Connecticut Department of

ENERGY &
ENVIRONMENTAL
PROTECTION

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. Box1642, Houston, TX 77251
Equipment Location	Chaplin Compressor Station 539 Tower Hill Road, Chaplin, CT 06235
Equipment Description	Solar Taurus 60-T7002S Natural Gas Turbine (simple cycle) with Low NOx burners
Town-Permit Numbers	034-0001
Premises Number	2
Stack Number	1
Revision Issue Date	March 24, 2016
Prior Permit Issue Date	April 26, 1996 (original Operating Permit) May 10, 2004 (Modification) June 1, 2015 (Modification)
Expiration Date	None

/s/Anne Gobin for
Robert J. Klee
Commissioner

March 24, 2016
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 pipeline 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. Gas is compressed at the Chaplin Compressor Station using two gas-fired turbine driven centrifugal compressors. The natural gas used to fuel the gas-fired units is supplied from Algonquin's pipeline.

B. Equipment Design Specifications

1. Turbine
   a. Maximum Fuel Firing Rate (scfh):
      - 64,291 at 0 °F
      - 60,275 at 50 °F

   b. Maximum Gross Heat Input (MMBtu/hr):
      - 65.58 at 0 °F
      - 61.48 at 50 °F

C. Control Equipment Design Specifications

Low NOx burner

D. Stack Parameters

1. Minimum Stack Height (ft): 51.0

2. Minimum Exhaust Gas Flow Rate at 100% load (acfm): 87,505

3. Stack Exit Temperature (°F): 946

4. Minimum Distance from Stack to Property Line (ft): 350

PART II. OPERATIONAL CONDITIONS

A. Equipment

1. Turbine
   a. Fuel Type(s): Natural Gas
   b. Maximum Fuel Consumption over any Consecutive 12 Month Period (MMscf): 528
   c. Maximum Natural Gas Sulfur Content: 20.0 grains/100scf [40 CFR §60.331(u)]

PART III. 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_{10}	0.43		
SOx	0.22		
NOx	9.91	0.15	42.0
VOC	0.40		
CO	7.18		

B. Startup and Shutdown Emission Limits

Pollutant	Startup Emissions (1)&(2) (lb/event)	Shutdown Emissions (1)&(2) (lb/event)
NOx	0.92	0.44
CO	89.34	39.88

(1) The startup/shutdown values were calculated using Solar information and adjusted to account for site specific temperature, flowrate and startup/shutdown information.

(2) The Permittee shall minimize emissions during periods of startup and shutdown by the following work practices and time constraints:

- lb/event means “one startup” or “one shutdown;”
- The duration of startup shall not exceed 10 minutes for a hot, warm or cold startup;
- The duration of shutdown shall not exceed 10 minutes; and
- Emissions during these periods shall be counted towards the annual emission limits stated herein.

C. Annual Emission Limits

Pollutant	tons per 12 consecutive months
PM_{10}	1.8
SOx	1.0
NOx	40.7
CO	29.5
VOC	1.7

PART III. ALLOWABLE EMISSION LIMITS, continued

D. 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]

E. 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.

F. 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	Emission Factor (lb/MMSCF)	Source
PM_{10}	6.73	AP42 Table 3.1-2a, dated 4/00
SOx	3.47	AP42 Table 3.1-2a, dated 4/00
NOx	154.07	Manufacturer's data
VOC	6.27	AP42 Table 3.1-2a, dated 4/00, adjusted with manufacturer's data
CO	111.66	Manufacturer's data

2. Startup/Shutdown

Criteria Pollutant	Startup Emission Factor	Shutdown Emission Factor	Source
NOx	0.92 lb/event	0.44 lb/event	The startup/shutdown emission factors were calculated using Solar information and best engineering judgment.
CO	89.34 lb/event	39.88 lb/event	

3. 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 IV. MONITORING, RECORD KEEPING AND REPORTING REQUIREMENTS

A. Monitoring

The Permittee shall use gas metering devices to continuously monitor fuel feed to the turbine to show compliance with the limit in Part II of this permit.

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_{10}, SO_x, NOx, 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 Permitteee 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 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.

5. 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.

6. The Permittee shall keep records of stack testing results.

7. The Permittee shall keep records of manufacturer's information for the low NOx burner.

8. 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 V. STACK EMISSION TEST REQUIREMENTS

A. Stack emission testing shall be performed in accordance with the Emission Test Guidelines available on the DEEP website.

Stack testing shall be required for the following pollutant: ☒ NOx

B. Recurrent stack testing for NOx shall be performed within five years from the previous stack test to demonstrate compliance with the limits in Part III of this permit.

C. 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:

$$Y: -0.0005X^2 - 0.0719X + 65.152$$

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

D. Stack test results shall be reported in units of lb/hr, ppmvd at 15% O_2 and lb/MMBtu.

E. The commissioner retains the right to require stack testing of any pollutant at any time to demonstrate compliance.

PART VI. 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 VII. 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]

PART VIII. 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; Engineering & Enforcement Division; Bureau of Air Management; Department of Energy and Environmental Protection; 79 Elm Street, 5th Floor; Hartford, Connecticut 06106-5127.