



The State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES



Thomas S. Burack, Commissioner

February 11, 2011

Mr. Jim Dombrosk
Director of Energy and Utilities
University of New Hampshire
17 Leavitt Lane
Durham, NH 03824

RE: Inspection Report

Dear Mr. Dombrosk:

The New Hampshire Department of Environmental Services, Air Resources Division (“DES”) conducted a Full Compliance Evaluation at your facility on September 30, 2010 and October 7, 2010. Enclosed is a copy of the Inspection Report for your records.

The following deficiencies were observed during the inspection, and are detailed in the enclosed report:

1. UNH recently provided an updated list of “Non EU10” emergency generators dated January 2011. It should be noted that the new list contains 21 additional emergency generators from the original list in the Permit and several changes to the original list. On that list, there are 8 diesel generators that are above the permitting threshold of 1.5 MMBtu/hr and therefore, are not considered to be insignificant. UNH should file a permit application for these devices and for any changes to the original “insignificant” list in the original Permit,
2. Currently, UNH does not report the yearly run hours of each emergency generator. DES recommends that UNH report the yearly run hours of each emergency generator to demonstrate compliance with Table 4a, Item 5 of the Permit,
3. UNH is not reporting the LFG usage in the Siemens turbine (EU7) and the duct burner (EU8) as required by Table 9, item 4 and Table 10, Item 1 of the Permit. UNH has been combining the use of Ng and LFG and reporting the total usage as Ng only. It should be noted that while the emission factors may be the same for both fuels, the heating values of the two fuels are different which may have an impact on the amount of emissions,
4. UNH is not providing the origin of several of the emission factors in the Annual Emission Statement as required by Table 7, Item 12a of the Permit. “Emission factors based on current permit limits” is not an acceptable origin. Some examples of acceptable origins include: AP-42, latest stack test results, CEM data, Vendor data and emission data from similar devices,

5. UNH used several incorrect emission factors in the 2009 Annual Emission Report. These issues were discussed over the telephone and by email between DES Emission Inventory Group and the consultant. UNH was invoiced for fees based on using the corrected emission factors. UNH should submit an amended 2009 Annual Emission Statement using the corrected emission factors, make the corrections noted above and submit to DES by March 18, 2011, and
6. UNH should update and submit its air toxics compliance demonstration to DES by March 18, 2011.

If you have any questions, please feel free to call me at (603) 271-0650.

Sincerely,



Greg Helve
Sr. Compliance Assessment Engineer

Enclosure: Inspection Report

cc: Neil Niman, Chairman, Durham Town Council



ON-SITE FULL COMPLIANCE EVALUATION

**University of New Hampshire
22 Colovos Road
Durham, New Hampshire 03824**

(603) 862-1234

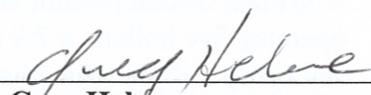
Strafford County

AFS #: 3301700009

**Inspected: September 30, 2010 (Campus facility) and
October 7, 2010 (Rochester facility)
Final Report: February 11, 2011**

Inspected and Prepared by:

**New Hampshire Department of Environmental Services
Air Resources Division
29 Hazen Dr., P.O. Box 95
Concord, New Hampshire 03302-0095**



Greg Helve

Sr. Compliance Assessment Engineer

I. Inspection

On September 30, 2010, the New Hampshire Department of Environmental Services, Air Resources Division (“DES”) conducted an Onsite Full Compliance Evaluation of the University of New Hampshire (“UNH”), located in Durham, NH. On October 7, 2010, DES conducted an Onsite Full Compliance Evaluation of UNH, located in Rochester, NH. UNH was targeted for inspection based on DES inspection criteria, which specifies that a major source with a Title V Permit be inspected once every two years.

Date/Time of Inspection:	September 30, 2010, 9am-Campus facility October 7, 2010 9am-Rochester facility
Inspection Type:	On-Site Full Compliance Evaluation
Inspected by:	Greg Helve, Senior Compliance Engineer Cathy Beahm, Erick Russell- Permit Engineers (Rochester only)
Weather:	Overcast, raining, 53 degF, wind-light-variable on 9/30/2010 Partly sunny, 61 degF, wind-light-variable on 10/7/2010
Source Contacts:	Jim Dombrosk, Director of Energy and Utilities David P. Bowley, Utility Systems Manager Tim Donnelly, Consultant
Last Inspection:	7/17/2008– On-Site Full Compliance Evaluation
Last Inspection Result:	Minor reporting issues noted
Permit Number:	TV-OP-010; issued: 4/11/2007, last amendment: 9/1/2010 expires: 4/30/2012 TP-B-0531; issued 7/25/2007, /amended/reissued 1/22/2010, expired: 1/31/2011

II. Facility/Process Description

UNH is an institution of higher education, is part of the University System of New Hampshire, and is operated by the State of New Hampshire. The campus consists of 130 buildings on a 950-acre parcel of property, located in downtown Durham. Approximately 10,000 undergraduate and 2,000 graduate students attend the university. There is housing on campus for about 50% of the undergraduate students. UNH has approximately 230 full-time employees. The university was founded in 1866 as a State-operated Agricultural and Mechanical College. The energy plant at UNH currently operates 24 hours per day, 365 days per year.

UNH has several permitted devices on its campus. The campus cogeneration plant currently operates five boilers, a 7.9 megawatt (MW) dual-fuel (distillate fuel oil and natural gas) stationary turbine with a heat input rating of 106.0 million British Thermal units per hour (MMBtu/hr), and a heat recovery steam generator (HRSG) with a natural gas-fired duct burner (DB) rated at 66.3 MMBtu/hr. The campus devices are currently operating under Title V

Operating Permit TV-OP-010. UNH has emergency generators located in the Central Heating Plant and throughout the campus. The boilers generate steam to provide heat for the buildings on campus. The combustion turbine (EU7) produces electricity for the campus. The emergency generators provide electricity to key areas of the campus in the event of a loss of electricity.

UNH has constructed and operates a Landfill Gas-to-Energy (LFGTE) facility located at the Turnkey Landfill in Rochester, NH. Landfill gas (LFG) generated at the Turnkey Landfill is processed and transferred by pipeline to the UNH cogeneration plant in Durham, which is located approximately twelve miles from the Turnkey Landfill. The LFGTE facility is considered a support facility to the UNH cogeneration plant and is therefore considered a modification to the existing UNH facility.

The five basic stages of the LFGTE facility are: 1) LFG preparation and sulfur removal; 2) electricity generation by two LFG-fired internal combustion engines; 3) LFG treatment and thermal oxidation of waste gas; 4) flaring of excess LFG gas; and 5) product gas transfer to the cogeneration plant in Durham. UNH has installed at the campus facility a supplemental stationary gas turbine generator rated at 43.6 MMBtu/hr as part of this LFGTE project. The electricity produced from this turbine (EU19) is sold to the grid.

The initial stage of LFG processing consists of pressurizing the gas, lowering the gas temperature and removing moisture. The next step is to remove sulfur-bearing compounds known as total reduced sulfur compounds (TRS) from the LFG. At this point, the LFG required for operating the LFGTE facility power generation equipment and the thermal oxidizer is supplied. The remaining LFG is further compressed, additional moisture is removed, and it is treated to remove siloxanes and volatile organic compounds by use of activated carbon. Activated carbon is followed by pressure swing adsorption, which employs a molecular sieve to remove carbon dioxide.

The power generation equipment for the LFGTE facility consists of two reciprocating engines designed to operate on LFG, each capable of generating 1,600 kW of electricity. The electricity is used to produce power for the LFG treatment system described above.

The thermal oxidizer will destruct the waste gas streams produced during the regeneration of the activated carbon and the pressure swing adsorption's molecular sieve. The thermal oxidizer's maximum heat input is expected to be approximately 36 MMBtu/hr. Because of the variability of the energy content of the waste gas stream, LFG will be required as a supplemental fuel for flame stabilization.

UNH has agreed to continuously take 7,000 standard cubic feet per minute (scfm) of LFG, regardless of the processing demand at the UNH campus. UNH has installed two open flares at the Rochester facility to be operated for supplemental and standby purposes. Based on current energy needs at the Durham campus, the supplemental flares may operate continuously, at an average of 12% of its rated capacity. When the processing equipment and turbines are not operating, both of the flares will operate at their maximum rated capacity to control the LFG. The amount of excess product gas will vary on a seasonal basis such that the greatest amount of excess gas will be available in the warmer months.

Insignificant activities at UNH include several emergency generators, small boilers, and gas-fired hot water heaters. The facility is a major source of NO_x and SO₂ emissions and, therefore, requires a Title V Operating Permit. During the inspections, nothing the inspector was given or saw was deemed confidential by UNH

III. Emission Unit Identification and Operating Conditions

Table 1 contains the permitted devices in use at the facility.

Table 1 – Significant Activity Identification			
Emission Unit ID	Description of Emission Unit	Emissions Unit Maximum Design/Permitted Capacity	Reported Operating and Fuel Use Data
EU1	Boiler #1 (Central Heating Plant) Babcock & Wilcox Model FF2972 Serial Number NA-Installed 1963	47.3 MMBtu/hr a) No. 6 fuel oil, equivalent to 315.3 gal/hr; or b) Natural gas, equivalent to 46,373 scf/hr	2009: 580 gal #6 oil 35.566 MMcf Ng 2008: 35,400 gal #6 oil 33.546 MMcf Ng
EU2	Boiler #2 (Central Heating Plant) Babcock & Wilcox Model FF2972 Serial Number NA-Installed 1963	47.3 MMBtu/hr a) No. 6 fuel oil, equivalent to 315.3 gal/hr; or b) Natural gas, equivalent to 46,373 scf/hr	2009: 27,770 gal #6 oil 33.666 MMcf Ng 2008: 38,945 gal #6 oil 22.596 MMcf Ng
EU3	Boiler #3 (Central Heating Plant) Babcock & Wilcox Model FF2713 Serial Number NA-Installed 1958	47.3 MMBtu/hr a) No. 6 fuel oil, equivalent to 315.3 gal/hr; or b) Natural gas, equivalent to 46,373 scf/hr	2009: 42,510 gal #6 oil 0 cf Ng 2008: 44,705 gal #6 oil 0 cf Ng
EU4	Boiler #4 (Central Heating Plant) Riley Model NA Serial Number NA-Installed 1948	47.3 MMBtu/hr a) No. 6 fuel oil, equivalent to 315.3 gal/hr; or b) Natural gas, equivalent to 46,373 scf/hr	2009: Decommissioned 2008: 0 gal #6 oil 0 cuft Ng
EU5	Boiler #5 (Central Heating Plant) Cleaver Brooks Model CB-600-400 Serial Number NA-Installed 1986	16.7 MMBtu/hr a) No. 6 fuel oil, equivalent to 111.7 gal/hr; or b) Natural gas, equivalent to 16,373 scf/hr	2009: 3,900 gal #6 oil 3.155 MMcfNg 2008: 0 gal #6 oil 4.214 MMcf Ng
EU6	New England Center Boiler Cleaver Brooks Model CB-662-300 Serial Number NA-Installed 1965	12.6 MMBtu/hr a) No. 2 fuel oil, equivalent to 89.5 gal/hr; or b) Natural gas, equivalent to 12,353 scf/hr	2009: 0 gal #6 oil 23.337 MMcf Ng 2008: 0 gal #6 oil 21.756 MMcf Ng

1 The heating values of Diesel fuel, No. 6 fuel oil, No. 2 fuel oil, and natural gas are assumed to be equal to 137,000 Btu/gal, 150,000 Btu/gal, 140,000 Btu/gal, and 1,020 Btu/scf, respectively.

Table 1 – Significant Activity Identification			
Emission Unit ID	Description of Emission Unit	Emissions Unit Maximum Design/Permitted Capacity	Reported Operating and Fuel Use Data
EU7	Combustion Turbine Siemens Power Tempest SGT-300 Contract #: 1405032NW0044 Installed 2004	104.8 MMBtu/hr using No. 2 fuel oil at 0 deg F with the Chiller OFF ² , equivalent to 748.6 gal/hr No. 2 fuel oil; 106.0 MMBtu/hr using Natural gas and LFG at 0 deg F with the Chiller OFF, equivalent to 103,922 scf/hr Natural gas	2009: 1,223,617 gal #2 oil 189.553 MMcf Ng 2008: 295,294 gal #2 oil 476.054 MMcf Ng
EU8	Heat Recovery Steam Generator With Duct Burner Energy Recovery International Model VC-4 Serial Number 4759 Nat Com Burner Model DBG 582R Serial Number 9511-1 Installed 2004	66.3 MMBtu/hr Natural gas and LFG	2009: 14.621 MMcf Ng 2008: 25.263 MMcf Ng
EU9	Black Start Emergency Generator ³ at the Combustion Turbine Building Caterpillar Model 3412/SR4B Serial Number BLG02735 750 KW Installed 2004	7.5 MMBtu/hr Diesel fuel, equivalent to 54.8 gal/hr	2009: 493 gal #2 oil 2008: 767 gal #2 oil
EU10	Emergency Generators (EG1 through EG7 listed in Attachment B) which are included in the facility wide emissions cap along with EU1 through EU9. Installed prior to 1999	See Attachment B	2009: 1885 gal diesel 0.110 MMcf Ng 2008: 1658 gal diesel 0.166 MMcf Ng
EU11	See Attachment B for a list of all emergency Generators on the UNH campus above permitting thresholds of 1.5 MMBtu/hr gross heat input rate combined for liquid fuels and 10.0 MMBtu/hr gross heat input rate combined for gaseous fuels, and which individually are above 150,000 Btu/hr gross heat input rate.	See Attachment B	2009: 803 gal diesel 0.756 MMcf Ng 2008: 2,052 gal diesel 0.874 MMcf Ng

- 2 The Combustion Turbine has an Absorption Chiller to provide combustion air pre-cooling for the Combustion Turbine. This operates whenever the ambient air temperature is above 70 degrees F and the Turbine can not meet the campus electrical load.
- 3 The Black Start Emergency Generator (EU9) is listed as EG8 in the table of all emergency generators at the facility above 150,000 Btu/hr in Attachment B of this permit.

Table 1 – Significant Activity Identification

Emission Unit ID	Description of Emission Unit	Emissions Unit Maximum Design/Permitted Capacity	Reported Operating and Fuel Use Data
EU14	Reciprocating Engine #1 Caterpillar Model # G3520C Serial # GZJ00311 Installed 2008/2009	<ol style="list-style-type: none"> 1. Operation shall be limited to the combustion of unprocessed or processed landfill gas. 2. The maximum heat input shall be limited to 16.0 MMBTU/hr (equivalent to 32,000 scf/hr⁴). 	<p>2009: 74.481 MMcf LFG</p> <p>2008: 0 cf LFG</p>
EU15	Reciprocating Engine #2 Caterpillar Model # G3520C Serial # GZJ00310 Installed 2008/2009	<ol style="list-style-type: none"> 1. Operation shall be limited to the combustion of unprocessed or processed landfill gas. 2. The maximum heat input shall be limited to 16.0 MMBTU/hr (equivalent to 32,000 scf/hr). 	<p>2009: 74.449 MMcf LFG</p> <p>2008: 0 cf LFG</p>
EU16	Supplemental Utility Flare John Zink Co./Perennial Energy Model # FL-16-C Serial # FL2-1575 Installed 2008	<ol style="list-style-type: none"> 1. Operation shall be limited to the combustion of unprocessed or processed landfill gas. 2. The maximum heat input shall be limited to 125.4 MMBTU/hr (equivalent to 250,800 scf/hr). 	<p>2009: 494.839 MMcf LFG</p> <p>2008: 3.039 MMcf LFG</p>
EU17	Standby Utility Flare John Zink Co./Perennial Energy Model # FL-16-C Serial # FL3-1575 Installed 2008	<ol style="list-style-type: none"> 1. Operation shall be limited to the combustion of unprocessed or processed landfill gas. 2. The maximum heat input shall be limited to 105.06 MMBTU/hr (equivalent to 210,120 scf/hr). 	<p>2009: 242.034 MMcf LFG</p> <p>2008: 11.486 MMcf LFG</p>
EU18	Thermal Oxidizer Perennial Energy Model # CP-1 Serial # CP-1575 Installed 2008/2009	<ol style="list-style-type: none"> 1. Operation shall be limited to the combustion of unprocessed landfill gas and waste gas produced from the regeneration of treatment media. 2. The maximum heat input to this device shall be limited to 36 MMBTU/hr. 	<p>2009: 513.313 MMcf LFG</p> <p>2008: 0 cf LFG</p>
EU19	Solar Mercury 50 Recuperative Turbine Solar Model # Mercury 50-6000R Engine Serial # 0048R Package Serial # PG08926 Installed 2008/2009	<ol style="list-style-type: none"> 1. Operation shall be limited to the combustion of processed landfill gas. 2. The maximum heat input shall be limited to 43.6 MMBTU/hr (equivalent to 57,978 scf/hr⁵). 	<p>2009: 48.129 MMcf LFG</p> <p>2008: 0 cf LFG</p>

Facility emissions for this inspection period are included in Tables 2, 3 and 4. Facility emissions are calculated using the facility's fuel usage data, the EPA's AP-42 Emission Factors, stack test data, NOx CEM data for EU07 and vendor supplied data. The fuel usage data and the facility emissions reported by UNH were confirmed during this inspection. Prior to the LFGTE Project,

- 4 The hourly fuel rate is set assuming a heating value of 500 Btu/scf for unprocessed landfill gas. The fuel consumption limits may vary based on the actual heat content of the fuel burned.
- 5 The hourly fuel rate is set assuming a heating value of 752 Btu/scf for processed landfill gas. The fuel consumption limits may vary based on the actual heat content of the fuel burned.

the UNH facility opted out of NSR and PSD program requirements by accepting federally enforceable emissions caps for the combined emissions from EU1 through EU11. See Table 3. UNH also accepted a separate set of emission caps for EU5 at the same time to avoid exceeding PSD/NSR thresholds. See Table 5. The LFGTE Project has required UNH to receive a Non-Attainment New Source Review (“NSR”) and a Prevention of Significant Deterioration (“PSD”) Permit for the activities connected with the treatment and combustion of LFG.

Tables 2, 3, 4 and 5 summarize the emissions from the facility.

Table 2: Facility-Wide Emissions						
	Nitrogen Oxides (tpy)	Sulfur Dioxide (tpy)	Carbon Monoxide (tpy)	Particulate Matter (PM₁₀) (tpy)	VOCs (tpy)	HAPS/TAPS (tpy)
Permitted Emission Limits	119.35	296.20	288.34	53.95	73.98	10/25
2008	60.62	75.59	133.45	25.65	33.69	2.60
2009	29.74	37.03	63.00	13.86	14.03	0.69

Table 3: Emissions: EU01 – EU11 combined (TV-OP-010)						
	Nitrogen Oxides (tpy)	Sulfur Dioxide (tpy)	Carbon Monoxide (tpy)	Particulate Matter (PM₁₀) (tpy)	VOCs (tpy)	HAPS/TAPS (tpy)
Permitted Emission Limits	77.83	257.20	106.34	30.81	25.74	6.90
2009	64.845	45.710	26.757	11.220	6.580	0.048
2008	25.103	26.256	35.316	10.866	9.574	0.426

Table 4: Emissions: EU14 – EU19 combined (TP-B-0531)						
	Nitrogen Oxides (tpy)	Sulfur Dioxide (tpy)	Carbon Monoxide (tpy)	Particulate Matter (PM₁₀) (tpy)	VOCs (tpy)	HAPS/TAPS (tpy)
Permitted Emission Limits	41.52	39.00	182.00	23.14	48.24	10/25
2009	18.506	29.824	95.130	11.045	18.227	0
2008	4.938	10.821	26.869	3.050	4.358	0

	Nitrogen Oxides (tpy)	Sulfur Dioxide (tpy)	Carbon Monoxide (tpy)	Particulate Matter (PM₁₀) (tpy)	TSP (tpy)
Permitted Emission Limits	8.24	35.29	0.75	2.19	2.55
2009	0.265	0.460	0.142	0.045	0.045
2008	0.211	0.001	0.177	0.016	0.016

IV. Control Equipment

Table 6 contains the control equipment currently being used at the Rochester facility. There is no control equipment at the campus facility.

Pollution Control Equipment Number	Emission Unit Controlled	Description of Equipment/Method	Primary Pollutants Controlled
PC1	LFG Treatment System	Thermal Oxidizer (EU18)	Waste gases generated from LFG treatment system (siloxanes, VOCs)
PC2	SulfaTreat System	Sulfur removal through reaction with iron to form iron sulfide	Sulfur in LFG
PC3	Molecular Sieve	Carbon dioxide removal via molecular sieve	Carbon Dioxide

V. Stack Criteria

Table 7 contains the stack criteria for this facility.

Stack Number	Emission Unit Number	Emission Unit Description	Minimum Stack Height Above Ground Level (Feet)	Maximum Inside Stack Diameter (Feet)
ST01	EU1, EU2, EU3 and EU4 (Combined stack)	Boilers	205	8.5

Table 7 – Stack Criteria				
Stack Number	Emission Unit Number	Emission Unit Description	Minimum Stack Height Above Ground Level (Feet)	Maximum Inside Stack Diameter (Feet)
ST02	EU5	Boiler	50	3.0
ST03	EU6	Boiler	35	2.0
ST04	EU07 EU08	Siemens Turbine and Duct Burner (combined stack)	100	6.5
ST14	EU14	Reciprocating Engine #1	32	1.3
ST15	EU15	Reciprocating Engine #2	32	1.3
ST16	EU16	Supplemental Utility Flare	61.2 (effective stack height)	6.5 (equivalent diameter)
ST17	EU17	Standby Utility Flare	58.6 (effective stack height)	5.9 (equivalent diameter)
ST18	EU18	Thermal Oxidizer	30	4
ST19	EU19	Solar Mercury Recuperative Turbine	100	4.1

VI. Compliance With Permitting Requirements

CHAPTER ENV-A 400 - Acid Deposition Control Program

This chapter applies to those sources that emitted 100 tons or more of SO₂ per year on average during the period 1979 through 1982. At that time, UNH met this criterion.

In accordance with Env-A 403.01, any source subject to the rule shall have an average emission rate not to exceed 1.6 lbs of SO₂ per million Btu heat input. This is equivalent to the use of #6 fuel oil with 1.5% sulfur by weight and meets the 75% of the baseline average emission rate. The average emission rate is calculated by using the annual fuel usage data, and applying the AP-42 factor for SO₂ emissions to calculate pounds of SO₂ emitted per year. The heat input, in Btu per year, is calculated using a factor of 150,000 Btu/gallon heat rating for #6 fuel oil, and the annual fuel usage rate. The average emissions per heat input is calculated by dividing the emission rate by the heat input rate. Results of DES's average emission rate calculations are listed in Table 8. As shown, UNH did not exceed the average SO₂ emission rate limit.

Year	Average SO₂ Emission Rates (Pounds of Sulfur Dioxide per Million Btu Heat Input)
Regulatory Limit	1.6
2009	0.21
2008	0.36

CHAPTER ENV-A 500 - Standards Applicable to Certain New or Modified Facilities and Sources of Hazardous Air Pollutants

UNH is subject to several New Source Performance Standards (“NSPS”) codified in 40 CFR 60 and incorporated by reference in Env-A 503.01: Subpart GG, *Standards of Performance for Stationary Gas Turbines*, Subpart Dc, *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*, Subpart Kb, *Standards of Performance for Volatile Organic Liquid Storage Vessels for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984*, and Subpart KKKK, *Standards of Performance for Stationary Combustion Turbines*. While the Facility emits small amounts of Hazardous Air Pollutants (“HAPs”), these HAPs are not regulated by 40 CFR 61, as incorporated by reference in Env-A 504.01. UNH is not subject to Env-A 505.01, which incorporates by reference the Maximum Achievable Control Technology (“MACT”) standards in 40 CFR 63, as it is a source category not covered by this section. See Section XV for further discussion.

CHAPTER ENV-A 600 - Statewide Permit System

DES issued a renewal of Title V Operating Permit TV-OP-010 (“the Permit”) to UNH on April 11, 2007. UNH requires a Title V Permit because its emissions of NO_x and SO₂ exceed the major source thresholds of 50 and 100 tons per year, respectively. The Permit expires on April 30, 2012.

On July 25, 2007, DES issued TP-B-0531 (“the Temporary Permit”) to UNH for the installation/operation of the LFGTE Project. A significant amendment was made on November 7, 2009 and the Temporary Permit was reissued on January 22, 2010. The Temporary Permit expired on January 31, 2011. A timely renewal application has been filed and application shield applies. The Temporary Permit is also a PSD/NSR Permit. The following devices or processes under UNH ownership are located at the Turnkey landfill: (1) LFG preparation and sulfur removal; (2) electricity generation by two LFG-fired internal combustion engines; (3) LFG treatment and thermal oxidation of waste gas; (4) flaring of excess LFG; and (5) product gas transfer to the cogeneration plant in Durham via 12 miles of pipeline. The Temporary Permit also covers the installation/operation of a second combustion turbine at the campus central heating plant.

Env-A 606 –Modeling

Modeling was performed as part of the technical review for the original Temporary Permit issued on July 25, 2007. Modeling was performed using the maximum permitted short term emission

rates and assuming 8,760 hours per year of operation for each device. Please refer to the Preliminary Determination dated June 15, 2007 for a detailed discussion of the original modeling analysis.

The facility meets the National Ambient Air Quality Standards (NAAQS) for all criteria pollutants. Further modeling was performed (see modeling memo dated November 8, 2010) for SO₂ due to exceedance of a permit limit during the recent stack test. UNH has requested that the 3-hour averaging time be changed to a 24-hour averaging time. Based on modeling, SO₂ was shown not to impact the NAAQS.

Env-A 609.04 – Insignificant Activities

UNH has a list of insignificant activities that include a list of emergency generators and small boilers. See attachment B. *UNH recently provided an updated list of “Non EU10” emergency generators dated January 2011. It should be noted that the new list contains 21 additional emergency generators from the original list in the Permit and several changes to the original list. On that list, there are 8 diesel generators that are above the permitting threshold of 1.5 MMBtu/hr and which, therefore, are not considered to be insignificant. UNH should file a permit application for these devices and for any changes to the original “insignificant” list in the original Permit.* UNH has reported fuel usage and emissions from all the insignificant activities in the annual emissions report.

Env-A 609 – Title V Operating Permits

During the inspection, the DES inspector reminded UNH that in order to renew the current Permit and be in compliance with application shield per Env-A 609.08, it must submit a complete permit application to DES at least six months prior to the expiration date of the Permit, i.e., by October 31, 2011. UNH has submitted a timely renewal application for the Temporary Permit.

Env-A 618 – Additional Requirements in Non-Attainment Areas and the New Hampshire Portion of the Northeast Ozone Transport Region

UNH is located in Strafford County of New Hampshire and is in the Northeast Ozone Transport Region. Strafford County is classified in this part as an ozone non-attainment region. UNH is an existing major stationary source of NO_x; therefore, the addition of the LFGTE Project is a major modification. The LFGTE Project has required UNH to receive a NSR Permit, i.e., the Temporary Permit.

Env-A 619 – Prevention of Significant Deterioration (“PSD”) of Air Quality Permit Requirements

UNH is an existing major stationary source of attainment pollutants; therefore, the addition of the LFGTE Project is a major modification. The LFGTE Project has required UNH to receive a PSD Permit, i.e., the Temporary Permit.

VII. Compliance with Permit Fee System

CHAPTER Env-A 700 - Permit Fee System

Emission-based fees are due by April 15 of the following year for the previous year's emissions. UNH has paid its emission-based fees each year through the 2009 emission year in a timely manner.

VIII. Source Testing and Monitoring

CHAPTER Env-A 800 - Testing and Monitoring Procedures

UNH has demonstrated via paper and electronic data that it is complying with all the testing and monitoring requirements in both permits. The required test reports are summarized in Appendix A.

IX. Compliance with Recordkeeping and Reporting

CHAPTER ENV-A 900 - Owner or Operator Recordkeeping and Reporting Obligations

Env-A 903.03 – General Recordkeeping Requirements for Combustion Devices

UNH maintains records of the consumption, fuel type, and sulfur content of the fuel oil or natural gas/LFG utilized in the boilers, generators, and heating devices. These records include the amount of each fuel combusted on a monthly basis and the sulfur content of the liquid fuels, in terms of percent sulfur by weight, and for natural gas, in terms of grains per 100 cubic feet. The four boilers and the combustion turbines all have fuel flow meters that are recorded daily. All of the generators have hour meters and hours of operation are recorded monthly. The data from the fuel flow meters or the hour meters is enough to determine the fuel usage in each fuel burning device.

Env-A 903.04 – General Recordkeeping Requirements for Sources with Continuous Emissions Monitoring Systems

UNH was required to install a continuous emissions monitoring system ("CEMS") on the EU07 turbine. UNH maintains the required records for its CEMS. The facility submits the audit data on these systems quarterly to DES. Upon receipt of each report by DES, the Stack Testing Section conducts a review of the report and, if necessary, addresses any compliance issues found in the report. At the time of the inspection, the Stack Testing Section did not have any compliance issues with the reports.

Env-A 905.02 – General NOx Recordkeeping

UNH maintains the required records to demonstrate its NOx emissions are within the Permit

limits.

Env-A 906.01 – Additional Recordkeeping Requirements

UNH maintains a 12-month running total of the emissions of NO_x, SO₂, CO, PM₁₀, VOC and H₂SO₄ mist from each of the devices EU1 through EU10 to demonstrate that the emissions of these pollutants are below the respective limits stated in the Permit. A review of the records indicated that the emission limits in the Permit were not exceeded.

For all of the emergency generators located at the facility, the Permit requires UNH to maintain the following data: hours of operation, dates of operation, monthly and consecutive 12-month fuel use, and consecutive 12-month hours of operation. The electricians record the hour meter reading from each generator once per month. Fuel usage is determined by multiplying the hours of operation data from the hour meters by the maximum design fuel flow rate for each emergency generator.

Env-A 907.01 – General Reporting Requirements

The Full Compliance Evaluation Records Review is included in Appendix A to this report. The appendix lists all the reports that were received and reviewed in order to complete this compliance evaluation. The records review attachment includes a determination of each report's timeliness with regard to the required submittal date, and if the report was acceptable in terms of its content. UNH has submitted all of the required reports. DES noted the following deficiencies:

- 1. Currently, UNH does not report the yearly run hours of each emergency generator. DES recommends that UNH report the yearly run hours of each emergency generator to demonstrate compliance with Table 4a, Item 5 of the Permit.*
- 2. UNH is not reporting the LFG usage in the Siemens turbine (EU7) and the duct burner (EU8) as required by Table 9, item 4 and Table 10, Item 1 of the Permit. UNH has been combining the use of Ng and LFG and reporting the total usage as Ng only. It should be noted that while the emission factors may be the same for both fuels, the heating values of the two fuels are different which may have an impact on the amount of emissions.*
- 3. UNH is not providing the origin of several of the emission factors in the Annual Emission Statement as required by Table 7, Item 12a of the Permit. "Emission factors based on current permit limits" is not an acceptable origin. Some examples of acceptable origins include: AP-42, latest stack test results, CEM data, Vendor data and emission data from similar devices.*
- 4. UNH used several incorrect emission factors in the 2009 Annual Emission Report. These issues were discussed over the telephone and by email between DES Emission Inventory Group and the consultant. UNH was invoiced for fees based on using the corrected emission factors. UNH should submit an amended 2009 Annual Emission Statement using the corrected emission factors for record purposes.*

Part Env-A 908 and 909 – VOC and NOx Emission Statements Reporting Requirements

UNH has actual VOC and NOx emissions greater than 10 tons per year and, therefore, is required to submit annual VOC and NOx Emissions Statements. UNH has filed the information required in the VOC and NOx Emissions Statement as part of the Annual Emissions Reports.

Env-A 910.01 – Additional Reporting Requirements

UNH has submitted all the required reports. See Appendix A for the complete list of reports submitted.

Part Env-A 911 – Recordkeeping and Reporting Requirements for Permit Deviations

UNH maintains records of any deviation that occurs during the operation of the facility and promptly reports the deviations to DES. The deviations are summarized in the Semi-Annual Permit Deviation and Monitoring Reports. There were no deviations reported in 2010 and 3 deviations in 2009.

X. Compliance with RACT

CHAPTER ENV-A 1200 – Prevention, Abatement, and Control of Stationary Source Air Pollution

Part Env-A 1204 - Stationary Sources of VOCs

UNH is not subject to the requirements of this part; it has no devices or processes that are subject to VOC RACT.

Part Env-A 1211 - Nitrogen Oxides

The six boilers at UNH, EU1 through EU6, are subject to the control requirements in Env-A 1211.05 (b). UNH shall comply by performing an annual efficiency test on each boiler. UNH has conducted these efficiency tests and maintains records of the efficiency tests on site.

UNH is opting out of the NOx RACT requirements for emergency generators in Env-A 1211.11, by keeping the combined theoretical potential to emit NOx emissions below 25 tons per consecutive 12-month period by taking a 275-hour per year limitation for each emergency generator at the facility. The emergency generators each operate less than 275 hours during any consecutive 12-month period and the generators have combined theoretical potential NOx emissions less than 25 tons per any consecutive 12-month period.

The combustion turbines are subject to the control requirements of Env-A 1211.06 (d). The NOx emissions shall be less than or equal to 25 ppmvd at 15% oxygen or 0.092 lb/MMBtu while firing on natural gas. UNH operates the combustion turbine EU7 on natural gas and LFG and has a CEM to monitor the NOx emissions. The combustion turbine EU19 only operates on LFG.

This unit is tested periodically to demonstrate compliance. UNH has had several deviations in which the NO_x emissions exceeded 25 ppm on EU7 in 2008 and 2009. UNH has since made modifications to minimize the exceedances and there were no deviations in 2010.

CHAPTER Env-A 1300 – Nitrogen Oxides (NO_x) Reasonably Available Control Technology (RACT)

Effective October 31, 2010, requirements in Env-A 1211 were replaced by Env-A 1300.

XI. Compliance with Toxics Regulations

CHAPTER ENV-A 1400 – Regulated Toxic Air Pollutants (“RTAPs”)

UNH emits compounds on the list of air toxics in Table 1450-1 of Env-A 1400. UNH last updated its air toxics compliance determination in February 2009. In that determination, UNH was able to verify compliance with the AALs in Env-A 1400. UNH is in the process of updating its air toxics compliance determination with respect to the November 2009 issue of Env-A 1400.

UNH should include its usage of the sulfa treat medium, as it contains silica. Approximately 380 tons of the material are used per year at the Rochester facility. *UNH should submit its air toxics compliance demonstration to DES by March 18, 2011.*

XII. Compliance with Fuel Regulations

CHAPTER ENV-A 1600 - Fuel Specifications

Env-A 1603.01 – Applicable Liquid Fuels

UNH uses #6 fuel oil in the Central Heating Plant boilers, #2 fuel oil in the New England Center boiler, and #2 diesel fuel oil in some of the emergency generators.

Env-A 1603.02 – Applicable Gaseous Fuels

UNH uses natural gas in the Central Heating Plant boilers, the New England Center boiler, the EU07 turbine, some of its emergency generators and some of its insignificant activities.

Env-A 1604.01 – Maximum Sulfur Content Allowable in Liquid Fuels

Env-A 1604.01 limits the sulfur content of the #2 fuel oil and #2 diesel fuel oil used in the fuel burning devices at UNH to 0.4% sulfur by weight. UNH has the sulfur content data for each shipment of #2 fuel oil or #2 diesel fuel oil received. The sulfur data indicates that the sulfur content is at or below permit requirements. The Permit and Env-A 403.01 limits the sulfur content of the #6 fuel oil used in the Central Heating Plant boilers to be 1.5% by weight. UNH has the sulfur content data for each shipment of #6 fuel oil received. The sulfur data indicates that the sulfur content is at or below permit requirements.

Env-A 1605.01 – Maximum Sulfur Content Allowable in Gaseous Fuels

UNH receives natural gas via a pipeline. In previous data that DES has received from the various natural gas supply companies, test results for the sulfur content of the pipeline quality natural gas indicate that it is at levels below the regulatory limits.

XIII. Compliance with Process/Particulate/Opacity Regulations

CHAPTER ENV-A 2000 - Fuel Burning Devices

Env-A 2002.01 – Visible Emission Standard for Fuel Burning Devices Installed on or Prior to May 13, 1970

Env-A 2002.01 and the Permit limit the emissions from boilers #1 through #4 and the New England Center boiler #1 at this facility to 40% opacity. During the inspection, the visible emissions from boiler #2 had an opacity less than 5%. At the time of inspection, boilers #1 and #3 were not in operation. Boiler #4 was decommissioned in 2009 and the New England Center boiler #1 was not observed.

Part Env-A 2002.02 – Visible Emission Standard for Fuel Burning Devices Installed After May 13, 1970

The Permit limits the emissions from boiler #5, the combustion turbines, the HRSG and the duct burner, and all the emergency generators at this facility to 20% opacity. During the inspection, the turbine EU07 and the duct burner were not in operation. The turbine EU19 had an opacity of less than 5%. Boiler #5 and all the emergency generators were not in operation; therefore, opacity readings could not be taken.

Env-A 2002.06 – Particulate Emission Standards for Fuel Burning Devices Installed on or Prior to May 13, 1970

For boilers #1 through #4 and the New England Center boiler #1, particulate emission standards specified in the Permit are based on a formula in Env-A 2002.06. Compliance with emission standards for the fuel burning devices can only be determined by stack testing which has not been required for these devices at this time.

Env-A 2002.08 – Particulate Emission Standards for Fuel Burning Devices Installed On or After January 1, 1985

For boiler #5, the turbines, the HRSG and the duct burner, and all the emergency generators at this facility, particulate matter emissions are limited to 0.30 lb/MMBtu. Compliance with emission standards for the fuel burning devices can only be determined by stack testing which has not been required for these devices at this time.

XIV. Compliance with other Miscellaneous Provisions

CHAPTERS ENV-A 3000 and 3100 - Emissions Reductions Trading Program

UNH has been granted ERC Certificates 97NUNH02C and 04NHCHEM01C, and is allowed to use a total of 57 ERCs to offset NOx emissions for the purpose of complying with the requirements of NSR (Env-A 618). Of the 57 ERCs, 24 ERCs are certified as ozone season ERCs and 33 are certified as non-ozone season ERCs. UNH has complied with the reporting requirements. The DES Emissions Trading Program Manager also reviews this information as it is received and accounts for it properly. No compliance issues have been observed with this program.

CHAPTER ENV-A 3700 – NOx Emissions Reduction Fund for NOx-Emitting Generation Sources

The combustion turbines EU7 and 19 and reciprocating engines #1 and #2 (EU14 and 15) at UNH are subject to this Chapter. The NOx emissions from both turbines and engines are less than 7 pounds of NOx per megawatt-hour of electricity produced; therefore, UNH is not subject to any Emissions Reduction Fund Fees and only is required to submit an annual report in accordance with Env-A 3700. UNH has filed a report for calendar years 2008 and 2009. No compliance issues have been observed with this program.

XV. Compliance With Applicable Federal Rules

40 CFR 60, Subpart GG - Standards of Performance for Stationary Gas Turbines

The combustion turbine EU7 at UNH is subject to the NSPS, 40 CFR 60 Subpart GG, which requires the facility to monitor the nitrogen and sulfur content of the pipeline natural gas combusted in the turbine. No monitoring of fuel nitrogen is required so long as only pipeline-quality natural gas is combusted in the turbine. UNH uses natural gas from a pipeline. Subpart GG and the Permit require that the combustion turbine's SO₂ emissions be limited to less than 0.015% SO₂ by volume at 15% oxygen and on a dry basis. UNH uses worst case vendor emission data for SO₂ emissions. The SO₂ emission factor that UNH and DES use is 4.3860 lb/MMft³ or 0.0043 lb/MMBtu, which is based on worst case vendor data. The SO₂ emission limit in Subpart GG converts to 0.76 lb/MMBtu. The use of the vendor data is more stringent than Subpart GG; therefore, UNH is in compliance with this requirement of Subpart GG.

40 CFR 60, Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

The duct burner in the HRSG is subject to the NSPS, 40 CFR 60 Subpart Dc, which requires the facility to maintain daily records on the types and amounts of fuel combusted by the duct burner each day. UNH consumes natural gas and LFG in the duct burner, and there is a meter on each gas line going to the unit. UNH records the amount of each gas combusted in the duct burner each day.

40 CFR 60, Subpart Kb - Standards of Performance for Volatile Organic Liquid Storage Vessels for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984

UNH has a #2 fuel oil storage tank that is subject to the NSPS, 40 CFR 60 Subpart Kb, which requires UNH to keep records on the fuel stored in the tank, the period of storage, and the maximum true vapor pressure of the fuel during the storage period. Subpart Kb also requires UNH to maintain records of the tank dimensions and capacity for the life of the tank. UNH is maintaining the required records to demonstrate compliance with this part. UNH indicated that it is unknown when fuel was last added to the tank. The tank is currently empty and has been empty since February 2008.

40 CFR 60 Subpart KKKK - Standards of Performance for Stationary Combustion Turbines

This subpart affects stationary combustion turbines with a design capacity greater than 10 MMBtu/hr and constructed after February 18, 2005. The pollutants regulated under this NSPS are SO₂ and NO_x. The Solar combustion turbine (EU19) is subject to this subpart. The requirements of this subpart are included in the Temporary Permit, and UNH has demonstrated compliance through monitoring, testing, recordkeeping and reporting as noted above.

40 CFR 70.6 (a)(3) Permit Content, Monitoring, Record Keeping, and Reporting Requirements

UNH is meeting its Title V permit requirements. See Appendix A to this report for greater detail of UNH's Title V reporting history and compliance status.

Clean Air Act Amendments 112 (r)(1) – Accidental Release Program Requirements

The Facility is subject to the Accidental Release Program requirements of the 1990 Clean Air Act Amendments, section 112(r). If a source stores substances specified in 40 CFR 68.130 in quantities that exceed the stated thresholds, then the source is required pursuant to subsection 112(r)(7) to prepare a Risk Management Plan ("RMP") and submit a copy of the RMP to EPA. UNH indicates that the quantities of regulated chemicals stored at the Facility are less than the applicable threshold quantities established in 40 CFR 68.130; therefore, a RMP is not required for this Facility.

XVI. Enforcement History and Status

From 2007 to 2009, DES has had no past or ongoing enforcement actions against UNH.

XVII. Conclusion & Recommended Actions

During the inspection, the following issues were found:

1. UNH recently provided an updated list of “Non EU10” emergency generators dated January 2011. It should be noted that the new list contains 21 additional emergency generators from the original list in the Permit and several changes to the original list. On that list, there are 8 diesel generators that are above the permitting threshold of 1.5 MMBtu/hr and which, therefore, are not considered to be insignificant. UNH should file a permit application for these devices and for any changes to the original “insignificant” list in the original Permit,
2. Currently, UNH does not report the yearly run hours of each emergency generator. DES recommends that UNH report the yearly run hours of each emergency generator to demonstrate compliance with Table 4a, Item 5 of the Permit,
3. UNH is not reporting the LFG usage in the Siemens turbine (EU7) and the duct burner (EU8) as required by Table 9, item 4 and Table 10, Item 1 of the Permit. UNH has been combining the use of Ng and LFG and reporting the total usage as Ng only. It should be noted that while the emission factors may be the same for both fuels, the heating values of the two fuels are different which may have an impact on the amount of emissions,
4. UNH is not providing the origin of several of the emission factors in the Annual Emission Statement as required by Table 7, Item 12a of the Permit. “Emission factors based on current permit limits” is not an acceptable origin. Some examples of acceptable origins include: AP-42, latest stack test results, CEM data, vendor data and emission data from similar devices,
5. UNH used several incorrect emission factors in the 2009 Annual Emission Report. These issues were discussed over the telephone and by email between DES Emission Inventory Group and the consultant. UNH was invoiced for fees based on using the corrected emission factors. UNH should submit an amended 2009 Annual Emission Statement using the corrected emission factors, make the corrections noted above and submit to DES by March 18, 2011, and
6. UNH should update and submit its air toxics compliance demonstration to DES by March 18, 2011.

Appendix A: Full Compliance Evaluation Records Review

Facility: University of New Hampshire
Date of FCE: September 30, 2010 and October 7, 2010
Reviewer: Greg Helve

Annual Emission Reports (incl. NOx, VOC etc.):

Reporting Period	When Rec'd	Report OK	In Database
2009	4/14/2010	Yes	Yes
2008	3/26/2009	Yes	Yes

Annual Emissions-Based Fee Payments:

Reporting Period	When Rec'd	In Database
2009	4/14/2010	Yes, in DES Emission Section's Spreadsheet.
2008	3/26/2009	Yes, in DES Emission Section's Spreadsheet.

TV Annual Compliance Certifications:

Reporting Period	When Rec'd	Report OK	In Database
2009	4/14/2010	Yes	Yes
2008	4/07/2009	Yes	Yes

TV Semi-Annual Permit Deviation and Monitoring Reports:

Reporting Period	When Rec'd	Report OK	In Database
2010-1 st	7/30/2010	Yes	Yes
2009-2 nd	1/28/2010	Yes	Yes
2009-1 st	7/20/2009	Yes	Yes
2008-2 nd	2/03/2009	Yes-Late	Yes

Individual Permit Deviations Reports:

UNH has submitted several Permit Deviation Reports between May 2007 and July 2008. Each report is submitted to DES and is summarized in the Semi-Annual Permit Deviation and Monitoring Reports and in the Annual Compliance Certification Report. DES then enters the deviation into the database and files it in the Source File.

Reporting Period	When Rec'd	Report OK	In Database
See Reports			

Quarterly Continuous Emission Monitoring Excess Emission Reports (CEM EERs):

Reporting Period	When Rec'd	Report OK	In Database
3 rd Qtr. 2010	10/28/2010	Yes	Yes
2 nd Qtr. 2010	7/30/2010	Yes	Yes
1 st Qtr. 2010	4/29/2010	Yes	Yes
4 th Qtr. 2009	1/27/2010	Yes	Yes
3 rd Qtr. 2009	10/30/2009	Yes	Yes
2 nd Qtr. 2009	7/24/2009	Yes	Yes
1 st Qtr. 2009	5/01/2009	Yes	Yes
4 th Qtr. 2008	2/03/2009	Yes-Late	Yes
3 rd Qtr. 2008	11/04/2008	Yes-Late	Yes

CEM Audits (OPAs, CGAs, RAAs, RATAs):

Reporting Period	Report Type	When Rec'd	Report OK	In Database
3 rd Qtr. 2010	RAA	10/28/2010	Yes	Yes
2 nd Qtr. 2010	RAA	7/30/2010	Yes	Yes
1 st Qtr. 2010	RAA	4/29/2010	Yes	Yes
4 th Qtr. 2009	RAA	1/27/2010	Yes	Yes
3 rd Qtr. 2009	RAA	10/30/2009	Yes	Yes
2 nd Qtr. 2009	RAA	7/24/2009	Yes	Yes
1 st Qtr. 2009	RAA	5/01/2009	Yes	Yes
4 th Qtr. 2008	RAA	2/03/2009	Yes-Late	Yes
3 rd Qtr. 2008	RAA	11/04/2008	Yes-Late	Yes

Stack Tests:

Stack Test Date	Device Tested	When Rec'd	Report OK	In Database
9/28/2010	Turbine EU7 RATA	10/28/2010	Yes	Yes
11/24/2009	Turbine EU19 initial	1/6/2010	Yes	Yes
9/29/2009	Turbine EU7 RATA	10/20/2009	Yes	Yes
9/29/2009	Therm Oxi EU18 initial	10/08/2009	Yes	Yes
7/1/2009	Engine EU14 initial	10/08/2009	Yes	Yes
6/30/2009	Engine EU15 initial	10/08/2009	Yes	Yes
9/24/2008	Turbine EU7 RATA	10/13/2008	Yes	Yes

Other reports:

Reporting Period	Report Type	When Rec'd	Report OK	In Database
None req'd				

Appendix B: List of Insignificant Activities

List of all Emergency Generators Rated Above 150,000 Btu/hr and below permitting thresholds "Non EU10" Emergency Generator Inventory (January 2011)

Location	Engine Make	Engine Model #	Engine Serial #	Fuel	F.R. (gal or cf/hr)	Heat Input (MMBtu/hr)	KW
Adams Tower West	CAT	3306BDI	85Z04098	Diesel	15.8	2.2	200
Aquaculture Lab at Equine Center	Winco	PSS 12 H/A	85377 M03	Propane	2.2	0.2	12
Cable TV Head End Bldg.	Onan	705JB3N4C	3RV/2835P	Nat Gas	134.0	0.1	7.5
Christenson	Ford	C5PG-005-A	18039 H60KT	Nat Gas	1100.0	1.1	100
New Castle Coastal Marine Lab	CAT	C4.4	E5M01130	Diesel	5.3	0.7	60
New Castle Pier Support Facility	CAT	C4.4	E5M00299	Diesel	6.5	0.9	100
Dispatch (located in Heating Plant)	KIA	SD20 3.0	C2920	Diesel	2.0	0.3	20
Gregg Hall (formerly ETB)	Cat	3406	4FD02289	Nat Gas	734.0	0.7	150
Dimond Library	CAT	3208	5YF03487	Diesel	13.1	1.8	200
Fairchild	Olympian	G4OF3	OLY00000LNGC00922	Nat Gas	576.0	0.6	40
Field House	Cummins	4BT-3.9	44Z37195	Diesel	4.7	0.6	60
Fire Dept	Ford	LRG 425	04WG25612	Nat Gas	450.0	0.5	25
Gables North	Cummins	WSG 1068	05QS48564	Nat Gas	557.0	0.6	225 hp
Gables South	Cummins	WSG 1068	05RS44735	Nat Gas	557.0	0.6	225 hp
Gables Sewer Lift	Cummins	WSG 1068	06SS58786	Nat Gas	557.0	0.6	225 hp
Gables serves Bldgs A, B & C	CAT	3408B	6NB00823	Nat Gas	3200.0	3.2	250
Health Service	White	NO MODEL #	3333394G3400X357	Nat Gas	600.0	0.6	45
Heating Plant (not Dispatch or Black Start)	CAT	3306	66D19216	Diesel	12.3	1.7	155
Holloway	Cummins	GTA 855G3	25275630	Nat Gas	1400.0	1.4	250
Horton	Onan	15RJC	4XR8 633R	Nat Gas	255.0	0.3	15

Hubbard	Onan	705JB	17C 941284	Nat Gas	134.0	0.1	7.5
Huddleston	White	G2300X14	MB3319406	Nat Gas	500.0	0.5	30
Jackson Lab	CAT	1104C-44T	2442-1800	Diesel	3.7	0.5	70.5
James Hall	CAT/GM	Model G150G1	--	Nat Gas	1798.0	1.8	150
Kendall	Ford	C5PF-6005-A	26739-K23KR	Nat Gas	600.0	0.6	30
Kingsbury	Cat	CTP02437	0000JKAP00339	Nat Gas	4472.0	4.5	350
McConnell	Ford	C5PF-6005-A	22822-S2KT	Nat Gas	600.0	0.6	30
Mills	CAT	3406	CTS00256	Nat Gas	2700.0	2.7	240
Mini Dorm	FORD	2712E	575953909	Diesel	2.6	0.4	30
Morse Hall	CAT	3406	2WB03136 (4W3822)	Diesel	19.0	2.6	250
One Leavitt Lane Data Center	CAT	3306	7YR02974	Diesel	19.1	2.6	250
Print & Mail Services (PAMS)	Ford	ESG642I6005E	03-02-051476	Nat Gas	585.0	0.6	45
Parson 1	FORD	4.9L	EO6455	Nat Gas	585.0	0.6	45
Parson 2	Ford	C5PG6 005-A	20912-C20KR	Nat Gas	585.0	0.6	45
Phillbrook	International	V549	112546	Nat Gas	1400.0	1.4	85
Ritzman	Kubota	95A-038-24S	CD008-A161.0118CDYN	Diesel	0.7	0.1	8
Rudman	CAT	3312	81216491	Diesel	46.1	6.3	600
SERC A	CAT	G3406TA	CT00548	Nat Gas	2894.0	2.9	240
SERC B	CAT/GM	G125G1	8P1L13989	Nat Gas	1508.0	1.5	125
SERC C	CAT/GM	G150G1	8P1L13452	Nat Gas	1798.0	1.8	150
Stillings	Onan	JC	2006-0005	Nat Gas	134.0	0.1	7.5
Stoke	Isuzu	4001E	03421/A1	Nat Gas	255.0	0.3	15
Telecom	Waukesha	F817GU	389312	Nat Gas	1500.0	1.5	115
Water Supply	Allis/Chalmers	25000 1-7451-69053	25-03545	Diesel	15.0	2.1	200
Whittemore Center	CAT	3306	2TM00105	Diesel	19.4	2.7	250
Williamson	Ford	C5PG-600-A	29268 A-17-HM	Nat Gas	585.0	0.6	45

Yellow indicates engine is above permitting threshold and requires a permit

List of Other Fuel Burning Devices at UNH That Are Insignificant Activities

Description & Location	Manufacturer	Model	Serial #	Fuel	Firing Rate (gal/hr or cf/hr)	Heat Input (MMBtu/hr)	Date Installed
New England Center Boiler #2	Cleaver Brooks	CB-500-60	L-75255	Nat gas or #2 fuel oil	Not available.	2.511	~1982 Mfg: 3/15/82
Gables Boiler #1	Cleaver Brooks	M4W-5000	4G018641	Nat gas or #2 fuel oil	Not available.	5.0	Pre 2002 Mfg: 1990
Gables Boiler #2	Cleaver Brooks	M4W-5000	4G018642	Nat gas or #2 fuel oil	Not available.	5.0	Pre 2002 Mfg: 1990
Gables Boiler #3	Cleaver Brooks	M4W-5000	4G018643	Nat gas	Not	5.0	Pre 2002

Description & Location	Manufacturer	Model	Serial #	Fuel	Firing Rate (gal/hr or cf/hr)	Heat Input (MMBtu/hr)	Date Installed
				or #2 fuel oil	available.		Mfg: 1990
Gables North Boiler #1	Lochinvar Copper-Fin II	CHN0991	L05H00182619	Nat gas	952	0.99	August 2006
Gables North Boiler #2	Lochinvar Copper-Fin II	CHN0991	L05H00182618	Nat gas	952	0.99	August 2006
Gables North Hot Water Heater #1	Lochinvar Copper-Fin II	CFN651PM	A06400182696	Nat gas	625	0.65	August 2006
Gables North Hot Water Heater #2	Lochinvar Copper-Fin II	CFN651PM	A06400182697	Nat gas	625	0.65	August 2006
Gables South Hot Water Heater #1	Lochinvar Copper-Fin II	CFN651PM	A06400182698	Nat gas	625	0.65	August 2006
Gables South Hot Water Heater #2	Lochinvar Copper-Fin II	CFN651PM	A06400182695	Nat gas	625	0.65	August 2006
Holloway Commons Boiler #1	HB Smith Boiler	4500A Mills	120206834	Nat gas	8277	8.6	August 2003
Holloway Commons Boiler #2	HB Smith Boiler	4500A Mills	120206835	Nat gas	8277	8.6	August 2003
Holloway Commons Hot Water Heater #1	TurboPower	2000N400A-TP	802108236	Nat gas	1538	1.6	August 2003
Holloway Commons Hot Water Heater #2	TurboPower	2000N400A-TP	802108237	Nat gas	1538	1.6	August 2003
SERC A Hot Water Heater #1	PVI EQ006695	BG600	481601	Nat gas	1933	2.01	August 2007
SERC A Hot Water Heater #2	PVI EQ006695	BG600	481603	Nat gas	1933	2.01	August 2007
SERC A Hot Water Heater #3	PVI EQ006695	BG600	481602	Nat gas	1933	2.01	August 2007
SERC C Hot Water Heater #1	PVI EQ006697	BG600	481604	Nat gas	577	0.60	August 2008
SERC C Hot Water Heater #2	PVI EQ006697	BG600	481605	Nat gas	577	0.60	August 2008