



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	Middletown Power LLC
Address	1866 River Road, Middletown, CT 06457
Equipment Location	1866 River Road, Middletown, CT 06457
Equipment Description	Unit 4: 4,684 MMBtu/hr Tangentially fired Combustion Engineering utility boiler, nominally rated at 400 MW
Town-Permit Numbers	104-0003
Premises Number	24
Stack Number	5
Modification Issue Date	June 19, 2020
Prior Permit Issue Date	March 5, 1982
Expiration Date	None

Tracy R. Babbidge

for Betsey C. Wingfield
Deputy Commissioner

6/19/2020

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

Middletown Power LLC operates a Combustion Engineering tangentially fired utility boiler nominally rated at 400 MW which is identified as Unit 4. The boiler fires No. 6 fuel oil and ultra-low sulfur distillate (ULSD) (for ignition only). The Permittee may use any of the following to control NOx emissions: Combustion Modification [Low-NOx burners, Excess Air Control (i.e. Low-NOx vanes, Over-fire Air)], and/or Urea Injection as allowed by this modified permit (Application No. 201912515). Unit 4 is equipped with the following CEM for compliance verification: CO₂, NO_x, SO₂, and opacity.

B. Equipment Design Specifications

1. Fuel Types: No. 6 Fuel Oil and ULSD (ignition only)
2. Maximum Fuel Firing Rate (gal/hr): 31,864
3. Maximum Gross Heat Input (MMBtu/hr): 4,684

C. Control Equipment Design Specifications

1. Urea Injection:
 - a. Rich Reagent Injection - make & model to be determined (tentative installation 2022)
2. Low NOx Burner, Over Fire Air, Staged Combustion
 - a. Low NOx Burner – CCA split flame oil tips & low NOx swirlers (expected installation 4/2020)
 - b. Separated Over Fire Air (SOFA) - make & model to be determined (tentative installation 2021)

D. Stack Parameters

1. Minimum Stack Height (ft): 498
2. Minimum Exhaust Gas Flow Rate (acfm): 1.710×10^6
3. Minimum Stack Exit Temperature (°F): 590
4. Minimum Distance from Stack to Nearest Property Line (ft): 100

PART II. OPERATIONAL CONDITIONS

A. Equipment

1. Maximum Fuel Consumption over any Consecutive 12 Month Period (gal/yr): 2.8×10^8
2. Maximum Fuel Sulfur Content (% by weight, dry basis): 0.3

PART III. ALLOWABLE EMISSION LIMITS

The Permittee shall not cause or allow this equipment to exceed the emission limits stated herein at any time.

A. Criteria Pollutants

Pollutant	lb/MMBtu
PM/PM ₁₀ /PM _{2.5}	0.14 (No. 6)
	0.12 (ULSD)
NO _x ^(d)	Until May 31, 2023
	The Permittee shall comply with Consent Order No. 8377 at all times.
	On and After June 1, 2023
	0.20 (No. 6) ^a
	0.10 (ULSD) ^a
	0.15 (Non-Ozone Season) ^c
SO ₂	<p>(1) Combust liquid fuel, gaseous fuel or a combination of each provided that each fuel possess a fuel sulfur limit of equal to or less than 3000 ppm (0.3 % sulfur, by weight);</p> <p>(2) Meet an average emission rate of equal to or less than 0.33 pounds SO₂ per MMBtu for each calendar quarter for an affected unit at a premises; or</p> <p>(3) Meet an average emission rate of equal to or less than 0.3 pounds SO₂ per MMBtu calculated for each calendar quarter, if Permittee averages the emissions from two or more affected units at the premises.</p>

Notes:

- (a) Daily Block Average
- (b) Ozone Season - 5 Month Average
- (c) Non-Ozone Season - 7 Month Average
- (d) NO_x Emissions limits while simultaneously combusting 1 or more fuels shall be determined in accordance with RCSA §22a-174-22e(d)(10).

The Permittee shall not exceed a significant emissions increase for any pollutant subject to regulation under the CAA, for a period of five years after the unit resumes normal operation, after the installation of the Combustion Modification and/or Urea Injection System, except as provided in 40 CFR §§51.165(a)(1)(v)(A) and 51.165(a)(1)(xxi).

B. 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 §22a-174-29. [STATE ONLY REQUIREMENT]

C. Opacity

1. This equipment shall comply with Consent Order No. 1888 at all times.

2. Except as provided in RCSA §22a-174-18(j), visible emission shall be no greater than 20% for any six-minute block and no greater than 40% for any one-minute block.

D. Demonstration of compliance with the above emission limits may be met by using emission factors from the following sources:

- *All Particulate, Ammonia: Latest Approved Stack Test*
- *NO_x and SO₂: CEM*

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

1. The Permittee shall comply with the CEM requirements as set forth in RCSA §22a-174-4. CEM shall be required for the following pollutant/operational parameters and enforced on the following basis:

Pollutant/Operational Parameter	Averaging Times	Emission Limit
Opacity	six minute block	See Part III of this permit
SO ₂	3 hour rolling; calendar quarter	
NO _x	As required by RCSA §22a-174-22e(m)	
CO ₂	1 hour block	

2. The Permittee shall continuously monitor fuel consumption using a non-resettable totalizing fuel meter.
3. The Permittee shall continuously monitor and continuously record the urea injection rate (lb/hr or gal/hr), if applicable.

B. Record Keeping

1. The Permittee shall keep records of monthly and consecutive 12 month fuel consumption, for each fuel. The consecutive 12 month fuel consumption shall be determined by adding (for each fuel) 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 keep records of the fuel certification for each delivery of fuel oil from a bulk petroleum provider or a copy of the current contract with the fuel supplier supplying the fuel used by this equipment that includes the applicable sulfur content of the fuel as a condition of each shipment. The shipping receipt or contract shall include the date of delivery, the name of the fuel supplier, type of fuel delivered, the percentage of sulfur in such fuel, by weight, dry basis, and the method used to determine the sulfur content of such fuel.
3. The Permittee shall calculate and record the monthly and consecutive 12 month PM, PM₁₀, PM_{2.5}, SO₂, NO_x, VOC, CO, and Ammonia emissions 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.

4. The Permittee shall keep records of each delivery of urea. The records shall include:
 - a. the date of delivery;
 - b. the name of the supplier;
 - c. the quantity of aqueous ammonia delivered; and
 - d. the percentage of ammonia in solution, by weight.
5. 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 notify the commissioner, in writing, of the dates of commencement of construction, completion of construction, and initial startup of the urea injection and combustion modification equipment no later than 30 days after each subject event.
2. No later than March 1 of each year the Permittee shall submit a written report of the actual annual emissions of PM_{2.5}, PM₁₀, SO₂, NO_x, VOC, CO, Pb, and ammonia for the prior calendar year compared to the 2-year baseline average emissions, immediately preceding the installation of the urea injection and/or combustion modification equipment, on an annual basis for five years after the installation of such control systems. Such report shall be submitted to Office of Director, Engineering, Bureau of Air Management, Department of Energy and Environmental Protection, 79 Elm Street, 5th Floor, Hartford, CT 06106-5127

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 at www.ct.gov/deep/stacktesting.
- B. Stack testing shall be required for the following pollutants:
 PM₁₀ PM_{2.5} CO Ammonia
- C. Emissions testing for CO shall be required within 240 operating hours of the initial startup of the combustion modification equipment.
- D. The Permittee shall conduct emissions testing for PM_{2.5}, PM₁₀, and ammonia with and without the urea injection in operation (if applicable).. Emissions testing shall be conducted within 240 operating hours on such fuel. Such testing timeframe shall begin with the initial startup of the urea injection control system.
- E. Recurrent stack testing for the above pollutants shall be conducted within five years from the date of the previous stack test.
- F. Stack test results shall be reported as follows: all pollutants in units of lb/MMBtu.

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 the control equipment to achieve compliance with the emissions limits in Part III.A. of this permit.

PART VII. SPECIAL REQUIREMENTS

- A.** The Permittee shall comply with all applicable sections of the following National Emission Standards for Hazardous Air Pollutants at all times.

Title 40 CFR Part 63, Subparts UUUUU and A

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

B. Premises Emissions Summary

1. On January 1st of each calendar year, if the potential emissions of NO_x and/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 with either of the following premises is exempt from Part VII.C.1 requirements of this permit if, on January 1st of the subject year, the:
 - a. Premises is operating in accordance with a valid Title V permit issued pursuant to RCSA section 22a-174-33; or
 - b. Premises is operating in accordance with a valid Approval of Registration issued pursuant to the General Permit to Limit Potential to Emit from Major Stationary Sources of Air Pollution issued on November 9, 2015.
- C.** The Permittee shall not cause or permit the emission of any substance or combination of substances which creates or contributes to an odor beyond the property boundary of the premises that constitutes a nuisance as set forth in RCSA Section 22a-174-23. [STATE ONLY REQUIREMENT]
- D.** 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 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.