



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).

<b>Owner/Operator</b>	Yale University, Central/Science Campus
<b>Address</b>	2 Whitney Avenue, 5 <sup>th</sup> Floor, New Haven, CT 06520
<b>Equipment Location</b>	120 Tower Parkway, New Haven, CT 06520
<b>Equipment Description</b>	Nebraska 100,000 lb/hr Boiler
<b>Town-Permit Numbers</b>	117-0210
<b>Premises Number</b>	48
<b>Stack Number</b>	4
<b>Revision Issue Date</b>	October 27, 2013
<b>Prior Permit Issue Date</b>	July 1, 1997
<b>Expiration Date</b>	None

Note: This permit contains collateral conditions for permit numbers 117-0204 through 117-0210.

/s/ Anne Gobin for  
Daniel C. Esty  
Commissioner

October 27, 2013  
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. Equipment Design Specifications**

1. Fuel Types: Natural Gas, Ultra Low Sulfur Distillate Fuel (or Biodiesel Blend)
2. Maximum Fuel Firing Rates: 118,000 ft<sup>3</sup>/hr (gas), 825 gal/hr (liquid)
3. Maximum Gross Heat Input: 118 MMBTU/hr (gas), 113 MMBTU/hr (liquid)

### **B. Control Equipment Design Specifications**

1. Low NO<sub>x</sub> Burner
  - a. Make and Model: Todd V665FGOXPX with Flue Gas Recirculation
  - b. Guaranteed NO<sub>x</sub> Emission Rate: 0.040 lb/MMBtu for Natural Gas

### **C. Stack Parameters**

1. Minimum Stack Height (ft): 150
2. Minimum Exhaust Gas Flow Rate (acfm): 17,574
3. Minimum Stack Exit Temperature (°F): 290
4. Minimum Distance from Stack to Property Line (ft): 20

## **PART II. OPERATIONAL CONDITIONS**

### **A. Equipment**

1. Maximum Fuel Consumption over any Consecutive 12 Month Period: The unit shall be limited to a maximum annual heat input of 1,033,680 MMBtu. The following equation establishes the corresponding maximum fuel consumption while allowing the flexibility of burning natural gas and ultra low sulfur distillate (or biodiesel blend):

$$X * (Y \text{ MMBtu/gal}) + Z * (0.001 \text{ MMBtu/ft}^3) = 1,033,680 \text{ MMBtu}$$

where,

- X = gallons of ultra low sulfur distillate (or biodiesel blend),  $\leq 2.638 \text{ MMgal}$ ;
- Y = higher heating value of liquid fuel actually combusted in boiler;
- X \* Y  $\leq 361,406 \text{ MMBtu}$ ; and
- Z = ft<sup>3</sup> of natural gas,  $\leq 1,033.68 \text{ MMft}^3$

2. Maximum Fuel Sulfur Content (% by weight, dry basis): 0.0015

### PART III. ALLOWABLE EMISSION LIMITS

The Permittee shall not cause or allow this equipment to exceed the short-term emission limits stated herein at any time, except during periods of start-up, shut-down and routine maintenance.

#### A. Criteria Pollutants

1. Natural Gas

Pollutant	lb/hr	lb/MMBTU	tpy
PM <sub>10</sub>	0.35	0.003	1.53
SO <sub>2</sub>	0.07	6.00E-4	0.31
NO <sub>x</sub>	4.72	0.04	20.67
VOC	0.35	0.003	1.53
CO	2.95	0.025	12.92

2. Ultra Low Sulfur Distillate Fuel (or Biodiesel Blend)

Pollutant	lb/hr	lb/MMBTU	tpy
PM <sub>10</sub>	1.92	0.017	3.07
SO <sub>2</sub>	0.002	1.6E-5	0.003
NO <sub>x</sub>	22.60	0.20	36.14
VOC	0.17	0.0015	0.27
CO	4.07	0.036	6.51

3. Total Annual Emissions

Pollutant	tpy
PM <sub>10</sub>	4.08
SO <sub>2</sub>	0.31
NO <sub>x</sub>	49.59
VOC	1.53
CO	14.91

4. Total NO<sub>x</sub> emissions from permit numbers 117-0204 through 117-0210 inclusive shall not exceed 121.5 tons per year.

#### 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 Section 22a-174-29. [STATE ONLY REQUIREMENT]

### PART III. ALLOWABLE EMISSION LIMITS, Continued

C. Demonstration of compliance with the above emission limits shall be met by calculating the emission rates using emission factors from the following sources:

- PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>x</sub>, VOC, CO (natural gas): Manufacturer's Data (from February 1996 NSR Application)
- PM<sub>10</sub>, SO<sub>2</sub>, VOC, CO (oil): AP-42, 5<sup>th</sup> Edition, Section 1.3, May 2010
- NO<sub>x</sub> (oil): RCSA §22a-174-22, Table 22-1
- HAPs (oil and natural gas): AP-42, 5<sup>th</sup> Edition, Section 1.3, May 2010 and Section 1.4, July 1998

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 Section 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	Units
NO <sub>x</sub>	24 hour rolling	See Part III.A of this permit	lb/MMBtu
O <sub>2</sub>	1 hour block	--	--

2. The Permittee shall use a fuel metering device to continuously monitor the total fuel feed to this permitted source in conjunction with permit numbers 117-0205 and 117-0206.

#### B. Record Keeping

1. The Permittee shall keep records of monthly and consecutive 12 month fuel consumption. 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.

**PART IV. MONITORING, RECORD KEEPING AND REPORTING REQUIREMENTS, Continued**

- 3. The Permittee shall calculate and record the monthly and consecutive 12 month PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>x</sub>, VOC, and CO emissions in units of tons for this unit. 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 calculate and record the consecutive 12 month emissions of NO<sub>x</sub> emissions from permits 117-0204 through 117-0210, inclusively.
- 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.

**PART V. STACK EMISSION TEST REQUIREMENTS**

Stack emission testing shall be performed in accordance with the [Emission Test Guidelines](#) available on the DEEP website.

Recurrent stack testing shall be required for the following pollutants:

- PM<sub>10</sub> (oil only)       SO<sub>2</sub>       NO<sub>x</sub>       CO       VOC       Opacity  
 Other (HAPs):

Recurrent stack testing for the above pollutants shall be conducted every 5 years from the date of the previous stack test (last test occurred on November 26, 2012).

Stack test results shall be reported as follows: all pollutants in units of lb/MMBtu and lb/hr.

**PART VI. SPECIAL REQUIREMENTS**

- A. The Permittee shall operate and maintain this equipment in accordance with the manufacturer's specifications and written recommendations.
- B. The Permittee shall comply with all applicable sections of the following New Source Performance Standard(s) at all times.

Title 40 CFR Part 60, Subparts Db and A

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

- C. 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 JJJJJJ and A

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

## **PART VI. SPECIAL REQUIREMENTS, Continued**

- D.** 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]
- E.** 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 VII. 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.

## **PART VII. ADDITIONAL TERMS AND CONDITIONS, Continued**

- 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.