


**BUREAU OF AIR MANAGEMENT
NEW SOURCE REVIEW PERMIT
TO CONSTRUCT AND OPERATE A STATIONARY SOURCE**

Issued pursuant to Title 22a of the Connecticut General Statutes (CGS) and Section 22a-174-3a of the Regulations of Connecticut State Agencies (RCSA).

Owner/Operator	Algonquin Gas Transmission, LLC
Address	P.O. Box 1642, Houston, TX 77251
Equipment Location	Cromwell Compressor Station 252 Shunpike Road, Cromwell, CT 06416
Equipment Description	Solar Centaur 40-T4702S Natural Gas Turbine
Town-Permit Numbers	043-0006
Premises Number	5
Stack Number	8
Modification Issue Date	August 16, 2024
Prior Permit Issue Dates	June 25, 1985 (Original Operating Permit) August 16, 1995 (Modification) May 10, 2004 (Modification) June 1, 2015 (Modification)
Expiration Date	None

for 
Katherine S. Dykes
Commissioner

August 16, 2024

Date

This permit specifies necessary terms and conditions for the operation of this equipment to comply with state and federal air quality standards. The Permittee shall at all times comply with the terms and conditions stated herein.

PART I. DESIGN SPECIFICATIONS

A. General Description

Algonquin Gas Transmission, LLC (Algonquin) transports natural gas via underground pipelines from New Jersey through southern New England to eastern Massachusetts or in reverse. At several points along the pipeline, the gas must be recompressed to ensure that it continues to move along the pipeline and can be delivered to customers at serviceable pressures. The gas is compressed by gas-fired turbine driven centrifugal compressors and gas-fired reciprocating internal combustion engine compressors. The natural gas used to fuel the gas-fired units comes from Algonquin's pipeline.

B. Equipment Design Specifications

1. Turbine
 - a. Maximum Fuel Firing Rate (scfh):
 - 50,512 at 0 °F
 - 46,868 at 50 °F
 - b. Maximum Gross Heat Input (MMBtu/hr):
 - 51.52 at 0 °F
 - 47.81 at 50 °F

C. Control Equipment Design Specifications

SoLoNOx

1. Make and Model: Solar
2. Pollutant Controlled: NOx

D. Stack Parameters

1. Minimum Stack Height (ft): 59.0
2. Minimum Exhaust Gas Flow Rate at 100% load (acfm): 73,112
3. Stack Exit Temperature (°F): 873
4. Minimum Distance from Stack to Property Line (ft): 480

PART II. DEFINITIONS

- A.** "Low load/speed operation" shall be defined as periods of operation of the turbine with SoLoNOx disabled, excluding startup/shutdown, low temperature events, and malfunctions.
- B.** "Low temperature event" shall be defined as operation of the turbine when the inlet air temperature is below 0°F.

- C. "Malfunction" shall be defined as any sudden, infrequent, and not reasonably preventable failure of air pollution control equipment, process equipment or a process to operate in accordance with the allowable limits in Part IV.A of this permit. Failures that were caused in part by poor maintenance or careless operation are not malfunctions.
- D. "Shutdown event" shall be defined as the initial lowering of turbine fuel combustion rate beginning once SoLoNO_x is inactive and ending at the point which the fuel combustion process has stopped.
- E. "Startup event" shall be defined as the period of time from initiation of fuel combustion until SoLoNO_x is enabled and active.
- F. "Steady-state" operation shall be defined as operation of the turbine when SoLoNO_x is enabled and active and ambient temperatures are above 0°F.
- G. "Transient event" shall be defined as any infrequent or unplanned operation of the turbine outside of manufacturer warranty conditions with SoLoNO_x enabled but inactive, not including startup/shutdown, low load/speed operation, or low temperature events.

PART III. OPERATIONAL CONDITIONS

A. Turbine

- 1. Fuel
 - a. Fuel Type(s): Natural Gas
 - b. Maximum Fuel Consumption over any Consecutive 12 Month Period (MMscf): 411
 - c. Maximum Natural Gas Sulfur Content: 20.0 grains/100scf [40 CFR §60.331(u)]
- 2. Startup and Shutdown Events
 - a. The duration of a startup event shall not exceed 10 minutes for a hot, warm or cold startup.
 - b. The duration of a shutdown event shall not exceed 10 minutes.
- 3. Low Load/Speed Operation
 - a. The duration of an event shall not exceed 30 minutes.
 - b. The Permittee shall not exceed 20 hours of low load/speed operation over any 12 consecutive month period for Permit No. 043-0006.

PART IV. ALLOWABLE EMISSION LIMITS

The Permittee shall not cause or allow this equipment to exceed the emission limits stated herein at any time, as determined in accordance with the applicable averaging periods defined in Part III of this permit or as specified in an approved stack test protocol.

An exceedance of either (i) the emission limits in the tables below, or (ii) the emissions limits developed for this permit due to an emergency, malfunction, or cleaning shall not be deemed a "Federally Permitted Release," as that term is used in 42 U.S.C. 9601(10).

A. Short Term Emission Limits

These short term emission limits do not apply during periods of startup and shutdown, unless otherwise noted.

1. Turbine Inlet Temperatures above 0 °F

Pollutant	lb/hr	lb/MMBtu	ppmvd @ 15% O ₂
PM/PM ₁₀	0.33		
SO _x	0.18		
NO _x	7.78	0.15	40.0
CO	5.64		
VOC	0.32		

B. Allowable Short Term Emissions During Low Temperature Events

1. Turbine Inlet Temperature Between -20 °F and 0 °F

Pollutant	lb/hr
PM/PM ₁₀	0.35
SO _x	0.18
NO _x	22.83
CO	17.38
VOC	0.73

2. Turbine Inlet Temperatures Below -20 °F

Pollutant	lb/hr
PM/PM ₁₀	0.35
SO _x	0.18
NO _x	22.83
CO	17.38
VOC	1.09

C. Allowable Short Term Emissions During Transient Events and Low Load/Speed Operation

Pollutant	lb/minute
NO _x	0.38
CO	0.02
VOC	0.29

D. Allowable Short Term Emissions During Startup and Shutdown (at all temperatures)

Pollutant	Startup Emissions (lb/event)	Shutdown Emissions (lb/event)
NO _x	0.78	0.37
CO	76.7	33.6

E. Annual Emission Limits

Pollutant	tons per 12 consecutive months
PM/PM ₁₀	1.4
SO _x	0.8
NO _x	31.7
CO	22.9
VOC	1.5

F. Hazardous Air Pollutants

This equipment shall not cause an exceedance of the Maximum Allowable Stack Concentration (MASC) for any hazardous air pollutant (HAP) emitted and listed in RCSA Section 22a-174-29. [STATE ONLY REQUIREMENT]

G. Opacity

This equipment shall not exceed 10% opacity during any six minute block average as measured by 40 CFR 60, Appendix A, Reference Method 9.

H. Demonstration of compliance with the above emission limits shall be met by calculating the emission rates using the most recent approved stack test results for that pollutant, or if unavailable, emission factors from the following sources:

1. Turbine Inlet Air Temperatures above 0 °F

Criteria Pollutant	Source
PM/PM ₁₀	AP42 Table 3.1-2a, dated 4/00
SO _x	AP42 Table 3.1-2a, dated 4/00
NO _x	Most recent approved stack test
VOC	AP42 Table 3.1-2a, dated 4/00, adjusted with manufacturer's data
CO	Manufacturer's data

2. Turbine Inlet Air Temperatures Between -20 °F and 0 °F

Criteria Pollutant	Source
PM/PM ₁₀	Emission factors were calculated using Solar information and best engineering judgment.
SO _x	
NO _x	
CO	
VOC	

3. Turbine Inlet Air Temperatures Below -20 °F

Criteria Pollutant	Source
PM/PM ₁₀	Emission factors were calculated using Solar information and best engineering judgment.
SO _x	
NO _x	
CO	
VOC	

4. Startup/Shutdown Events, at all temperatures

Criteria Pollutant	Source
NOx	The startup/shutdown emission factors were calculated using Solar information and best engineering judgment.
CO	

5. Transient Events and Low Load/Speed Operation

Criteria Pollutant	Source
NOx	The transient event and low load/speed operation emission factors were calculated based on, not directly from, information provided by Solar, Product Information Letter 167 (PIL167) – Revision 6 (December 1, 2016) for full load operation at ambient temperature less than or equal to -20 °F, and best engineering judgment.
CO	
VOC	

- I. The commissioner may require other means (e.g. stack testing) to demonstrate compliance with the above emission limits, as allowed by state or federal statute, law or regulation.

PART V. MONITORING, RECORD KEEPING AND REPORTING REQUIREMENTS

A. Monitoring

1. The Permittee shall use gas metering devices to continuously monitor fuel feed to the turbine to show compliance with the limit in Part III of this permit.
2. The Permittee shall monitor the status of the SoLoNOx operation at all times.
3. The Permittee shall monitor all startup/shutdown, malfunction, low load/speed operation and transient events.
4. The Permittee shall continuously monitor the turbine inlet air temperature.
5. The Permittee shall perform inspections of the turbine, air pollution control equipment and monitoring equipment in accordance with manufacturer’s specification and written recommendations.

B. Record Keeping

1. The Permittee shall keep records of monthly and consecutive 12 month fuel consumption in units of standard cubic feet. The consecutive 12 month fuel consumption shall be determined by adding the current month’s fuel consumption to that of the previous 11 months. The Permittee shall make these calculations within 30 days of the end of the previous month.
2. The Permittee shall calculate and record the monthly and consecutive 12 month PM, PM₁₀, SO_x, NO_x, VOC and CO emissions, including startup and shutdown, in units of tons. The consecutive 12 month emissions shall be determined by adding (for each pollutant) the current month’s emissions to that of the previous 11 months. Such records shall include a sample calculation for each pollutant.

The Permittee shall make these calculations within 30 days of the end of the previous month.

3. The Permittee shall make and keep records of the Allowable Stack Concentration (ASC) and MASC calculations for the turbine to show compliance with RCSA Section 22a-174-29.
4. The Permittee shall keep on site a record of the vendor guaranteed emission rate for NO_x, CO and VOC at inlet air temperature greater than 0°F.
5. The Permittee shall make and keep records of turbine inlet air temperature on a no less frequent basis than hourly while the turbine is operating during the months in which low ambient temperatures are within the realm of reasonability (October, November, December, January, February and March). The Permittee may utilize ambient temperature monitoring data recorded at the nearest observing station which collects National Weather Service (NWS) data for data substitution purposes should the monitoring and recording system which is integral to the turbine malfunction.
6. The Permittee shall make and keep records of the date and hours of operation when the turbine inlet air temperature is greater than -20 °F and below or equal to 0 °F. Such records shall contain the following information:
 - a. date and time of the event;
 - b. duration of the event, and
 - c. total emissions emitted (lb) during the event.

These Emissions shall be counted towards the annual emissions limits in Part IV.E of this permit.

7. The Permittee shall make and keep records of the date and hours of operation when the turbine inlet air temperature is below -20 °F. Such records shall contain the following information:
 - a. date and time of the event;
 - b. duration of the event, and
 - c. total emissions emitted (lb) during the event.

These Emissions shall be counted towards the annual emissions limits in Part IV.E of this permit.

8. The Permittee shall keep records of the occurrence and duration of any startup, shutdown, or malfunction in the operation of the stationary gas turbine; or any malfunction of the air pollution control equipment [40 CFR §60.7(b)]. Such records shall contain the following information:
 - a. type of event (startup, shutdown, or malfunction);
 - b. equipment affected;
 - c. date of event;
 - d. duration of event (minutes);
 - e. fuel being used during event; and
 - f. total NO_x and CO emissions emitted (lb) during the event.
9. The Permittee shall make and keep records indicating the instances when the SoLoNO_x is disabled while the turbine is in operation, not including startup/shutdown, low load/speed operation, or low temperature events. Such records shall include:
 - a. the date and time the SoLoNO_x is disabled;
 - b. the duration the SoLoNO_x is disabled; and
 - c. the reason and corrective action taken.

10. The Permittee shall make and keep records of all transient events and low load/speed operation. Such records shall include, but not be limited to the following:
 - a. date and time of the event;
 - b. duration of the event, and
 - c. identification of transient event or low load/speed operation, if such event caused a shutdown of the turbine.

These Emissions shall be counted towards the annual emissions limits in Part IV.E of this permit.

11. The Permittee shall calculate and record NO_x, CO and VOC emissions during transient events and low load/speed operation using emission rates supplied by the manufacturer. These emissions shall be counted towards the annual emissions limits in Part IV.E of this permit.
12. The Permittee shall keep records of a current valid purchase contract, tariff sheet, or transportation contract which demonstrates the maximum total sulfur content of the natural gas burned in the combustion turbine.
13. The Permittee shall make and keep records of all exceedances of any operating parameter. Such records shall include:
 - a. the date and time of the exceedance;
 - b. a detailed description of the exceedance;
 - c. the duration of the exceedance; and
 - d. reason and corrective action taken.
14. The Permittee shall maintain records of the maintenance/repairs/parts replacement of the turbine. The maintenance records shall include, at a minimum, a description of the maintenance activity, the date the maintenance was performed, and cost of service.
15. The Permittee shall keep records of stack testing results.
16. The Permittee shall keep records of manufacturer's information for the SoLoNO_x.
17. The Permittee shall keep all records required by this permit for a period of no less than five years and shall submit such records to the commissioner upon request.

C. Reporting

1. The Permittee shall submit annual emission inventory statements as requested by the commissioner.
2. The Permittee shall notify the commissioner in writing of a deviation from an emission limit (short-term and/or long term) or operational parameter, used as a surrogate, as follows:
 - a. For any hazardous air pollutant, no later than 24 hours after such exceedance commenced; and
 - b. For any other regulated air pollutant or operating parameter, no later than ten days after such exceedance commenced.

The notification shall include the following:

- a. a description of the circumstances surrounding the cause or likely cause of such deviation; and
- b. a description of all corrective actions and preventive measures taken and/or planned with respect to such deviation and the dates of such actions and measures.
- c. the quantity of excess emissions occurring during the event.
- d. the duration of the event.

PART VI. STACK EMISSION TEST REQUIREMENTS

- A. Stack emission testing shall be performed in accordance with the Emission Test Guidelines available on the DEEP website at www.ct.gov/deep/stacktesting.

Stack testing shall be required for the following pollutant: NO_x

- B. Recurrent stack testing for NO_x shall be performed within five years from the previous stack test to demonstrate compliance with the limits in Part IV of this permit.
- E. The maximum rated capacity of the turbine may be corrected for the ambient temperature at the time of stack testing using Equation 1 below.
Note: The equation is applicable at temperatures between 0 °F and 100 °F

Equation 1:

$$Y: -0.0007X^2 - 0.0549X + 51.97$$

Where Y= Heat Input (MMBtu/hr)
X= Ambient Air Temperature (°F)

- F. Stack test results shall be reported in units of lb/hr, ppmvd at 15% O₂ and lb/MMBtu.
- G. The commissioner retains the right to require stack testing of any pollutant at any time to demonstrate compliance.

PART VII. OPERATION AND MAINTENANCE REQUIREMENTS

- A. The Permittee shall operate and maintain this equipment in accordance with the manufacturer's specifications and written recommendations.
- B. The Permittee shall operate and maintain this equipment and air pollution control equipment in a manner consistent with good air pollution control practices for minimizing emissions at all times including during startup, shutdown, and malfunction.
- C. The Permittee shall properly operate the control equipment at all times that this equipment is in operation and emitting air pollutants.

PART VIII. SPECIAL REQUIREMENTS

- A. The Permittee shall comply with all applicable sections of the following New Source Performance Standard(s) at all times.

Title 40 CFR Part 60, Subpart: GG

Copies of the Code of Federal Regulations (CFR) are available online at the U.S. Government Printing Office website.

- B. The Permittee shall operate this facility at all times in a manner so as not to violate or contribute significantly to the violation of any applicable state noise control regulations, as set forth in RCSA Sections 22a-69-1 through 22a-69-7.4. [STATE ONLY REQUIREMENT]

C. Premises Emissions Summary

1. On January 1st of each calendar year, if the potential emissions of NO_x or VOC from the premises are equal to or greater than 25 tons per year per pollutant, then for such pollutant(s), the Permittee shall:
 - a. Monitor NO_x and/or VOC emissions, as applicable, from the premises for such calendar year.
 - b. Calculate and record annual NO_x and/or VOC emissions, as applicable, from the premises for such calendar year, in units of tons. The Permittee shall make these calculations on or before February 1st of the following year with respect to the previous calendar year. Such records shall include a sample calculation(s).
 - c. If actual NO_x and/or VOC emissions, as applicable, from the premises are equal to or greater than 25 tons for such calendar year, the Permittee shall submit to the commissioner, on or before March 1st of the following year, an annual emissions summary with respect to the premises for the previous calendar year. Such summary shall be submitted on forms prescribed or provided by the commissioner.
2. A Permittee is exempt from Part VIII.C.1 requirements of this permit if, on January 1st of the subject year, the premises was operating in accordance with any of the following:
 - a. A valid Title V permit issued pursuant to RCSA section 22a-174-33;
 - b. RCSA section 22a-174-33a; or
 - c. RCSA section 22a-174-33b

PART IX. ADDITIONAL TERMS AND CONDITIONS

- A.** This permit does not relieve the Permittee of the responsibility to conduct, maintain and operate the regulated activity in compliance with all applicable requirements of any federal, municipal or other state agency. Nothing in this permit shall relieve the Permittee of other obligations under applicable federal, state and local law.
- B.** Any representative of the DEEP may enter the Permittee's site in accordance with constitutional limitations at all reasonable times without prior notice, for the purposes of inspecting, monitoring and enforcing the terms and conditions of this permit and applicable state law.
- C.** This permit may be revoked, suspended, modified or transferred in accordance with applicable law.
- D.** This permit is subject to and in no way derogates from any present or future property rights or other rights or powers of the State of Connecticut and conveys no property rights in real estate or material, nor any exclusive privileges, and is further subject to any and all public and private rights and to any federal, state or local laws or regulations pertinent to the facility or regulated activity affected thereby. This permit shall neither create nor affect any rights of persons or municipalities who are not parties to this permit.
- E.** Any document, including any notice, which is required to be submitted to the commissioner under this permit shall be signed by a duly authorized representative of the Permittee and by the person who is responsible for actually preparing such document, each of whom shall certify in writing as follows: "I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that any false statement made in the submitted information may be punishable as a criminal offense under section 22a-175 of the Connecticut General Statutes, under section 53a-157b of the Connecticut General Statutes, and in accordance with any applicable statute."

- F.** Nothing in this permit shall affect the commissioner's authority to institute any proceeding or take any other action to prevent or abate violations of law, prevent or abate pollution, recover costs and natural resource damages, and to impose penalties for violations of law, including but not limited to violations of this or any other permit issued to the Permittee by the commissioner.
- G.** Within 15 days of the date the Permittee becomes aware of a change in any information submitted to the commissioner under this permit, or that any such information was inaccurate or misleading or that any relevant information was omitted, the Permittee shall submit the correct or omitted information to the commissioner.
- H.** The date of submission to the commissioner of any document required by this permit shall be the date such document is received by the commissioner. The date of any notice by the commissioner under this permit, including but not limited to notice of approval or disapproval of any document or other action, shall be the date such notice is personally delivered or the date three days after it is mailed by the commissioner, whichever is earlier. Except as otherwise specified in this permit, the word "day" means calendar day. Any document or action which is required by this permit to be submitted or performed by a date which falls on a Saturday, Sunday or legal holiday shall be submitted or performed by the next business day thereafter.
- I.** Any document required to be submitted to the commissioner under this permit shall, unless otherwise specified in writing by the commissioner, be directed to: Office of Director; Enforcement Division; Bureau of Air Management; Department of Energy and Environmental Protection; 79 Elm Street, 5th Floor; Hartford, Connecticut 06106-5127.