



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Northeast Regional Office • 205B Lowell Street, Wilmington MA 01887 • 978-694-3200

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March 28, 2016

Mr. James Macleod
Fox Hill Village
10 Longwood Drive
Westwood, MA 02090

RE: WESTWOOD
Transmittal No.: X265113
Application No.: NE-15-004
Class: SM25
FMF No.: 52457, RO No.: 162059
**AMENDED AIR QUALITY PLAN
APPROVAL**

Dear Mr. Macleod:

The Massachusetts Department of Environmental Protection (“MassDEP”), Bureau of Air and Waste, has reviewed your Non-major Comprehensive Plan Application (“Application”) listed above. This Application concerns the existing unapproved installation and operation of two (2) combined heat and power (CHP) systems including two (2) natural gas fired internal combustion engines located at Fox Hill Village, Westwood, Massachusetts (“Facility”). This Application was submitted as a result of the Administrative Consent Order, ACOP-NE-9005-27NT, dated December 7, 2015. The Application bears the seal and signature of Carl Berhardt, Massachusetts Registered Professional Engineer Number 27576. On March 15, 2016, the Facility requested correction for catalysts operating temperature range in the January 12, 2016 Approval.

This Application was submitted in accordance with 310 CMR 7.02 Plan Approval and Emission Limitations as contained in 310 CMR 7.00 “Air Pollution Control” regulations adopted by MassDEP pursuant to the authority granted by Massachusetts General Laws, Chapter 111, Section 142 A-N, Chapter 21C, Section 4 and 6, and Chapter 21E, Section 6. MassDEP’s review of your Application has been limited to air pollution control regulation compliance and does not relieve you of the obligation to comply with any other regulatory requirements.

MassDEP has determined that the Application is administratively and technically complete and that the Application is in conformance with the Air Pollution Control regulations and current air pollution control engineering practice, and hereby grants this **Plan Approval** for said Application, as submitted, subject to the conditions listed below.

Please review the entire Plan Approval, as it stipulates the conditions with which the Facility owner/operator (“Permittee”) must comply in order for the Facility to be operated in compliance with this Plan Approval.

DESCRIPTION OF FACILITY AND APPLICATION

Fox Hill Village (“the Permittee”) operates a real estate complex which houses two (2) combined heat and power (CHP) systems, each having a natural gas fired internal combustion engine (ICE). These two ICEs are subject to 310 CMR 7.00 permit requirements. The Facility also houses some combustion equipment that is exempt from the permit requirement, as set forth below. The Facility is not classified as a major source of hazardous air pollutants (HAPs).

The Permittee installed two (2) CHP systems in 2011, each consisting of engine/generator sets designated as EU1 and EU2. Each CHP system is capable of producing 75 kilowatts of electricity and 523,000 BTU/hr of thermal energy at maximum output. Each unit has a maximum fuel consumption rate of 930 standard cubic feet per hour of natural gas.

EU1 and EU2 do not qualify for Environmental Results Program (ERP) certifications for new Engine and Turbines in accordance with 310 CMR 7.26 (43), because the emissions for each unit were greater than the limits set forth in 310 CMR 7.26(43). The Permittee proposes to modify EU1 and EU2 such that they will comply with current Best Available Control Technology (BACT) emission standards and requirements.

EU1 and EU2 are 7.4 liter stoichiometric (rich burn) engines, equipped with a Non-Selective Catalytic Reduction (NSCR) system for control of nitrogen oxides (NO_x), carbon monoxide (CO), and volatile organic compounds (VOC) emissions. The exhaust gases from each engine pass through a Model DC45 catalytic converter at maximum temperature of 1250 degrees Fahrenheit (°F). The NSCR system achieves minimum NO_x, CO and VOC control efficiencies of 90.0 percent for each pollutant. The catalyst’s operating temperature ranges from 752 to 1250 °F. In addition, each engine is equipped with a Continental EGC-2 Electronic Gas Carburetor (EGC). The EGC controls the air/fuel ratio using variable pressure control combined with an advanced and improved mixing venturi. The EGC provides built-in control for a wide band oxygen sensor that is located in the exhaust stream. This control technique and enhanced fuel-mixing combine to provide reduced emissions along with improved engine fuel efficiency.

Temperature measurement is achieved in three places along the exhaust system: pre-catalyst, post-catalyst, and post-heat exchanger. The pre-catalyst temperature is normally between 752 °F to 1250 °F. The post-catalyst temperature is normally less than 1350 °F. Rise in post-catalyst gas temperature indicates that the three-way catalyst is actively reducing emissions. The Permittee shall perform inspections of each EU and PCD on a monthly basis and monitor equipment data remotely on a daily basis. When exhaust temperatures deviations are detected, operator shall access the equipment on-site and rectify the situation within 24 hours of occurrence.

Facility also houses several exempt combustion units: one Caterpillar 600 KW, ULSD fired emergency generator; one Caterpillar 125 KW, natural gas fired emergency generator; one CBH-700-50A, natural gas fired heating boiler, rated at 2,092,000 Btu/hr; three (3) CB-700-150, natural gas fired heating boilers, rated at 6,277,000 Btu/hr; two Ajax, natural gas fired back-up heating boilers, rated at 1,500,000 Btu/hr; one PVI, natural gas fired back-up heating boiler, rated at 2,500,000 Btu/hr.

All records, including preventive maintenance and malfunction maintenance records shall be recorded and shall be available for inspection. The exhaust gases from EU1, EU2, and all exempt units listed above exhaust through the existing 34-inch diameter, vertical, stainless steel stack. The height of the stack exit is 4.17 feet above the roof.

Facility may be subject to the Federal New Source Performance Standard (NSPS) for stationary Spark Ignited (SI) Internal Combustion Engine (ICE) (40 CFR Part 60 Subpart JJJJ). This regulation covers SI ICE with a maximum engine power less than 500 horse-power that are manufactured on or after July 1, 2008. Since MassDEP has not accepted delegation for subpart JJJJ, Facility is advised to consult with USEPA Region 1-New England Air Branch, 5 Post Office Square, Suite 100, Boston, MA 02109-3912, telephone: (617) 918-1111 for additional information. There may be additional notification, record keeping, and reporting requirements.

1. EMISSION UNIT IDENTIFICATION

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

Table 1			
EU	Description	Design Capacity	Pollution Control Device (PCD)
EU1 EU2	Aegenco Aegen ThermoPower 3410A, 7.4 liter Stoichiometric rich burn natural gas fired engine.	75 KW of Electricity, 523,000 BTU/hr of thermal heat.	PCD1 and PCD2: NSCR Model DC45 or equivalent NSCR Catalytic Converter to control NO _x , CO, and VOC emissions.

Table 1 Key:

EU = Emission Unit Number
 BTU/hr = British thermal units per hour
 NO_x = Nitrogen Oxides
 VOC = Volatile Organic Compounds
 CO = Carbon Monoxide
 KW = Kilowatts

PCD = Pollution Control Device
 NSCR = Non-Selective Catalytic Reduction

2. APPLICABLE REQUIREMENTS

A. OPERATIONAL, PRODUCTION and EMISSION LIMITS

The Permittee is subject to, and shall not exceed the emission limits/restrictions as contained in Table 2:

Table 2					
EU #	Restrictions/ Operating Parameters	Air Contaminant	Emission Limit		Applicable Regulation And/or Approval Number
			Pounds per hour ¹ (each engine)	Tons per 12 month ² rolling period (Total)	
EU1 EU2	Natural gas (exclusive fuel of use) Continuously monitor the temperature (°F) before and after the catalysts in each unit. Maintain pre-catalyst temperature between 752 °F - 1250 °F, and post-catalyst temperature less than 1350 °F.	NO _x	0.08	0.70	NE-15-004
		CO	0.13	1.14	
		VOC	0.03	0.26	
		SO ₂	0.0006	0.005	
		PM	0.02	0.18	
		Total HAP	0.031	0.27	
		Smoke and Opacity	Not to exceed limits contained in 310 CMR 7.06(1)(a) & (b)		

Table 2 Footnotes:

¹ These emission limitations shall only apply while maintaining catalyst inlet temperature between 752 °F -1250 °F

² These emission limitations are based on 8760 hours of operation.

Table 2 Key:

EU = Emission Unit Number

NO_x = Nitrogen Oxides

CO = Carbon Monoxide

VOC = Volatile Organic Compounds

PM = total particulate matter/particulates which have particle sizes less than or equal to 10 microns/
 particulates which have particle sizes less than or equal to 2.5 microns (PM_{2.5}), including filterable and condensable

SO₂ = Sulfur Dioxide

HAP = Hazardous Air Pollutant

°F = degrees Fahrenheit

B. COMPLIANCE DEMONSTRATION

The Permittee is subject to, and shall comply with, the monitoring, testing, record keeping, and reporting requirements as contained in Tables 3, 4, and 5:

Table 3	
EU	Monitoring and Testing Requirements
EU1 EU2	1. The Permittee shall monitor hours of operation for each EU to monitor all natural gas usage.
	2. The Permittee shall continuously monitor the temperature (°F) before and after the catalysts in EU1 and EU2. Maintain pre-catalyst temperature between 752 °F - 1250 °F, and post-catalyst temperature less than 1350 °F to achieve compliance with the emission limits as contained in Table 2 above. Start-up and shut-down are excluded from the minimum temperature requirements.
	3. The Permittee shall maintain an adequate supply of spare parts, as recommended by manufacturer(s), on-site to maintain the air pollution control system and monitoring equipment serving each unit.
	4. The Permittee shall ensure that each unit and PCD equipment can accommodate the emissions testing requirements as stipulated in 40 CFR Part 60, Appendix A or the latest test methods recommended by USEPA.
	5. The Permittee shall perform inspections of each EU and PCD on a monthly basis and monitor equipment data remotely on a daily basis. When exhaust temperature deviations are detected, operator shall access the equipment on-site and rectify the situation on the same day.
Facility- wide	6. The Permittee shall monitor all operations to ensure sufficient information is available to comply with 310 CMR 7.12 Source Registration.
	7. If and when MassDEP requires it, the Permittee shall conduct emission testing in accordance with USEPA Reference Test Methods and Regulation 310 CMR 7.13.
	8. At least 30 days prior to emission testing, the Permittee shall submit to MassDEP for approval a stack emission pretest protocol.
	9. Within 45 days after emission testing, the Permittee shall submit to MassDEP a final stack emission test results report.

Table 3 Key:

- EU = Emission Unit
- PCD = Pollution control device
- °F = degrees Fahrenheit
- USEPA = United States Environmental Protection Agency

Table 4	
EU	Record Keeping Requirements
EU1 EU2	<p>1. The Permittee shall maintain adequate records to demonstrate compliance status with all operational and emission limits contained in Table 2 above, including:</p> <ul style="list-style-type: none"> i. records of monthly and consecutive 12-month rolling hours of operation; and ii. continuous records of temperatures (°F) before and after catalysts.
	<p>2. The Permittee shall maintain a record of all startup, shutdown and malfunctions affecting air contaminant emission rates on the approved EU(s) and PCD(s) and monitoring equipment. At a minimum, the records shall include:</p> <ul style="list-style-type: none"> i. type of event (startup, shutdown, or malfunction); ii. equipment affected; iii. date of event; and iv. duration of event (minutes)
	<p>3. The Permittee shall maintain a record of routine maintenance activities performed on the approved EU(s), PCD(s) and monitoring equipment. The records shall include, at a minimum;</p> <ul style="list-style-type: none"> i. name of the person performing the inspection and/or maintenance; ii. date of the inspection and/or maintenance; iii. results or actions taken or scheduled to be taken with the proposed dates for the same; and iv. date the catalyst is replaced.
	<p>4. The Permittee shall maintain a copy of this Plan Approval, underlying Application and the most up-to-date SOMP for the EU(s) and PCD(s) approved herein on-site.</p>
	<p>5. The Permittee shall maintain records of monitoring and testing as required by Table 3.</p>
Facility-wide	<p>6. The Permittee shall maintain records to ensure sufficient information is available to comply with 310 CMR 7.12 Source Registration.</p>
	<p>7. The Permittee shall maintain records required by this Plan Approval for a minimum of five (5) years.</p>
	<p>8. The Permittee shall make records required by this Plan Approval available to MassDEP and USEPA personnel upon request.</p>

Table 4 Key:

EU = Emission Unit

PCD = Pollution Control Device

SOMP = Standard Operating and Maintenance Procedure
 °F = degrees Fahrenheit

USEPA = United States Environmental Protection Agency

Table 5	
EU	Reporting Requirements
EU1 EU2	1. The Permittee shall submit a test protocol, describing the test methods and procedures for NO _x , CO, optimization/compliance testing, sampling point locations, sampling equipment, sampling and analytical procedures, and the operating conditions for the required testing to this Office, attention Bureau of Air and Waste (BAW) Permit Chief, for review and MassDEP approval at least 30 days prior to the commencement of any compliance testing at the Facility.
	2. The Permittee shall submit to MassDEP all information required by this Plan Approval 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).
	3. The Permittee shall submit any records requested by MassDEP at anytime, which is recorded in accordance with Table 4, Condition Nos. 1, 2, and 3, by email at nero.air@state.ma.us or by Fax at 978-694-3499, as soon as possible, but no later than three (3) business days to Northeast Regional Office of MassDEP, BAW Permit Chief, over the signature of a “Responsible Official”.
	4. The Permittee shall notify the Northeast Regional Office of MassDEP, BAW Permit Chief by email at nero.air@state.ma.us or fax at 978-694-3499, as soon as possible, but no later than three (3) business days after discovery of an exceedance(s) of Table 2 requirements. A written report shall be submitted to Permit Chief at MassDEP within seven (7) 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).
Facility-wide	5. The Permittee shall submit tri-annual report to MassDEP, in accordance with 310 CMR 7.12, all information as required by the Source Registration/Emission Statement Form. The Permittee shall note therein any minor changes (under 310 CMR 7.02(2)(e), 7.03, 7.26, etc.), which did not require Plan Approval.

Table 5 Key:

EU = Emission Unit Number
 NO_x = Nitrogen Oxides
 CO = Carbon Monoxide

PCD = Pollution Control Device

4. SPECIAL TERMS AND CONDITIONS

A. The Permittee is subject to, and shall comply with, the Special Terms and Conditions as contained in Table 6 below:

Table 6	
EU	Special Terms and Conditions
EU1 EU2	1. The Permittee shall ensure that the noise generated by the operation of each unit shall be in compliance with Regulation 310 CMR 7.10 and the BAW's Noise Policy No. 90-001 (copy attached).
	2. The Permittee shall follow the Standard Operating and Maintenance Procedures (SOMP) for each unit to maintain efficient operation of each unit to minimize emissions as contained in Table 2 above.
Facility- Wide	3. The Permittee shall ensure that any modifications or new equipment installation which increases emissions by one (1) ton or more per year shall comply with the requirements of Regulation 310 CMR 7.02. Any other modifications (such as moving equipment for increased efficiency, or changing exhaust configurations) shall be noted on the Source Registration/Emission Statement Forms as required by Regulation 310 CMR 7.12. These modifications cannot violate the condition of this facility-wide approval, including the emission restrictions.
	4. The Permittee shall submit Compliance Certifications Form within 60 days of commencement of operation for any emergency generator and/or boilers to MassDEP for any proposed new boilers and emergency generators under the Environmental Results Program (ERP) in accordance with 310 CMR 7.26(32) and 310 CMR 7.26(42), as applicable.
	5. The Permittee shall report decommissioning of any existing emergency generators and boilers on the next triennial Source Registration Forms.
	6. The Permittee shall label each emission unit (EU) approved herein for proper monitoring, recordkeeping, and reporting purposes.

Table 6 Key:

EU# = Emission Unit Number
 BAW = Bureau of Air and Waste
 SOMP = Standard Operating and Maintenance
 Procedure

B. The Permittee shall utilize each exhaust stack with the following parameters as contained in Table 7 that is consistent with good air pollution control engineering practice and that discharges so as to not cause or contribute to a condition of air pollution. Exhaust stack shall be configured to discharge the gases vertically and shall not be equipped with any part or device that restricts the vertical exhaust flow of the emitted gases, including, but not limited to, rain protection devices known as “shanty caps” and “egg beaters.”, for each Emission Units as contained in Table 1 that are regulated by this Plan Approval.

Table 7				
EU	Stack Height Above roof (feet)	Stack Inside Exit Dimensions (feet)	Stack Gas Exit Velocity Range (feet per second)	Stack Gas Exit Temperature Range (°F)
EU1 EU2	4.17	2.83	20	200 - 250

Table 7 Key:

EU = Emission Unit Number

°F = Degree Fahrenheit

5. GENERAL CONDITIONS

The Permittee is subject to, and shall comply with, the following general conditions:

- A. Pursuant to 310 CMR 7.01, 7.02, 7.09 and 7.10, should any nuisance condition(s), including but not limited to smoke, dust, odor or noise, occur as the result of the operation of the Facility, then the Permittee shall immediately take appropriate steps including shutdown, if necessary, to abate said nuisance condition(s).
- B. If asbestos remediation/removal will occur as a result of the approved construction, reconstruction, or alteration of this Facility, the Permittee shall ensure that all removal/remediation of asbestos shall be done in accordance with 310 CMR 7.15 in its entirety and 310 CMR 4.00.
- C. If construction or demolition of an industrial, commercial or institutional building will occur as a result of the approved construction, reconstruction, or alteration of this Facility, the Permittee shall ensure that said construction or demolition shall be done in accordance with 310 CMR 7.09(2) and 310 CMR 4.00.
- D. Pursuant to 310 CMR 7.01(2)(b) and 7.02(7)(b), the Permittee shall allow MassDEP and / or USEPA personnel access to the Facility, buildings, and all pertinent records for the purpose

of making inspections and surveys, collecting samples, obtaining data, and reviewing records.

- E. This Plan Approval does not negate the responsibility of the Permittee to comply with any other applicable Federal, State, or local regulations now or in the future.
- F. Should there be any differences between the Application and this Plan Approval, the Plan Approval shall govern.
- G. Pursuant to 310 CMR 7.02(3)(k), MassDEP may revoke this Plan Approval if the construction work is not commenced within two years from the date of issuance of this Plan Approval, or if the construction work is suspended for one year or more.
- H. This Plan Approval may be suspended, modified, or revoked by MassDEP if MassDEP determines that any condition or part of this Plan Approval is being violated.
- I. This Plan Approval may be modified or amended when in the opinion of MassDEP such is necessary or appropriate to clarify the Plan Approval conditions or after consideration of a written request by the Permittee to amend the Plan Approval conditions.
- J. Pursuant to 310 CMR 7.01(3) and 7.02(3)(f), the Permittee shall comply with all conditions contained in this Plan Approval. Should there be any differences between provisions contained in the General Conditions and provisions contained elsewhere in the Plan Approval, the latter shall govern.

6. MASSACHUSETTS ENVIRONMENTAL POLICY ACT

MassDEP has determined that the filing of an Environmental Notification Form (ENF) with the Secretary of Energy & Environmental Affairs, for air quality control purposes, was not required prior to this action by MassDEP. Notwithstanding this determination, the Massachusetts Environmental Policy Act (MEPA) and 301 CMR 11.00, Section 11.04, provide certain “Fail-Safe Provisions,” which allow the Secretary to require the filing of an ENF and/or an Environmental Impact Report (EIR) at a later time.

7. APPEAL PROCESS

This Plan Approval is an action of MassDEP. If you are aggrieved by this action, you may request an adjudicatory hearing. A request for a hearing must be made in writing and postmarked within twenty-one (21) days of the date of issuance of this Plan Approval.

Under 310 CMR 1.01(6)(b), the request must state clearly and concisely the facts, which are the grounds for the request, and the relief sought. Additionally, the request must state why the Plan Approval is not consistent with applicable laws and regulations.

The hearing request along with a valid check payable to the Commonwealth of Massachusetts in the amount of one hundred dollars (\$100.00) must be mailed to:

Commonwealth of Massachusetts
Department of Environmental Protection
P.O. Box 4062
Boston, MA 02211

This request will be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver as described below. The filing fee is not required if the appellant is a city or town (or municipal agency), county, or district of the Commonwealth of Massachusetts, or a municipal housing authority.

MassDEP may waive the adjudicatory hearing-filing fee for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file, together with the hearing request as provided above, an affidavit setting forth the facts believed to support the claim of undue financial hardship.

Should you have any questions concerning this Plan Approval, please contact Dhiraj B. Desai by telephone at 978-694-3282, or in writing at the letterhead address.

Sincerely,

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.

Dhiraj B. Desai
Environmental Engineer

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.

Susan P. Ruch
Acting Permit Chief and Deputy
Regional Director
Bureau of Air and Waste

Enclosures: Noise Policy, Administrative Consent Order, ACOP-NE-9005-27NT

E-Copy: Board of Health Westwood, MA, Linda Shea, Health Director, lshea@town.westwood.ma.us
Fire Department Westwood MA, Chief W. Scoble, bscoble@town.westwood.ma.us
MassDEP/BOSTON – Y. Tian
MassDEP/NERO- M. Bolis, E. Braczyk
Air Quality Associates, lsantos@airqualityassoc.com

Hard Copy: MassDEP/NERO – M. Bolis, M. Persky