



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Southeast Regional Office • 20 Riverside Drive, Lakeville MA 02347 • 508-946-2700

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Matthew A. Beaton
Secretary

Martin Suuberg
Commissioner

Draft
Prevention of Significant Deterioration Permit
Application No. SE-16-015
Transmittal No. X269143

NRG Canal 3 Development, LLC
Canal Generating Station
Canal 3 Project
9 Freezer Road
Sandwich, MA 02563

350-MW Simple-Cycle Combustion Turbine
Electric Generating Facility

Pursuant to the provisions of the Clean Air Act (CAA) Chapter I, Part C (42 U.S.C. Section 7470, et seq.), the regulations found at the Code of Federal Regulations Title 40, Section 52.21, and the Agreement for Delegation of the Federal Prevention of Significant Deterioration Program, dated April 2011, by the United States Environmental Protection Agency, Region 1 (“EPA”) to the Massachusetts Department of Environmental Protection (“MassDEP”), MassDEP is issuing a Prevention of Significant Deterioration (“PSD”) Permit to NRG Canal 3 Development, LLC (“the Permittee” or “Canal 3”) concerning its proposed installation and operation of a simple-cycle peaking combustion turbine electric generator and ancillary equipment to be located at 9 Freezer Road in Sandwich, MA (“Project”).

This information is available in alternate format. Contact Michelle Waters-Ekanem, Director of Diversity/Civil Rights at 617-292-5751.
TTY# MassRelay Service 1-800-439-2370
MassDEP Website: www.mass.gov/dep

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The proposed Project shall be designed, constructed, and operated in accordance with the conditions and limitations set forth herein. This PSD Permit is valid only for the equipment described herein and as submitted to MassDEP in the February 17, 2016 as revised in the October 2016 and the July 15, 2017 applications for a PSD Permit under 40 CFR 52.21 and subsequent application submittal addenda. In accordance with 40 CFR 124.15(b), this PSD Permit shall be effective 30 days after the date of service of notice of the final decision, unless review by the Environmental Appeals Board (EAB) is requested in accordance with 40 CFR 124.19. This Permit becomes invalid if the construction does not commence as defined in 40 CFR 52.21(b)(9) within 18 months after this PSD Permit takes effect, is discontinued for a period of 18 months or more, or is not completed within a reasonable time. Pursuant to 40 CFR 52.21, MassDEP may extend the 18-month period upon a satisfactory showing that an extension is justified. This Final PSD Permit does not relieve the Permittee from the obligation to comply with applicable state and federal air pollution control rules and regulations. Failure to comply with the terms and conditions of this PSD Permit may result in enforcement action by MassDEP and/or EPA pursuant to Sections 113 and 167 of the CAA.

This final document copy is being provided to you electronically by the
Department of Environmental Protection. A signed copy of this document
is on file at the DEP office listed on the letterhead.

Thomas Cushing
Permit Chief
Bureau of Air and Waste

August 23, 2017
Date Issued

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I. PROJECT DESCRIPTION (FOR INFORMATIONAL PURPOSES)

The Permittee proposed to modify the existing Canal Generating Station at 9 Freezer Road in Sandwich, Massachusetts by constructing one (1) new quick-starting simple-cycle combustion turbine and ancillary equipment. The existing Canal Station is subject to the terms and conditions of Final Air Quality Operating Permit 4V95058 and SE-13-022 (transmittal no. 108004 and X256286) dated June 12, 2013. The proposed construction (“the Project”) is a nominal 350-megawatt (“MW”) peaking electric generating turbine with ancillary equipment. The proposed Project is expected to operate as part of the “Ten-Minute Non-Spinning Reserve” (“TMNSR”) market, which includes resources in Independent System Operator – New England’s (“ISO-NE”) Real Time Operation with the ability to start-up in 10 minutes. The combustion turbine will run primarily on natural gas, with a limited amount of Ultra-Low Sulfur Diesel fuel (“ULSD”) as a backup fuel.

The Project consists of one simple-cycle combustion turbine with a nominal maximum electrical output of 350 MW¹. The Permittee has chosen a General Electric Company (GE) 7HA.02 combustion turbine. Other emissions units supporting the operation of the combustion turbine and addressed by this permit include one (1) ULSD-fired emergency generator engine, one (1) ULSD-fired emergency fire pump engine, and two (2) existing aqueous ammonia storage tanks.

II. EMISSION UNIT IDENTIFICATION

Each Emission Unit (“EU”) identified in Table 1 is subject to and regulated by this PSD Permit:

Table 1			
Emission Unit Identification			
EU	Description	Design Capacity	Pollution Control Device
10	Combustion Turbine: GE 7HA.02 (or equivalent)	3,425 MMBtu/hr heat input firing natural gas, 0 °F 3,471 MMBtu/hr heat input firing ULSD, 0 °F	Dry Low NO _x Combustor (Natural Gas) or Water Injection (ULSD) Low-NO _x , Selective Catalytic Reduction, Oxidation Catalyst
11	Emergency Generator Engine Caterpillar C-15 (or equivalent)	5.03 MMBtu/hr heat input 581 kW (mechanical)	None
12	Emergency Fire Pump Engine John Deere/Clarke JU4H-UFAD5G (or equivalent)	1.20 MMBtu/hr heat input 135 brake-horsepower	None

Table 1 Key:

- | | |
|---|-----------------------------------|
| °F = degrees Fahrenheit | NO _x = Nitrogen oxides |
| EU = Emission Unit | ULSD = Ultra-Low Sulfur Diesel |
| MMBtu/hr = million British thermal units per hour | |
| kW = kilowatts | |

¹ The gross electrical output of the Combustion Turbine Generator will vary from approximately 330 MW at higher ambient temperatures to approximately 365 MW at ambient temperatures less than 0 °F.

III. OPERATIONAL, PRODUCTION, AND EMISSION LIMITS

The Facility is subject to, and the Permittee shall ensure that the Facility shall not exceed the Operational, Production, and Emission Limits as contained in Table 2 (normal operation) and Table 2a (startup/shutdown operation) below, including footnotes:

Table 2			
Operational/Production and Emission Limits			
EU	Operational / Production Limit	Air Contaminant	Emission Limit⁽¹⁾⁽²⁾
10	1. Emission limits apply from first combustion of fuel until flame out except as noted in Table 2a. 2. Natural Gas and ULSD shall be the only fuels combusted in the CTG 3. ≤ 4,380 hours per consecutive 12-month period total operation (includes all fuels) 4. ≤ 4,380 hours per consecutive 12-month period operating firing natural gas. 5. ≤ 720 hours per consecutive 12-month period operating firing ULSD. 6. The Permittee shall operate the SCR, in accordance with the manufacturer’s recommendations, at all time during operation of the CTG.	NOx (natural gas)	31.5 lb/hr 0.0092 lb/MMBtu 2.5 ppmvd @ 15% O ₂ ⁽³⁾
		NOx (ULSD)	67.3 lb/hr 0.0194 lb/MMBtu 5.0 ppmvd @ 15% O ₂ ⁽³⁾
		Sulfur in Fuel	0.5 grains/100 scf (natural gas) 0.0015% sulfur by weight (ULSD)
		H ₂ SO ₄ (natural gas)	5.48 lb/hr ⁽⁶⁾ 0.0016 lb/MMBtu ⁽⁶⁾⁽⁷⁾
		H ₂ SO ₄ (ULSD)	6.25 lb/hr ⁽⁶⁾ 0.0018 lb/MMBtu ⁽⁶⁾⁽⁷⁾
		PM/PM ₁₀ /PM _{2.5} (natural gas) ⁽⁸⁾	18.1 lb/hr ⁽⁶⁾ 0.012 lb/MMBtu(< 75% load ≥ MECL ⁽⁴⁾) 0.0073 lb/MMBtu(≥ 75% load)
		PM/PM ₁₀ /PM _{2.5} (ULSD) ⁽⁸⁾	65.8 lb/hr ⁽⁶⁾ 0.046lb/MMBtu(< 75% load ≥ MECL ⁽⁴⁾) 0.026 lb/MMBtu(≥ 75% load)
		CO ₂	The applicable CO ₂ emission standard in 40 CFR part 60, subpart TTTT at §60.5520 and Table 2
		GHG, CO _{2e} (natural gas)	1,178 lb/MW-hr (gross) ⁽⁵⁾
		GHG, CO _{2e} (ULSD)	1,673 lb/MW-hr (gross) ⁽⁵⁾
		NOx	103.5 TPY
		PM/PM ₁₀ /PM _{2.5}	60.4 TPY
		H ₂ SO ₄	12.0 TPY
		CO _{2e}	932,325 TPY

Table 2 (continued)			
Operational/Production and Emission Limits			
EU	Operational / Production Limit	Air Contaminant	Emission Limit⁽¹⁾⁽²⁾
11	7. ≤ 300 hours of operation per consecutive 12-month period. 8. Ultra-Low Sulfur Diesel shall be the only fuel of use.	NOx	4.48 lb/hr 3.5 g/kW-hr
		Sulfur in Fuel	≤ 0.0015% by weight
		H ₂ SO ₄	0.000578 lb/hr 0.00012 lb/MMBtu
		PM/PM ₁₀ /PM _{2.5}	0.17 lb/hr 0.010 g/bhp-hr 0.13 g/kW-hr
		GHG, CO _{2e}	819 lb/hr 162.85 lb/MMBtu
		NOx	0.67 TPY
		PM/PM ₁₀ /PM _{2.5}	0.03 TPY
		H ₂ SO ₄	0.00009 TPY
12	9. ≤ 300 hours of operation per consecutive 12-month period. 10. Ultra-Low Sulfur Diesel shall be the only fuel of use.	NOx (and NMHC, combined total)	0.89 lb/hr 4.0 g/kW-hr
		Sulfur in Fuel	≤ 0.0015% by weight
		H ₂ SO ₄	0.000138 lb/hr 0.00012 lb/MMBtu
		PM/PM ₁₀ /PM _{2.5}	0.074 lb/hr 0.25 g/bhp-hr 0.33 g/kW-hr
		GHG, CO _{2e}	195 lb/hr 163.64 lb/MMBtu
		NOx	0.13 TPY
		PM/PM ₁₀ /PM _{2.5}	0.01 TPY
		H ₂ SO ₄	0.00002 TPY
GHG, (CO _{2e})	29 TPY		

Table 2 Notes:

1. Emission limits are the maximum allowed emission and are one hour block averages unless otherwise noted, and apply to any block hour with more than 30 minutes of normal operation.
2. Emissions limits for EU11 and EU12 are consistent with manufacturer’s certifications using gaseous testing procedures in accordance with 40 CFR Part 89.
3. Compliance with the BACT NOx emission limits of 2.5ppmvd @ 15% O₂ for natural gas and 5.0 ppmvd @ 15% O₂ in this PSD Permit shall be deemed compliance with the less stringent NOx limits of 15 ppmvd @ 15% O₂ and 42 ppmvd @ 15% O₂ at 40 CFR 60, Subpart KKKK.
4. MECL is the Minimum Emission Compliance Load, as determined by the stack NOx and CO monitoring data, which ranges between 30% and 40% load based on fuel and ambient temperature.
5. The pound per megawatt-hour emission limit calculated using the 100% load emission factor and gross electrical output, corrected to ISO conditions (59°F, 14.7 psia and 60% humidity).
6. Compliance with these lb/MMBtu and lb/hr emission limits shall be demonstrated by stack testing as required in Table 3.
7. H₂SO₄ lb/MMBtu emission limits are based on performance data provided by General Electric Company for the 7HA.02 CTG for the Canal 3 configuration.
8. Particulate matter emission limits include both filterable and condensable particulate matter.

Table 2 Key:

%	= percent	lb/MW-hr	= pounds per Megawatt-hour
CFR	= Code of Federal Regulations	MECL	= Minimum emissions compliance load
CO	= Carbon monoxide	NMHC	= Non-methane hydrocarbons
CO ₂	= Carbon dioxide	NOx	= Nitrogen oxide
CO ₂ e	= Carbon dioxide equivalents	ppmvd @ 15% O ₂	= parts per million by volume, dry basis, corrected to 15 percent oxygen
CTG	= Combustion Turbine Generator	scf	= standard cubic feet
EU	= Emission Unit	PM	= Total particulate matter
g/bhp-hr	= grams per brake horsepower-hour	PM10	= Particulate matter less than or equal to 10 microns in diameter
g/kW-hr	= grams per kilowatt-hour	PM2.5	= Particulate matter less than or equal to 2.5 microns in diameter
GHG	= Greenhouse gas	TPY	= tons per year (consecutive 12-month period)
H ₂ SO ₄	= Sulfuric acid mist	ULSD	= Ultra Low Sulfur Diesel
HHV	= higher heating value		
lb/hr	= pounds per hour		
lb/MMBtu	= pounds per million British thermal units		
ISO	= International Organization for Standardization		

Table 2a			
EU	Operational / Production Limit	Air Contaminant	Emission Limit ⁽¹⁾
10	1. Operation during startups (from first combustion of fuel to MECL, but no more than 30 minutes)	NOx (natural gas)	151 pounds per startup event
		NOx (ULSD)	219 pounds per startup event
		PM/PM ₁₀ /PM _{2.5} (natural gas) ⁽²⁾	9.1 pounds per startup event
		PM/PM ₁₀ /PM _{2.5} (ULSD) ⁽²⁾	48.2 pounds per startup event
	2. Operation during shutdowns (from initiating turndown from MECL until fuel flow is shutoff, but no more than 14 minutes)	NOx (natural gas)	7 pounds per shutdown event
		NOx (ULSD)	8 pounds per shutdown event
		PM/PM ₁₀ /PM _{2.5} (natural gas) ⁽²⁾	4.2 pounds per shutdown event
		PM/PM ₁₀ /PM _{2.5} (ULSD) ⁽²⁾	12.8 pounds per shutdown event

Table 2 Notes:

1. Emission limits and duration are subject to revision by MassDEP based on review of compliance testing (stack testing) data and CEMS data generated from the first year of commercial operation.
2. Particulate matter emission limits include both filterable and condensable particulate matter

Table 2a Key:

EU =	Emission Unit
CEMS =	Continuous Emission Monitoring System
MECL =	Minimum Emission Compliance Load
NOx =	Nitrogen oxides
PM =	Total particulate matter
PM ₁₀ =	Particulate matter less than or equal to 10 microns in diameter
PM _{2.5} =	Particulate matter less than or equal to 2.5 microns in diameter
ULSD =	Ultra-Low Sulfur Diesel
% =	Percent

IV. MONITORING AND TESTING REQUIREMENTS

Table 3	
EU#	Monitoring and Testing Requirements
10	<ol style="list-style-type: none"> 1. The Permittee shall install, calibrate, certify, maintain and continuously operate a data acquisition and handling system (DAHS), and a Continuous Emission Monitoring Systems (CEMS) in accurate operating condition to measure and record the emissions of Oxygen (O₂) and Nitrogen Oxides (NO_x) from the EU10 stack. The CEMS shall satisfy the Performance Specifications of 40 CFR Part 60, Appendix B and the Quality Control Procedures of 40 CFR Part 60, Appendix F. 2. The Permittee shall install, operate and maintain a certified natural gas flow meter and a certified ULSD flow meter to monitor fuel flow to EU10. Fuel flow meters that satisfy the requirements of 40 CFR Part 75 for the subject emission unit shall be considered to meet the requirements of this condition. 3. The Permittee shall monitor the sulfur content of each shipment of ULSD received. The Permittee may determine the sulfur content of ULSD by analyzing the sulfur content of the ULSD or by relying on ULSD suppliers to provide the sulfur content of ULSD received. The analysis of sulfur content of ULSD shall be in accordance with the applicable ASTM International test methods or any other method approved by MassDEP and EPA. 4. The Permittee shall determine the sulfur content of the natural gas combusted by EU10 in accordance with 40 CFR Part 60 Subpart KKKK, or pursuant to any alternative fuel monitoring schedule issued in accordance with 40 CFR Part 60 Subpart KKKK. 5. The Permittee shall program a calibration error check sequence for the CEMS unit into the DAHS and perform the error check sequence at least daily, or as otherwise required by 40 CFR 75 and 60, subject to any custom monitoring procedures approved by USEPA. 6. The Permittee shall obtain emissions data from the CEMS at all times EU10 is firing except for periods of CEMS calibration error checks, zero and span adjustments, maintenance, and periods of malfunction. 7. The Permittee shall obtain emissions data from the CEMS for at least ninety five (95) percent of the unit’s operating hours every calendar quarter, except for periods of CEMS calibration error checks, zero and span adjustments, and preventive maintenance. 8. The Permittee shall continuously monitor NO_x and compile one-hour block average emission concentrations using the DAHS to calculate the emissions in pounds per hour (lbs/hr), pounds per million British thermal units (lbs/MMBtu) and parts per million by volume, dry basis, at 15% O₂ (ppmvd @15% O₂) to determine compliance with the applicable emission limits in Table 2 of this PSD Permit. 9. The Permittee shall determine total annual NO_x emissions (tons per consecutive 12-month period) for EU10 by using the totalizing function of the NO_x CEMS. 10. The Permittee shall equip the CEMS with properly operated and properly maintained audible and visual alarms. The alarms shall be set to activate whenever emissions from the CTG are within 5% of the lbs/hr emission limits in Table 2 of this PSD permit. 11. The Permittee shall comply with the applicable monitoring and testing requirements at 40 CFR 60, Subpart A, 40 CFR Part 60, Subpart KKKK and 40 CFR Part 60 Appendices B and F, and all applicable portions of 40 CFR Part 72, 40 CFR Part 75, 310 CMR 7.32, and 310 CMR 7.70. 12. The Permittee shall develop and implement a quality assurance/quality control program for the long term operation of the CEMS serving EU10 before the commencement of commercial operation. The QA/QC program shall conform with 40 CFR Part 60, Appendices B and F, and all applicable portions of 40 CFR Part 72, 40 CFR Part 75, 310 CMR 7.32, and 310 CMR 7.70.

Table 3 (continued)	
EU#	Monitoring and Testing Requirements
10	<p>13. The Permittee shall construct the Project to accommodate the emissions (compliance) testing requirements as stipulated in 40 CFR Part 60, Appendix A. The two outlet sampling ports (90 degrees apart from each other) must be located at a minimum of one-half (1/2) duct diameters upstream and two (2) duct diameters downstream of any flow disturbance. In addition, the Permittee shall facilitate access to the sampling ports and testing equipment by constructing platforms, ladders, or other necessary equipment.</p> <p>14. The Permittee shall complete compliance testing of EU10 within 180 days after initial firing to demonstrate compliance with the emission limits specified in Table 2 and 2a of this PSD Permit. All emissions testing shall be conducted in accordance with MassDEP’s “Guidelines for Source Emissions Testing” and in accordance with EPA reference test methods as specified in 40 CFR Part 60, Appendix A, 40 CFR Part 51, Appendix M, 40 CFR Part 60, Subpart KKKK, 40 CFR Parts 72 and 75, or by another method which has been approved in writing by MassDEP, or EPA in the case of an alternative method for which EPA approval is not delegable to MassDEP. The Permittee shall schedule the compliance testing such that MassDEP personnel can witness it.</p> <p>15. The Permittee shall use and maintain the CEMS serving EU10 as a “direct-compliance” monitor to measure emissions of NOx. “Direct-compliance” monitors generate data that legally documents the compliance status of a source.</p> <p>16. Whenever the NOx CEMS unit is not available for more than two hours, the Permittee shall monitor the following parameters to determine NOx emissions based on the values of such parameters in correlation with NOx emissions during normal CEMS operation:</p> <ul style="list-style-type: none"> (a) ammonia CEMS unit, (b) temperature of SCR and oxidation catalyst inlet, (c) temperature of ammonia injection system, (d) ammonia injection rate, and (e) Pressure drop across the SCR and oxidation catalyst. <p>17. The Permittee shall install and maintain a non-resettable elapsed operating hour meter or equivalent software to accurately indicate the date and hours that EU10 operates.</p> <p>18. The Permittee shall install and continuously operate monitors fitted with alarms to monitor the temperatures at the inlets to the SCR and oxidation catalysts serving EU10. The alarms shall be set to activate when temperatures at the inlets to the SCR and oxidation catalysts deviate from normal operating temperatures. In addition, the Permittee shall monitor the ambient temperature at all times EU10 is operating.</p> <p>19. The Permittee shall continuously monitor fuel heat input rate (MMBtu/hr, HHV), natural gas heat input (MMBtu), ULSD heat input (MMBtu), natural gas consumption (scf) and ULSD consumption (gallons) for EU10.</p> <p>20. The Permittee shall continuously monitor the load during startup and shutdown of EU10.</p> <p>21. The Permittee shall continuously monitor the gross electrical output of the Project.</p> <p>22. The Permittee shall conduct initial compliance testing of EU10 within 180 days of the initial firing of EU10 to determine compliance status with the emission limits (in lb/hr, lb/MMBtu, and ppmvd, as applicable) in Table 2 and 2a of this PSD Permit while firing natural gas and ULSD for the following pollutants: NOx, PM, PM₁₀, PM_{2.5} and H₂SO₄.</p> <p>23. The Permittee shall conduct initial compliance testing of EU10:</p> <ul style="list-style-type: none"> (a) at representative operating conditions, (b) at no less than the following load conditions while testing for NOx: while firing natural gas; MECL and 100%, and while firing ULSD; MECL and 100%, (c) at no less than the following load conditions while testing for PM, PM₁₀, PM_{2.5}: while firing natural gas at 100%, and while firing ULSD at 100%, and (d) at no less than the following load conditions while testing for H₂SO₄: while firing natural gas; 100%, and while firing ULSD; 100%.

Table 3 (continued)	
EU#	Monitoring and Testing Requirements
10	24. The Permittee shall comply with the parametric monitoring methodology approved by MassDEP for emissions of PM, PM ₁₀ , PM _{2.5} and H ₂ SO ₄ from EU10 pursuant to Table 5, Provisions 2 and 5. 25. The Permittee shall conduct emission tests for PM, PM ₁₀ , PM _{2.5} and H ₂ SO ₄ that meet the requirements for initial compliance tests in Table 3 Conditions 22. and 23. above, every five years.
Project-wide	26. If and when MassDEP requires it, the Permittee shall conduct emission testing in accordance with EPA Reference Test Methods and 310 CMR 7.13.

Table 3 Key:

CO ₂ = Carbon dioxide	NOx = Nitrogen oxides
CFR = Code of Federal Regulations	PM = Particulate matter
CMR = Code of Massachusetts Regulations	PM _{2.5} = Particulate matter less than or equal to 2.5 microns in diameter
CEMS = Continuous Emission Monitors	PM ₁₀ = Particulate matter less than or equal to 10 microns in diameter
DAHs = Data Acquisition and Handling System	% = percent
EU = Emission Unit	ppmvd = parts per million by volume, dry basis
EPA = Environmental Protection Agency	PSD = Prevention of Significant Deterioration
H ₂ SO ₄ = Sulfuric acid mist	RATA = Relative Accuracy Test Audits
HHV = Higher heating value	scf = standard cubic feet
lb/event = Pounds per event	SCR = Selective Catalytic Reduction
lb/hr = Pounds per hour	ULSD = Ultra Low Sulfur Diesel
lb/MW-hr = Pounds per megawatt-hour	U.S.C. = United States Code
lb/MMBtu = Pounds per million British thermal units	
MMBtu = Million British thermal units	
MMBtu/hr = Million British thermal units per hour	

V. RECORD KEEPING REQUIREMENTS

Table 4	
EU#	Record Keeping Requirements
10	1. The Permittee shall maintain on-site, permanent records of output from all continuous monitors (including CEMS) for flue gas emissions, natural gas consumption (scf) and ULSD consumption (gallons). 2. The Permittee shall record all periods that emissions are above the emission limits in Table 2 and 2a of this PSD Permit, and the corresponding emissions values, even if the exceedance is attributable to startup, shutdown, malfunction, emergency, equipment cleaning, and upsets or failures associated with the emission control system or the CEMS. An exceedance of emission limits in Table 2 or 2a of this PSD Permit due to an emergency or malfunction shall not be deemed a federally permitted release as that term is used in 42 U.S.C. 9601(10). 3. The Permittee shall maintain records of the load, startup and shutdown duration, and mass emissions (lb/event) of NOx during startup and shutdown of EU10. 4. The Permittee shall maintain records of the hourly fuel heat input rate (MMBtu/hr, HHV), NOx hourly emissions natural gas heat input (MMBtu), ULSD heat input (MMBtu), natural gas consumption (scf), ULSD consumption (gallons) and purchase records for natural gas and ULSD per month and on a twelve month rolling period basis for EU10. 5. The Permittee shall maintain records of sulfur monitoring performed in accordance with 40 CFR 60, Subpart KKKK.

Table 4 (continued)		
EU#	Record Keeping Requirements	
10	6. The Permittee shall maintain a record of the testing performed on site, or fuel supplier certifications for each fuel delivery that documents the sulfur content of the ULSD is 15 ppm by weight or less.	
	7. The Permittee shall maintain a record of natural gas supplier certifications and/or or natural gas test data demonstrating that all natural gas purchases for EU10 meet the definition of “pipeline natural gas” as defined at 40 CFR Part 72, § 72.2 Definitions.	
	8. The Permittee shall calculate and maintain records of the Greenhouse Gas emission rate of EU10 in accordance with the schedule and calculation procedures in 40 CFR 98.	
	9. The Permittee shall maintain continuous records of the SCR and oxidation catalyst: <ul style="list-style-type: none"> a) inlet temperature, b) the ambient temperature, and c) the pressure drop across the SCR and the oxidation catalyst. 	
	10. The Permittee shall maintain records of gross electrical output from the Project, on a daily basis.	
	11. The Permittee shall maintain records of the dates and hours that EU10 operates per month and per 12-month rolling period.	
	12. The Permittee shall maintain a log to record problems, upsets or failures associated with the emission control systems, DAHS, and CEMS serving EU10.	
	13. The Permittee shall keep records of the CEMS unit’s calibration error check sequences.	
	14. The Permittee shall continuously record the following: <ul style="list-style-type: none"> a) ammonia injection rate, and b) temperature of the injected ammonia. 	
	15. The Permittee shall record the date, time of observation and name of the observer (if applicable) of the following: <ul style="list-style-type: none"> a) the condition of the ammonia system, daily, and b) alarm event when triggered on the ammonia leak detection system. 	
	16. The Permittee shall maintain records all of manufacturer’s required monitoring protocols and inspections included in the SOMP for each CEMS, the SCR, the oxidation catalyst and the ammonia handling system. The records shall include: the date, time of monitoring and/or inspection, the results of inspection, and the name of the staff member performing the monitoring and/or inspection.	
	11	17. The Permittee shall maintain for EU11, a logbook of the hours of operation per month and per 12-month rolling period and the reason the engine operated.
		18. The Permittee shall maintain a record of refueling events and fuel specifications to document compliance with sulfur content limitation.
	12	19. The Permittee shall maintain for EU12, a logbook of the hours of operation per month and per 12-month rolling period and the reason the engine operated.
		20. The Permittee shall maintain a record of refueling events and fuel specifications to document compliance with sulfur content limitation.

Table 4 (continued)	
EU#	Record Keeping Requirements
Project-wide	<p>21. The Permittee shall establish and maintain a record keeping system for the Project so that year-to-date information is readily available. Record keeping shall, at a minimum, include:</p> <ul style="list-style-type: none"> a) Compliance records sufficient to document actual emissions from the Project in order to determine compliance with the operational/production limits and emission limits in Table 2 and 2a of this PSD Permit. Such records shall include, but are not limited to, fuel usage rates, emissions test results, monitoring equipment data and reports, and calculations; b) Maintenance: A record of maintenance, repair and inspection activities performed on all emission units and their associated equipment, control equipment and their associated equipment and monitoring equipment. The records shall include, at a minimum, the type or a description of the maintenance, repair or inspection performed and the date and time the work was commenced and completed; and c) Malfunctions: A record of all malfunctions of the control and monitoring equipment serving EU 10 including, at a minimum: the date and time the malfunction occurred; a description of the malfunction and the corrective action taken; the date and time corrective actions began; and the date and time corrective actions were completed.
	<p>22. The Permittee shall maintain records on-site sufficient to determine compliance with all operational/production limits and emission limits in Tables 2 and 2a, above:</p> <ul style="list-style-type: none"> a) the records shall include all associated calculations and supporting data, b) the records shall include the actual emissions of air contaminants emitted for each calendar month and for each consecutive twelve-month period, and c) the Permittee shall compile these records no later than the 15th day following each month. <p>The Permittee may download an electronic version of the MassDEP approved record keeping form, in Microsoft Excel format, at: http://www.mass.gov/eea/agencies/massdep/air/approvals/limited-emissions-record-keeping-and-reporting.html#WorkbookforReportingOn-SiteRecordKeeping.</p>
	<p>23. The Permittee shall maintain a copy of this PSD Permit, its underlying Application, and the most up-to-date SOMP at the Facility or readily available.</p>
	<p>24. The Permittee shall maintain records required by this PSD Permit on-site for a minimum of five (5) years.</p>
	<p>25. The Permittee shall make records required by this PSD Permit available to MassDEP and EPA personnel upon request.</p>
	<p>26. The Permittee shall maintain records of monitoring and testing as required by Table 3 of this PSD Permit.</p>

Table 4 Key:

CFR = Code of Federal Regulations	MMBtu/hr = Million British thermal units per hour
CMR = Code of Massachusetts Regulations	NOx = Nitrogen oxides
CEMS = Continuous Emission Monitors	PSD = Prevention of Significant Deterioration
DAHS = Data Acquisition and Handling System	scf = standard cubic feet
EU = Emission Unit	SCR = Selective Catalytic Reduction
EPA = Environmental Protection Agency	SOMP = Standard Operating and Maintenance Procedures
HHV = Higher heating value	ULSD = Ultra Low Sulfur Diesel
lb/event = pounds per event	
MMBtu = Million British thermal units	

VI. REPORTING REQUIREMENTS

Table 5	
EU#	Reporting Requirements
10	<ol style="list-style-type: none"> 1. The Permittee shall submit a QA/QC program plan for the CEMS serving EU10 to MassDEP, in writing, at least 30 days before commencement of commercial operation of EU10. The Permittee shall implement the QA/QC program approved by MassDEP. The Permittee shall submit subsequent changes to the QA/QC program plan to MassDEP for MassDEP approval prior to their implementation. 2. The Permittee shall submit a written test protocol to MassDEP at least 45 days before initial compliance testing and obtain MassDEP approval of an emissions test protocol before conducting initial compliance testing of EU10. The protocol shall include, but not be limited to: <ol style="list-style-type: none"> a) A detailed description of sampling port locations, sampling equipment, sampling and analytical procedures, and operating conditions for the initial compliance testing, b) Procedures for initial compliance testing of startup and shutdown emissions, and c) Procedures to confirm the parametric monitoring methodology for emissions of PM, PM₁₀, PM_{2.5} and H₂SO₄ approved by MassDEP. 3. The Permittee shall notify MassDEP of the proposed schedule for initial compliance testing at least 30 days prior to conducting the initial compliance testing. 4. The Permittee shall submit a final emissions test results report to MassDEP within 45 days of completion of the initial compliance testing. 5. The Permittee shall submit to MassDEP for approval a proposed parametric monitoring methodology to assure emissions of PM, PM₁₀, PM_{2.5} and H₂SO₄ comply with the emission limits in Table 2 of this PSD Permit. The Permittee shall submit the proposed parametric monitoring methodology within 60 days after commencement of commercial operations. The Permittee shall implement the parametric monitoring methodology approved by MassDEP. 6. The Permittee shall submit a quarterly Excess Emissions Report to MassDEP by the thirtieth (30th) day of April, July, October, and January each year. The Excess Emissions Report shall include at least the information listed below for the previous calendar periods of January through March, April through June, July through September, and October through December, respectively. <ol style="list-style-type: none"> a) CEMS excess emissions data, in a format acceptable to MassDEP, b) exceedances of operational/production limits, for each period of excess emissions or exceedances of operational/production limits for EU10, the Permittee shall list the duration, cause, the response taken, and the amount of excess emissions. Periods of excess emissions shall include excess emissions during startup and shutdown, malfunction, emergency, equipment cleaning, and upsets or failures associated with the emission control system or CEMS. (<i>“Malfunction” means any sudden and unavoidable failure of air pollution control equipment or process equipment or of a process to operate in a normal or usual manner. Failures caused entirely or in part by poor maintenance, careless operation, or any other preventable upset condition or preventable equipment breakdown are not malfunctions. “Emergency” means any situation arising from sudden and reasonably unforeseeable events beyond the control of the Permittee, including acts of God, which would require immediate corrective action to restore normal operation, and that causes the Project to exceed a technology based limitation in this PSD Permit, due to unavoidable increases in emissions attributable to the emergency. An emergency does not include noncompliance caused by improperly designed equipment, lack of maintenance, careless or improper operations, operator error or decision to keep operating despite knowledge of these things.</i>), c) A tabulation of periods of operation of EU10 and total hours of operation of EU10 during the calendar quarter, and d) The number of hours each of the CEMS collected data and the percent data capture for each CEMs when EU10 was operating.

Table 5 (continued)	
EU#	Reporting Requirements
Project-wide	<p>7. The Permittee shall submit a semi-annual report to MassDEP by January 30 and July 30 of each year to demonstrate the Project’s compliance status regarding the Project-wide emission limits (TPY) and annual operational/production limits in Table 2 and 2a. (The Permittee may download the optional MassDEP format at: http://www.mass.gov/eea/docs/dep/air/approvals/aq/aqsarpt.doc).</p> <p>The Permittee shall include in its calculation of actual emissions, emissions during steady state operation, startup, shutdown, malfunction, emergency, equipment cleaning, and upsets or failures associated with the emission control system or CEMS.</p> <p>The semi-annual report shall include, but not be limited to:</p> <ul style="list-style-type: none"> a) actual emissions for each month of the previous 12-month period, b) the maximum hourly fuel heat input rate (MMBtu/hr, HHV), natural gas heat input (MMBtu), ULSD heat input (MMBtu), natural gas consumption (scf), and ULSD consumption (gallons) per month and on a 12-month rolling period basis, and c) a list of deviations from the conditions of the PSD Permit.
	<p>8. The Permittee shall submit, in writing, the following notifications to MassDEP within five (5) business days of:</p> <ul style="list-style-type: none"> a) the date of commencement of construction of each Emission Unit, b) the date each Emission Unit construction has been completed, c) the date of initial firing of each Emission Unit, d) the date CEMS is certified, and e) the date of commencement of commercial operation.
	<p>9. The Permittee shall submit to MassDEP, in accordance with the provisions of 310 CMR 7.02(5)(c), plans and specifications for the main exhaust stacks, EU10, the SCR (including the ammonia handling and storage system), and the CEMS and DAHS once the specific information has been determined, but in any case not later than 30 days before the construction or installation of each component.</p>
	<p>10. The Permittee shall submit to MassDEP for approval, a SOMP for:</p> <ul style="list-style-type: none"> a) all emission units, b) all emissions control equipment, c) the ammonia handling system, d) the CEMS, and e) the DAHS, <p>no later than 45days before commencement of commercial operation. The Permittee shall include in the SOMP, but not be limited to, manufacturer’s required monitoring protocols, schedules and inspections. Summary information is acceptable for the combustion equipment. The Permittee shall implement the SOMP approved by MassDEP. Thereafter, the Permittee shall submit updated versions of the SOMP to MassDEP no later than thirty (30) days before a significant change. The updated SOMP shall supersede prior versions of the SOMP.</p>
	<p>11. The Permittee shall submit an Operating Permit Application to MassDEP in accordance with 310 CMR 7.00: Appendix C(4)(a)5 no later than one year after commencement of operation.</p>
	<p>12. The Permittee shall notify the Southeast Regional Office of MassDEP, BAW Air Quality Permitting by telephone: 508-946-2770, email: sero.air@state.ma.us, or fax: 508-947-6557, as soon as possible, but no later than three (3) business days after discovery of an exceedance(s) of Table 2 or 2a requirements. A written report shall be submitted to the Permit Chief at MassDEP within ten (10) business days thereafter and shall include: identification of exceedance(s), duration of exceedance(s), reason for the exceedance(s), corrective actions taken, and action plan to prevent future exceedance(s).</p>
	<p>13. The Permittee shall notify MassDEP immediately by telephone or fax or e-mail [sero.air@state.ma.us] and within three (3) business days, in writing, of any upset or malfunction to the ammonia handling or delivery systems that resulted in a release or threat of release of ammonia to the ambient air. In addition, the Permittee shall comply with all notification procedures required under M.G.L. c. 21 E for any release or threat of release of ammonia.</p>

Table 5 (continued)	
EU#	Reporting Requirements
Project-wide	14. All notifications and reporting to MassDEP required by this PSD Permit shall be made, unless otherwise noted, to the attention of: Department of Environmental Protection Bureau of Air and Waste 20 Riverside Drive Lakeville, Massachusetts 02347 Attn: Permit Chief Phone: (508) 946-2824 Fax: (508) 947-6557 E-Mail: sero.air@state.ma.us
	15. The Permittee shall submit to MassDEP all information required by this PSD Permit over the signature of a “Responsible Official” as defined in 310 CMR 7.00 and shall include the Certification statement as provided in 310 CMR 7.01(2)(c).
	16. The Permittee shall provide to MassDEP a copy of any record required by this PSD Permit within thirty (30) days of MassDEP’s request.
	17. If and when MassDEP requires emission testing, the Permittee shall submit to MassDEP for approval an emission pretest protocol, at least forty-five (45) days before emission testing.
	18. If and when MassDEP requires emission testing, the Permittee shall submit to MassDEP a final emission test results report, within forty five (45) days of completion of the emission testing.

Table 5 Key:

BAW = Bureau of Air and Waste	MMBtu/hr = Million British thermal units per hour
CFR = Code of Federal Regulations	QA/QC = Quality assurance/quality control
CMR = Code of Massachusetts Regulations	PSD = Prevention of Significant Deterioration
CEMS = Continuous Emission Monitors	scf = standard cubic feet
DAHS = Data Acquisition and Handling System	SCR = Selective Catalytic Reduction
EU = Emission Unit	SOMP = Standard Operation and Maintenance Procedures
H ₂ SO ₄ = Sulfuric acid mist	TPY = Tons per 12-month rolling period
HHV = Higher heating value	ULSD = Ultra Low Sulfur Diesel
M.G.L. = Massachusetts General Laws	
MMBtu = Million British thermal units	

VII. SPECIAL TERMS AND CONDITIONS

Table 6	
EU#	Special Terms and Conditions
10	1. The Permittee shall certify the CEMS serving EU10 according to the procedures and schedule in 40 CFR 75. 2. The Permittee shall maintain an adequate supply of spare parts on-site to maximize the on-line availability and data capture of the CEMS equipment and to maximize the availability of the SCR. 3. The Permittee shall operate the SCR serving EU10 whenever the flue gas temperature at the inlet to the SCR is above the minimum flue gas temperature specified by the SCR manufacturer and other system parameters are satisfied for SCR operation.

Table 6 (continued)	
EU#	Special Terms and Conditions
10	<p>4. The Permittee shall not operate EU10 at less than MECL while firing natural gas or less than MECL while firing ULSD, except during startups and shutdowns.</p> <p>5. The Permittee shall develop as part of the SOMP for EU10, an optimization protocol to establish conditions that maintain compliance with all emission limits at all ambient temperatures and conditions.</p> <p>6. The Permittee shall limit the use of ULSD to any of the following specific conditions:</p> <ul style="list-style-type: none"> a) When ISO-NE declares an Emergency as defined in ISO New England’s Operating Procedure No. 21, No. 4, and No. 7, or declares a Scarcity Condition; b) When AGT issues a critical notice that disallows increases in nominations from where gas is received on its pipeline system to the point of delivery for the Project; c) When gas supplies cannot be procured or delivered at any price or are not available for purchase or delivery within the timeframe required to support operation of the Project. The Project will use all commercially reasonable efforts to switch to natural gas operation as soon as possible without jeopardizing the safety of equipment or operating personnel; d) If the Project is operating on natural gas and the supply or delivery is curtailed by the pipeline operator. In this situation, the Project will use all commercially reasonable efforts to switch back to natural gas operation as soon as it is again available without jeopardizing the safety of equipment or operating personnel; e) Any equipment (whether on-site or off-site) required to allow the turbine to operate on natural gas has failed including a physical blockage of the supply pipeline; f) During commissioning when the combustion turbine is required to operate on ULSD pursuant to the turbine manufacturer’s written instructions; g) For emission testing purposes as specified in the Project’s permit or as required by the Commonwealth of Massachusetts; h) During routine maintenance if any equipment requires ULSD operation; and i) In order to maintain an appropriate turnover of the on-site fuel oil inventory, ULSD can be used when the age of the fuel in the tank is greater than six months. A new waiting period for when ULSD can be used pursuant to this condition will commence once ULSD firing is stopped. The use of ULSD burned pursuant to this condition (i) is limited to 4,000,000 gallons per rolling four-year period (rolling calendar years). <p>Additionally, the Project agrees not to operate on ULSD pursuant to conditions g), h) and i) on any day when the air quality index for the area including Sandwich MA is, or is forecast to be, 101 or greater. Fairhaven MA, which is the current AQI tabulation/prediction site closest to Sandwich MA, may be used for the reference AQI value for this condition. AQI is made available through the AIRNow web site at http://airnow.gov/index.cfm?action=airnow.local_city&cityid=74 (or its successor). If the AQI is re-scaled, “101” in this condition shall be replaced by an equivalent value indicating air quality Unhealthy for Sensitive Groups or worse. This limitation does not apply to conditions a) through f).</p> <p>7. The Permittee shall maintain a logbook documenting usage of ULSD and the specific condition that qualified the usage, and corresponding records of associated ISO-NE, AGT or other such independent agents to verify the occurrence or presence of such condition or event.</p>

Table 6 (continued)	
EU#	Special Terms and Conditions
10	8. The Permittee shall continue to operate the emission control system during periods of CEMS data unavailability.
Project-wide	9. The Permittee shall properly train all personnel to operate the Project and the control and monitoring equipment in accordance with manufacturer specifications. All persons responsible for the operation of the Project shall sign a statement affirming that they have read and understand the approved SOMP. The Permittee shall give refresher training to Project personnel at least annually.
	10. The Permittee shall determine compliance with the annual CO _{2e} emission limit in Table 2 of the PSD Permit using the calculation procedures in 40 CFR 98.
	11. All requirements of this PSD Permit that apply to the Permittee shall apply to all subsequent owners and/or operators of the Project.

Table 6 Key:

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|---|--|
| AGT = Algonquin Gas Transmission, LLC | ISO-NE = Independent Service Operator – New England |
| CO _{2e} = Carbon dioxide equivalents | PSD = Prevention of Significant Deterioration |
| CFR = Code of Federal Regulations | SOMP = Standard Operating and Maintenance Procedures |
| CMR = Code of Massachusetts Regulations | SCR = Selective Catalytic Reduction |
| CEMS = Continuous Emission Monitors | ULSD = Ultra Low Sulfur Diesel |
| EU = Emission Unit | |

VIII. RIGHT OF ENTRY

The Permittee shall allow all authorized representatives of MassDEP and EPA, upon presentation of credentials, to enter upon or through the Project and anywhere records required under this PSD Permit are kept. The Permittee shall allow such authorized representatives, at reasonable times:

1. To access and copy any records that must be kept under this PSD Permit;
2. To inspect any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated under this PSD Permit; and
3. To monitor substances or parameters for purposes of assuring compliance with this PSD Permit.

IX. TRANSFER OF OWNERSHIP

In the event of any changes in control or ownership of the Facility, this PSD Permit shall be binding on all subsequent owners and operators. The Permittee shall notify the succeeding owner and operator of the existence of this PSD Permit and its conditions before such change, if possible, but in no case later than 14 days after such change. Notification shall be sent by letter with a copy forwarded within 5 days to MassDEP and EPA.

X. SEVERABILITY

The provisions of this PSD Permit are severable, and if any provision of the PSD Permit is held invalid, the remainder of this PSD Permit will not be affected thereby.

XI. CREDIBLE EVIDENCE

For the purpose of submitting compliance certifications or establishing whether or not the Permittee has violated or is in violation of any provision of this PSD Permit, the methods used in this PSD Permit shall be used, as applicable. However, nothing in this PSD Permit shall preclude the use, including the exclusive use, of any credible evidence or information, relevant to whether the Permittee would have been in compliance with applicable requirements if the appropriate performance or compliance test procedures or methods had been performed.

XII. OTHER APPLICABLE REGULATIONS

The Permittee shall operate all equipment regulated herein in compliance with all other applicable provisions of federal and state air regulations.

The Permittee has addressed the PSD Environmental Justice (EJ) requirements as required by the April 11, 2011 PSD Delegation Agreement between EPA and MassDEP to “identify and address, as appropriate high and adverse human health or environmental effects of federal programs, policies and activities on minority and low income populations” in accordance with Executive Order 12898 (February 11, 1994). Additional EJ discussion is provided in the PSD Fact sheet for the NRG Canal 3 project.

XIII. AGENCY ADDRESS

Subject to change, all correspondence required by this PSD Permit shall be forwarded to:

Permit Chief, Bureau of Air and Waste
Department of Environmental Protection
Southeast Regional Office
20 Riverside Drive
Lakeville, Massachusetts 02347

XIV. APPEAL PROCEDURES

1. Within 30 days after the final PSD Permit decision has been issued under 40 CFR 124.15, any person who filed comments on the Draft Permit or participated in any public hearing may petition EPA's Environmental Appeals Board to review any condition of the Permit decision.
2. The effective date of the Permit is 30 days after service of notice to the Permittee and commenters of the final decision to issue, modify, or revoke and reissue the PSD Permit, unless review is requested on the Permit under 40 CFR 124.19 within the 30 day period.
3. If an appeal is made to the Environmental Appeals Board, the effective date of the Permit is suspended until the appeal is resolved.