for hourly and annual emissions, respectively.**

(e) Maximum Hourly Emissions SO<sub>2</sub> Caclulation (lb/hr) = (20.0 grain S/100ft<sup>3</sup>) \* Fuel throughput (ft<sup>3</sup>/hr) \* (1lb/7000 grains) \* (lbmol S/32.06 lb S) \* (lbmol SO<sub>2</sub>/ lbmol S) \* (64.07 lb SO<sub>2</sub>/lbmol SO<sub>2</sub>)

(f) Annual Emissions SO<sub>2</sub> Caclulation (ton/yr) = (0.25 grain S/100ft<sup>3</sup>) \* Fuel throughput (ft<sup>3</sup>/hr) \* (1lb/7000 grains) \* (lbmol S/32.06 lb S) \* (lbmol SO<sub>2</sub>/ lbmol S) \* (64.07 lb SO<sub>2</sub>/lbmol SO<sub>2</sub>) \* Annual hours of operation (hr/yr) \* (1ton/2000lbs)

MAXIMUM HOURLY EMISSION INPUTS	
Engine Power Output (kW) =	16405
Engine Power Output (hp) =	22,000
Number of Engines =	1
Average BSFC (BTU/HP-hr) =	9,200 (6)
Heat Content Natural Gas(Btu/scf) =	1,020.0 (7)
Fuel Throughput (ft3/hr) =	198,431.4 (8)
PTE Hours of Operation =	1

ANNUAL EMISSION INPUTS	
Engine Power Output (kW) =	10253
Engine Power Output (hp) =	13,750
Number of Engines =	1
Average BSFC (BTU/HP-hr) =	9,200 (6)
Heat Content Natural Gas(Btu/scf) =	1,020.0 (7)
Fuel Throughput (ft3/hr) =	124,019.6 (8)
PTE Hours of Operation =	8,760

(g) CO<sub>2</sub> equivalent = [(CO<sub>2</sub> emissions)\*(GWP<sub>CO2</sub>)]+[(CH<sub>4</sub> emissions)\*(GWP<sub>CH4</sub>)]+[(N<sub>2</sub>O emissions)\*(GWP<sub>N2O</sub>)]  
 Global Warming Potential (GWP)

CO <sub>2</sub>	1	(9)
CH <sub>4</sub>	25	(9)
N <sub>2</sub> O	298	(9)

**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
- AP-42, Chapter 3.1, Table 3.1-1 - Emission Factors for NO<sub>x</sub> and CO from Stationary Gas Turbines (4/00)
- 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.
- Value obtained from AP-42, Chapter 3.1, Table 3.1-2a, footnote c
- Fuel throughput = BSFC (BTU/HP-hr) x Power (HP) / Heat Content (BTU/scf)
- Global Warming Potentials obtained from 40 CFR 98, Subpart A, Table A-1

**Table 3a. Turbine Engine / Centrifugal Compressor (E05-E06)**  
**Solar; Taurus 60-7800S**  
**Columbia Gas Transmission - Seneca Compressor Station**

Normal Load Operations (@ 0° F & > 50%)				Hours of Operation (hrs/yr)		8152
Pollutant	Maximum Hourly Emissions			Annual Emissions		
	Emission Factor	PTE per Engine (lb/hr)		Emission Factor	PTE per Engine (tons/yr)	
<b>Pollutants</b>						
NO <sub>x</sub>	2.19E-01 g/hp-hr	(1)	3.8 (a)	2.19E-01 g/hp-hr	(1)	15.56 (c)
CO	2.22E-01 g/hp-hr	(1)	3.9 (a)	2.22E-01 g/hp-hr	(1)	15.79 (c)
VOC	1.27E-02 g/hp-hr	(1)	0.2 (a)	1.27E-02 g/hp-hr	(1)	0.90 (c)
PM/PM <sub>10</sub> /PM <sub>2.5</sub>	6.60E-03 lb/mmBtu	(2)	0.5 (b)	6.60E-03 lb/mmBtu	(2)	1.86 (d)
SO <sub>2</sub>	3.50E-04 lb/mmBtu	(3)	0.02 (b)	3.50E-04 lb/mmBtu	(3)	0.10 (d)
Formaldehyde	7.10E-04 lb/mmBtu	(4)	0.05 (b)	7.10E-04 lb/mmBtu	(4)	0.20 (d)
Total HAPs	1.03E-03 lb/mmBtu	(4)	0.07 (b)	1.03E-03 lb/mmBtu	(4)	0.29 (d)
CO <sub>2e</sub>	1.17E+02 lb/mmBtu	(5)	8080.19 (b)	1.17E+02 lb/mmBtu	(5)	32934.86 (d)

Normal Load Operations Inputs		
Engine Power Output (kW) =	5902	
Engine Power Output (hp) =	7,915	
Average BSFC (BTU/HP-hr) =	7,854	(6)
HHV Heat Content Natural Gas(Btu/scf) =	1,020.0	(7)
LHV Total Heat Input (mmBtu/hr) =	62.16	(8)
HHV Total Heat Input (mmBtu/hr) =	69.00	(9)
Fuel Throughput (ft3/hr) =	67,649.51	(10)

Low Temperature Operations (<0°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)	
<b>Pollutants</b>						
NO <sub>x</sub>	6.20E-01 g/hp-hr	(1)	11.0 (a)	6.20E-01 g/hp-hr	(1)	1.32 (c)
CO	8.95E-01 g/hp-hr	(1)	15.9 (a)	8.95E-01 g/hp-hr	(1)	1.91 (c)
VOC	2.55E-02 g/hp-hr	(1)	0.5 (a)	2.55E-02 g/hp-hr	(1)	0.05 (c)
PM/PM <sub>10</sub> /PM <sub>2.5</sub>	6.60E-03 lb/mmBtu	(2)	0.5 (b)	6.60E-03 lb/mmBtu	(2)	0.06 (d)
SO <sub>2</sub>	3.50E-04 lb/mmBtu	(3)	0.02 (b)	3.50E-04 lb/mmBtu	(3)	0.00 (d)
Formaldehyde	7.10E-04 lb/mmBtu	(4)	0.05 (b)	7.10E-04 lb/mmBtu	(4)	0.01 (d)
Total HAPs	1.03E-03 lb/mmBtu	(4)	0.07 (b)	1.03E-03 lb/mmBtu	(4)	0.01 (d)
CO <sub>2e</sub>	1.17E+02 lb/mmBtu	(5)	8317.10 (b)	1.17E+02 lb/mmBtu	(5)	998.05 (d)

Low Temperature Operations Inputs		
Engine Power Output (kW) =	6018	
Engine Power Output (hp) =	8,070	
Average BSFC (BTU/HP-hr) =	7,929	(6)
HHV Heat Content Natural Gas(Btu/scf) =	1,020.0	(7)
LHV Total Heat Input (mmBtu/hr) =	63.99	(8)
HHV Total Heat Input (mmBtu/hr) =	71.03	(9)
Fuel Throughput (ft3/hr) =	69,632.94	(10)

Very Low Temperature Operations (<- 20°F)				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)	
<b>Pollutants</b>						
NO <sub>x</sub>	1.77E+00 g/hp-hr	(1)	31.6 (a)	1.77E+00 g/hp-hr	(1)	0.19 (c)
CO	1.35E+00 g/hp-hr	(1)	24.1 (a)	1.35E+00 g/hp-hr	(1)	0.14 (c)
VOC	4.00E-02 g/hp-hr	(1)	0.7 (a)	4.00E-02 g/hp-hr	(1)	0.00 (c)
PM/PM <sub>10</sub> /PM <sub>2.5</sub>	6.60E-03 lb/mmBtu	(2)	0.5 (b)	6.60E-03 lb/mmBtu	(2)	0.00 (d)
SO <sub>2</sub>	3.50E-04 lb/mmBtu	(3)	0.03 (b)	3.50E-04 lb/mmBtu	(3)	0.00 (d)
Formaldehyde	7.10E-04 lb/mmBtu	(4)	0.05 (b)	7.10E-04 lb/mmBtu	(4)	0.00 (d)
Total HAPs	1.03E-03 lb/mmBtu	(4)	0.07 (b)	1.03E-03 lb/mmBtu	(4)	0.00 (d)
CO <sub>2e</sub>	1.17E+02 lb/mmBtu	(5)	8367.03 (b)	1.17E+02 lb/mmBtu	(5)	50.20 (d)

Very Low Temperature Operations Inputs		
Engine Power Output (kW) =	6038	
Engine Power Output (hp) =	8,097	
Average BSFC (BTU/HP-hr) =	7,950	(6)
HHV Heat Content Natural Gas(Btu/scf) =	1,020.0	(7)
LHV Total Heat Input (mmBtu/hr) =	64.37	(8)
HHV Total Heat Input (mmBtu/hr) =	71.45	(9)
Fuel Throughput (ft3/hr) =	70,050.96	(10)

**Table 3b. Turbine Engine / Centrifugal Compressor (E05-E06)**  
**Solar; Taurus 70**  
**Columbia Gas Transmission - Seneca Compressor Station**

Low Load Operations (< 50%)				Hours of Operation (hrs/yr)		320
Pollutant	Maximum Hourly Emissions			Annual Emissions		
	Emission Factor	PTE per Engine (lb/hr)		Emission Factor	PTE per Engine (tons/yr)	
<b>Pollutants</b>						
NO <sub>x</sub>	1.18E+00 g/hp-hr (1)	10.3	(a)	1.18E+00 g/hp-hr (1)	1.64	(c)
CO	2.25E+01 g/hp-hr (1)	196.5	(a)	2.25E+01 g/hp-hr (1)	31.4	(c)
VOC	1.77E-01 g/hp-hr (1)	1.5	(a)	1.77E-01 g/hp-hr (1)	0.25	(c)
PM/PM <sub>10</sub> /PM <sub>2.5</sub>	6.60E-03 lb/mmBtu (2)	0.3	(b)	6.60E-03 lb/mmBtu (2)	0.04	(d)
SO <sub>2</sub>	3.50E-04 lb/mmBtu (3)	0.01	(b)	3.50E-04 lb/mmBtu (3)	0.00	(d)
Formaldehyde	7.10E-04 lb/mmBtu (4)	0.03	(b)	7.10E-04 lb/mmBtu (4)	0.00	(d)
Total HAPs	1.03E-03 lb/mmBtu (4)	0.04	(b)	1.03E-03 lb/mmBtu (4)	0.01	(d)
CO <sub>2e</sub>	1.17E+02 lb/mmBtu (5)	4658.33	(b)	1.17E+02 lb/mmBtu (5)	745.33	(d)

Low Load Operations Inputs	
Engine Power Output (kW) =	2951
Engine Power Output (hp) =	3,957
Average BSFC (BTU/HP-hr) =	9,057 (6)
HHV Heat Content Natural Gas(Btu/scf) =	1,020.0 (7)
LHV Total Heat Input (mmBtu/hr) =	35.84 (8)
HHV Total Heat Input (mmBtu/hr) =	39.78 (9)
Fuel Throughput (ft3/hr) =	39,000.77 (10)

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)	
<b>Pollutants</b>						
NO <sub>x</sub>	9.00E-01 lb/event (1)	3.9	(a)	9.00E-01 lb/event (1)	0.07	(b)
CO	1.68E+01 lb/event (1)	72.0	(a)	1.68E+01 lb/event (1)	1.31	(b)
VOC	1.66E+02 lb/event (1)	711.2	(a)	1.66E+02 lb/event (1)	12.94	(b)

Summarization of Operating Modes 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)	
<b>Pollutants</b>						
NO <sub>x</sub>	2.46E-01 g/hp-hr	4.3	(a)	2.46E-01 g/hp-hr	18.79	(c)
CO	6.62E-01 g/hp-hr	11.5	(a)	6.62E-01 g/hp-hr	50.59	(c)
VOC	1.85E-01 g/hp-hr	3.2	(a)	1.85E-01 g/hp-hr	14.15	(c)
PM/PM <sub>10</sub> /PM <sub>2.5</sub>	6.48E-03 lb/mmBtu	0.4	(b)	6.48E-03 lb/mmBtu	1.96	(d)
SO <sub>2</sub>	3.43E-04 lb/mmBtu	0.0	(b)	3.43E-04 lb/mmBtu	0.10	(d)
Formaldehyde	6.97E-04 lb/mmBtu	0.0	(b)	6.97E-04 lb/mmBtu	0.21	(d)
Total HAPs	1.01E-03 lb/mmBtu	0.1	(b)	1.01E-03 lb/mmBtu	0.31	(d)
CO <sub>2e</sub>	1.15E+02 lb/mmBtu	7928.5	(b)	1.15E+02 lb/mmBtu	34728.45	(d)

Summarization of Operating Modes Inputs	
Number of Units =	2

**Calculations:**

**Maximum Hourly Emissions - If emission factor note 1 is used, use calculation (a). If emission factor notes 2, 3, 4, or 5 is used, use calculation (b).**

(a) Maximum Hourly Emissions (lb/hr) = Emission factor (g/hp-hr) \* Engine Power Output (hp) \* (1lb/453.6grams)

(b) Maximum Hourly Emissions (lb/hr) = Emission factor (lb/MMBtu) \* HHV Total Heat Input (mmBtu/hr)

**Annual Emissions - If emission factor note 1 is used, use calculation (c). If emission factor notes 2, 3, 4, or 5 is used, use calculation (d).**

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

(d) Annual emissions (tons/yr) = Emission factor (lb/MMBtu) \* HHV Total Heat Input (mmBtu/hr) \* Annual Hours of operation (hr/yr) \* (1ton/2000lbs)

**Notes:**

- (1) Emission factors supplied from manufacturer's specification sheets
- (2) AP-42, Chapter 3.1, Table 3.1-2a - *Emission Factors for Criteria Pollutants and Greenhouse Gases from Stationary Gas Turbines* (4/00)
- (3) AP-42, Chapter 5.3, Section 5.3.1 - Converted from grains S/100 scf to lb/mmBtu
- (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) - All HAPs combined
- (5) Emission factors are from 40 CFR 98, Subpart C, Table C-1 and C-2.
- (6) Fuel consumption from manufacturer's specification sheet.
- (7) Value obtained from AP-42, Chapter 3.1, Table 3.1-2a, footnote c
- (8) Low Heat Value (LHV) Total Heat Input = Power (HP) \* BSFC (BTU/hp-hr) / (1000000BTU/mmBtu)
- (9) High Heat Value (HHV) Total Heat Input = LHV \* 1.11
- (10) Fuel throughput = HHV Total Heat Input (mmBtu/hr) \* (1000000Btu/mmBtu) / Heat Content (Btu/scf)
- (11) Global Warming Potentials obtained from 40 CFR 98, Subpart A, Table A-1

**Table 4a. Combustion Turbine/Compressor Emissions (E07)**  
**Solar; Saturn 10-1400**  
**Columbia Gas Transmission - Seneca Compressor Station**

Normal Load Operations (@ 30° F & > 50%)				Hours of Operation (hrs/yr)		8442
Pollutant	Maximum Hourly Emissions		Annual Emissions			
	Emission Factor	PTE per Engine (lb/hr)	Emission Factor	PTE per Engine (tons/yr)		
<b>Criteria Pollutants</b>						
NOx	7.11E-03 lb/hp-hr (3)	9.48 (b)	7.11E-03 lb/hp-hr (3)	40.02 (d)		
CO	1.15E-02 lb/hp-hr (3)	15.39 (b)	1.15E-02 lb/hp-hr (3)	64.96 (d)		
VOC	3.30E-04 lb/hp-hr (3)	0.44 (b)	3.30E-04 lb/hp-hr (3)	1.86 (d)		
<b>Low Temperature Operations (0°F &gt; Temp &gt; 20°F)</b>				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)		
<b>Criteria Pollutants</b>						
NOx	7.77E-03 lb/hp-hr (3)	10.36 (b)	7.77E-03 lb/hp-hr (3)	1.24 (d)		
CO	1.26E-02 lb/hp-hr (3)	16.82 (b)	1.26E-02 lb/hp-hr (3)	2.02 (d)		
VOC	3.60E-04 lb/hp-hr (3)	0.48 (b)	3.60E-04 lb/hp-hr (3)	0.06 (d)		
<b>Very Low Temperature Operations (Temp &lt; -20° F)</b>				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)		
<b>Criteria Pollutants</b>						
NOx	7.77E-03 lb/hp-hr (3)	10.36 (b)	7.77E-03 lb/hp-hr (3)	0.06 (d)		
CO	1.26E-02 lb/hp-hr (3)	16.82 (b)	1.26E-02 lb/hp-hr (3)	0.10 (d)		
VOC	3.60E-04 lb/hp-hr (3)	0.48 (b)	3.60E-04 lb/hp-hr (3)	0.00 (d)		
<b>Low Load Operations (&lt;50%)</b>				Hours of Operation (hrs/yr)		30
Pollutant	Maximum Hourly Emissions		Annual Emissions			
	Emission Factor	PTE per Engine (lb/hr)	Emission Factor	PTE per Engine (tons/yr)		
<b>Criteria Pollutants</b>						
NOx	4.25E-03 lb/hp-hr (3)	5.67 (b)	4.25E-03 lb/hp-hr (3)	0.09 (d)		
CO	1.08E-02 lb/hp-hr (3)	14.37 (b)	1.08E-02 lb/hp-hr (3)	0.22 (d)		
VOC	4.95E-04 lb/hp-hr (3)	0.66 (b)	4.95E-04 lb/hp-hr (3)	0.01 (d)		
<b>Startup / Shutdown Cycles</b>				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)		
<b>Criteria Pollutants</b>						
NOx	1.08E-03 lb/event (3)	1.44 (b)	1.08E-03 lb/event (3)	0.11 (d)		
CO	3.33E-03 lb/event (3)	4.44 (b)	3.33E-03 lb/event (3)	0.33 (d)		
VOC	1.73E-04 lb/event (3)	0.23 (b)	1.73E-04 lb/event (3)	0.02 (d)		
<b>Summarization of Operating Mode Emissions</b>				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)		
<b>Criteria Pollutants</b>						
NOx	7.11E-03 lb/hp-hr	9.48 (b)	7.11E-03 lb/hp-hr	41.51 (d)		
CO	1.16E-02 lb/hp-hr	15.44 (b)	1.16E-02 lb/hp-hr	67.63 (d)		
VOC	3.33E-04 lb/hp-hr	0.44 (b)	3.33E-04 lb/hp-hr	1.94 (d)		

**Table 4b. Combustion Turbine/Compressor Emissions (E07)**  
**Solar; Saturn 10-1400**  
**Columbia Gas Transmission - Seneca Compressor Station**

Pollutant	Maximum Hourly Emissions		Annual Emissions	
	Emission Factor	PTE per Engine (lb/hr)	Emission Factor	PTE per Engine (tons/yr)
<b>Criteria Pollutants</b>				
PM/PM10/PM2.5	1.80E-02 lb/MMBtu (3)	0.32 (a)	1.80E-02 lb/MMBtu (3)	1.32 (c)
SO <sub>2</sub>	20.0 grains S / 100 ft <sup>3</sup> (2)	0.98 (e)	0.25 grains S / 100 ft <sup>3</sup> (2)	0.05 (f)
<b>Hazardous Air Pollutants</b>				
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)	0.001 (a)	4.00E-05 lb/MMBtu (4)	0.003 (c)
Acrolein	6.40E-06 lb/MMBtu (4)	0.000 (a)	6.40E-06 lb/MMBtu (4)	0.000 (c)
Benzene	1.20E-05 lb/MMBtu (4)	0.000 (a)	1.20E-05 lb/MMBtu (4)	0.001 (c)
Ethylbenzene	3.20E-05 lb/MMBtu (4)	0.001 (a)	3.20E-05 lb/MMBtu (4)	0.002 (c)
Formaldehyde	7.10E-04 lb/MMBtu (4)	0.012 (a)	7.10E-04 lb/MMBtu (4)	0.052 (c)
Naphthalene	1.30E-06 lb/MMBtu (4)	0.000 (a)	1.30E-06 lb/MMBtu (4)	0.000 (c)
PAH (POM)	2.20E-06 lb/MMBtu (4)	0.000 (a)	2.20E-06 lb/MMBtu (4)	0.000 (c)
Phenol	2.90E-05 lb/MMBtu (4)	0.001 (a)	2.90E-05 lb/MMBtu (4)	0.002 (c)
Toluene	1.30E-04 lb/MMBtu (4)	0.002 (a)	1.30E-04 lb/MMBtu (4)	0.010 (c)
Xylenes	6.40E-05 lb/MMBtu (4)	0.001 (a)	6.40E-05 lb/MMBtu (4)	0.005 (c)
<b>Total HAP</b>		<b>0.018</b>		<b>0.075</b>
<b>Greenhouse Gas Emissions</b>				
CO <sub>2</sub>	116.89 lb/MMBtu (5)	2052.48 (a)	116.89 lb/MMBtu (5)	8560.87 (c)
CH <sub>4</sub>	2.2E-03 lb/MMBtu (5)	0.04 (a)	2.2E-03 lb/MMBtu (5)	0.16 (c)
N <sub>2</sub> O	2.2E-04 lb/MMBtu (5)	0.00 (a)	2.2E-04 lb/MMBtu (5)	0.02 (c)
CO <sub>2</sub> e <sup>(g)</sup>	-	2054.60	-	8569.72

**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 @ 30°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 @ 50°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)

**SO<sub>2</sub> Emissions - If emission factor note 2 is used, use calculations (e) and (f) for hourly and annual emissions, respectively.**

(e) Maximum Hourly Emissions SO<sub>2</sub> Calculation (lb/hr) = (20.0 grain S/100ft<sup>3</sup>) \* Fuel throughput (ft<sup>3</sup>/hr) \* (1lb/7000 grains) \* (lbmol S/32.06 lb S) \* (lbmol SO<sub>2</sub>/lbmol S) \* (64.07 lb SO<sub>2</sub>/lbmol SO<sub>2</sub>)

(f) Annual Emissions SO<sub>2</sub> Calculation (ton/yr) = (0.25 grain S/100ft<sup>3</sup>) \* Fuel throughput (ft<sup>3</sup>/hr) \* (1lb/7000 grains) \* (lbmol S/32.06 lb S) \* (lbmol SO<sub>2</sub>/lbmol S) \* (64.07 lb SO<sub>2</sub>/lbmol SO<sub>2</sub>) \* Annual hours of operation (hr/yr) \* (1ton/2000lbs)

MAXIMUM HOURLY EMISSION INPUTS	
Engine Power Output (kW) =	994
Engine Power Output (hp) @ 50°F =	1,333
Average BSFC (BTU/HP-hr) @ 50°F =	11,301 (6)
LHV Total Heat Input (mmBtu/hr) @ 50°F =	15.06 (7)
HHV Total Heat Input (mmBtu/hr) @ 50°F =	16.72 (8)
Fuel Throughput (ft <sup>3</sup> /hr) @ 50°F =	16,393.4 (9)
HHV Heat Content Natural Gas(Btu/scf) =	1,020 (10)
Engine Power Output (hp) @ 30°F =	1,557
Average BSFC (BTU/HP-hr) @ 30°F =	10,160 (6)
LHV Total Heat Input (mmBtu/hr) @ 30°F =	15.82 (7)
HHV Total Heat Input (mmBtu/hr) @ 30°F =	17.56 (8)
Fuel Throughput (ft <sup>3</sup> /hr) @ 30°F =	17,214.9 (9)
Number of Engines =	1
PTE Hours of Operation =	1

ANNUAL EMISSION INPUTS	
Engine Power Output (kW) =	994
Engine Power Output (hp) @ 50°F =	1,333
Average BSFC (BTU/HP-hr) @ 50°F =	11,301 (6)
LHV Total Heat Input (mmBtu/hr) @ 50°F =	15.06 (7)
HHV Total Heat Input (mmBtu/hr) @ 50°F =	16.72 (8)
Fuel Throughput (ft <sup>3</sup> /hr) @ 50°F =	16,393.4 (9)
HHV Heat Content Natural Gas(Btu/scf) =	1,020 (10)
Engine Power Output (hp) @ 30°F =	1,557
Average BSFC (BTU/HP-hr) @ 30°F =	10,160 (6)
LHV Total Heat Input (mmBtu/hr) @ 30°F =	15.82 (7)
HHV Total Heat Input (mmBtu/hr) @ 30°F =	17.56 (8)
Fuel Throughput (ft <sup>3</sup> /hr) @ 30°F =	17,214.9 (9)
Number of Engines =	1
PTE Hours of Operation =	8,760

(g) CO<sub>2</sub> equivalent = [(CO<sub>2</sub> emissions)\*(GWP<sub>CO2</sub>)]+[(CH<sub>4</sub> emissions)\*(GWP<sub>CH4</sub>)]+[(N<sub>2</sub>O emissions)\*(GWP<sub>N2O</sub>)]  
 Global Warming Potential (GWP)

CO <sub>2</sub>	1	(11)
CH <sub>4</sub>	25	(11)
N <sub>2</sub> O	298	(11)

**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 / WV NSR Permit, R13-2715F, Condition 4.1.6.
- 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 5a. Combustion Turbine/Compressor Emissions (E08)**  
**Solar; Mars 100-15000S**  
**Columbia Gas Transmission - Seneca Compressor Station**

Normal Load Operations (@ 30° F & > 50%)				Hours of Operation (hrs/yr)		8442
Pollutant	Maximum Hourly Emissions		Annual Emissions			
	Emission Factor	PTE per Engine (lb/hr)	Emission Factor	PTE per Engine (tons/yr)		
<b>Criteria Pollutants</b>						
NOx	4.89E-04 lb/hp-hr (3)	6.76 (b)	4.89E-04 lb/hp-hr (3)	28.53 (d)		
CO	4.96E-04 lb/hp-hr (3)	6.85 (b)	4.96E-04 lb/hp-hr (3)	28.91 (d)		
VOC	5.72E-05 lb/hp-hr (3)	0.79 (b)	5.72E-05 lb/hp-hr (3)	3.33 (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)		
<b>Criteria Pollutants</b>						
NOx	1.49E-03 lb/hp-hr (3)	20.58 (b)	1.49E-03 lb/hp-hr (3)	2.47 (d)		
CO	2.16E-03 lb/hp-hr (3)	29.83 (b)	2.16E-03 lb/hp-hr (3)	3.58 (d)		
VOC	1.23E-04 lb/hp-hr (3)	1.70 (b)	1.23E-04 lb/hp-hr (3)	0.20 (d)		

Very Low Temperature Operations (Temp < -20° F)				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)		
<b>Criteria Pollutants</b>						
NOx	4.26E-03 lb/hp-hr (3)	58.80 (b)	4.26E-03 lb/hp-hr (3)	0.35 (d)		
CO	3.24E-03 lb/hp-hr (3)	44.74 (b)	3.24E-03 lb/hp-hr (3)	0.27 (d)		
VOC	1.23E-04 lb/hp-hr (3)	1.70 (b)	1.23E-04 lb/hp-hr (3)	0.01 (d)		

Low Load Operations (<50%)				Hours of Operation (hrs/yr)		30
Pollutant	Maximum Hourly Emissions		Annual Emissions			
	Emission Factor	PTE per Engine (lb/hr)	Emission Factor	PTE per Engine (tons/yr)		
<b>Criteria Pollutants</b>						
NOx	1.17E-03 lb/hp-hr (3)	16.10 (b)	1.17E-03 lb/hp-hr (3)	0.24 (d)		
CO	4.73E-02 lb/hp-hr (3)	653.41 (b)	4.73E-02 lb/hp-hr (3)	9.80 (d)		
VOC	5.41E-04 lb/hp-hr (3)	7.47 (b)	5.41E-04 lb/hp-hr (3)	0.11 (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)		
<b>Criteria Pollutants</b>						
NOx	2.24E-04 lb/event (3)	3.10 (b)	2.24E-04 lb/event (3)	0.23 (d)		
CO	1.97E-02 lb/event (3)	272.70 (b)	1.97E-02 lb/event (3)	20.45 (d)		
VOC	2.26E-04 lb/event (3)	3.12 (b)	2.26E-04 lb/event (3)	0.23 (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)		
<b>Criteria Pollutants</b>						
NOx	4.89E-04 lb/hp-hr (1)	6.76 (b)	5.26E-04 lb/hp-hr	31.83 (d)		
CO	4.96E-04 lb/hp-hr (1)	6.85 (b)	1.04E-03 lb/hp-hr	63.02 (d)		
VOC	5.72E-05 lb/hp-hr (1)	0.79 (b)	6.44E-05 lb/hp-hr	3.89 (d)		

**Table 5b. Combustion Turbine/Compressor Emissions (E08)**  
**Solar; Mars 100-15000S**  
**Columbia Gas Transmission - Seneca Compressor Station**

Pollutant	Maximum Hourly Emissions		Annual Emissions	
	Emission Factor	PTE per Engine (lb/hr)	Emission Factor	PTE per Engine (tons/yr)
<b>Criteria Pollutants</b>				
PM/PM10/PM2.5	1.80E-02 lb/MMBtu (3)	2.25 (a)	1.80E-02 lb/MMBtu (3)	9.42 (c)
SO <sub>2</sub>	20.0 grains S / 100 ft <sup>3</sup> (2)	6.99 (e)	0.25 grains S / 100 ft <sup>3</sup> (2)	0.38 (f)
<b>Hazardous Air Pollutants</b>				
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)	0.005 (a)	4.00E-05 lb/MMBtu (4)	0.021 (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)	0.006 (c)
Ethylbenzene	3.20E-05 lb/MMBtu (4)	0.004 (a)	3.20E-05 lb/MMBtu (4)	0.017 (c)
Formaldehyde	7.10E-04 lb/MMBtu (4)	0.089 (a)	7.10E-04 lb/MMBtu (4)	0.371 (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)	0.004 (a)	2.90E-05 lb/MMBtu (4)	0.015 (c)
Toluene	1.30E-04 lb/MMBtu (4)	0.016 (a)	1.30E-04 lb/MMBtu (4)	0.068 (c)
Xylenes	6.40E-05 lb/MMBtu (4)	0.008 (a)	6.40E-05 lb/MMBtu (4)	0.033 (c)
<b>Total HAP</b>		<b>0.128</b>		<b>0.537</b>
<b>Greenhouse Gas Emissions</b>				
CO <sub>2</sub>	116.89 lb/MMBtu (5)	14608.21 (a)	116.89 lb/MMBtu (5)	61154.44 (c)
CH <sub>4</sub>	2.2E-03 lb/MMBtu (5)	0.28 (a)	2.2E-03 lb/MMBtu (5)	1.15 (c)
N <sub>2</sub> O	2.2E-04 lb/MMBtu (5)	0.03 (a)	2.2E-04 lb/MMBtu (5)	0.12 (c)
CO <sub>2</sub> e <sup>(g)</sup>	-	14623.30	-	61217.65

**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 @ 30°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 @ 50°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)

**SO<sub>2</sub> Emissions - If emission factor note 2 is used, use calculations (e) and (f) for hourly and annual emissions, respectively.**

(e) Maximum Hourly Emissions SO<sub>2</sub> Calculation (lb/hr) = (20.0 grain S/100ft<sup>3</sup>) \* Fuel throughput (ft<sup>3</sup>/hr) \* (1lb/7000 grains) \* (lbmol S/32.06 lb S) \* (lbmol SO<sub>2</sub>/ lbmol S) \* (64.07 lb SO<sub>2</sub>/lbmol SO<sub>2</sub>)

(f) Annual Emissions SO<sub>2</sub> Calculation (ton/yr) = (0.25 grain S/100ft<sup>3</sup>) \* Fuel throughput (ft<sup>3</sup>/hr) \* (1lb/7000 grains) \* (lbmol S/32.06 lb S) \* (lbmol SO<sub>2</sub>/ lbmol S) \* (64.07 lb SO<sub>2</sub>/lbmol SO<sub>2</sub>) \* Annual hours of operation (hr/yr) \* (1ton/2000lbs)

MAXIMUM HOURLY EMISSION INPUTS	
Engine Power Output (kW) =	10301
Engine Power Output (hp) @ 50°F =	13,814
Average BSFC (BTU/HP-hr) @ 50°F =	7,790 (6)
LHV Total Heat Input (mmBtu/hr) @ 50°F =	107.61 (7)
HHV Total Heat Input (mmBtu/hr) @ 50°F =	119.45 (8)
Fuel Throughput (ft <sup>3</sup> /hr) @ 50°F =	117,106.2 (9)
HHV Heat Content Natural Gas(Btu/scf) =	1,020 (10)
Engine Power Output (hp) @ 30°F =	15,432
Average BSFC (BTU/HP-hr) @ 30°F =	7,296 (6)
LHV Total Heat Input (mmBtu/hr) @ 30°F =	112.59 (7)
HHV Total Heat Input (mmBtu/hr) @ 30°F =	124.97 (8)
Fuel Throughput (ft <sup>3</sup> /hr) @ 30°F =	122,524.4 (9)
Number of Engines =	1
PTE Hours of Operation =	1

ANNUAL EMISSION INPUTS	
Engine Power Output (kW) =	10301
Engine Power Output (hp) @ 50°F =	13,814
Average BSFC (BTU/HP-hr) @ 50°F =	7,790 (6)
LHV Total Heat Input (mmBtu/hr) @ 50°F =	107.61 (7)
HHV Total Heat Input (mmBtu/hr) @ 50°F =	119.45 (8)
Fuel Throughput (ft <sup>3</sup> /hr) @ 50°F =	117,106.2 (9)
HHV Heat Content Natural Gas(Btu/scf) =	1,020 (10)
Engine Power Output (hp) @ 30°F =	15,432
Average BSFC (BTU/HP-hr) @ 30°F =	7,296 (6)
LHV Total Heat Input (mmBtu/hr) @ 30°F =	112.59 (7)
HHV Total Heat Input (mmBtu/hr) @ 30°F =	124.97 (8)
Fuel Throughput (ft <sup>3</sup> /hr) @ 30°F =	122,524.4 (9)
Number of Engines =	1
PTE Hours of Operation =	8,760

(g) CO<sub>2</sub> equivalent = [(CO<sub>2</sub> emissions)\*(GWP<sub>CO2</sub>)]+[(CH<sub>4</sub> emissions)\*(GWP<sub>CH4</sub>)]+[(N<sub>2</sub>O emissions)\*(GWP<sub>N2O</sub>)]  
 Global Warming Potential (GWP)

CO <sub>2</sub>	1	(11)
CH <sub>4</sub>	25	(11)
N <sub>2</sub> O	298	(11)

**Notes:**

- (1) WV NSR Permit, R13-2715F, Condition 4.1.5
- (2) AP-42, Chapter 5.3, Section 5.3.1 / WV NSR Permit, R13-2715F, Condition 4.1.6.
- (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 6a. Combustion Turbine/Compressor Emissions (E09)**  
**Solar; Taurus 70**  
**Columbia Gas Transmission - Seneca Compressor Station**

Normal Load Operations (@ 32° F & > 50%)				Hours of Operation (hrs/yr)		8273
Pollutant	Maximum Hourly Emissions			Annual Emissions		
	Emission Factor		PTE per Engine (lb/hr)	Emission Factor		PTE per Engine (tons/yr)
<b>Criteria Pollutants</b>						
NOx	4.47E-04 lb/hp-hr	(4)	4.74 (b)	4.47E-04 lb/hp-hr	(4)	19.61 (d)
CO	4.53E-04 lb/hp-hr	(4)	4.81 (b)	4.53E-04 lb/hp-hr	(4)	19.90 (d)
VOC	5.18E-05 lb/hp-hr	(4)	0.55 (b)	5.18E-05 lb/hp-hr	(4)	2.28 (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)
<b>Criteria Pollutants</b>						
NOx	1.34E-03 lb/hp-hr	(4)	14.21 (b)	1.34E-03 lb/hp-hr	(4)	1.71 (d)
CO	1.94E-03 lb/hp-hr	(4)	20.59 (b)	1.94E-03 lb/hp-hr	(4)	2.47 (d)
VOC	1.11E-04 lb/hp-hr	(4)	1.18 (b)	1.11E-04 lb/hp-hr	(4)	0.14 (d)

Low Load Operations (<50%)				Hours of Operation (hrs/yr)		180
Pollutant	Maximum Hourly Emissions			Annual Emissions		
	Emission Factor		PTE per Engine (lb/hr)	Emission Factor		PTE per Engine (tons/yr)
<b>Criteria Pollutants</b>						
NOx	1.36E-03 lb/hp-hr	(4)	14.45 (b)	1.36E-03 lb/hp-hr	(4)	1.30 (d)
CO	5.53E-02 lb/hp-hr	(4)	586.42 (b)	5.53E-02 lb/hp-hr	(4)	52.78 (d)
VOC	6.31E-04 lb/hp-hr	(4)	6.70 (b)	6.31E-04 lb/hp-hr	(4)	0.60 (d)

Startup / Shutdown Cycles				Hours of Operation (hrs/yr)		67
Pollutant	Maximum Hourly Emissions			Annual Emissions		
	Emission Factor		PTE per Engine (lb/hr)	Emission Factor		PTE per Engine (tons/yr)
<b>Criteria Pollutants</b>						
NOx	1.79E-04 lb/hp-hr	(4)	1.90 (b)	1.79E-04 lb/hp-hr	(4)	0.19 (d)
CO	1.57E-02 lb/hp-hr	(4)	166.50 (b)	1.57E-02 lb/hp-hr	(4)	16.65 (d)
VOC	1.79E-04 lb/hp-hr	(4)	1.90 (b)	1.79E-04 lb/hp-hr	(4)	0.19 (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)
<b>Criteria Pollutants</b>						
NOx	4.47E-04 lb/hp-hr	(1)	4.74 (b)	4.91E-04 lb/hp-hr		22.80 (d)
CO	4.53E-04 lb/hp-hr	(1)	4.81 (b)	1.97E-03 lb/hp-hr		91.80 (d)
VOC	5.18E-05 lb/hp-hr	(1)	0.55 (b)	6.90E-05 lb/hp-hr		3.21 (d)

**Table 6b. Combustion Turbine/Compressor Emissions (E09)**  
**Solar; Taurus 70**  
**Columbia Gas Transmission - Seneca Compressor Station**

Pollutant	Maximum Hourly Emissions		Annual Emissions	
	Emission Factor	PTE per Engine (lb/hr)	Emission Factor	PTE per Engine (tons/yr)
<b>Criteria Pollutants</b>				
PM/PM10/PM2.5	6.60E-03 lb/MMBtu (2)	0.58 (a)	6.60E-03 lb/MMBtu (2)	2.54 (c)
SO <sub>2</sub>	20 grains S / 100 ft <sup>3</sup> (3)	4.91 (e)	0.25 grains S / 100 ft <sup>3</sup> (3)	0.27 (f)
<b>Hazardous Air Pollutants</b>				
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)	0.004 (a)	4.00E-05 lb/MMBtu (5)	0.015 (c)
Acrolein	6.40E-06 lb/MMBtu (5)	0.001 (a)	6.40E-06 lb/MMBtu (5)	0.002 (c)
Benzene	1.20E-05 lb/MMBtu (5)	0.001 (a)	1.20E-05 lb/MMBtu (5)	0.005 (c)
Ethylbenzene	3.20E-05 lb/MMBtu (5)	0.003 (a)	3.20E-05 lb/MMBtu (5)	0.012 (c)
Formaldehyde	7.10E-04 lb/MMBtu (5)	0.062 (a)	7.10E-04 lb/MMBtu (5)	0.273 (c)
Naphthalene	1.30E-06 lb/MMBtu (5)	0.000 (a)	1.30E-06 lb/MMBtu (5)	0.000 (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)	0.003 (a)	2.90E-05 lb/MMBtu (5)	0.011 (c)
Toluene	1.30E-04 lb/MMBtu (5)	0.011 (a)	1.30E-04 lb/MMBtu (5)	0.050 (c)
Xylenes	6.40E-05 lb/MMBtu (5)	0.006 (a)	6.40E-05 lb/MMBtu (5)	0.025 (c)
<b>Total HAP</b>		<b>0.090</b>		<b>0.395</b>
<b>Greenhouse Gas Emissions</b>				
CO <sub>2</sub>	116.89 lb/MMBtu (6)	10250.42 (a)	116.89 lb/MMBtu (6)	44896.82 (c)
CH <sub>4</sub>	2.2E-03 lb/MMBtu (6)	0.19 (a)	2.2E-03 lb/MMBtu (6)	0.85 (c)
N <sub>2</sub> O	2.2E-04 lb/MMBtu (6)	0.02 (a)	2.2E-04 lb/MMBtu (6)	0.08 (c)
CO <sub>2</sub> e <sup>(g)</sup>	-	10261.01	-	44943.23

**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)

**SO<sub>2</sub> Emissions - If emission factor note 3 is used, use calculations (e) and (f) for hourly and annual emissions, respectively.**

(e) Maximum Hourly Emissions SO<sub>2</sub> Calculation (lb/hr) = (20.0 grain S/100ft<sup>3</sup>) \* Fuel throughput (ft<sup>3</sup>/hr) \* (1lb/7000 grains) \* (lbmol SO<sub>2</sub>/32.06 lb S) \* (lbmol SO<sub>2</sub>/lbmol S) \* (64.07 lb SO<sub>2</sub>/lbmol SO<sub>2</sub>)

(f) Annual Emissions SO<sub>2</sub> Calculation (ton/yr) = (0.25 grain S/100ft<sup>3</sup>) \* Fuel throughput (ft<sup>3</sup>/hr) \* (1lb/7000 grains) \* (lbmol S/32.06 lb S) \* (lbmol SO<sub>2</sub>/lbmol S) \* (64.07 lb SO<sub>2</sub>/lbmol SO<sub>2</sub>) \* Annual hours of operation (hr/yr) \* (1ton/2000lbs)

MAXIMUM HOURLY EMISSION INPUTS	
Engine Power Output (kW) =	7914
Engine Power Output (hp) =	10,613
Average BSFC (BTU/HP-hr) =	7,444 (7)
HHV Heat Content Natural Gas(Btu/scf) =	1,020.0 (8)
LHV Total Heat Input (mmBtu/hr) =	79.00 (9)
HHV Total Heat Input (mmBtu/hr) =	87.69 (10)
Fuel Throughput (ft <sup>3</sup> /hr) =	8.597E+04 (11)
Number of Engines =	1
PTE Hours of Operation =	1

ANNUAL EMISSION INPUTS	
Engine Power Output (kW) =	7914
Engine Power Output (hp) =	10,613
Average BSFC (BTU/HP-hr) =	7,444 (7)
HHV Heat Content Natural Gas(Btu/scf) =	1,020.0 (8)
LHV Total Heat Input (mmBtu/hr) =	79.00 (9)
HHV Total Heat Input (mmBtu/hr) =	87.69 (10)
Fuel Throughput (ft <sup>3</sup> /hr) =	85974.04012 (11)
Number of Engines =	1
PTE Hours of Operation =	8,760

(g) CO<sub>2</sub> equivalent = [(CO<sub>2</sub> emissions)\*(GWP<sub>CO2</sub>)]+[(CH<sub>4</sub> emissions)\*(GWP<sub>CH4</sub>)]+[(N<sub>2</sub>O emissions)\*(GWP<sub>N2o</sub>)]  
 Global Warming Potential (GWP)

CO <sub>2</sub>	1	(12)
CH <sub>4</sub>	25	(12)
N <sub>2</sub> O	298	(12)

**Notes:**

- (1) WV NSR Permit, R13-2715F, Condition 4.1.5
- (2) AP-42, Chapter 3.1, Table 3.1-2a - Emission Factors for Criteria Pollutants and Greenhouse Gases from Stationary Gas Turbines (4/00)
- (3) AP-42, Chapter 5.3, Section 5.3.1 / WV NSR Permit, R13-2715F, Condition 4.1.6.
- (4) Emissions supplied from vendor data
- (5) AP-42, Chapter 3.1, Table 3.1-3 - Emission Factors for Hazardous Air Pollutants from Natural Gas-Fired Stationary Gas Turbines (4/00)
- (6) Emission factors are from 40 CFR 98, Subpart C, Table C-1 and C-2.
- (7) Fuel consumption from manufacturer's specification sheet.
- (8) Value obtained from AP-42, Chapter 3.1, Table 3.1-2a, footnote c
- (9) Low Heat Value (LHV) Total Heat Input = Power (HP) \* BSFC (BTU/hp-hr) / (1000000BTU/mmBtu)
- (10) High Heat Value (HHV) Total Heat Input = LHV \* 1.11
- (11) Fuel throughput = HHV Total Heat Input (mmBtu/hr) \* (1000000Btu/mmBtu) / Heat Content (Btu/scf)
- (12) Global Warming Potentials obtained from 40 CFR 98, Subpart A, Table A-1

**Table 7. Reciprocating Engine / Generator Emissions (G3)  
Waukesha VGF-L36GL; 4SLB  
Columbia Gas Transmission - Seneca Compressor Station**

Pollutant	Emission Factor	PTE (lb/hr)	PTE (ton/yr)
<b>Criteria Pollutants</b>			
PM/PM10/PM2.5**	9.98E-03 lb/MMBtu (1)	0.07 (a)	0.02 (c)
SO <sub>2</sub> (Hourly)	20.0 grains S / 100 ft <sup>2</sup> (2)	0.38 (e)	-
SO <sub>2</sub> (Annual)	0.25 grains S / 100 ft <sup>3</sup> (2)	-	0.001 (f)
NO <sub>x</sub>	2.00E+00 g/hp-hr (3)	3.88 (b)	0.97 (d)
CO	1.30E+00 g/hp-hr (3)	2.52 (b)	0.63 (d)
VOC	4.00E-02 g/hp-hr (3)	0.08 (b)	0.02 (d)
<b>Hazardous Air Pollutants</b>			
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)	0.057 (a)	0.014 (c)
Acrolein	5.14E-03 lb/MMBtu (1)	0.035 (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	5.28E-02 lb/MMBtu (1)	0.360 (a)	0.090 (c)
Methanol	2.50E-03 lb/MMBtu (1)	0.017 (a)	0.004 (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)
<b>Total HAPs</b>		<b>0.490</b>	<b>0.122</b>
<b>Greenhouse Gas Emissions</b>			
CO <sub>2</sub>	116.89 lb/MMBtu (4)	797.90 (a)	199.48 (c)
CH <sub>4</sub>	2.2E-03 lb/MMBtu (4)	0.02 (a)	0.00 (c)
N <sub>2</sub> O	2.2E-04 lb/MMBtu (4)	0.00 (a)	0.00 (c)
CO <sub>2</sub> e <sup>(g)</sup>	-	798.73	199.68

\*\* includes condensable PM

**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)

**SO<sub>2</sub> Emissions - If emission factor note 2 is used, use calculations (e) and (f) for hourly and annual emissions, respectively.**

(e) Maximum Hourly Emissions SO<sub>2</sub> Calculation (lb/hr) = (20 grain S/100ft<sup>3</sup>) \* Fuel throughput (ft<sup>3</sup>/hr) \* (1lb/7000 grains) \* (lbmol S/32.06 lb S) \* (lbmol SO<sub>2</sub>/ lbmol S) \* (64.07 lb SO<sub>2</sub>/lbmol SO<sub>2</sub>)

(f) Annual Emissions SO<sub>2</sub> Calculation (ton/yr) = (0.25 grain S/100ft<sup>3</sup>) \* Fuel throughput (ft<sup>3</sup>/hr) \* (1lb/7000 grains) \* (lbmol S/32.06 lb S) \* (lbmol SO<sub>2</sub>/ lbmol S) \* (64.07 lb SO<sub>2</sub>/lbmol SO<sub>2</sub>) \* Annual hours of operation (hr/yr) \* (1ton/2000lbs)

EMISSION INPUTS TABLE	
Engine Power Output (kW) =	656
Engine Power Output (hp) =	880
Number of Engines Operating at a Time =	1
Average BSFC (BTU/HP-hr) =	7,757 (5)
Heat Content Natural Gas(Btu/scf) =	1,020.0 (6)
Fuel Throughput (ft <sup>3</sup> /hr) =	6,692.3 (7)
PTE Hours of Operation =	500

(g) CO<sub>2</sub> equivalent = [(CO<sub>2</sub> emissions)\*(GWP<sub>CO2</sub>)]+[(CH<sub>4</sub> emissions)\*(GWP<sub>CH4</sub>)]+[(N<sub>2</sub>O emissions)\*(GWP<sub>N2O</sub>)]  
Global Warming Potential (GWP)

CO <sub>2</sub>	1	(8)
CH <sub>4</sub>	25	(8)
N <sub>2</sub> 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 / WV NSR Permit, R13-2715F, Condition 4.1.6.

(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 8. Fuel Gas Heater Emissions (H1 & H2)**  
**ETI; Model # SB18-18**  
**Columbia Gas Transmission - Seneca Compressor Station**

Pollutant	Emission Factor	PTE (lb/hr)	PTE (ton/yr)
<b>Criteria Pollutants</b>			
PM/PM10/PM2.5	7.6 lb/MMcf (1)	0.00 (a)	0.02 (b)
SO <sub>2</sub> (Hourly)	20 grains S / 100ft <sup>3</sup> (5)	0.03 (e)	-
SO <sub>2</sub> (Annual)	0.25 grains S / 100ft <sup>3</sup> (5)	-	0.00 (f)
NOx	100 lb/MMcf (2)	0.05 (a)	0.21 (b)
CO	84 lb/MMcf (2)	0.04 (a)	0.18 (b)
VOC	5.5 lb/MMcf (1)	0.00 (a)	0.01 (b)
<b>Hazardous Air Pollutants</b>			
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)
<b>Total HAP</b>		<b>0.00</b>	<b>0.004</b>
<b>Greenhouse Gas Emissions</b>			
CO <sub>2</sub>	116.89 lb/MMBtu (6)	58.44 (c)	255.99 (d)
CH <sub>4</sub>	2.2E-03 lb/MMBtu (6)	0.00 (c)	0.00 (d)
N <sub>2</sub> O	2.2E-04 lb/MMBtu (6)	0.00 (c)	0.00 (d)
CO <sub>2</sub> e <sup>(g)</sup>	-	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/yr) \* Hours of operation (hr/yr) \* (1ton/2000lbs)

**SO<sub>2</sub>**

- (e) Hourly Emissions SO<sub>2</sub> Calculation (lb/hr) = (20 grain S/100ft<sup>3</sup>) \* Fuel throughput (MMft<sup>3</sup>/yr) \* (1000000ft<sup>3</sup>/1MMft<sup>3</sup>) / annual hours of operation (hr/yr) \* (1lb/7000 grains) \* (lbmol S/32.06 lb S) \* (lbmol SO<sub>2</sub>/lbmol S) \* (64.07 lb SO<sub>2</sub>/lbmol SO<sub>2</sub>)  
 (f) Annual Emissions SO<sub>2</sub> Calculation (ton/yr) = (0.25 grain S/100ft<sup>3</sup>) \* Fuel throughput (MMft<sup>3</sup>/yr) \* (1000000ft<sup>3</sup>/1MMft<sup>3</sup>) \* (1lb/7000 grains) \* (lbmol S/32.06 lb S) \* (lbmol SO<sub>2</sub>/lbmol S) \* (64.07 lb SO<sub>2</sub>/lbmol SO<sub>2</sub>) \* (1ton/2000lbs)

EMISSION INPUTS TABLE	
Fuel Use (MMBtu/hr) =	0.5
Number of Units =	2
Hours of Operation (hr/yr) =	8760
MMBtu/MMcf =	1020
PTE Fuel Use (MMft <sup>3</sup> /yr) =	4.29

(g) CO<sub>2</sub> equivalent = [(CO<sub>2</sub> emissions)\*(GWP<sub>CO2</sub>)] + [(CH<sub>4</sub> emissions)\*(GWP<sub>CH4</sub>)] + [(N<sub>2</sub>O emissions)\*(GWP<sub>N2O</sub>)]  
 Global Warming Potential (GWP)

CO <sub>2</sub>	1	(7)
CH <sub>4</sub>	25	(7)
N <sub>2</sub> 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. Process Heater Emissions (H3)  
Unknown Make / Model  
Columbia Gas Transmission - Seneca Compressor Station**

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

**SO<sub>2</sub>**

- (e) Hourly Emissions SO<sub>2</sub> Caclulation (lb/hr) = (20 grain S/100ft<sup>3</sup>) \* Fuel throughput (MMft<sup>3</sup>/yr) \* (1000000ft<sup>3</sup>/1MMft<sup>3</sup>) / annual hours of operation (hr/yr) \* (1lb/7000 grains) \* (lbmol S/32.06 lb S) \* (lbmol SO<sub>2</sub>/lbmol S) \* (64.07 lb SO<sub>2</sub>/lbmol SO<sub>2</sub>)  
 (f) Annual Emissions SO<sub>2</sub> Caclulation (ton/yr) = (0.25 grain S/100ft<sup>3</sup>) \* Fuel throughput (MMft<sup>3</sup>/yr) \* (1000000ft<sup>3</sup>/1MMft<sup>3</sup>) \* (1lb/7000 grains) \* (lbmol S/32.06 lb S) \* (lbmol SO<sub>2</sub>/lbmol S) \* (64.07 lb SO<sub>2</sub>/lbmol SO<sub>2</sub>) \* (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 <sup>3</sup> /yr) =	2.15

- (g) CO<sub>2</sub> equivalent = [(CO<sub>2</sub> emissions)\*(GWP<sub>CO2</sub>)]+[(CH<sub>4</sub> emissions)\*(GWP<sub>CH4</sub>)]+[(N<sub>2</sub>O emissions)\*(GWP<sub>N2O</sub>)]  
 Global Warming Potential (GWP)

CO <sub>2</sub>	1	(7)
CH <sub>4</sub>	25	(7)
N <sub>2</sub> 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. Space Heater Emissions (SH1)**  
**36 Catalytic Space Heaters**  
**Columbia Gas Transmission - Seneca Compressor Station**

Pollutant	Emission Factor	PTE (lb/hr)	PTE (ton/yr)
<b>Criteria Pollutants</b>			
PM/PM10/PM2.5	7.6 lb/MMcf (1)	0.02 (a)	0.08 (b)
SO <sub>2</sub> (Hourly)	20 grains S / 100ft <sup>3</sup> (5)	0.15 (e)	-
SO <sub>2</sub> (Annual)	0.25 grains S / 100ft <sup>3</sup> (5)	-	0.01 (f)
NOx	100 lb/MMcf (2)	0.25 (a)	1.11 (b)
CO	84 lb/MMcf (2)	0.21 (a)	0.93 (b)
VOC	5.5 lb/MMcf (1)	0.01 (a)	0.06 (b)
<b>Hazardous Air Pollutants</b>			
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)	0.00 (a)	0.020 (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)
<b>Total HAP</b>		0.00	0.021
<b>Greenhouse Gas Emissions</b>			
CO <sub>2</sub>	116.89 lb/MMBtu (6)	302.98 (c)	1327.04 (d)
CH <sub>4</sub>	2.2E-03 lb/MMBtu (6)	0.01 (c)	0.03 (d)
N <sub>2</sub> O	2.2E-04 lb/MMBtu (6)	0.00 (c)	0.00 (d)
CO <sub>2</sub> e <sup>(g)</sup>	-	303.29	1328.41

**Calculations:**

**LB/MMCF**

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

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

**LB/MMBTU**

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

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

**SO<sub>2</sub>**

(e) Hourly Emissions SO<sub>2</sub> Caclulation (lb/hr) = (20 grain S/100ft<sup>3</sup>) \* Fuel throughput (MMft<sup>3</sup>/yr) \* (1000000ft<sup>3</sup>/1MMft<sup>3</sup>) / annual hours of operation (hr/yr) \* (1lb/7000 grains) \* (lbmol S/32.06 lb S) \* (lbmol SO<sub>2</sub>/ lbmol S) \* (64.07 lb SO<sub>2</sub>/lbmol SO<sub>2</sub>)

(f) Annual Emissions SO<sub>2</sub> Caclulation (ton/yr) = (0.25 grain S/100ft<sup>3</sup>) \* Fuel throughput (MMft<sup>3</sup>/yr) \* (1000000ft<sup>3</sup>/1MMft<sup>3</sup>) \* (1lb/7000 grains) \* (lbmol S/32.06 lb S) \* (lbmol SO<sub>2</sub>/ lbmol S) \* (64.07 lb SO<sub>2</sub>/lbmol SO<sub>2</sub>) \* (1ton/2000lbs)

EMISSION INPUTS TABLE	
Fuel Use (MMBtu/hr) =	2.592
Number of Units =	36
Hours of Operation (hr/yr) =	8760
MMBtu/MMcf =	1020
PTE Fuel Use (MMft <sup>3</sup> /yr) =	22.26

(g) CO<sub>2</sub> equivalent = [(CO<sub>2</sub> emissions)\*(GWP<sub>CO2</sub>)]+[(CH<sub>4</sub> emissions)\*(GWP<sub>CH4</sub>)]+[(N<sub>2</sub>O emissions)\*(GWP<sub>N2o</sub>)]  
 Global Warming Potential (GWP)

CO <sub>2</sub>	1	(7)
CH <sub>4</sub>	25	(7)
N <sub>2</sub> 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. Space Heater Emissions (SH2)**  
**23 Catalytic Space Heaters: 15 - 0.072 mmBtu/hr & 8 - 0.005 mmBtu/hr**  
**Columbia Gas Transmission - Seneca Compressor Station**

Pollutant	Emission Factor	PTE (lb/hr)	PTE (ton/yr)
<b>Criteria Pollutants</b>			
PM/PM10/PM2.5	7.6 lb/MMcf (1)	0.01 (a)	0.04 (b)
SO <sub>2</sub> (Hourly)	20 grains S / 100ft <sup>3</sup> (5)	0.06 (e)	-
SO <sub>2</sub> (Annual)	0.25 grains S / 100ft <sup>3</sup> (5)	-	0.00 (f)
NOx	100 lb/MMcf (2)	0.11 (a)	0.48 (b)
CO	84 lb/MMcf (2)	0.09 (a)	0.40 (b)
VOC	5.5 lb/MMcf (1)	0.01 (a)	0.03 (b)
<b>Hazardous Air Pollutants</b>			
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)	0.009 (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)
<b>Total HAP</b>		0.00	0.009
<b>Greenhouse Gas Emissions</b>			
CO <sub>2</sub>	116.89 lb/MMBtu (6)	130.92 (c)	573.41 (d)
CH <sub>4</sub>	2.2E-03 lb/MMBtu (6)	0.00 (c)	0.01 (d)
N <sub>2</sub> O	2.2E-04 lb/MMBtu (6)	0.00 (c)	0.00 (d)
CO <sub>2</sub> e <sup>(g)</sup>	-	131.05	574.00

**Calculations:**

**LB/MMCF**

- (a) Hourly emissions (lb/hr) = Emission Factor (lb/MMcf) \* Fuel Use (MMCF/yr) / Annual hours of operation (hr/yr)  
 (b) Annual emissions (ton/yr) = Emission Factor (lb/MMcf) \* Fuel Use (MMcf/yr) \* (1ton/2000lbs)

**LB/MMBTU**

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

**SO<sub>2</sub>**

- (e) Hourly Emissions SO<sub>2</sub> Cacluation (lb/hr) = (20 grain S/100ft<sup>3</sup>) \* Fuel throughput (MMft<sup>3</sup>/yr) \* (1000000ft<sup>3</sup>/1MMft<sup>3</sup>) / annual hours of operation (hr/yr) \* (1lb/7000 grains) \* (lbmol S/32.06 lb S) \* (lbmol SO<sub>2</sub>/ lbmol S) \* (64.07 lb SO<sub>2</sub>/lbmol SO<sub>2</sub>)  
 (f) Annual Emissions SO<sub>2</sub> Cacluation (ton/yr) = (0.25 grain S/100ft<sup>3</sup>) \* Fuel throughput (MMft<sup>3</sup>/yr) \* (1000000ft<sup>3</sup>/1MMft<sup>3</sup>) \* (1lb/7000 grains) \* (lbmol S/32.06 lb S) \* (lbmol SO<sub>2</sub>/ lbmol S) \* (64.07 lb SO<sub>2</sub>/lbmol SO<sub>2</sub>) \* (1ton/2000lbs)

EMISSION INPUTS TABLE	
Fuel Use (MMBtu/hr) =	1.12
Number of Units =	23
Hours of Operation (hr/yr) =	8760
MMBtu/MMcf =	1020
PTE Fuel Use (MMft <sup>3</sup> /yr) =	9.62

- (g) CO<sub>2</sub> equivalent = [(CO<sub>2</sub> emissions)\*(GWP<sub>CO2</sub>)]+[(CH<sub>4</sub> emissions)\*(GWP<sub>CH4</sub>)]+[(N<sub>2</sub>O emissions)\*(GWP<sub>N2O</sub>)]  
 Global Warming Potential (GWP)

CO <sub>2</sub>	1	(7)
CH <sub>4</sub>	25	(7)
N <sub>2</sub> 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. Tank Emissions**  
**Columbia Gas Transmission - Seneca Compressor Station**

Emission Point	Tank Capacity (gal)	Tank Contents	Control Devices	Tank Throughput (bbls/day)	VOC Emission Factor (lbs/bbls)		VOC Emissions (lbs/yr) <sup>(a)</sup>	VOC Emissions (lb/hr) <sup>(b)</sup>	VOC Emissions (tons/yr) <sup>(c)</sup>
A01	2000	Lube Oil	None	1.57	1.49E-03	(1)	0.85	0.000	0.000
A02	2000	Gasoline	None	1.57	1.15E+00	(1)	658.86	0.075	0.329
A03	500	Used Oil	None	0.78	8.40E-04	(1)	0.24	0.000	0.000
A04	5000	Pipeline Liquids	None	3.91	1.06E+00	(2)	1508.57	0.172	0.754
A05	5000	Pipeline Liquids	None	3.91	1.06E+00	(2)	1508.57	0.172	0.754
A13	150	Pipeline Liquids	None	0.12	2.15E+00	(2)	92.10	0.011	0.046
<b>Totals</b>							<b>3769.19</b>	<b>0.43</b>	<b>1.88</b>

**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 (1400 psi) at a similar site and is considered to be worst case representative with respect to gas composition and pressure at the Station

**Table 13. Fugitive Leak Emissions  
Columbia Gas Transmission - Seneca Compressor Station**

Pollutant	Emission Factor	PTE <sup>(a)</sup> 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
<b>Total Gas Released</b>	- -	50.49
<b>Total VOC Released (gas service)</b>		(b) <b>1.01</b>
<b>Calculations:</b>	<b>CO2e</b>	<b>23.48</b>

(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<sup>(3)</sup>

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 14. Centrifugal Compressor Venting Emissions  
Solar; Saturn 10 (E07)  
Columbia Gas Transmission - Seneca Compressor Station**

Number of Pneumatic Actuators:	9	per turbine		
Pneumatic Actuator Vent Rate:	3	scf/hr/actuator	27	scf/hr/turbine
Number of Startup/Shutdown Cycles	150	per yr		
Pneumatic Starter Emissions per Startup	1,575	scf/event/turbine		
Blowdown Emissions per Shutdown	4,967	scf/event/turbine		
Number of Turbines	1			
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 <sub>4</sub> <sup>(2)</sup>	CO <sub>2</sub> <sup>(2)</sup>	CH <sub>4</sub> <sup>(3)</sup>	CO <sub>2</sub> <sup>(3)</sup>	CH <sub>4</sub>	CO <sub>2</sub>	CO <sub>2e</sub>	VOC <sup>(6)</sup>
<b>Continuous During Operation</b>	<b>scf/hr</b>	<b>scf/hr</b>	<b>scf/hr</b>	<b>lb/hr</b>	<b>lb/hr</b>	<b>ton/yr</b>	<b>ton/yr</b>	<b>ton/yr</b>	<b>ton/yr</b>
Pneumatic Actuator (Total for Number of units)	27.00	25.18	0.27	1.06	0.03	4.66	0.14	116.59	0.18
Dry Seals (Total for number of units)	60.00	55.95	0.59	2.36	0.07	10.35	0.30	259.09	0.40
<b>Intermittent During Startup/Shutdown</b>	<b>scf/event</b>	<b>scf/event</b>	<b>scf/event</b>	<b>lb/event</b>	<b>lb/event</b>	<b>ton/yr</b>	<b>ton/yr</b>	<b>ton/yr</b>	<b>ton/yr</b>
Pneumatic Starter (Total for Number of Units) <sup>(1)</sup>	1.58E+03	1.47E+03	15.59	62.04	1.80	4.65	0.14	1.16E+02	0.18
Blowdowns (Total for Number of Units) <sup>(1,5)</sup>	4.97E+03	4.63E+03	49.17	195.64	5.69	14.67	0.43	3.67E+02	0.57
							<b>Total</b>	<b>859.3889266</b>	<b>1.34</b>

1. Emission rates per event instead of per hour
2. CH<sub>4</sub> and CO<sub>2</sub> emission rates based on 93.25 vol % CH<sub>4</sub> and 0.99 vol % CO<sub>2</sub> in natural gas
3. Conversion based on Densities of GHG as provided in 40 CFR 98.233(v) [density CH<sub>4</sub> - 0.0192 kg/scf ; CO<sub>2</sub> - 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 15. Centrifugal Compressor Venting Emissions  
Solar; Mars 100 (E08)**

**Columbia Gas Transmission - Seneca 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	150	per yr		
Pneumatic Starter Emissions per Startup	15,700	scf/event/turbine		
Blowdown Emissions per Shutdown	67,126	scf/event/turbine		
Number of Turbines	1			
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 <sub>4</sub> <sup>(2)</sup>	CO <sub>2</sub> <sup>(2)</sup>	CH <sub>4</sub> <sup>(3)</sup>	CO <sub>2</sub> <sup>(3)</sup>	CH <sub>4</sub>	CO <sub>2</sub>	CO <sub>2e</sub>	VOC <sup>(6)</sup>
<b>Continuous During Operation</b>	<b>scf/hr</b>	<b>scf/hr</b>	<b>scf/hr</b>	<b>lb/hr</b>	<b>lb/hr</b>	<b>ton/yr</b>	<b>ton/yr</b>	<b>ton/yr</b>	<b>ton/yr</b>
Pneumatic Actuator (Total for Number of units)	21.00	19.58	0.21	0.83	0.02	3.62	0.11	90.68	0.14
Dry Seals (Total for number of units)	60.00	55.95	0.59	2.36	0.07	10.35	0.30	259.09	0.40
<b>Intermittent During Startup/Shutdown</b>	<b>scf/event</b>	<b>scf/event</b>	<b>scf/event</b>	<b>lb/event</b>	<b>lb/event</b>	<b>ton/yr</b>	<b>ton/yr</b>	<b>ton/yr</b>	<b>ton/yr</b>
Pneumatic Starter (Total for Number of Units) <sup>(1)</sup>	1.57E+04	1.46E+04	155.43	618.40	17.99	46.38	1.35	1.16E+03	1.81
Blowdowns (Total for Number of Units) <sup>(1,5)</sup>	6.71E+04	6.26E+04	664.55	2644.01	76.90	198.30	5.77	4.96E+03	7.73
							<b>Total</b>	<b>6473.913395</b>	<b>10.09</b>

1. Emission rates per event instead of per hour
2. CH<sub>4</sub> and CO<sub>2</sub> emission rates based on 93.25 vol % CH<sub>4</sub> and 0.99 vol % CO<sub>2</sub> in natural gas
3. Conversion based on Densities of GHG as provided in 40 CFR 98.233(v) [density CH<sub>4</sub> - 0.0192 kg/scf ; CO<sub>2</sub> - 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 17. Centrifugal Compressor Venting Emissions**  
**Solar; Taurus 70 (E09)**  
**Columbia Gas Transmission - Seneca 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	200	per yr		
Pneumatic Starter Emissions per Startup	0	scf/event/turbine		
Blowdown Emissions per Shutdown	84,856	scf/event/turbine		
Number of Turbines	1			
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 <sub>4</sub> <sup>(2)</sup>	CO <sub>2</sub> <sup>(2)</sup>	CH <sub>4</sub> <sup>(3)</sup>	CO <sub>2</sub> <sup>(3)</sup>	CH <sub>4</sub>	CO <sub>2</sub>	CO <sub>2e</sub>	VOC <sup>(6)</sup>
<b>Continuous During Operation</b>	<b>scf/hr</b>	<b>scf/hr</b>	<b>scf/hr</b>	<b>lb/hr</b>	<b>lb/hr</b>	<b>ton/yr</b>	<b>ton/yr</b>	<b>ton/yr</b>	<b>ton/yr</b>
Pneumatic Actuator (Total for Number of units)	45.00	41.96	0.45	1.77	0.05	7.76	0.23	194.31	0.30
Dry Seals (Total for number of units)	60.00	55.95	0.59	2.36	0.07	10.35	0.30	259.09	0.40
<b>Intermittent During Startup/Shutdown</b>	<b>scf/event</b>	<b>scf/event</b>	<b>scf/event</b>	<b>lb/event</b>	<b>lb/event</b>	<b>ton/yr</b>	<b>ton/yr</b>	<b>ton/yr</b>	<b>ton/yr</b>
Pneumatic Starter (Total for Number of Units) <sup>(1)</sup>	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) <sup>(1,5)</sup>	8.49E+04	7.91E+04	840.07	3342.38	97.21	334.24	9.72	8.37E+03	13.04
							<b>Total</b>	<b>8819.060975</b>	<b>13.74</b>

1. Emission rates per event instead of per hour
2. CH<sub>4</sub> and CO<sub>2</sub> emission rates based on 93.25 vol % CH<sub>4</sub> and 0.99 vol % CO<sub>2</sub> in natural gas
3. Conversion based on Densities of GHG as provided in 40 CFR 98.233(v) [density CH<sub>4</sub> - 0.0192 kg/scf ; CO<sub>2</sub> - 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**

**Seneca Compressor Station, Facility ID No. 071-00008  
Seneca Rocks, 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  
Seneca Compressor Station  
R30-07100008-2017**

---

*William F. Durham  
Director*

*Issued: [Date of issuance] • Effective: [Equals issue date plus two weeks]  
Expiration: [5 years after issuance date] • Renewal Application Due: [6 months prior  
to expiration]*

Permit Number: **R30-07100008-2017**  
Permittee: **Columbia Gas Transmission, LLC**  
Facility Name: **Seneca 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:	Seneca Rocks, Pendleton County, West Virginia
Facility Mailing Address:	Route 28 North, Seneca Rocks, WV 26884
Telephone Number:	(304) 567-7500
Type of Business Entity:	LLC
Facility Description:	Natural Gas Transmission Facility
SIC Codes:	4922
UTM Coordinates:	639.5 km Easting • 4,301.10 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.*

## Table of Contents

<b>1.0. Emission Units and Active R13, R14, and R19 Permits.....</b>	<b>3</b>
<b>2.0. General Conditions.....</b>	<b>4</b>
<b>3.0. Facility-Wide Requirements and Permit Shield.....</b>	<b>13</b>

### Source-specific Requirements

<b>4.0. 45CSR13 Permit Conditions from R13-2715F.....</b>	<b>21</b>
<b>5.0. 40 C.F.R. 60, Subpart JJJJ Requirements for Emergency Reciprocating Internal Combustion Engine (RICE) .....</b>	<b>25</b>
<b>6.0. 40 C.F.R. 60, Subpart KKKK Requirements for Turbines.....</b>	<b>29</b>

## 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
03704*	E04	Turbine Engine/Centrifugal Compressor; General Electric; 3132R Frame 3	1981**	13,750 hp	N/A
03705*	E05	Turbine Engine/Centrifugal Compressor; Solar; Taurus 60-7800S	2008	7,491 hp	N/A
03706*	E06	Turbine Engine/Centrifugal Compressor; Solar; Taurus 60-7800S	2008	7,491 hp	N/A
03707*	E07	Combustion Turbine/Compressor; Solar; Saturn 10-1400	2013	1,557 hp @ 30°F 1,333 hp @ 50°F	N/A
03708*	E08	Combustion Turbine/Compressor; Solar; Mars 100-15000S	2013	15,432 hp @ 30°F 13,814 hp @ 50°F	N/A
03709*	E09	Combustion Turbine/Compressor; Solar; Taurus 70 Turbine	2017	10,613 hp @ 32°F	N/A
037G3*	G3	Reciprocating Engine/Generator Waukesha VGF-L36GL; 4 Cycle, Lean Burn	2013	880 hp	N/A
HTR1*	H1	Fuel Gas Heater; ETI; Model # SB18-18	2008	0.5 mmBtu/hr	N/A
HTR2*	H2	Fuel Gas Heater; ETI; Model # SB18-18	2013	0.5 mmBtu/hr	N/A
HTR3*	H3	Process Heater	2017	0.25 mmBtu/hr	N/A
SH1*	037SH1	Catalytic Space Heaters (36)	2013	2.592 mmBtu/hr (TOTAL)	N/A
SH2*	037SH2	Catalytic Space Heaters (23)	2017	1.12 mmBtu/hr (TOTAL)	N/A

\* All combustion equipment is fired with pipeline quality natural gas only.

\*\* This turbine was originally purchased in 1971, and relocated to Seneca Station in 1981

## 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.

<b>Permit Number</b>	<b>Date of Issuance</b>
R13-2715F	04-26-2016

## 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

<b>CAAA</b>	Clean Air Act Amendments	<b>NSPS</b>	New Source Performance Standards
<b>CBI</b>	Confidential Business Information	<b>PM</b>	Particulate Matter
<b>CEM</b>	Continuous Emission Monitor	<b>PM<sub>10</sub></b>	Particulate Matter less than 10µm in diameter
<b>CES</b>	Certified Emission Statement	<b>pph</b>	Pounds per Hour
<b>C.F.R. or CFR</b>	Code of Federal Regulations	<b>ppm</b>	Parts per Million
<b>CO</b>	Carbon Monoxide	<b>PSD</b>	Prevention of Significant Deterioration
<b>C.S.R. or CSR</b>	Codes of State Rules	<b>psi</b>	Pounds per Square Inch
<b>DAQ</b>	Division of Air Quality	<b>SIC</b>	Standard Industrial Classification
<b>DEP</b>	Department of Environmental Protection	<b>SIP</b>	State Implementation Plan
<b>FOIA</b>	Freedom of Information Act	<b>SO<sub>2</sub></b>	Sulfur Dioxide
<b>HAP</b>	Hazardous Air Pollutant	<b>TAP</b>	Toxic Air Pollutant
<b>HON</b>	Hazardous Organic NESHAP	<b>TPY</b>	Tons per Year
<b>HP</b>	Horsepower	<b>TRS</b>	Total Reduced Sulfur
<b>lbs/hr or lb/hr</b>	Pounds per Hour	<b>TSP</b>	Total Suspended Particulate
<b>LDAR</b>	Leak Detection and Repair	<b>USEPA</b>	United States Environmental Protection Agency
<b>m</b>	Thousand	<b>UTM</b>	Universal Transverse Mercator
<b>MACT</b>	Maximum Achievable Control Technology	<b>VEE</b>	Visual Emissions Evaluation
<b>mm</b>	Million	<b>VOC</b>	Volatile Organic Compounds
<b>mmBtu/hr</b>	Million British Thermal Units per Hour		
<b>mmft<sup>3</sup>/hr or mmcf/hr</b>	Million Cubic Feet Burned per Hour		
<b>NA or N/A</b>	Not Applicable		
<b>NAAQS</b>	National Ambient Air Quality Standards		
<b>NESHAPS</b>	National Emissions Standards for Hazardous Air Pollutants		
<b>NO<sub>x</sub></b>	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 require 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 57<sup>th</sup> 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](mailto: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.

<b>45CSR4</b>	<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.
<b>45CSR10</b>	<i>To Prevent and Control Air Pollution from the Emission of Sulfur Dioxide - Emissions from Indirect Heat Exchangers.</i> WVDAQ has determined that 45CSR10 does not apply to natural gas fired engines.
<b>45CSR21</b>	<i>To Prevent and Control Air Pollution from the Emission of Volatile Organic Compounds:</i> The facility is not located in a designated VOC County. Therefore, this State Rule does not apply.
<b>45CSR27</b>	<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.”
<b>40 C.F.R. Part 60 Subpart OOOO</b>	<i>Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution.</i> The Storage Vessel requirements defined for transmission sources are not applicable to this site because there are no affected source storage vessels constructed or reconstructed prior to August 23, 2011 as stated in accordance with 40CFR§60.5365(e). The compressor requirements defined for transmission sources are not applicable to this site because the facility is not located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment as stated in accordance with 40CFR§60.5365(b). No other affected sources were identified at this site.
<b>40 C.F.R. Part 60 Subpart OOOOa</b>	<i>Standards of Performance for Crude Oil and Natural 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 the applicability criteria defined within [40CFR§60.5365a]. Affected source evaluated are as follows: Compressors, Equipment Leaks, Pneumatic Controllers, and Storage Vessels.
<b>40 C.F.R. Part 60 Subpart K and Ka</b>	<i>Standards of Performance for Petroleum Liquid Storage Vessels.</i> All tanks at the station are below the applicability criteria of 40,000 gallons in capacity as stated in 40CFR§§60.110(a) and 60.110a(a)
<b>40 C.F.R. Part 60 Subpart Kb</b>	<i>Standards of Performance for Volatile Organic Liquid Storage</i>

	<i>Vessels.</i> All tanks at the station are below the applicability criteria of 19,813 gallons in capacity as stated in 40CFR§60.110b(a).
<b>40 C.F.R. Part 60 Subpart Dc</b>	<i>Standards of Performance for Steam Generating Units:</i> The fuel gas heater burner has a maximum design heat input capacity of less than 10 MMBtu/hr, which is below the applicability threshold defined within [40CFR60.40c(a)].
<b>40 C.F.R. Part 60 Subpart GG</b>	<i>Standards of Performance for Stationary Turbines:</i> The provisions of this subpart are not applicable because the turbines were installed after the applicability dates and are therefore, subject to NSPS KKKK. The only exception is the GE Frame 3 Turbine (ID 03704) which was installed in 1981, but as a relocated unit originally purchased in 1971. Therefore, the unit in not considered a new construction or modification in accordance with the General Provisions, 40CFR§60.14(e)(6).
<b>40 C.F.R. Part 60 Subpart IIII</b>	<i>Standards of Performance for Stationary Compression Ignition Internal Combustion Engines.</i> The Compressor Station does not have any compression ignition internal combustion engines.
<b>40 C.F.R. Part 63 Subpart HHH</b>	<i>National Emission Standards for Hazardous Air Pollutants from Natural Gas Transmission and Storage Facilities.</i> The Compressor Station is not subject to Subpart HHH since it is not a major source of HAPs and it does not incorporate dehydration operations.
<b>40 C.F.R. Part 63 Subpart YYYY</b>	National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines does not apply to this station since it does not exceed major source HAP thresholds.
<b>40 C.F.R. Part 63 Subpart DDDDD</b>	National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters does not apply to this station since it does not exceed major source HAP thresholds.
<b>40 C.F.R. Part 63 Subpart JJJJJ</b>	<i>National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources.</i> The facility is not subject to 40 C.F.R. Part 63 Subpart JJJJJ since the fuel gas heaters is not a boiler, but a process heater, which is not regulated under this source category.
<b>40 C.F.R. Part 64</b>	There are no add-on controls, so the CAM requirements are not applicable per 40 CFR§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 45CSR13 Permit Conditions from R13-2715 [Emission Point ID(s): ( H2, H3, E05, E06, E07, E08, E09, G3, SH1, and SH2)]**

**4.1. Limitations and Standards**

4.1.1. Annual emissions from the two Solar Taurus 60-7800S turbines (E05 & E06) shall not exceed the following:

	NO <sub>x</sub>	CO	VOC	SO <sub>2</sub>	PM <sub>10</sub>	CH <sub>2</sub> O
	tpy	tpy	tpy	Tpy	tpy	tpy
E05	18.79	50.5	14.15	0.21	1.96	0.21
E06	18.79	50.5	14.15	0.21	1.96	0.21
Total	37.6	101.0	28.3	0.42	3.92	0.42

**[45CSR13; Permit R13-2715, Condition 4.1.1]**

4.1.2. The two Solar Taurus 60-7800S turbines (E05 & E06) shall combust only pipeline quality natural gas which contains a maximum of 20 grains of sulfur per 100 scf.  
 [40 CFR §60.4365(a)]

**[45CSR13; Permit R13-2715, Condition 4.1.2]**

4.1.3. Each of the two Solar Taurus 60-7800S turbines (E05 & E06) shall consume no more than 75,916 cubic feet of natural gas per hour nor  $6.00 \times 10^8$  scf of natural gas per year.

**[45CSR13; Permit R13-2715, Condition 4.1.3]**

4.1.4. Emissions from the two Solar Taurus 60-7800S turbines (E05 & E06) shall not exceed the following:

	E05	E06
<b>NO<sub>x</sub></b>		
Full Load @ O°F	25 ppm@ 15% O <sub>2</sub> / 3.8 lb/hr	25 ppm@ 15% O <sub>2</sub> / 3.8 lb/hr
Low Temp (<0 to -20°F)	11 lb/hr	11 lb/hr
Very Low Temp (<-20°F)	31.6 lb/hr	31.6 lb/hr
Startup/Shutdown	3.9 lb/hr	3.9 lb/hr
Low Load (<50%)	10.3 lb/hr	10.3 lb/hr
<b>SO<sub>2</sub></b>		
Full Load	0.5 lb/hr	0.5 lb/hr
Startup/Shutdown	0.05 lb/hr	0.05 lb/hr
Low Load (<50%)	0.3 lb/hr	0.3 lb/hr
<b>CO</b>		
Full Load @ OoF	3.9 lb/hr	3.9 lb/hr
Low Temp (<0 to -20°F)	15.9 lb/hr	15.9 lb/hr

Very Low Temp (<-20°F)	24.1 lb/hr	24.1 lb/hr
Startup/Shutdown	72.0 lb/hr	72.0 lb/hr
Low Load (<50%)	196.5 lb/hr	196.5 lb/hr
<b>VOC</b>		
Full Load @ 0°F	0.2 lb/hr	0.2 lb/hr
Low Temp (<0 to -20°F)	0.5 lb/hr	0.5 lb/hr
Very Low Temp (<-20°F)	0.7 lb/hr	0.7 lb/hr
Startup/Shutdown	711.2 lb/hr	711.2 lb/hr
Low Load (<50%)	1.5 lb/hr	1.5 lb/hr
<b>PM<sub>10</sub></b>		
Full Load @ 0°F	0.5 lb/hr	0.5 lb/hr
Startup/Shutdown	0.3 lb/hr	0.3 lb/hr
Low Load (<50%)	0.3 lb/hr	0.3 lb/hr

**[45CSR13; Permit R13-2715, Condition 4.1.4]**

4.1.5. Emissions from turbine E07, turbine E08, turbine E09, emergency generator G3, fuel gas heater H2, fuel gas heater H3, 36 combined space heaters SH1, and 23 combined space heaters SH2 shall not exceed the following:

	NO <sub>x</sub>		CO		VOC		SO <sub>2</sub>		PM <sub>10</sub> /PM <sub>2.5</sub>	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
E07	9.48	41.51	15.39	67.63	0.44	1.94	1.00	0.05	0.32	1.32
E08	6.76	31.83	6.85	63.02	0.79	3.88	7.14	0.37	2.25	9.42
E09	4.74	22.80	4.81	91.80	0.55	3.22	5.01	0.27	0.58	2.53
G3	3.88	0.97	2.52	0.63	0.08	0.02	0.39	0.01	0.07	0.02
H2	0.08	0.37	0.07	0.31	0.01	0.02	0.05	0.01	0.01	0.03
H3	0.02	0.11	0.02	0.09	0.01	0.01	0.01	0.01	0.01	0.01
SH1 (36)	0.25	1.11	0.21	0.93	0.02	0.06	0.15	0.01	0.02	0.08
SH2 (23)	0.11	0.48	0.09	0.40	0.01	0.03	0.06	0.01	0.01	0.04

Note: Maximum hourly emission rate based on 30 °F for E07 and E08  
 Maximum hourly emission rate based on 32 °F for E09

Emission Point ID	CO <sub>2</sub> e
	tpy
E07	8,576
E08	61,264
E09	44,975
G3	200
H2	436
H3	128
SH1 (36)	1,329
SH2 (23)	574

**[45CSR13; Permit R13-2715, Condition 4.1.5]**

4.1.6. The Solar Mars 100-15000S turbine (E08), the Solar Saturn 10-1400 turbine (E07), the Solar Taurus 70 turbine (E09) and the Dresser-Waukesha VGF-L36GL emergency generator (G3) shall combust only pipeline quality natural gas which contains a maximum of 20 grains of sulfur per 100 scf and which contains a maximum of 0.25 grains of sulfur per 100 scf as averaged over a rolling period of twelve (12) months.

[40 CFR §60.4365(a), 45CSR§13-5.11]

**[45CSR13; Permit R13-2715, Condition 4.1.6]**

4.1.7. The Solar Mars 100-15000S turbine (E08) , the Solar Saturn 10-1400 turbine (E07) and the Solar Taurus 70 turbine (E09) shall consume no more than the following amounts of natural gas:

Emission Point ID	Natural gas consumption	
	scf/hr	scf/yr
E07	17,216	143.61 x 10 <sup>6</sup>
E08	122,525	1,025.86 x 10 <sup>6</sup>
E09	85,971	753.1 x 10 <sup>6</sup>

Note: E07 and E08 hourly natural gas consumption is based on 30 °F, E09 hourly and annual natural gas consumption is based on 32 °F and annual natural gas consumption is based on 50 °F.

**[45CSR13; Permit R13-2715, Condition 4.1.7]**

4.1.8. Emissions from the Solar Mars 100-15000S turbine (E08), the Solar Saturn 10-1400 turbine (E07) and the Solar Taurus 70 turbine (E09) shall not exceed the following:

Pollutant	E08	E07
<b>NO<sub>x</sub></b>		
Full Load@ 30oF	25 PPillv@ 15% O <sub>2</sub> / 6.76 lb/hr	150 PPillv@ 15% O <sub>2</sub> / 9.48 lb/hr
Low Temp (<0 to -20°F)	20.58 lb/hr	10.36lb/hr
Very Low Temp (<-20°F)	58.80 lb/hr	10.36lb/hr
Startup/Shutdown	3.1lb/cycle	1.44 lb/cycle
Low Load (<50%)	16.10 lb/hr	5.67lb/hr
<b>SO<sub>x</sub></b> (short term emission rate based on 20 gr S/100 set)		
Full Load	7.14lb/hr	1.00 lb/hr
Startup/Shutdown	7.14lb/hr	1.00 lb/hr
Low Load (<50%)	7.14lb/hr	1.00 lb/hr
<b>CO</b>		
Full Load @30°F	6.85lb/hr	15.39lb/hr
Low Temp (<0 to -20°F)	29.83lb/hr	16.82lb/hr
Very Low Temp (<-20°F)	44.74lb/hr	16.82lb/hr
Startup/Shutdown	272.70 lb/cycle	4.44lb/cycle
Low Load (<50%)	653.4lb/hr	14.37lb/hr
<b>VOC</b>		
Full Load @30°F	0.79lb/hr	0.44lb/hr
Low Temp (<0 to -20°F)	1.70 lb/hr	0.48lb/hr
Very tow Temp (<-20°F)	1.70 lb/hr	0.48lb/hr
Startup/Shutdown	3.12lb/cycle	0.23 lb/cycle
Low Load (<50%)	7.47lb/hr	0.66lb/hr
<b>PI\110</b>		
Full Load @30°F	2.251b/hr	0.32lb/hr
Startup/Shutdown	2.25lb/hr	0.32lb/hr

|| Low Load (<50%) 2.25lb/hr 0.32lb/hr

<b>Pollutant</b>	<b>E09</b>
<b>NOX</b>	
Full Load @ 32oF	15 ppilly@ 15% O <sub>2</sub> / 4.74 lb/hr
Low Temp (<OaF)	14.21lb/hr
Low Load (<50%)	14.45 lb/hr
Startup/Shutdown	1.90 lb/cycle
SOx (short term emission rate based on 20 gr S/100 set)	
Full Load @ 3rF	5.01lb/hr
Startup/Shutdown	5.01lb/hr
Low Load (<50%)	5.01lb/hr
<b>CO</b>	
Full Load @32oF	4.81lb/hr
Low Temp (<0 °F)	20.59lb/hr
Low Load (<50%)	586.42 lb/hr
Startup/Shutdown	166.50 lb/cycle
<b>VOC</b>	
Full Load @32 °F	0.55lb/hr
Low Temp (<0°F)	1.18lb/hr
Low Load (<50%)	6.70 lb/hr
Startup/Shutdown	1.90 lb/cycle
<b>PM<sub>10</sub></b>	
Full Load @ 3rF	0.58lb/hr
Startup/Shutdown	0.58lb/hr
Low Load (<50%)	0.58lb/hr

[45CSR13; Permit R13-2715, Condition 4.1.8]

- 4.1.9. Emergency Generator G3 shall not operate more than 500 hours per year based on a rolling 12 month total.  
**[45CSR13; Permit R13-2715, Condition 4.1.9]**
- 4.1.10. The MDHI of the fuel gas heater (H2) shall not exceed 0.85mmBtu/hr and the unit shall only be fired by natural gas. The MDHI of the fuel gas heater (H3) shall not exceed 0.25 mmBtu/hr and the unit shall only be fired by natural gas.  
**[45CSR13; Permit R13-2715, Condition 4.1.10]**
- 4.1.11. 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.]  
**[45CSR13; Permit R13-2715, Condition 4.1.11]**
- 4.1.12. The MDHI for each of the 36 catalytic space heaters (SH1) shall not exceed 0.072 MMBTU/hr. The MDHI for each of the 23 catalytic space heaters (SH2) shall not exceed 8 units@ 0.005 MMBTU/hr and 15 units@ 0.072 MMBTU/hr;  
**[45CSR13; Permit R13-2715, Condition 4.1.12]**
- 4.1.13. Emissions from Emergency Generator G3 shall not exceed the following:  
[40 CFR§ 60.4233(e)]

	NOX	CO	VOC
Standard (g/HP-hr)	2.0	4.0	1.0

**[45CSR13; Permit R13-2715, Condition 4.1.13]**

- 4.1.14. Reserved
- 4.1.15. Reserved
- 4.1.16. Reserved
- 4.1.17. Operation and Maintenance of Air Pollution Control Equipment. The permittee shall, to the extent practicable, install, maintain, and operate all pollution control equipment listed in Section 1.0 and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary.  
[45CSR§13-5.11.]  
**[45CSR13; Permit R13-2715, Condition 4.1.17]**
- 4.1.18. The permittee shall install, maintain, and operate all above-ground piping, valves, pumps, etc. that service lines in the transport of potential sources of regulated air pollutants to prevent any substantive fugitive escape of regulated air pollutants. Any above-ground piping, valves, pumps, etc. that shows signs of excess wear and that have a reasonable potential for substantive fugitive emissions of regulated air pollutants shall be repaired or replaced as needed.

**[45CSR13; Permit R13-2715, Condition 4.1.18]**

## 4.2. Testing Requirements

- 4.2.1. Reserved

- 4.2.2. In order to show compliance with the CO emission limits contained in 4.1.1, 4.1.4, 4.1.5 and 4.1.8 of this permit the permittee shall perform initial and periodic performance tests on each turbine using EPA approved methods (or other alternative methods approved by the Director). Said testing shall be performed while the turbines are operating at normal conditions, within 25% of full load or at the highest achievable load (and while ambient temperatures are above 0°F). The initial performance test shall be conducted within 180 days of startup. Subsequent testing shall be conducted at least every 5 years.

**[45CSR13; Permit R13-2715, Condition 4.2.2]**

### **4.3. Monitoring and Recordkeeping Requirements**

- 4.3.1. **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.

**[45CSR13; Permit R13-2715, Condition 4.3.1]**

- 4.3.2. **Record of Malfunctions of Air Pollution Control Equipment.** For all air pollution control equipment listed in Section 1.0, the permittee shall maintain records of the occurrence and duration of any malfunction or operational shutdown of the air pollution control equipment during which excess emissions occur. For each such case, the following information shall be recorded:

- a. The equipment involved.
- b. Steps taken to minimize emissions during the event. c.  
The duration of the event.
- d. The estimated increase in emissions during the event.

For each such case associated with an equipment malfunction, the additional information shall also be recorded:

- e. The cause of the malfunction.
- f. Steps taken to correct the malfunction.
- g. Any changes or modifications to equipment or procedures that would help prevent future recurrences of the malfunction.

**[45CSR13; Permit R13-2715, Condition 4.3.2]**

- 4.3.3. In order to demonstrate compliance with conditions 4.1.3 and 4.1.7 of this permit, the permittee shall monitor and record the amount of natural gas consumed by each piece of equipment.

**[45CSR13; Permit R13-2715, Condition 4.3.3]**

- 4.3.4. In order to demonstrate compliance with the emission limitations of condition 4.1.1, 4.1.4, 4.1.5 and 4.1.8 of this permit the permittee will monitor and record the following:

- a. Monthly operating hours of the turbines at normal dry low NO<sub>x</sub> (DLN) conditions ( 50% of rated load and ambient temperatures of 0 to 100°F). b. Monthly operating hours of the turbines at low load ( 50% load).
- c. Monthly operating hours of the turbines at low ambient temperature (<0 to -20°F).
- d. Monthly operating hours of the turbines at very low temperature (<-20°F). e. Monthly operating hours of turbine startup and shutdown cycles.
- f. Monthly total operating hours of each turbine and emergency generator G3.

**[45CSR13; Permit R13-2715, Condition 4.3.4]**

- 4.3.5 The monthly records required by condition 4.3.4 of this permit shall be used to calculate monthly emissions for each regulated pollutant (P<sub>j</sub>) using the following equation for turbines E05, E06, E07, E08 and E09:

$$PT = DLN P_x * DLN \text{ hours} + LL P_x * LL \text{ hours} + LT P_x * LT \text{ hours} + VLT P_x * VLT \text{ hours} + SS P_x * SS \text{ cycles}$$

Where, PT is the total tons of emissions for the month, DLN P<sub>x</sub>, LL P<sub>x</sub>, LT P<sub>x</sub>, VLT P<sub>x</sub> and SS P<sub>x</sub> are the unit emission rates for pollutant X during normal DLN, low- load, low temperature, very low temperature and startup/shutdown operation respectively. DLN hours, LL hours, LT hours, VLT hours, and SS hours are the unit monthly operating hours at DLN, low-load, low temperature, very low temperature and startup/shutdown conditions respectively. The unit emission rates for each pollutant are the emission limits contained in conditions 4.1.4 and 4.1.8 of this permit.

**[45CSR13; Permit R13-2715, Condition 4.3.5]**

- 4.3.6. The monthly records required by condition 4.3.4 of this permit shall be used to calculate monthly emissions for each regulated pollutant (P<sub>x</sub>) using the following equation for the emergency generator (G3), fuel gas heaters (H2, H3) and catalytic heaters.

$$PT = P_x * \text{total monthly operating hours}$$

Where, P<sub>T</sub> is the total tons of emissions for the month, and P<sub>x</sub> is the unit emission rate for pollutant X during normal operation. The unit emission rates for each pollutant are the emission limits contained in condition 4.1.5 of this permit.

**[45CSR13; Permit R13-2715, Condition 4.3.6]**

4.3.7. At the end of each month, the monthly emissions will be calculated for the preceding 12 months to determine compliance with the annual emission limits.

**[45CSR13; Permit R13-2715, Condition 4.3.7]**

4.3.8. In order to determine compliance with 4.1.9 of this permit, the permittee shall maintain monthly records of the number of hours of operation of the Emergency Generator G3.

**[45CSR13; Permit R13-2715, Condition 4.3.8]**

#### **4.4. Reporting Requirements**

4.4.1. The permittee shall comply with all applicable reporting requirements of 40 CFR 60 Subparts JJJJ and KKKK.

**[45CSR13; Permit R13-2715, Condition 4.4.1]**

4.4.2. Any deviation(s) from the allowable natural gas consumption limits of conditions 4.1.3, and 4.1.7 shall be reported in writing to the Director of the Division of Air Quality as soon as practicable, but in any case within ten (10) calendar days of the occurrence and shall include at least the following information: the extent of the deviation, the cause or suspected cause of the deviation(s), and any corrective measures taken or planned.

**[45CSR13; Permit R13-2715, Condition 4.4.2]**

4.4.3. Any deviation(s) from the allowable emission limits of conditions 4.1.1, 4.1.4, 4.1.5 and 4.1.8 shall be reported in writing to the Director of the Division of Air Quality as soon as practicable, but in any case within ten (10) calendar days of the occurrence and shall include at least the following information: the extent of the deviation, the cause or suspected cause of the deviation(s), and any corrective measures taken or planned.

**[45CSR13; Permit R13-2715, Condition 4.4.3]**

4.4.4. Any deviation(s) from the allowable hours of operation limits of conditions 4.1.9 shall be reported in writing to the Director of the Division of Air Quality as soon as practicable, but in any case within ten (10) calendar days of the occurrence and shall include at least the following information: the extent of the deviation, the cause or suspected cause of the deviation(s), and any corrective measures taken or planned.

**[45CSR13; Permit R13-2715, Condition 4.4.4]**

4.4.5. Any deviation(s) from the allowable visible emission requirement for any emission source discovered during observations using 40CFR Part 60, Appendix A, Method 9 or 22 shall be reported in writing to the Director of the Division of Air Quality as soon as practicable, but in any case within ten (10) calendar days of the occurrence and shall include at least the following information: the results of the visible determination of opacity of emissions, the cause or suspected cause of the deviation(s), and any corrective measures taken or planned.

**[45CSR13; Permit R13-2715, Condition 4.4.5]**

## 5.0 40 C.F.R. 60, Subpart JJJJ Requirements for Emergency Reciprocating Internal Combustion Engine (RICE) [emission point ID(s): G3]

### 5.1. Limitations and Standards

5.1.1. Emissions from Emergency Generator G05 shall not exceed the following:

NSPS JJJJ –Limits	NOx	CO	VOC
Standard (g/Hp hr)	2.0	4.0	1.0

[45CSR16; 40CFR§60.4233(e)]

5.1.2. The permittee must install a non-resettable hour meter.

[45CSR16; 40CFR§60.4237(a)]

5.1.3. If you own or operate an emergency stationary ICE, you must operate the emergency stationary ICE according to the requirements in paragraphs (a) through (c) of this section. In order for the engine to be considered an emergency stationary ICE 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 (a) through (c) of this section, is prohibited. If you do not operate the engine according to the requirements in paragraphs (a) through (c) of this section, the engine will not be considered an emergency engine under this subpart and must meet all requirements for non-emergency engines.

- a. There is no time limit on the use of emergency stationary ICE in emergency situations.
- b. You may operate your emergency stationary ICE for any combination of the purposes specified in paragraphs (b)(1) through (3) of this section for a maximum of 100 hours per calendar year. Any operation for non-emergency situations as allowed by paragraph (c) of this section counts as part of the 100 hours per calendar year allowed by this paragraph (b).
  1. Emergency stationary ICE 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 ICE beyond 100 hours per calendar year.
  2. Emergency stationary ICE 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 §60.17), 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.
  3. Emergency stationary ICE may be operated for periods where there is a deviation of voltage or frequency of 5 percent or greater below standard voltage or frequency.
- c. Emergency stationary ICE 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 (b) of this section. Except as provided in paragraph (c)(1) of this section, the 50 hours per year for non-emergency situations cannot be used for peak shaving or non-emergency demand response, or to generate income for a facility to an electric grid or otherwise supply power as part of a financial arrangement with another entity.

1. The 50 hours per year for non-emergency situations can be used to supply power as part of a financial arrangement with another entity if all of the following conditions are met:
  - i. The engine is dispatched by the local balancing authority or local transmission and distribution system operator;
  - ii. The dispatch is intended to mitigate local transmission and/or distribution limitations so as to avert potential voltage collapse or line overloads that could lead to the interruption of power supply in a local area or region.
  - iii. The dispatch follows reliability, emergency operation or similar protocols that follow specific NERC, regional, state, public utility commission or local standards or guidelines.
  - iv. The power is provided only to the facility itself or to support the local transmission and distribution system.
  - v. The owner or operator identifies and records the entity that dispatches the engine and the specific NERC, regional, state, public utility commission or local standards or guidelines that are being followed for dispatching the engine. The local balancing authority or local transmission and distribution system operator may keep these records on behalf of the engine owner or operator.

**[45CSR16; 40CFR§60.4243(d)]**

- 5.1.4. The permittee must operate and maintain the stationary SI ICE as required in 40CFR§60.4233 over the entire life of the engine.

**[45CSR16; 40CFR§60.4234]**

- 5.1.5. Owners and operators of stationary SI natural gas fired engines may operate their engines using propane for a maximum of 100 hours per year as an alternative fuel solely during emergency operations, but must keep records of such use. If propane is used for more than 100 hours per year in an engine that is not certified to the emission standards when using propane, the owners and operators are required to conduct a performance test to demonstrate compliance with the emission standards of 40CFR§60.4233.

**[45CSR16; 40CFR§60.4243(e)]**

## **5.2. Monitoring Requirements**

- 5.2.1. If you are an owner or operator of a stationary SI internal combustion engine and must comply with the emission standards specified in 40CFR§60.4233(d) or (e), you must demonstrate compliance according to the methods specified in the following paragraphs:

- a. Purchasing a non-certified engine and demonstrating compliance with the emission standards specified in 40CFR§§60.4233(d) or (e) and according to the requirements specified in 40CFR§60.4244, as applicable, and according to the following paragraph:

**[40CFR§60.4243(b)(2)]**

1. 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.

**[40CFR§60.4243(b)(2)(ii)]**

**[45CSR16; 40CFR§60.4243(b)(2) and 45CSR13 Permit R13-2715, Conditions 4.3.9]**

### **5.3. Testing Requirements**

5.3.1. None

### **5.4. Recordkeeping Requirements**

5.4.1. Owners and operators of all stationary SI ICE must keep records of the information in paragraphs (a) through (d) of this section.

- a. All notifications submitted to comply with this subpart and all documentation supporting any notification.
- b. Maintenance conducted on the engine.
- c. *Reserved*
- d. 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 40CFR§60.4243(a)(2), documentation that the engine meets the emission standards.

**[45CSR16; 40CFR§60.4245(a)]**

5.4.2. For all stationary SI emergency ICE greater than or equal to 500 HP manufactured on or after July 1, 2010, that do not meet the standards applicable to non-emergency engines, the owner or operator of must keep records of the hours of operation of the engine that is recorded through the non-resettable hour meter.

The owner or operator must document how many hours are spent for emergency operation, including what classified the operation as emergency and how many hours are spent for non-emergency operation.

**[45CSR16; 40CFR§60.4245(b)]**

### **5.5. Reporting Requirements**

5.5.1. If you own or operate an emergency stationary SI ICE with a maximum engine power more than 100 HP that operates or is contractually obligated to be available for more than 15 hours per calendar year for the purposes specified in 40CFR§§60.4243(d)(2)(ii) and (iii) or that operates for the purposes specified in 40CFR§60.4243(d)(3)(i), you must submit an annual report according to the requirements in paragraphs (a) through (c) of this section.

- a. The report must contain the following information:
  1. Company name and address where the engine is located.
  2. Date of the report and beginning and ending dates of the reporting period.
  3. Engine site rating and model year.

4. Latitude and longitude of the engine in decimal degrees reported to the fifth decimal place.
  5. Hours operated for the purposes specified in 40CFR§§60.4243(d)(2)(ii) and (iii), including the date, start time, and end time for engine operation for the purposes specified in 40CFR§§60.4243(d)(2)(ii) and (iii).
  6. Number of hours the engine is contractually obligated to be available for the purposes specified in 40CFR§§60.4243(d)(2)(ii) and (iii).
  7. Hours spent for operation for the purposes specified in 40CFR§60.4243(d)(3)(i), including the date, start time, and end time for engine operation for the purposes specified in 40CFR§60.4243(d)(3)(i). The report must also identify the entity that dispatched the engine and the situation that necessitated the dispatch of the engine.
- b. 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.
  - c. 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](http://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 40CFR§60.4.

**[45CSR16; 40CFR§60.4245(e)]**

## **5.6. Compliance Plan**

- 5.6.1. None

## **6.0 40 C.F.R. 60, Subpart KKKK Requirements for Turbine [emission point ID(s): E05, E06, E07, E08, and E09]**

### **6.1. Limitations and Standards**

- 6.1.1. NO<sub>x</sub> emissions from the Solar Taurus 60 Turbines (E05 & E06), Solar Mars Turbine (E08), and the Solar Taurus 70 Turbine (E09) shall not exceed 25 ppm at 15% O<sub>2</sub> (or an alternative limit of 150 ng/J of useful output). Additional, for units less than or equal to 30 MW output, under low load (less than 75% load) or low temperature (less than 0°F) conditions these turbines shall not exceed 150 ppm at 15 percent O<sub>2</sub> or 1,100 ng/J of useful output (8.7 lb/MWh)  
**[45CSR16; 40CFR§60.4320(a), 45CSR13 Permit R13-2715, Condition 4.1.14]**
- 6.1.2. The Solar Taurus 60 Turbines (E05 & E06), Solar Mars Turbine (E08), and the Solar Taurus 70 Turbine (E09) shall only burn fuel with a total potential SO<sub>2</sub> emission rate of less than 0.06 lb/MMBTU.  
**[45CSR16; 40CFR§60.4330(a)(2), 45CSR13 Permit R13-2715, Condition 4.1.16]**
- 6.1.3. The permittee 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.  
**[45CSR16; 40CFR§60.4333(a)]**
- 6.1.4. If you are not using water or steam injection to control NO<sub>x</sub> emissions, you must perform annual performance tests in accordance with 40CFR§60.4400 to demonstrate continuous compliance. If the NO<sub>x</sub> emission result from the performance test is less than or equal to 75 percent of the NO<sub>x</sub> 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<sub>x</sub> emission limit for the turbine, you must resume annual performance tests.  
**[45CSR16; 40CFR§60.4340(a)]**
- 6.1.5. You must monitor the total sulfur content of the fuel being fired in the turbine, except as provided in §60.4365.  
**[45CSR16; 40CFR§60.4360]**
- 6.1.6. NO<sub>x</sub> emissions from the Solar Saturn 10 Turbine (E07) shall not exceed 100 ppm at 15% O<sub>2</sub> (or an alternative limit of 690 ng/J of useful output). Additional, for units less than or equal to 30 MW output, under low load (less than 75% load) or low temperature (less than 0°F) conditions these turbines shall not exceed 150 ppm at 15 percent O<sub>2</sub> or 1,100 ng/J of useful output (8.7 lb/MWh)  
**[45CSR16; 40CFR§60.4320(a), 45CSR13 Permit R13-2715, Condition 4.1.15]**  
*This requirement streamlines compliance with the Rule 13 limit of 150 ppm.*

### **6.2. Monitoring Requirements**

- 6.2.1. 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 SO<sub>2</sub>/J (0.060 lb SO<sub>2</sub>/MMBtu) heat input for units located in continental areas. You must use one of 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 26 ng SO<sub>2</sub>/J (0.060 lb SO<sub>2</sub>/MMBtu) heat input for continental areas; or

- b. Representative fuel sampling data which show that the sulfur content of the fuel does not exceed 26 ng SO<sub>2</sub>/J (0.060 lb SO<sub>2</sub>/MMBtu) heat input for continental areas. At a minimum, the amount of fuel sampling data specified in section 2.3.1.4 or 2.3.2.4 of appendix D to part 75 of this chapter is required.

**[45CSR16; 40CFR§60.4365, 45CSR13 Permit R13-2715, Condition 4.3.10]**

### 6.3. Testing Requirements

6.3.1. 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.

- a. The permittee must conduct an initial performance test, as required in §60.8. Subsequent NO<sub>x</sub> performance tests shall be conducted on an annual basis (no more than 14 calendar months following the previous performance test).

1. There are two general methodologies that you may use to conduct the performance tests. For each test run:

- i. Measure the NO<sub>x</sub> concentration (in parts per million (ppm)), using EPA Method 7E or EPA Method 20 in appendix A of this part. For units complying with the output based standard, concurrently measure the stack gas flow rate, using EPA Methods 1 and 2 in appendix A of this part, and measure and record the electrical and thermal output from the unit. Then, use the following equation to calculate the NO<sub>x</sub> emission rate:

$$E = \frac{1.194 \times 10^{-7} * (NO_x)_e * Q_{std}}{P} \quad (\text{Eq. 5})$$

Where:

E = NO<sub>x</sub> emission rate, in lb/MWh

1.194 × 10<sup>-7</sup> = conversion constant, in lb/dscf-ppm

(NO<sub>x</sub>)<sub>e</sub> = average NO<sub>x</sub> concentration for the run, in ppm

Q<sub>std</sub> = stack gas volumetric flow rate, in dscf/hr

P = gross electrical and mechanical energy output of the combustion turbine, in MW (for simple-cycle operation), for combined-cycle operation, the sum of all electrical and mechanical output from the combustion and steam turbines, or, for combined heat and power operation, the sum of all electrical and mechanical output from the combustion and steam turbines plus all useful recovered thermal output not used for additional electric or mechanical generation, in MW, calculated according to §60.4350(f)(2); or

- ii. Measure the NO<sub>x</sub> and diluent gas concentrations, using either EPA Methods 7E and 3A, or EPA Method 20 in appendix A of this part. Concurrently measure the heat input to the unit, using a fuel flowmeter (or flowmeters), and measure the electrical and thermal output of the unit. Use EPA Method 19 in appendix A of this part to calculate the NO<sub>x</sub> emission rate in lb/MMBtu. Then, use Equations 1 and, if necessary, 2 and 3 in §60.4350(f) to calculate the NO<sub>x</sub> emission rate in lb/MWh.

2. Sampling traverse points for NO<sub>x</sub> and (if applicable) diluent gas are to be selected following EPA Method 20 or EPA Method 1 (non-particulate procedures), and sampled for equal time intervals. The sampling must be performed with a traversing single-hole probe, or, if feasible, with a

stationary multi-hole probe that samples each of the points sequentially. Alternatively, a multi-hole probe designed and documented to sample equal volumes from each hole may be used to sample simultaneously at the required points.

3. Notwithstanding paragraph (a)(2) of this section, you may test at fewer points than are specified in EPA Method 1 or EPA Method 20 in appendix A of this part if the following conditions are met:
  - i. The permittee may perform a stratification test for NO<sub>x</sub> and diluent pursuant to
    - A. [Reserved], or
    - B. The procedures specified in section 6.5.6.1(a) through (e) of appendix A of part 75 of this chapter.
  - ii. Once the stratification sampling is completed, you may use the following alternative sample point selection criteria for the performance test:
    - A. If each of the individual traverse point NO<sub>x</sub> concentrations is within ±10 percent of the mean concentration for all traverse points, or the individual traverse point diluent concentrations differs by no more than ±5ppm or ±0.5 percent CO<sub>2</sub>(or O<sub>2</sub>) from the mean for all traverse points, then you may use three points (located either 16.7, 50.0 and 83.3 percent of the way across the stack or duct, or, for circular stacks or ducts greater than 2.4 meters (7.8 feet) in diameter, at 0.4, 1.2, and 2.0 meters from the wall). The three points must be located along the measurement line that exhibited the highest average NO<sub>x</sub> concentration during the stratification test; or
    - B. For turbines with a NO<sub>x</sub> standard greater than 15 ppm @ 15% O<sub>2</sub>, you may sample at a single point, located at least 1 meter from the stack wall or at the stack centroid if each of the individual traverse point NO<sub>x</sub> concentrations is within ±5 percent of the mean concentration for all traverse points, or the individual traverse point diluent concentrations differs by no more than ±3ppm or ±0.3 percent CO<sub>2</sub> (or O<sub>2</sub>) from the mean for all traverse points; or
    - C. For turbines with a NO<sub>x</sub> standard less than or equal to 15 ppm @ 15% O<sub>2</sub>, you may sample at a single point, located at least 1 meter from the stack wall or at the stack centroid if each of the individual traverse point NO<sub>x</sub> concentrations is within ±2.5 percent of the mean concentration for all traverse points, or the individual traverse point diluent concentrations differs by no more than ±1ppm or ±0.15 percent CO<sub>2</sub> (or O<sub>2</sub>) from the mean for all traverse points

**[45CSR16; 40CFR§60.4400(a) and 45CSR13 Permit R13-2715, Condition 4.2.1]**

## **6.4. Recordkeeping Requirements**

- 6.4.1. N/A

## **6.5. Reporting Requirements**

- 6.5.1. 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 40CFR§60.7(c). Excess emissions must be reported for all periods of unit operation, including start-up, shutdown, and malfunction.

**[45CSR16; 40CFR§60.4375(a) and 45CSR13 Permit R13-2715, Condition 4.4.1]**

- 6.5.2. For each affected unit that performs annual performance tests in accordance with 40CFR§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.

**[45CSR16; 40CFR§60.4375(b) and 45CSR13 Permit R13-2715, Condition 4.4.1]**

- 6.5.3. All reports required under §60.7(c) must be postmarked by the 30th day following the end of each 6-month period.

**[45CSR16; 40CFR§60.4395]**

**6.6. Compliance Plan**

- 6.6.1. None

## **APPENDIX C**

### **ELECTRONIC SUBMITTAL**

#### **Title V Operating Permit Renewal Application**

**Seneca Compressor Station, Facility ID No. 071-00008  
Seneca Rocks, 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:	Seneca - A01 - Lube Oil Tank
City:	Seneca Rocks
State:	West Virginia
Company:	Columbia Pipeline Group
Type of Tank:	Vertical Fixed Roof Tank
Description:	Seneca Compressor Station

**Tank Dimensions**

Shell Height (ft):	11.50
Diameter (ft):	5.50
Liquid Height (ft) :	11.50
Avg. Liquid Height (ft):	6.00
Volume (gallons):	2,000.00
Turnovers:	12.00
Net Throughput(gal/yr):	24,000.00
Is Tank Heated (y/n):	N

**Paint Characteristics**

Shell Color/Shade:	Gray/Light
Shell Condition:	Good
Roof Color/Shade:	Gray/Light
Roof Condition:	Good

**Roof Characteristics**

Type:	Dome
Height (ft)	1.00
Radius (ft) (Dome Roof)	5.50

**Breather Vent Settings**

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

Meteorological Data used in Emissions Calculations: Pittsburgh, Pennsylvania (Avg Atmospheric Pressure = 14.11 psia)

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

**Seneca - A01 - Lube Oil Tank - Vertical Fixed Roof Tank**  
**Seneca Rocks, 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	56.69	48.70	64.69	52.55	0.0058	0.0043	0.0077	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0065

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

**Seneca - A01 - Lube Oil Tank - Vertical Fixed Roof Tank**  
**Seneca Rocks, West Virginia**

<b>Annual Emission Calculations</b>	
Standing Losses (lb):	0.4135
Vapor Space Volume (cu ft):	143.0734
Vapor Density (lb/cu ft):	0.0001
Vapor Space Expansion Factor:	0.0579
Vented Vapor Saturation Factor:	0.9981
<b>Tank Vapor Space Volume:</b>	
Vapor Space Volume (cu ft):	143.0734
Tank Diameter (ft):	5.5000
Vapor Space Outage (ft):	6.0220
Tank Shell Height (ft):	11.5000
Average Liquid Height (ft):	6.0000
Roof Outage (ft):	0.5220
<b>Roof Outage (Dome Roof)</b>	
Roof Outage (ft):	0.5220
Dome Radius (ft):	5.5000
Shell Radius (ft):	2.7500
<b>Vapor Density</b>	
Vapor Density (lb/cu ft):	0.0001
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0058
Daily Avg. Liquid Surface Temp. (deg. R):	516.3645
Daily Average Ambient Temp. (deg. F):	50.3083
Ideal Gas Constant R (psia cu ft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	512.2183
Tank Paint Solar Absorptance (Shell):	0.5400
Tank Paint Solar Absorptance (Roof):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,202.9556
<b>Vapor Space Expansion Factor</b>	
Vapor Space Expansion Factor:	0.0579
Daily Vapor Temperature Range (deg. R):	31.9767
Daily Vapor Pressure Range (psia):	0.0034
Breather Vent Press. Setting Range (psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0058
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0043
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0077
Daily Avg. Liquid Surface Temp. (deg R):	516.3645
Daily Min. Liquid Surface Temp. (deg R):	508.3704
Daily Max. Liquid Surface Temp. (deg R):	524.3587
Daily Ambient Temp. Range (deg. R):	19.1500
<b>Vented Vapor Saturation Factor</b>	
Vented Vapor Saturation Factor:	0.9981
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0058
Vapor Space Outage (ft):	6.0220
<b>Working Losses (lb):</b>	
Working Losses (lb):	0.4337
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0058
Annual Net Throughput (gal/yr.):	24,000.0000
Annual Turnovers:	12.0000
Turnover Factor:	1.0000
Maximum Liquid Volume (gal):	2,000.0000
Maximum Liquid Height (ft):	11.5000
Tank Diameter (ft):	5.5000
Working Loss Product Factor:	1.0000
<b>Total Losses (lb):</b>	<b>0.8472</b>



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

**Emissions Report for: Annual**

**Seneca - A01 - Lube Oil Tank - Vertical Fixed Roof Tank**  
**Seneca Rocks, West Virginia**

Components	Losses(lbs)		
	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	0.43	0.41	0.85



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

**Identification**

User Identification:	Seneca - A02 - Gasoline Tank
City:	Seneca Rocks
State:	West Virginia
Company:	Columbia Pipeline Group
Type of Tank:	Horizontal Tank
Description:	Seneca Compressor Station

**Tank Dimensions**

Shell Length (ft):	11.50
Diameter (ft):	5.50
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: Pittsburgh, Pennsylvania (Avg Atmospheric Pressure = 14.11 psia)

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

**Seneca - A02 - Gasoline Tank - Horizontal Tank**  
**Seneca Rocks, 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	56.69	48.70	64.69	52.55	4.8617	4.1450	5.6748	66.0000			92.00	Option 4: RVP=10, ASTM Slope=3

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

**Seneca - A02 - Gasoline Tank - Horizontal Tank**  
**Seneca Rocks, West Virginia**

<b>Annual Emission Calculations</b>	
Standing Losses (lb):	475.4993
Vapor Space Volume (cu ft):	174.0257
Vapor Density (lb/cu ft):	0.0579
Vapor Space Expansion Factor:	0.2209
Vented Vapor Saturation Factor:	0.5853
<b>Tank Vapor Space Volume:</b>	
Vapor Space Volume (cu ft):	174.0257
Tank Diameter (ft):	5.5000
Effective Diameter (ft):	8.9763
Vapor Space Outage (ft):	2.7500
Tank Shell Length (ft):	11.5000
<b>Vapor Density</b>	
Vapor Density (lb/cu ft):	0.0579
Vapor Molecular Weight (lb/lb-mole):	66.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.8617
Daily Avg. Liquid Surface Temp. (deg. R):	516.3645
Daily Average Ambient Temp. (deg. F):	50.3083
Ideal Gas Constant R (psia cu ft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	512.2183
Tank Paint Solar Absorptance (Shell):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,202.9556
<b>Vapor Space Expansion Factor</b>	
Vapor Space Expansion Factor:	0.2209
Daily Vapor Temperature Range (deg. R):	31.9767
Daily Vapor Pressure Range (psia):	1.5297
Breather Vent Press. Setting Range (psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.8617
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	4.1450
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	5.6748
Daily Avg. Liquid Surface Temp. (deg R):	516.3645
Daily Min. Liquid Surface Temp. (deg R):	508.3704
Daily Max. Liquid Surface Temp. (deg R):	524.3587
Daily Ambient Temp. Range (deg. R):	19.1500
<b>Vented Vapor Saturation Factor</b>	
Vented Vapor Saturation Factor:	0.5853
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.8617
Vapor Space Outage (ft):	2.7500
<b>Working Losses (lb):</b>	
Working Losses (lb):	183.3571
Vapor Molecular Weight (lb/lb-mole):	66.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.8617
Annual Net Throughput (gal/yr.):	24,000.0000
Annual Turnovers:	0.0000
Turnover Factor:	1.0000
Tank Diameter (ft):	5.5000
Working Loss Product Factor:	1.0000
<b>Total Losses (lb):</b>	<b>658.8564</b>



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

**Emissions Report for: Annual**

**Seneca - A02 - Gasoline Tank - Horizontal Tank**  
**Seneca Rocks, West Virginia**

Components	Losses(lbs)		
	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 10)	183.36	475.50	658.86



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

**Identification**

User Identification:	Seneca - A03 - Used Oil Tank
City:	Seneca Rocks
State:	West Virginia
Company:	Columbia Pipeline Group
Type of Tank:	Horizontal Tank
Description:	Seneca Compressor Station

**Tank Dimensions**

Shell Length (ft):	5.50
Diameter (ft):	4.00
Volume (gallons):	500.00
Turnovers:	0.00
Net Throughput(gal/yr):	6,000.00
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: Pittsburgh, Pennsylvania (Avg Atmospheric Pressure = 14.11 psia)

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

**Seneca - A03 - Used Oil Tank - Horizontal Tank**  
**Seneca Rocks, 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	56.69	48.70	64.69	52.55	0.0058	0.0043	0.0077	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0065

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

**Seneca - A03 - Used Oil Tank - Horizontal Tank**  
**Seneca Rocks, West Virginia**

Annual Emission Calculations	
Standing Losses (lb):	0.1274
Vapor Space Volume (cu ft):	44.0223
Vapor Density (lb/cu ft):	0.0001
Vapor Space Expansion Factor:	0.0579
Vented Vapor Saturation Factor:	0.9994
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	44.0223
Tank Diameter (ft):	4.0000
Effective Diameter (ft):	5.2939
Vapor Space Outage (ft):	2.0000
Tank Shell Length (ft):	5.5000
Vapor Density	
Vapor Density (lb/cu ft):	0.0001
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0058
Daily Avg. Liquid Surface Temp. (deg. R):	516.3645
Daily Average Ambient Temp. (deg. F):	50.3083
Ideal Gas Constant R (psia cu ft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	512.2183
Tank Paint Solar Absorptance (Shell):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,202.9556
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0579
Daily Vapor Temperature Range (deg. R):	31.9767
Daily Vapor Pressure Range (psia):	0.0034
Breather Vent Press. Setting Range (psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0058
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0043
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0077
Daily Avg. Liquid Surface Temp. (deg R):	516.3645
Daily Min. Liquid Surface Temp. (deg R):	508.3704
Daily Max. Liquid Surface Temp. (deg R):	524.3587
Daily Ambient Temp. Range (deg. R):	19.1500
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9994
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0058
Vapor Space Outage (ft):	2.0000
Working Losses (lb):	
Working Losses (lb):	0.1084
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0058
Annual Net Throughput (gal/yr.):	6,000.0000
Annual Turnovers:	0.0000
Turnover Factor:	1.0000
Tank Diameter (ft):	4.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	0.2358



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

**Emissions Report for: Annual**

**Seneca - A03 - Used Oil Tank - Horizontal Tank**  
**Seneca Rocks, West Virginia**

Components	Losses(lbs)		
	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	0.11	0.13	0.24



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

**Identification**

User Identification:	Seneca - A05 & A06 - Pipeline Liquids Tank
City:	Seneca Rocks
State:	West Virginia
Company:	Columbia Pipeline Group
Type of Tank:	Horizontal Tank
Description:	Seneca 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: Pittsburgh, Pennsylvania (Avg Atmospheric Pressure = 14.11 psia)

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

**Seneca - A05 & A06 - Pipeline Liquids Tank - Horizontal Tank**  
**Seneca Rocks, 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	56.69	48.70	64.69	52.55	4.8617	4.1450	5.6748	66.0000			92.00	Option 4: RVP=10, ASTM Slope=3

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

**Seneca - A05 & A06 - Pipeline Liquids Tank - Horizontal Tank**  
**Seneca Rocks, West Virginia**

<b>Annual Emission Calculations</b>	
Standing Losses (lb):	966.4504
Vapor Space Volume (cu ft):	433.7199
Vapor Density (lb/cu ft):	0.0579
Vapor Space Expansion Factor:	0.2209
Vented Vapor Saturation Factor:	0.4773
<b>Tank Vapor Space Volume:</b>	
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
<b>Vapor Density</b>	
Vapor Density (lb/cu ft):	0.0579
Vapor Molecular Weight (lb/lb-mole):	66.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.8617
Daily Avg. Liquid Surface Temp. (deg. R):	516.3645
Daily Average Ambient Temp. (deg. F):	50.3083
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	512.2183
Tank Paint Solar Absorptance (Shell):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,202.9556
<b>Vapor Space Expansion Factor</b>	
Vapor Space Expansion Factor:	0.2209
Daily Vapor Temperature Range (deg. R):	31.9767
Daily Vapor Pressure Range (psia):	1.5297
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.8617
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	4.1450
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	5.6748
Daily Avg. Liquid Surface Temp. (deg R):	516.3645
Daily Min. Liquid Surface Temp. (deg R):	508.3704
Daily Max. Liquid Surface Temp. (deg R):	524.3587
Daily Ambient Temp. Range (deg. R):	19.1500
<b>Vented Vapor Saturation Factor</b>	
Vented Vapor Saturation Factor:	0.4773
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.8617
Vapor Space Outage (ft):	4.2500
<b>Working Losses (lb):</b>	
Working Losses (lb):	458.3927
Vapor Molecular Weight (lb/lb-mole):	66.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.8617
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
<b>Total Losses (lb):</b>	<b>1,424.8432</b>



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

**Emissions Report for: Annual**

**Seneca - A05 & A06 - Pipeline Liquids Tank - Horizontal Tank**  
**Seneca Rocks, West Virginia**

Components	Losses(lbs)		
	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 10)	458.39	966.45	1,424.84



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

**Identification**

User Identification:	Seneca - A13 - Pipeline Liquids Tank
City:	Seneca Rocks
State:	West Virginia
Company:	Columbia Pipeline Group
Type of Tank:	Horizontal Tank
Description:	Seneca Compressor Station

**Tank Dimensions**

Shell Length (ft):	5.00
Diameter (ft):	3.00
Volume (gallons):	150.00
Turnovers:	0.00
Net Throughput(gal/yr):	1,800.00
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: Pittsburgh, Pennsylvania (Avg Atmospheric Pressure = 14.11 psia)

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

**Seneca - A13 - Pipeline Liquids Tank - Horizontal Tank**  
**Seneca Rocks, 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	56.69	48.70	64.69	52.55	4.8617	4.1450	5.6748	66.0000			92.00	Option 4: RVP=10, ASTM Slope=3

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

**Seneca - A13 - Pipeline Liquids Tank - Horizontal Tank**  
**Seneca Rocks, West Virginia**

<b>Annual Emission Calculations</b>	
Standing Losses (lb):	75.7978
Vapor Space Volume (cu ft):	22.5114
Vapor Density (lb/cu ft):	0.0579
Vapor Space Expansion Factor:	0.2209
Vented Vapor Saturation Factor:	0.7212
<b>Tank Vapor Space Volume:</b>	
Vapor Space Volume (cu ft):	22.5114
Tank Diameter (ft):	3.0000
Effective Diameter (ft):	4.3713
Vapor Space Outage (ft):	1.5000
Tank Shell Length (ft):	5.0000
<b>Vapor Density</b>	
Vapor Density (lb/cu ft):	0.0579
Vapor Molecular Weight (lb/lb-mole):	66.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.8617
Daily Avg. Liquid Surface Temp. (deg. R):	516.3645
Daily Average Ambient Temp. (deg. F):	50.3083
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	512.2183
Tank Paint Solar Absorptance (Shell):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,202.9556
<b>Vapor Space Expansion Factor</b>	
Vapor Space Expansion Factor:	0.2209
Daily Vapor Temperature Range (deg. R):	31.9767
Daily Vapor Pressure Range (psia):	1.5297
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.8617
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	4.1450
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	5.6748
Daily Avg. Liquid Surface Temp. (deg R):	516.3645
Daily Min. Liquid Surface Temp. (deg R):	508.3704
Daily Max. Liquid Surface Temp. (deg R):	524.3587
Daily Ambient Temp. Range (deg. R):	19.1500
<b>Vented Vapor Saturation Factor</b>	
Vented Vapor Saturation Factor:	0.7212
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.8617
Vapor Space Outage (ft):	1.5000
<b>Working Losses (lb):</b>	
Working Losses (lb):	13.7518
Vapor Molecular Weight (lb/lb-mole):	66.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.8617
Annual Net Throughput (gal/yr.):	1,800.0000
Annual Turnovers:	0.0000
Turnover Factor:	1.0000
Tank Diameter (ft):	3.0000
Working Loss Product Factor:	1.0000
<b>Total Losses (lb):</b>	<b>89.5496</b>



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

**Emissions Report for: Annual**

**Seneca - A13 - Pipeline Liquids Tank - Horizontal Tank**  
**Seneca Rocks, West Virginia**

Components	Losses(lbs)		
	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 10)	13.75	75.80	89.55

