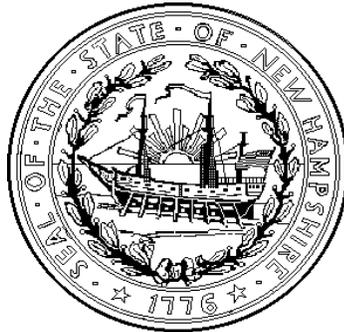


FINAL DETERMINATION

To Grant a
Prevention of Significant Deterioration Permit
and
Non-Attainment Permit
for
Newington Energy, L.L.C.
for a
595 MW Combustion Turbine Facility
at
Newington Power Facility
in
Newington, NH



Prepared by the
New Hampshire Department of Environmental Services
Air Resources Division

December 12, 2006

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I. Applicant's Name and Address:

Newington Energy, L.L.C.
Newington Power Facility

Mailing Address:
111 Broadway
16th Floor
New York, NY 10006

II. Physical Address of the Facility:

200 Shattuck Way (formerly Old Dover Road)
Newington, NH

County: Rockingham

USGS Map Coordinates: Easting 353.2 m Northing 4773.7 m

III. Background:

On April 26, 1999, DES and EPA issued a joint Prevention of Significant Deterioration (PSD) and Non-Attainment Permit to Newington Energy, L.L.C. ("Newington Energy") to construct and operate a Combined-Cycle Combustion Turbine facility in Newington, NH. On December 4, 2001, DES issued a Temporary Permit for one natural gas-fired Auxiliary Boiler, eight natural gas-fired Fuel Gas Heaters, a diesel-fired Emergency Generator, and a diesel-fired Firewater Pump. The facility commenced operation on June 19, 2002.

On July 14, 2003, Newington Energy submitted an application to modify the joint PSD and Non-Attainment Permit. As required by DES under the original joint PSD and Non-Attainment Permit, Newington Energy proposed permit conditions related to fuel transition periods and emission limits during startup and shutdown periods. Newington Energy also requested a change in the frequency of reporting of daily ammonia consumption used in the selective catalytic reduction (SCR) system, from a monthly to a quarterly basis.

On October 20, 2003, Newington Energy submitted an application requesting additional modifications to the joint PSD and Non-Attainment Permit. In this application, Newington Energy requested an increase in the permitted amount of (low sulfur) distillate oil firing in the two combustion turbines, from 19,800,000 gallons to 33,120,000 gallons during any consecutive 12-month period. This is roughly equivalent to an increase from 30 days to 50 days (at 100% load) per year for each turbine. For simplicity, the July 14 and October 20, 2003 requests were merged and processed as a single application.

On September 25, 2006, DES issued a Preliminary Determination stating that the modifications described in Application FY04-0157 should be approved. The Preliminary Determination contained a Draft PSD Permit and Temporary Permit stating conditions for the modified operation.

On September 25, 2006, a public notice was published in the *Union Leader* and *Portsmouth Herald* newspapers notifying the public of the proposed modifications and providing the opportunity for public comments or requests for a public hearing. The public comment period expired on October 26, 2006. Comments were received from the Federal Land Manager and USEPA Region I. There were no comments received from the general public. The comments received during the public comment period have been reviewed by DES and have been taken into consideration in making this Final Determination.

IV. Facility Description:

Newington Energy currently operates a nominal 518 Megawatt (“MW”) (at 95° F) (gross electrical output) combined cycle combustion turbine facility in Newington, NH. The Newington Energy facility consists of two combustion turbines with two heat recovery steam generators (“HRSGs”) and a single steam turbine, one natural gas-fired auxiliary boiler, six natural gas-fired fuel gas heaters, one diesel-fired emergency generator, and one diesel-fired fire pump. The Newington Energy facility is classified as a “combined cycle” plant, as it produces electrical power with two gas turbines and a steam turbine. Each combustion turbine is rated at approximately 154 MW (at 95°F). The exhaust gas from each turbine passes through separate HRSGs connected to a single steam turbine producing approximately an additional 224 MW. At lower ambient temperatures (0°F) the turbine output ratings would increase to approximately 195 MW each, producing a plant capacity of 595 MW (195 + 195 + 205).

Excess heat in the HRSG water exhausting from the steam turbine is removed by cooling towers. The auxiliary boiler is for preheating combined cycle components during startup and to initially provide sealing steam for the steam turbines. The emergency generators are used to help power down equipment, provide standby emergency lighting and control power and maintain operation of lubricating pumps in the event of a system power outage. The diesel fire water pump is for fire suppression use if the electrical power system is down.

During limited summer hours (when ambient temperatures are above 60 °F) and when conducting required performance testing, the Newington Energy facility may operate in a supplemental firing mode. During the supplemental firing mode, natural gas fired duct burners are operated to increase the exhaust heat to the HRSGs, which subsequently increases the power output of the facility. Auxiliary equipment at the Newington Energy facility includes a wet mechanical draft cooling tower and a water treatment system. Air pollution control at the facility includes a NOx reduction system, a combustion control system to minimize CO, and monitors to continuously record CO, NOx, opacity and other certain operational parameters.

V. Project Description:

The purpose of this permit is to incorporate permit modifications requested by Newington Energy as well as modifications required by DES in the original PSD Permit/Temporary Permit. Newington Energy requested an increase in the amount of fuel oil that can be combusted in Combustion Turbines #1 and #2, from 19,850,000 gallons

(equivalent to 30 days at 100% load) to 33,120,000 gallons (equivalent to 50 days at 100% load) during any 12-consecutive month period. Newington Energy also requested a less frequent reporting period for ammonia usage at this facility, specifically, reducing the reporting frequency from a monthly to a quarterly basis.

This permit incorporates additional permit conditions related to the periods of startup, shutdown, and fuel transition at this facility. In the original PSD Permit /Temporary Permit, Newington Energy was required to propose (and DES to establish) permit limits for periods of startup, shutdown, and fuel transition. The PSD Permit /Temporary Permit also required Newington Energy to propose (and DES to establish) operational and emissions limitations during periods of startup and shutdown. DES has evaluated the proposed limits and incorporated these limits into the attached PSD Permit/Temporary Permit.

In addition to the above modifications, this permit streamlines and replaces two existing permits: the original PSD Permit /Temporary Permit (DES Temporary Permit FP-T-0036, EPA PSD Permit 044-121NH10), and Temporary Permit TP-B-0483, which was originally issued for one natural gas-fired Auxiliary Boiler, eight natural gas-fired Fuel Gas Heaters, a diesel-fired Emergency Generator, and a diesel-fired Emergency Firewater Pump. This permit also authorizes Newington Energy to replace the eight natural gas-fired Fuel Gas Heaters with six new natural gas-fired Fuel Gas Heaters.

This permit also makes corrections to the maximum hourly emission rates listed in the original PSD/Temporary Permit. The maximum hourly emission rates in the original PSD/Temporary Permit were based on the lower heating value of the fuels. The maximum hourly emission rates in this PSD Permit/Temporary Permit are now based on the higher heating value of the fuels. These higher emission rates were evaluated to verify that they will meet all applicable National Ambient Air Quality Standards (NAAQS).

Lastly, this permit incorporates the applicable standards, recordkeeping, and reporting requirements of the Code of Federal Regulations (CFR) 40 Part 60, Subpart Db, *Standards of Performance for Industrial-Commercial-Institutional Steam generating Units* for the HRSGs. These requirements were inadvertently left out of the original PSD Permit/Temporary Permit.

With the exception of sulfur dioxide (SO₂), pollutant emissions will increase as a result of the increase in fuel oil firing in Combustion Turbines #1 and #2. Pollutant emissions will decrease by replacing the eight natural gas-fired Fuel Gas Heaters with six new natural gas-fired Fuel Gas Heaters. DES evaluated all of the facility-wide emissions increases and decreases and determined that the modifications do not exceed the thresholds for significant modifications under the PSD and non-attainment New Source Review programs. However, any time a permit limit founded in BACT is being considered for revision, as is the case with this project, a corresponding reevaluation (or reopening) of the original BACT determination is necessary. Therefore, this permitting review included a reevaluation of the original fuel oil firing BACT limits established for nitrogen oxides, particulate matter (including PM₁₀), carbon monoxide, sulfur dioxide and sulfuric acid mist. The BACT limits while firing natural gas were not being modified and thus did not require a new BACT evaluation.

Table 1 below summarizes the net emissions increases/decreases resulting from the increase in fuel oil firing in Combustion Turbines #1 and #2 and the replacement of the existing Fuel Gas Heaters.

Table 1: Prevention of Significant Deterioration (PSD) and Non-Attainment Applicability Thresholds (All Values in Tons Per Year)						
Pollutant						
	Nitrogen Oxides (NO_x)	Carbon Monoxide (CO)	Total Particulate Matter (PM) Particulate Matter Less than 10 Microns (PM-10)	Volatile Organic Compounds (VOC)	Sulfur Dioxide (SO₂)	Sulfuric Acid Mist (H₂SO₄)
(1) Baseline Annual Emission Rate from All Devices Contained in Temporary Permit FP-T-0036/ EPA PSD Permit 044-121NH10¹	204.9	484.8	104.8	36.3	125.4	20.9
(2) Baseline Annual Emission Rate from All Devices Contained in Temporary Permit TP-B-0483	6.2	4.8	0.7	0.6	1.1	0.0
Baseline Annual Emission Rate from All Devices Combined (sum of (1) and (2) above)	211.1	489.6	105.5	36.9	126.5	20.9
(3) Emissions Increase/(Decrease) due to Increase in Fuel Oil Firing for Combustion Turbines #1 and #2	18.9	41.9	2.4	2.2	(-70.2)	6.7
(4) Emissions Increase/(Decrease) due to Replacement of Eight Existing Fuel Gas Heaters with Six New Fuel Gas Heaters	(-0.5)	(-1.8)	(-0.1)	(-0.1)	0.1 ²	(-0.0)
(5) Total Emissions Increases/(Decreases) due to Above Modifications (sum of (3) and (4) above)	18.4	40.1	2.3	2.1	(-70.1)	6.7
PSD/Nonattainment Modification Significance Threshold (Compare to (5) above)	40 (PSD) 25 (NA)	100	25/15	25	40	7
PSD/ Non-Attainment Significance Threshold Levels Exceeded (Y/N)	N	N	N	N	N	N

1 Pursuant to 40 CFR 52.21(b)(21)(iii) and 40 CFR 165.(a)(1)(xii)(C), the reviewing authority may presume that the source-specific allowable emissions (i.e., permitted emission limits) for the unit are equivalent to the actual emissions of the unit. For purposes of this permitting review, NHDES agrees with the source that it is appropriate to consider the actual emissions as the source-specific allowable emissions for the unit, rather than the average annual emissions over the two years preceding the project.

2 While the total heat input of the new fuel gas heaters will decrease, the SO₂ emissions are shown as an increase due to a revision of the USEPA AP-42 (5th Edition) SO₂ emission factor that occurred after the issuance of Temporary Permit TP-B-0483.

The emissions in Table 1 were estimated based upon the following assumptions:

- 1) The plant is operated at a load that would produce the worst-case emissions;
- 2) Annual emissions for the proposed modification are based on a maximum of 33,120,000 gallons per year of distillate fuel oil firing;
- 3) The sulfur content of distillate fuel oil is 0.0015 % by weight; and
- 4) The BACT and LAER limitations identified in this Final Determination.

VI. Summary of Comments:

A. Comment received from USEPA Region I:

One comment was submitted by the USEPA Region I office on October 26, 2006 regarding the sulfur content of the distillate fuel oil combusted in Combustion Turbines #1 and #2. Specifically, USEPA recommended that the Best Available Control Technology (BACT) analysis for SO₂ consider restricting the sulfur content of the distillate fuel oil from 0.05% to 0.0015% (by weight). USEPA noted that 0.0015% sulfur distillate fuel oil became available in October 2006 and would further reduce hourly and annual SO₂ emissions. USEPA also noted that as the PSD permitting authority for Massachusetts, USEPA was reviewing similar requests for increased fuel oil firing at Massachusetts facilities and would only approve such requests if the facilities committed to switching to the 0.0015% sulfur fuel oil.

In response to this comment, Newington Energy agreed to transition to the distillate fuel oil with a sulfur limit of 0.0015%. This will result in a potential net emission decrease of 70.2 tons of SO₂, where the originally proposed fuel oil increase (using distillate fuel oil with a sulfur limit of 0.05%) would have resulted in a potential net emission increase of 39.3 tons. Table 1 above reflects the emissions increases and decreases associated with the switch to 0.0015% sulfur fuel oil.

While Newington Energy has committed to the above fuel switch, they informed DES that they had already purchased approximately three million gallons of the 0.05% sulfur distillate fuel oil and requested that they be allowed to use up this reserve. DES has agreed to this request and has incorporated permit conditions that require Newington Energy to receive only 0.0015% sulfur distillate fuel oil after the issuance date of the final permit but also allow the facility to use up the existing 0.05% sulfur distillate fuel oil. The final permit has also been revised to specify that new (lower) SO₂ emission limits will become effective when the average sulfur content of the distillate fuel oil in the storage tank drops below 0.0015% by weight. Newington Energy anticipates that the average sulfur content in the storage tank will drop to 0.0015% by weight after approximately three tank turnovers.

B. Comments received from Federal Land Manager:

DES received comments from the Federal Land Manager (United States Department of Agriculture, National Forest Service) in regard to the results of the Class I area impact analyses presented in the Preliminary Determination. The comments regarded the Class I area visibility analysis and the deposition analysis that was conducted to verify that no adverse deposition impacts were predicted as a result of the proposed fuel oil increase. No changes to the permit resulted from these comments. These comments are discussed in Section VIII of this Final Determination.

VII. Summary of BACT/LAER Limitations:

In accordance with PSD regulations, the Newington Energy facility is subject to Best Available Control Technology (BACT) for emissions of particulate matter, sulfur dioxide, carbon monoxide, and nitrogen oxides (NO_x). Both State and Federal regulations and policies define BACT as an emission limitation based on the maximum degree of reduction for each regulated pollutant taking into consideration technical, economic and environmental factors. In no case shall the BACT emission limitation result in emissions of any pollutant in excess of any applicable standard under 40 CFR Part 60, *Standards of Performance for New Stationary Sources of Air Pollution* and 40 CFR Part 61, *National Emission Standards for Hazardous Air Pollutants*.

In accordance with non-attainment New Source Review regulations, the Newington Energy facility is also subject to a lowest achievable emission rate (LAER) for emissions of NO_x³. LAER is defined as that rate of emissions which reflects (a) the most stringent emission limitation which is contained in the implementation plan of any State for such class or category of source, unless the owner or operator of the proposed source demonstrates that such limitations are not achievable; or (b) the most stringent emission limitation which is achieved in practice by such class or category of source, whichever is more stringent.

Although the proposed emissions increases (that would result from an increase in the permitted amount of distillate oil firing) did not trigger the significance thresholds for modifications under PSD, any modification of a BACT limit requires a re-evaluation of all original BACT limits, per existing EPA guidance. Therefore, Newington Energy was required to re-evaluate the oil firing BACT limits for NO_x, PM₁₀, CO, SO₂, and H₂SO₄.

On September 25, 2006, DES issued a Preliminary Determination and Draft PSD Permit/Temporary Permit for the modifications proposed by Newington Energy. The Preliminary Determination explained DES' review of the permit application and included a detailed discussion on applicability of the PSD program and the need to revisit the original Best Available Control Technology ("BACT") limits that were established for this facility. The Preliminary Determination contained proposed BACT limits for all applicable PSD pollutants and the rationale used in establishing those limits.

3 Rockingham County is currently classified as a non-attainment area for ozone. While it is classified as an attainment area for nitrogen dioxide, nitrogen oxides are precursors to ozone formation, therefore this area is also treated as a non-attainment area for nitrogen oxides.

DES received one comment from USEPA on the proposed BACT limits. The one comment was in regard to the SO₂ BACT limit proposed for Combustion Turbines #1 and #2 while firing distillate fuel oil. This comment is detailed in Section VI.A above. Table 2 below compares the proposed and final SO₂ BACT limits.

Table 2: Proposed and Final SO₂ BACT Limits

Pollutant	SO ₂ BACT Limit Proposed in Preliminary Determination	SO ₂ BACT Limit Final Determination	Averaging Time
Sulfur Dioxide (Fuel Oil Firing)	0.0505 lb/MM BTU (Maximum 0.05% sulfur by weight) Limit of 33,120,000 Gallons of Low Sulfur Oil per consecutive 12-month period	<u>During Transition Period:</u> 0.0505 lb/MM BTU (Maximum 0.05% sulfur by weight) Limit of 33,120,000 Gallons of Low Sulfur Oil per consecutive 12-month period <u>After Transition Period:</u> 0.0015 lb/MM BTU (Maximum 0.0015% sulfur by weight) Limit of 33,120,000 Gallons of Low Sulfur Oil per consecutive 12-month period	3 hour rolling

Since no other comments were received on the proposed BACT limits, this Final Determination only discusses changes to the SO₂ BACT limit for Combustion Turbines #1 and #2 while firing distillate fuel oil. All other BACT and LAER limits will remain as proposed in the Preliminary Determination. A detailed discussion of the rationale used to determine BACT limits for other pollutants can be found in Section IX of the Preliminary Determination. Table 3 below summarizes all of the BACT and LAER limitations contained in the final PSD Permit/Temporary Permit.

Table 3: Summary of BACT/LAER Limitations

Pollutant	Limitation	Technology BACT/LAER	Averaging Time
Nitrogen Oxides (Gas Firing)	2.5 ppmdv @ 15 % O ₂	Low NO _x Burner with SCR LAER	3 hour block average
Nitrogen Oxides (Oil Firing)	9.0 ppmdv @ 15 % O ₂	Low NO _x Burner with Water Injection and SCR LAER	1 hour block average
Sulfur Dioxide (Gas Firing)	0.0036 lb/MM BTU	Low Sulfur Fuels BACT	3 hour rolling
Sulfur Dioxide (Oil Firing)	<u>During Transition Period:</u> 0.0505 lb/MM BTU <u>After Transition Period:</u> 0.0015 lb/MMBTU	Limit of 33,120,000 Gallons of Low Sulfur Oil per consecutive 12-month period BACT	3 hour rolling
Carbon Monoxide (Gas Firing) @ All Loads	15 ppmdv @ 15 % O ₂	Low NO _x Burner with Good Combustion Practices BACT	1 hour block average
Carbon Monoxide (Oil Firing) @ 75 to 100 % Load	20 ppmdv @ 15 % O ₂	Low NO _x Burner with Good Combustion Practices BACT	1 hour block average
Carbon Monoxide (Oil Firing) @ 50 to 75 % Load	30 ppmdv @ 15 % O ₂	Low NO _x Burner with Good Combustion Practices BACT	1 hour block average
TSP/PM ₁₀ (Gas Firing)	0.015 lb/MM BTU	Low Sulfur Fuels BACT	1 hour block average
TSP/PM ₁₀ (Oil Firing)	0.040 lb/MM BTU	Low Sulfur Fuels BACT	1 hour block average
Volatile Organic Compounds (Natural Gas Firing)	0.002 lb/MM BTU	Good Combustion Practices N/A	1 hour block average
Volatile Organic Compounds (Fuel Oil Firing)	0.0038 lb/MM BTU	Good Combustion Practices N/A	1 hour block average
Opacity	20 %	Good Combustion Practices N/A	6 minute block average
Sulfuric Acid Mist (H ₂ SO ₄) (Fuel Oil Firing)	14.20 lb/hr	Low Sulfur Fuels BACT	1 hour block average
Ammonia	10 ppmdv @ 15 % O ₂	N/A	24 hour block average

VIII. Air Quality Impact Analysis:

Section X of the Preliminary Determination presented a detailed overview of the ambient air impact analyses that were conducted as part of the permit application review. Two comments were received from the office of the Federal Land Manager regarding the Class I area impact analysis and are discussed below. Neither comment resulted in changes to the PSD Permit/Temporary Permit.

A. Comment on Visibility Impact Analysis:

To determine the effects of the Newington Energy facility on visibility, the EPA VISCREEN model (Version 1.01) was originally used. A Level-I assessment was performed and it was found that impacts were well below the thresholds of plume contrast and perceptibility.

As the distance from Newington Energy to the nearest Class I area was greater than 50 kilometers, the Federal Land Manager requested that the EPA CALPUFF model be used instead of VISCREEN. The CALPUFF analysis was performed, which also concluded that that impacts were well below the thresholds of plume contrast and perceptibility.

B. Comment on Deposition Analysis:

A quantitative analysis was originally performed to evaluate the effects of the proposed facility on soils and sensitive vegetation, using criteria established by EPA as contained in *A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils and Animals*. As stated in the EPA guidance document, Ambient Air Quality Standards (AAQS) are protective against vegetative damage, except possibly for the 3-hour and annual SO₂ standards. Since AAQS, and the lower Class II increment levels, were not exceeded by the proposed facility, there were not expected to be any adverse effects on vegetation due to the plant's impacts. This was also the case for the 3-hour and annual SO₂ screening criteria since the modeled single-source impacts were seen to be well below the screening levels.

The Federal Land Manager requested that DES re-evaluate the above analysis with higher emission rates, as it appeared that this analysis did not use the maximum emission rates contained in the proposed permit. DES verified that no adverse effects on vegetation are expected as a result of the plant's impacts.

IX. Conclusion:

It is the Final Determination of DES that a modified PSD Permit/Temporary Permit be granted to Newington Energy. This recommendation is based upon the review of the application submitted by Newington Energy and comments provided by EPA and the Federal Land Manager and are supported by the findings outlined in this Final Determination.