



The State of New Hampshire  
**DEPARTMENT OF ENVIRONMENTAL SERVICES**



**Thomas S. Burack, Commissioner**  
July 29, 2008

Mr. Michael O'Leary  
General Manager  
Bridgewater Power Company, L.P.  
PO Box 678  
Ashland, NH 03217-0678

**RE: Inspection Report**

Dear Mr. O'Leary:

The New Hampshire Department of Environmental Services, Air Resources Division ("DES") conducted a Full Compliance Evaluation at your facility on April 17, 2008. 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. Bridgewater failed to include the Certification of Accuracy Statement, fuel usage, and emissions from the diesel fire pump, emissions from the cooling pond, and fuel usage and/or emissions from its insignificant activities in its annual emissions reports filed with DES prior to April 2008.
2. Bridgewater failed to include the NOx Emission Statements in its annual emissions reports filed with DES prior to April 2008.
3. Bridgewater failed to pay emission-based fees on the emissions from the diesel fire pump, the cooling pond, and the insignificant activities, prior to April 2008, as required by Env-A 705.04.
4. Bridgewater has made statements on its annual compliance certification that are not accurate.

The results of this inspection have been forwarded to the Enforcement Section for further review. If you have any questions, please feel free to call me at (603) 271-6797 or Tara Olson, Compliance Assessment Section Supervisor, at (603) 271-4625.

Sincerely,

Alan H. Moulton  
Compliance Assessment Engineer  
Air Resources Division

Enclosure: Inspection Report

cc: Terence Murphy, Chairman, Bridgewater Board of Selectmen



## **AIR RESOURCES DIVISION**

### **Full Compliance Evaluation Report Onsite Visit**

**Bridgewater Power Company, L.P.  
300 Route 3  
Bridgewater, New Hampshire 03222**

**(603) 968-9602**

**Grafton County**

**AFS #: 3300900021**

**Inspection Date: April 17, 2008**

**Final Report: July 29, 2008**

Date/Time of Inspection: April 17, 2008, 10:00 AM - 3:00 PM  
Type of Inspection: Onsite Full Compliance Evaluation  
Inspected by: Alan Moulton, DES ARD Compliance Inspector  
Weather: Sunny and ~55° F  
Source Contact(s): Michael O'Leary, Plant Manager

Observation upon approach to the facility: There were some visible emissions; less than 10% from the wood-fired boiler stack and steam emitted from the cooling pond, and there were no unusual odors detected.

Last compliance inspection conducted at facility: Offsite evaluation completed on May 26, 2006.

Inspection Result: There were no problems noted during the offsite full compliance evaluation.

Permit Number(s): TV-OP-008  
TP-B-0533 – Wood-fired Boiler with Non-Catalytic Reduction (“SNCR”) & Regenerative Selective Catalytic Reduction (“RSCR”) Systems and Cooling Pond

## I. Inspection

On April 17, 2008, the New Hampshire Department of Environmental Services, Air Resources Division (“DES”) conducted an On-site Full Compliance Evaluation of Bridgewater Power Co. (“Bridgewater”), located in Bridgewater, NH. Bridgewater was targeted for inspection based on DES inspection criteria, which requires that a major source with a Title V Permit be inspected once every two years. An offsite evaluation was conducted in 2006. The last onsite inspection of this Title V facility was conducted in 2004.

DES contacted Mr. O'Leary on April 16, 2008 to schedule a compliance inspection for April 17, 2008.

The DES Inspector discussed the purpose of the current inspection with Bridgewater personnel and discussed the rules pertaining to claims of confidentiality. Mr. O'Leary agreed to the inspection and authorized access to the facility. No material provided to the inspector during the inspection was stated to be confidential.

After the opening meeting and a safety briefing, Mr. O'Leary conducted a tour of the facility.

Bridgewater is a privately-owned company that employs 19 people. The facility was designed and built to produce power from the combustion of wood chips and came on

line in 1987. The facility operates two 12-hour shifts for the continuous production of electricity 24 hours per day, seven days per week.

## **II. Process Description**

Bridgewater is a wood-fired power plant that has a gross electricity generation capacity of 15 MW. Bridgewater produces electricity by the combustion of whole wood chips (having up to 50 percent moisture content) in a Foster Wheeler Treebrook overfeed, air swept, vibrating grate, stoker boiler. The boiler has a maximum heat input rate of 250 MMBtu/hr. The heat generated by the combustion heats water to produce steam on the tube side of the boiler which turns the turbine to generate electricity. The steam, after passing through the blades to turn the turbine, is condensed back to liquid water in the condenser and returned to the boiler to be re-heated. Bridgewater is permitted to operate continuously, 24 hours per day and seven days per week.

Additional permitted sources of emissions at the facility are a 269 HP Caterpillar emergency diesel generator, a 121 HP diesel fire pump, and a cooling pond. Insignificant activities at Bridgewater include a 3 MMBtu/hr package boiler, a #2 fuel oil storage tank, and the handling activities in the wood chip yard. The RSCR system has two burners, which use #2 fuel oil. Emissions from the burners are combined with the #2 fuel oil emissions from the wood-fired boiler. The facility is a major source of NOx and CO emissions and, therefore, requires a Title V Operating Permit.

## **III. Observations**

Mr. O'Leary conducted a tour of the facility which began in the control room. The DES Inspector then observed the wood-fired boiler, the multi-clone, the gravel bed filter, the baghouse for the gravel bed filter, the package boiler, the emergency diesel generator, the diesel fire pump, and the newly installed Regenerative Selective Catalytic Reduction ("RSCR") System. The Temporary Permit was issued for the installation of the RSCR system and a Selective Non-Catalytic Reduction ("SNCR") system. Bridgewater has installed the RSCR system, but has not installed the SNCR system. Currently, the RSCR system is reducing Bridgewater's NOx emissions to the required levels.

The wood-fired boiler was in operation during the inspection and the emissions from the stack had an opacity less than 10%. The package boiler, the emergency diesel generator, and the diesel fire pump were not in operation during the inspection. There was a small amount of steam being emitted from the cooling pond during the inspection.

## **IV. Compliance With Permitting Requirements**

### **CHAPTER ENV-A 600 - Statewide Permit System**

DES issued Title V Operating Permit TV-OP-008 ("the Permit") to Bridgewater on March 22, 2006. Bridgewater requires a Title V Permit because its emissions of NOx and CO exceed the major source thresholds of 100 tons per year, each. The Permit

expires on March 31, 2011.

On September 12, 2007, DES issued TP-B-0533 ("the Temporary Permit") to Bridgewater for the installation of the SNCR and the RSCR systems to reduce emissions of nitrogen oxide from the wood-fired boiler. The Temporary Permit expires on March 31, 2009.

An Administrative Amendment to the Temporary Permit was issued on November 9, 2007, which changed the temperature range for the operation of the RSCR and changed the RSCR catalyst bed temperature to average chamber temperature.

A. Fuel and Operating Data

Inspection and operation information for the significant activities at the facility are listed in Table 1.

**Table 1: Information on Significant Activities**

Device	Permitted Operating Limits	Operating & Reported Fuel Usage Data
<p><u>EU1</u></p> <p><u>Wood/Oil-fired Boiler</u></p> <p>Foster Wheeler Treebrook</p> <p>Contract #: 2-78-2946-1</p> <p>Serial #: 6770</p> <p>Heat Rating: *</p> <p>Fuel: Wood Chips, #2 fuel oil and specification used oil</p> <p>Maximum Design Fuel Flow Rate: *</p> <p>Install Date: 1987</p>	<p>Fuel oil usage limitation: See * below.</p> <p>Sulfur content of #2 fuel oil and specification used oil limited to 0.4% by weight.</p> <p>Opacity: 20%</p>	<p><u>2006</u>: 226,300 tons of wood chips 40,812 gal. #2 fuel oil 0 gal. spec used oil</p> <p><u>2007</u>: 227,212 tons of wood chips 39,293.5 gal. #2 fuel oil 0 gal. spec used oil</p> <p>Operation Status: Operating during the inspection.</p> <p>Opacity observed: &lt;10%</p> <p>Steam Pressure: 686 psig</p> <p>Steam Temperature: 838°F</p> <p>Stack Temperature: 365°F</p>
<p><u>EU2</u></p> <p><u>Emergency Diesel Generator</u></p> <p>Caterpillar</p> <p>Model # 3208</p> <p>Serial # 30A0223</p> <p>Rating: 269 hp</p> <p>1.8 MMBtu/hr</p> <p>Fuel: #2 fuel oil</p> <p>Maximum Design Fuel Flow</p>	<p>Hours of operation: 500 hrs/yr</p> <p>No fuel usage limit.</p> <p>Sulfur content of #2 fuel oil limited to 0.4% by weight.</p> <p>Opacity: 20%</p>	<p>Hour Meter Reading: 2358 hrs</p> <p><u>2006</u>: 169.0 gallons #2 fuel oil</p> <p><u>2007</u>: 370.5 gallons #2 fuel oil</p> <p>Fuel oil usage is estimated.</p> <p>Operation Status: Not in operation during the inspection.</p>

Rate: 13 gallons/hr Install Date: 1987		
<u>EU3</u>  <u>Diesel Fire Pump</u>  Caterpillar Model #: 3208 Serial #: 90N69074 Rating: 121 hp 1.1 MMBtu/hr Fuel: #2 fuel oil Maximum Design Fuel Flow Rate: Not available. Install Date: 1987	Hours of operation: 500 hrs/yr No fuel usage limit.  Sulfur content of #2 fuel oil limited to 0.4% by weight.  Opacity: 20%	Hour Meter Reading: 967 hrs  <u>2006</u> : 36.4 gallons #2 fuel oil <u>2007</u> : 27.3 gallons #2 fuel oil  Operation Status: Not in operation during the inspection.
<u>EU4</u>  <u>Cooling Pond</u>  Installed: 1987	Drift Factor = 0.0012%  Circulation Rate = 15,800 gallons per minute	Not tested.

- \* Wood-fired boiler, maximum firing rate:
1. 250 MMBtu/hr for wood, equivalent to 165,000 lb/hr of steam averaged over 24-hour period at 850°F, 695 psig, boiler efficiency of 68% and boiler feed water temperature of 340°F and wood moisture of 50%; and
  2. 50 MMBtu/hr for oil equivalent to 345 gal/hr which shall be limited as follows:
    - a) Specification used oil shall be limited to 4,286 gallons per any 24-hour period; and
    - b) Monthly oil usage (#2 fuel oil and specification used oil combined or separately) shall be limited to 128,600 gal/30 days.
    - c) #2 fuel oil and specification used oil limited to 1,564,400 gal/yr.

Bridgewater has not combusted specification used oil in the wood-fired boiler.

**Env-A 609.04 – Insignificant Activities**

Bridgewater included a list of insignificant activities in its application for the Title V Permit. These activities include a 3 MMBtu/hr package boiler, #2 fuel oil storage tank, and handling activities in the wood chip yard. Bridgewater has not reported emissions from the insignificant activities in the annual emissions report.

Fuel usage in the package boiler is listed in Table 2

**Table 2: Package Boiler Fuel Usage**

	Fuel Usage (gallons)
2006	7,265
2007	9,843

**B. Emissions**

Facility emissions for calendar years 2006-2007 are included in Tables 3 and 4. Facility emissions are calculated using the facility's fuel usage data and CEM data when available, stack test data, or the EPA's AP-42 Emission Factors. The fuel usage data and the facility emissions reported by Bridgewater were confirmed during this inspection.

**Table 3: Individual Device Emissions**

	NO <sub>x</sub> (tpy)	SO <sub>2</sub> (tpy)	CO (tpy)	PM <sub>10</sub> (tpy)	VOC (tpy)
<b>Wood-Fired Boiler</b>					
2006	206.48	8.61	232.22	38.45	4.53
2007	153.19	24.15	211.44	38.61	4.55
<b>Emergency Diesel Generator</b>					
2006	0.0	0.0	0.0	0.0	0.0
2007	0.11	0.01	0.03	0.0	0.02
<b>Diesel Fire Pump</b>					
2006	0.08	0.01	0.02	0.01	0.01
2007	0.06	0.0	0.01	0.0	0.01
<b>Package Boiler</b>					
2006	0.07	0.21	0.02	0.01	0.0
2007	0.10	0.28	0.02	0.01	0.0
<b>Cooling Pond</b>					
2006	0.0	0.0	0.0	1.80	0.0
2007	0.0	0.0	0.0	1.74	0.0

Based on calculations from Bridgewater, the PM<sub>10</sub> emissions from the wood chip handling activity in the wood yard is 0.61 tons per year. Bridgewater, using the TANKS program, calculated the VOC losses from the #2 fuel oil storage tank to be 0.001 tons per year.

**Table 4: Facility-Wide Emissions**

	NO <sub>x</sub> (tpy)	SO <sub>2</sub> (tpy)	CO (tpy)	PM <sub>10</sub> (tpy)	VOC (tpy)
<b>Permit Limits</b>	<b>250</b>	<b>--</b>	<b>250</b>	<b>--</b>	<b>--</b>
2006	206.63	8.83	232.26	40.87	4.54
2007	153.46	24.44	211.50	40.97	4.58

Emissions limits for NO<sub>x</sub> and CO are listed in the Permit for PSD avoidance.

Part Env-A 609 – Title V Operating Permits

During the inspection, the DES Inspector reminded Bridgewater 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 September 30, 2010.

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

Bridgewater is located in Grafton County of New Hampshire and is in the Northeast Ozone Transport Region. Grafton County is not classified in this part. Bridgewater is not a new major stationary source and is major, but has not had any major modifications. Therefore, this part is not applicable to the facility.

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

Bridgewater has emission limits in the Permit for NOx and CO of 250 tons per year, each. Bridgewater has not had NOx and CO emissions in excess of 250 tons per year. For PSD, Bridgewater is not a major stationary source. Therefore, this part is not applicable to the facility.

**V. Control Equipment**

Air pollution control equipment in use at Bridgewater is listed in Table 5.

**Table 5: Air Pollution Control Equipment**

Pollution Control Equipment Number	Description of Equipment	Activity
PCE1	Multicyclone (“Multiclone”)	Control of large particulate matter for EU1.
PCE2	Gravel Bed Filter (“GBF”)	Control of fine particulate matter for EU1.
PCE3	Baghouse for Gravel Bed Filter – Reverse Jet Pulse	Final removal of fine particulate matter from the Gravel Bed Filter for EU1.
PCE4	Regenerative Selective Catalytic Reduction (“RSCR”) System	Control of nitrogen oxides for EU1.

The Temporary Permit lists a Selective Non-Catalytic Reduction (“SNCR”) system (PCE5) for the additional control of NOx. Bridgewater has not purchased or installed this piece of equipment.

Bridgewater operates the RSCR system to maintain a maximum NO<sub>x</sub> emission rate from the wood-fired boiler of 0.075 lb NO<sub>x</sub>/MMBtu on a quarterly basis. The ammonia feed rate is adjusted based on the NO<sub>x</sub> emission rate data from the NO<sub>x</sub> CEM. Ammonia slip emissions are limited to 20 ppmvd @ 6% O<sub>2</sub> dry volume. The RSCR system is equipped with two #2 diesel fuel oil burners with a combined maximum flow of 17 gal/hr #2 diesel fuel oil at 137,000 Btu/gal or 2.33 MMBtu/hr combined maximum gross heat input rate. The burners maintain the chamber temperature between 315° and 650°F.

The RSCR system went on line in 2007. The two duct burners consumed 6,896.5 gallons of #2 diesel fuel oil in 2007 and that fuel usage is included in the total #2 fuel oil usage for the wood-fired boiler. See Table 1.

During the inspection, the Multiclone, the GBF, the baghouse, and the RSCR system were in operation.

## VI. Compliance with Recordkeeping and Reporting

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

Bridgewater has all the required monitoring data and records to show that it meets the conditions of the Permit. Bridgewater has submitted all required reports.

#### Env-A 903.02 – General Recordkeeping Requirements for Process Operations (Eff. 4/21/07, Formerly Env-A 901.04, eff. 11/15/92)

Bridgewater maintains records of the total quantity of chemicals used in the cooling pond.

#### Env-A 903.03 – General Recordkeeping Requirements for Combustion Devices (Eff. 4/21/07, Formerly Env-A 901.03, eff. 11/15/92)

Bridgewater maintains records of the consumption and type of wood utilized in the wood-fired boiler. Bridgewater also maintains records of the consumption, fuel type, and sulfur content of the fuel oil utilized in the wood-fired boiler, the RSCR burners, the emergency diesel generator, the diesel fire pump, and the package boiler. These records include the amount of fuel combusted on a monthly basis, the hours of operation of the permitted devices, and the sulfur content of the liquid fuel burned in terms of percent sulfur by weight.

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

Bridgewater 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. After the report is deemed to be in compliance, DES files it in the source files. At the time of the inspection, the Stack Testing Section had not had any compliance issues with the reports.

#### Env-A 905.02 – General NOx Recordkeeping

Bridgewater maintains the required records to demonstrate its NOx emissions are within the Permit limits.

#### Env-A 905.03 – Recordkeeping Requirements for Add-On NOx Control Equipment

Bridgewater maintains the required records on the operation of the RSCR.

#### Env-A 906.01 – Additional Recordkeeping Requirements

Bridgewater maintains the following records on the RSCR system:

1. Daily ammonia usage in gallons;
2. Average daily ammonia flow in lb/hr;
3. Daily calculated ratio of the average daily ammonia flow (lb/hr) to the average daily NOx flow (lb/hr); and
4. Daily average of the average chamber temperature of the RSCR system.

#### 40 CFR 60 Subpart Db Recordkeeping Requirements

Bridgewater maintains the following records to meet the NSPS requirements of Subpart Db.

1. Maintain daily records of each fuel combusted and calculate the annual capacity factor. The annual capacity factor is determined on a 12-month rolling average, with a new annual capacity factor calculated at the end of each calendar month.
2. Maintain continuous records of opacity.
3. Maintain records of the occurrence and duration of any startup, shutdown, or malfunction of the boiler, air pollution equipment, or CEMs;
4. Maintain for each operating day:
  - a. Calendar date;
  - b. Number of hours of operation; and
  - c. Hourly steam load.

#### Env-A 907.01 – General Reporting Requirements

Bridgewater is required to submit an annual emissions report, in addition to several other reports, which are submitted on either an annual, semi-annual, or quarterly basis. The company has submitted the reports as required; see the *Full Compliance Evaluation Records Review* sheet attached to the back of this report.

Bridgewater has submitted annual emissions reports for 2006 and 2007 as required. The

annual emissions report for 2006 was received by DES three weeks after the due date. The annual emissions report for 2007 was submitted prior to the due date. The annual emissions reports included fuel usage and emissions from the wood-fired boiler, RSCR burners, and the emergency diesel generator. The annual emissions reports did not include fuel usage and/or emissions data from the diesel fire pump, the cooling pond, and the following insignificant activities: #2 fuel oil storage tank, wood chip handling yard, and package boiler. DES informed Bridgewater of the missing data and requested five years worth of missing emission data and that it resubmit the annual emissions report for 2007. The resubmitted 2007 annual emissions report, which DES received on May 27, 2008, included the missing emission data. Every report that Bridgewater submits to DES is also required to contain a "Certification of Accuracy Statement" as per Condition VIII. F., Table 8, Item 1 of the Permit. The annual emissions reports that Bridgewater filed with DES prior to this inspection did not contain the Certification of Accuracy Statement. The revised annual emissions report for 2007, which DES received on May 27, 2008, does contain the Certification of Accuracy Statement. See attachment 052708AHM01D.

***Bridgewater failed to include the Certification of Accuracy Statement, fuel usage and emissions from the diesel fire pump, emissions from the cooling pond, and fuel usage and/or emissions from its insignificant activities in its annual emissions reports filed with DES prior to April 2008.***

#### Part Env-A 909 – NOx Emission Statements Reporting Requirements

Bridgewater has actual NOx emissions greater than 10 tons per year and, therefore, is required to submit annual NOx Emissions Statements. Prior to the inspection, Bridgewater had not filed NOx Emissions Statements. After the inspection, Bridgewater filed a NOx Emission Statement with the resubmitted 2007 annual emissions report. See attachment 052708AHM01D.

***Bridgewater failed to include the NOx Emission Statements in its annual emissions reports filed with DES prior to April 2008.***

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

Bridgewater 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 Annual Compliance Certification and in the Semi-Annual Permit Deviation and Monitoring Reports.

A review was conducted of the deviation reports that Bridgewater filed between May 2006 and July 2008. During this period, DES received eight reports. Most of the reports were for equipment problems that resulted in excess opacity or excess temperatures. One report was for a frozen data transmission line. In these cases, DES determined that no further action was required.

In 2007, Bridgewater submitted a report because it had failed to file its annual emissions

report and pay its emission-based fees on time. For this deficiency, DES issued to Bridgewater a Notice of Past Violation.

## **VII. Compliance with RACT**

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

#### **Part Env-A 1204 - Stationary Sources of VOCs**

Bridgewater 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 wood-fired boiler at Bridgewater is subject to control requirements in Env-A 1211.03 (c)(5)(a). Bridgewater shall comply with a NOx emissions rate of 0.33 lb/MMBtu, based on a 24-hour calendar day average. This is less stringent than the 0.075 lb NOx/MMBtu emission limit based on a quarterly average that Bridgewater has voluntarily chosen to comply with for the purpose of qualifying for generating renewable energy certificates in the State of Connecticut. Bridgewater has a NOx CEM which records this data daily. Bridgewater compiles this data into monthly reports. During the inspection, the DES Inspector reviewed a representative sample of monthly reports, and Bridgewater was in compliance with the NOx emissions limits.

The emergency diesel generator and the diesel fire pump at Bridgewater are exempt from the NOx RACT provisions of Env-A 1211.11. The engines on these devices each operate less than 500 hours during any consecutive 12-month period and the engines have combined theoretical potential NOx emissions less than 25 tons per any consecutive 12-month period.

## **VIII. Compliance with Toxics Regulations**

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

Fuel burning devices burning virgin fuels are exempt from Env-A 1400.

Bridgewater uses ammonia in the RSCR system. An air toxics compliance determination was conducted as part of the application Bridgewater filed with DES on May 16, 2007, for the installation of the RSCR and SNCR systems. The adjusted in-stack concentration method was used to verify compliance with Env-A 1400 for the ammonia emissions from the RSCR and SNCR systems.

**IX. Compliance with Process/Particulate/Opacity Regulations**

**CHAPTER ENV-A 1600 - Fuel Specifications**

Env-A 1603.01 – Applicable Liquid Fuels

Bridgewater uses #2 fuel oil or diesel fuel oil in the wood-fired boiler, the RSCR burners, the oil-fired package boiler, the emergency diesel generator, and the diesel fire pump.

Part Env-A 1604 – Maximum Sulfur Content Allowable in Liquid Fuels

Bridgewater has the delivery tickets for each shipment of #2 fuel oil or diesel fuel oil received. The tickets contain data that indicate the sulfur content is at or below permit requirements.

**CHAPTER ENV-A 2000 - Fuel Burning Devices**

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

The Permit limits the emissions from the wood-fired boiler, the package boiler, the emergency diesel generator, and the diesel fire pump at this facility to 20% opacity. According to the Opacity CEM, the visible emissions from the boiler stack during the inspection had an opacity of 6.88%. At the time of inspection, the package boiler, the emergency diesel generator, and the diesel fire pump were not in operation; therefore, opacity readings could not be taken.

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

Env-A 2002.08 - Particulate Emission Standards for Fuel Burning Devices

Bridgewater is required to meet a particulate emission standard that is less than 0.15 lb/MMBtu for the wood-fired boiler, which was installed after January 1, 1985. See Compliance With Applicable Federal Rules section of this report on Subpart Db.

Bridgewater is required to meet a particulate emission standard that is less than 0.30 lb/MMBtu for the remaining fuel burning devices installed after January 1, 1985. Compliance with the particulate matter emission standards for the other fuel burning devices can only be determined by stack testing, which has not been required for these devices at this time.

## **CHAPTER ENV-A 2100 – Particulate Matter and Visible Emissions Standards**

### **Env-A 2103.02 – Visible Emission Standards**

This rule applies to Bridgewater's process device, which requires Bridgewater to comply with the 20% opacity standard for visible emissions. At the time of inspection, only steam was emitted from the cooling pond.

## **X. Source Testing and Monitoring**

### **CHAPTER ENV-A 800 - Testing and Monitoring Procedures**

The Permit requires Bridgewater to conduct monitoring in several areas.

Bridgewater shall install, maintain, and operate a continuous steam flow rate monitoring/recording system on the wood-fired boiler. Calibration of the steam flow transducer shall occur at least once annually.

Bridgewater continuously operates a steam flow rate monitoring and recording system. Bridgewater calibrates the steam monitoring system annually and maintains calibration records on file at the facility.

Bridgewater shall conduct compliance stack testing on the wood-fired boiler for Total Suspended Particulate every five years, within 90 days of the anniversary of the last stack test.

Bridgewater last conducted a stack test for particulates on June 10, 2004. Results from the test indicated that Bridgewater is in compliance with the TSP standard.

Bridgewater shall install, calibrate, maintain, and operate a continuous monitoring system on the wood-fired boiler for measuring each of the following: opacity of emissions; NO<sub>x</sub> emissions; CO emissions; and, O<sub>2</sub> emissions.

Bridgewater operates a CEM system on the wood-fired boiler and is required to perform periodic tests to show the system meets State and Federal requirements. The CEM system monitors opacity of emissions, and emissions of NO<sub>x</sub>, CO, and O<sub>2</sub>. Bridgewater calculates its emissions daily and conducts annual Relative Accuracy Test Audits ("RATAs") of the CEMs. (See the *Full Compliance Evaluation Records Review* at the end of this report.)

The Permit requires Bridgewater to install and maintain a continuous emission rate monitoring system ("CERMS").

Bridgewater uses data from the stack volumetric flow measuring device, combined with the NO<sub>x</sub> and CO concentrations obtained from the CEM, to calculate NO<sub>x</sub> and CO mass

emission rates and demonstrate that it is in compliance with the NOx and CO limits stated in the Permit.

- When the RSCR is in operation, the Permit requires Bridgewater to continuously monitor the ammonia flow and the temperature in each chamber. Bridgewater is required to use a DES-approved ammonia flow meter and temperature monitoring system.

Bridgewater monitors the ammonia flow and calculates ammonia usage daily. Bridgewater records the temperature in each chamber of the RSCR continuously and calculates the daily average chamber temperature each day.

- The Permit requires Bridgewater to calculate the ammonia flow/NOx emission rate to determine catalyst performance.

Bridgewater monitors the catalyst daily by taking the ammonia flow meter data and dividing it by the NOx CEM data and recording the result.

## **XI. Compliance with Permit Fee System**

### **CHAPTER ENV-A 700 - Permit Fee System**

#### **Env-A 705.04 – Payment of Emission-Based Fee**

Emission-based fees are due by April 15 of the following year for the previous year's emissions.

Bridgewater has paid its emission-based fees each year through the 2007 emission year. **The fees for 2006 were submitted to DES three weeks after the due date.** The fees for 2007 were submitted prior to the due date.

***Bridgewater failed to pay emission-based fees on the emissions from the diesel fire pump, the cooling pond, and its insignificant activities, prior to April 2008, as required by Env-A 705.04.***

On May 27, 2008, Bridgewater paid to DES five years of emission-based fees it owed on the emissions from the diesel fire pump, the cooling pond, and the insignificant activities.

## **XII. Compliance with other Miscellaneous Provisions**

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

Bridgewater is subject to Env-A 503.01 and the New Source Performance Standard ("NSPS"), 40 CFR 60, Subpart Db, *Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units*. See Section XIII. Compliance with

Applicable Federal Rules of this report. Bridgewater is not subject to other NSPS defined in 40 CFR 60, or any of the National Emission Standards for Hazardous Air Pollutants ("NESHAP") specified in Env-A 504.01 or 40 CFR 61, or any of the National Emission Standards for Hazardous Air Pollutants for Source Categories (Maximum Achievable Control Technology, or MACT, Standards) specified in Env-A 505.01 or 40 CFR 63.

### **XIII. Compliance With Applicable Federal Rules**

#### **40 CFR 60, Subpart Db - Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units**

The wood-fired boiler at Bridgewater is subject to the NSPS, 40 CFR 60 Subpart Db, which requires the facility to limit its particulate matter emissions. Bridgewater conducts stack testing for particulate matter on the wood-fired boiler once every five years and monitors the opacity from the wood-fired boiler using an Opacity CEM.

Subpart Db requires Bridgewater to meet a particulate emission standard that is less than 0.10 lb/MMBtu for the wood-fired boiler, which is less than the Env-A 2002.08 requirement of 0.15 lb/MMBtu. On June 10, 2004, Bridgewater conducted stack testing on the wood-fired boiler. Results from the particulate matter tests were 0.054 lb/MMBtu. The wood-fired boiler meets the particulate matter standards.

In the Permit, the wood-fired boiler has an opacity limit of 20%, except for one 6-minute period per hour of not more than 27%. Bridgewater has an opacity CEM and is meeting this requirement.

Bridgewater is required to report the annual capacity factor over the previous 12 months for each fuel fired in the boiler in each semi-annual report to DES and EPA. Based on the issuance date of the Temporary Permit, the annual capacity factor report is due to be included in the first semi-annual report for 2008.

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

See the *Full Compliance Evaluation Records Review* which is included as an attachment to this report for greater detail of Bridgewater's Title V reporting history and compliance status.

In its annual compliance certification, Bridgewater certified that it included the Certification of Accuracy statement, reported emissions on significant activities, and reported emissions of insignificant activities. The reports that Bridgewater submitted did not include the required information.

***Bridgewater has made statements on its annual compliance certification that are not accurate.***

**XIV. Enforcement History and Status**

Bridgewater was issued a Notice of Past Violation on February 19, 2008 because:

- It did not pay the annual emission fees for calendar year 2006 until May 7, 2007; and,
- It did not submit the annual emissions report for calendar year 2006 until May 7, 2007.

DES determined that no further action in response to the listed violations was required at that time.

**XV. Conclusion & Recommended Actions**

During the closing meeting, the DES Inspector discussed the following issues.

There are issues with the annual emissions report:

1. It does not contain the Certification of Accuracy Statement.
2. It contains fuel usage and emissions for the wood-fired boiler and the emergency generator, but Bridgewater needs to add the fuel usage and emissions from the diesel fire pump, cooling pond and insignificant activities.
3. It did not contain the NOx Emissions Statement.

The DES Inspector requested that Bridgewater add the Certification of Accuracy Statement to the 2007 annual emissions report, add the missing fuel usage and emission data, add the NOx Emissions Statement, and resubmit the report within 30 days. Bridgewater submitted a corrected 2007 annual emissions report.



Alan H. Moulton  
Air Pollution Control Engineer  
Air Resources Division

Attachments: 052708AHM01D – Revised 2007 Annual Emissions Report, 2007 NOx Emissions Statement, Insignificant Activities Emissions 2003 - 2007. (20 Pages) (DES file only.)  
Full Compliance Evaluation Records Review.

## Full Compliance Evaluation Records Review

**Facility:** Bridgewater Power Company, L.P.

**Date of FCE:** April 17, 2008

**Reviewer:** Alan Moulton

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

Reporting Period	When Rec'd	Report OK	In Database
2006	5/07/07 (Late)	No*	Yes
2007	3/27/08	No*	Yes

\* The Annual Emissions Reports do not contain the Certification of Accuracy Statement, fuel usage and/or emission data for the diesel fire pump, the cooling pond, and the insignificant activities, and the NOx Emissions Statement.

### Annual Emissions-Based Fee Payments:

Reporting Period	When Rec'd	In Database
2006	5/07/07 (Late)	Yes, in DES Emission Section's Spreadsheet
2007	3/27/08	Yes, in DES Emission Section's Spreadsheet

### TV Annual Compliance Certifications:

Reporting Period	When Rec'd	Report OK	In Database
2006	1/12/07	Yes**	Yes
2007	3/27/08	Under review.	Yes

\*\* Bridgewater has made statements in its annual compliance certifications on recordkeeping and reporting that are not accurate.

### TV Semi-Annual Permit Deviation and Monitoring Reports:

Reporting Period	When Rec'd	Report OK	In Database
Jan – Jun 2006	7/10/06	Yes	Yes
Jul – Dec 2006	1/12/07 Resubmitted 1/29/07	Yes	Yes
Jan – Jun 2007	7/09/07 Resubmitted 8/13/07	Yes	Yes
Jul – Dec 2007	2/04/08	Yes	Yes

### Individual Permit Deviations Reports:

Bridgewater has submitted eight Permit Deviation Reports between May 2006 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 Files...			

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

Reporting Period	When Rec'd	Report OK	In Database
2 <sup>nd</sup> Qtr. 2006	7/24/06	Yes	Yes
3 <sup>rd</sup> Qtr. 2006	10/30/06	Yes	Yes
4 <sup>th</sup> Qtr. 2006	1/29/07	Yes	Yes
1 <sup>st</sup> Qtr. 2007	4/16/07	Yes	Yes
2 <sup>nd</sup> Qtr. 2007	7/30/07	Yes	Yes
3 <sup>rd</sup> Qtr. 2007	10/23/07	Yes	Yes
4 <sup>th</sup> Qtr. 2007	2/04/08	Yes	Yes
1 <sup>st</sup> Qtr. 2008	5/01/08	Yes	Yes

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

Reporting Period	Report Type	When Rec'd	Report OK	In Database
2 <sup>nd</sup> Qtr. 2006	RAA	6/19/06	Yes	Yes
2 <sup>nd</sup> Qtr. 2006	OPA	6/19/06	Yes	Yes
2 <sup>nd</sup> Qtr. 2006	CGA	6/19/06	Yes	Yes
3 <sup>rd</sup> Qtr. 2006	RAA	8/21/06	Yes	Yes
3 <sup>rd</sup> Qtr. 2006	OPA	8/21/06	Yes	Yes
3 <sup>rd</sup> Qtr. 2006	CGA	8/14/06	Yes	Yes
4 <sup>th</sup> Qtr. 2006	OPA	10/30/06	Yes	Yes
4 <sup>th</sup> Qtr. 2006	2006 RATA	10/05/06	Yes	Yes
1 <sup>st</sup> Qtr. 2007	Flow Transducer Check	3/26/07	Yes	Yes
1 <sup>st</sup> Qtr. 2007	OPA	3/26/07	Yes	Yes
1 <sup>st</sup> Qtr. 2007	CGA	3/26/07	Yes	Yes
2 <sup>nd</sup> Qtr. 2007	RAA	6/11/07	Yes	Yes
2 <sup>nd</sup> Qtr. 2007	OPA	6/11/07	Yes	Yes
2 <sup>nd</sup> Qtr. 2007	CGA	6/11/07	Yes	Yes
3 <sup>rd</sup> Qtr. 2007	RAA	7/30/07	Yes	Yes
3 <sup>rd</sup> Qtr. 2007	OPA	7/30/07	Yes	Yes
3 <sup>rd</sup> Qtr. 2007	CGA	7/30/07	Yes	Yes
4 <sup>th</sup> Qtr. 2007	OPA	12/10/07	Yes	Yes
4 <sup>th</sup> Qtr. 2007	2007 RATA	11/01/07	Yes	Yes
1 <sup>st</sup> Qtr. 2008	Flow Transducer Check	3/27/08	Yes	Yes
1 <sup>st</sup> Qtr. 2008	OPA	3/27/08	Yes	Yes
1 <sup>st</sup> Qtr. 2008	CGA	3/27/08	Yes	Yes
2 <sup>nd</sup> Qtr. 2008	RAA	Pending		
2 <sup>nd</sup> Qtr. 2008	OPA	6/02/08	Yes	Yes
2 <sup>nd</sup> Qtr. 2008	CGA	6/02/08	Yes	Yes

Stack Tests:

Stack Test Date	Device Tested	When Rec'd	Report OK	In Database
11/01/07	Ammonia slip, RSCR on wood-fired boiler	12/05/07	Yes	Yes

Other reports:

Reporting Period	Report Type	When Rec'd	Report OK	In Database
2006	Opacity Monitor 7DD	10/30/06	Yes	Yes
2006	CEM QA/QC Plan	1/29/07	Yes	Yes
2007	Opacity Monitor 7DD	12/31/07	Yes	Yes
2007	CEM QA/QC Plan	2/11/08	Yes	Yes



# **BRIDGEWATER POWER COMPANY**

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NEW HAMPSHIRE

MAY 27 2008

052708AHM 017

(20 PAGES)

May 21, 2008

AIR RESOURCES DIVISION

State of New Hampshire  
Department of Environmental Services  
Air Resources Division  
29 Hazen Drive, PO Box 95  
Concord, N.H. 03302-0095  
Attention: Alan Moulton – Air Pollution Control Engineer

Reference: Compliance Inspection

Dear Mr. Moulton,

As a follow-up to your compliance inspection and e-mail of April 23, 2008 I have enclosed the following:

- Revised Annual Emissions Summary for 2007
- 2007 NOx Emissions Statement Reporting Form INV-N1 & N2
- Emissions data for insignificant activities going back to 2003
- Certification statement

"I am authorized to make this submission on behalf of the facility for which the submission is made. Based on information and belief formed after reasonable inquiry, I certify that the statements and information stated is to the best of my knowledge and belief true, accurate and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine or imprisonment."

Thank you for the cooperation of the agency with regard to this inspection & follow-up.

If you need additional information or clarification, please call me at 603-968-9602.

Sincerely,

Michael O'Leary  
Plant Manager

# ANNUAL AIR EMISSIONS SUMMARY – 2007 AMENDED

FACILITY	MAILING ADDRESS	PHYSICAL ADDRESS
BRIDGEWATER POWER CO., L.P.	P.O. Box 678 Ashland, NH 03217-0678	Rt. 3 Bridgewater, NH 03222

**OPERATOR**  
Bridgewater Power Co., L.P.

PERMITTED DEVICES	BOILER	PERMIT NUMBER
	Wood-Bark/#2 Fuel Oil	TV-OP-008 & TP-B-0533
	Emergency Diesel Generator	TV-OP-008
	Emergency Diesel Fire Pump	TV-OP-008
	Package Boiler	TV-OP-008
	Cooling Pond	TV-OP-008

2007 FUEL CONSUMPTION	DEVICE	TONS/GALS	FUEL TYPE
	Boiler	227,212.00 Tons	Wood
		39,293.5 Gals 0.00 Gals	#2 Fuel Oil Waste Oil
	Diesel Gen.	370.50 Gals *	#2 Fuel Oil
	Diesel Fire Pump	195 Gals *	#2 Fuel Oil
	Package Boiler	9,843 Gals	#2 Fuel Oil
	<b>Totals</b>	227,212.00 Tons 49,702 Gals	Wood #2 Fuel Oil

\* Generator operated 28.5 hours at a max firing rate of 13 gal/hr, Fire Pump operated 15 hour at a max firing rate of 13 gal/hr.

DEVICE	POLLUTANT	TONS	LEVEL DETERMINATION METHOD
BOILER	CO	211.44	Actual CEM Data
	NO <sub>x</sub>	153.19	Actual CEM Data
	SO <sub>2</sub>	24.15	AP - 42/W Actual Fuel Use
	VOC	4.54	AP - 42/W Actual Fuel Use
	Particulate	53.35	Estimate w/ave rate from stack test (6/04) & actual fuel use
DIESEL GEN.	CO	.025	Actual Operating Hrs. with AP - 42 theoretical emissions
	NO <sub>x</sub>	.11	Actual Operating Hrs. with AP - 42 theoretical emissions

	SO <sub>2</sub>	.006	Actual Operating Hrs. with AP - 42 theoretical emissions
	VOC	.002	Actual Operating Hrs. with AP - 42 theoretical emissions
	Particulate	.004	Actual Operating Hrs. with AP - 42 theoretical emissions
DIESEL FIRE	CO	.013	Actual Operating Hrs. with AP - 42 theoretical emissions
	NO <sub>x</sub>	.06	Actual Operating Hrs. with AP - 42 theoretical emissions
	SO <sub>2</sub>	.003	Actual Operating Hrs. with AP - 42 theoretical emissions
	VOC	.001	Actual Operating Hrs. with AP - 42 theoretical emissions
	Particulate	.002	Actual Operating Hrs. with AP - 42 theoretical emissions
PACKAGE BOILER	CO	.03	Actual Operating Hrs. with AP - 42 theoretical emissions
	NO <sub>x</sub>	.10	Actual Operating Hrs. with AP - 42 theoretical emissions
	SO <sub>2</sub>	.28	Actual Operating Hrs. with AP - 42 theoretical emissions
	VOC	0	Actual Operating Hrs. with AP - 42 theore Actual Operating Hrs. with AP -42 theoretical emissions tical emissions
	Particulate	.01	Actual Operating Hrs. with AP - 42 theoretical emissions
COOLING POND	TDS	1.74 tons	Title V Permit

**Total**

**449.046tons**

EMISSION BASED FEE	TOTAL CRITERIA POLLUTANTS (TONS)	\$/TON	INVENTORY STABILIZATION FACTOR	CPI	TOTAL
\$102.04/ton	449.046	\$60.00	1.1052	1.5388	\$ 45,820.66

**ANNUAL AIR EMISSIONS SUMMARY – 2007 AMENDED**  
**SUPPORT CALCULATIONS**

FUEL	HEAT VALUE
Wood	4,250 BTU/LB
#2 Fuel Oil	Approx. 19,500 BTU/LB
	Approx. 140,000 BTU/GAL

2007 FUEL CONSUMPTION		TONS/GAL	TYPE
DEVICE			
Boiler		227,212.00 Tons	Wood
		39,293.5 Gals 0 Gals	#2 Fuel Oil Waste Oil
Diesel Gen.		370.50 Gals est*	#2 Fuel Oil
Diesel Fire Pump		195 Gals est*	#2 Fuel Oil
Package Boiler		9,843 Gals	#2 Fuel Oil
Cooling Pond			

\* Generator operated 28.5 hours at a max firing rate of 13 gal/hr, Fire Pump operated 15 hour at a max firing rate of 13 gal/hr.

TOTAL BTU INPUT	DEVICE
$1.94 \times 10^{12}$	Boiler
51,870,000	Diesel Generator
27,300,000	Diesel Fire Pump
$1.38 \times 10^9$	Package Boiler

# ANNUAL AIR EMISSIONS SUMMARY - 2007

## ACTUAL CALCULATIONS

DEVICE	CALCULATIONS	POLLUTANT
BOILER	.025 LB/mmbtu (AP 42) X 227,212.00 (4250)(2000) = 48,282.55 48,282.55/2000 = 24.14 TONS .568 LBS/1000 GAL (AP 42) X 39.29 1000GAL =22.3 LBS /2000 = .011 TONS 24.14 + .011 = 24.15	SO <sub>2</sub>
BOILER	.04 LB/TON (AP42) X 227,212.00 = 9088.48 9088.48/2000 = 4.54 .04LB/1000G X 39.29 1000GAL =1.57 LB 1.57/2000 = 0.00 TON 4.54 + 0 = 4.54	VOC NON-METHANE
BOILER	.055 LBS/MM BTU X 1,940,000.00 = 106,700.00 LBS 106,700.00/2000 = 53.35	PARTICULATE
DIESEL GENERATOR	.95 LB/MMBTU X 51.87MM BTU = 49.27 LBS 49.27/2000 = .025 TONS	CO
DIESEL GENERATOR	4.41 LB/MMBTU X 51.87MM BTU = 228.75 LBS 228.75/2000 = .11 TONS	NO <sub>x</sub>
DIESEL GENERATOR	.4 LBS/HR X 28.5 HRS = 11.4 LBS 11.4/2000 = .006 TONS	SO <sub>2</sub>
DIESEL GENERATOR	.1 LB/MM BTU X 51.87MM BTU = 5.19 LBS 5.19/2000 = .002 TONS	VOC
DIESEL GENERATOR	.3 LBS/HR X 28.5 HRS = 8.55 LBS 8.55/2000 = .004 TONS	PARTICULATE
DIESEL FIRE PUMP	.95 LB/MMBTU X 27.3MM BTU = 25.93 LBS 25.93/2000 = .013 TONS	CO
DIESEL FIRE PUMP	4.41 LB/MMBTU X 27.3MM BTU = 120.39 LBS 120.39/2000 = .06 TONS	NO <sub>x</sub>
DIESEL FIRE PUMP	.4 LBS/HR X 15 HRS = 6 LBS 6/2000 = .003 TONS	SO <sub>2</sub>
DIESEL FIRE PUMP	.1 LB/MM BTU X 27.3MM BTU = 2.73 LBS 2.73/2000 = .001 TONS	VOC
DIESEL FIRE PUMP	.3 LBS/HR X 15 HRS = 4.5 LBS 4.5/2000 = .002 TONS	PARTICULATE
PACKAGE BOILER	5LB/ 1000GAL X 9.843 = 49 LBS 49 LBS / 2000 = .03 TONS	CO
PACKAGE BOILER	20 LBS / 1000 GAL X 9.843 = 197 LBS 197/2000 = .10 TONS	NO <sub>x</sub>
PACKAGE BOILER	(142 X .4)/ 1000GALS X 9.843 = 559.1LBS 559.1/ 2000= .28 TONS	SO <sub>2</sub>
PACKAGE BOILER	.2LBS/ 1000 GALS X 9.843 = 2.0 LBS 2/ 2000 = 0 TONS	VOC
PACKAGE BOILER	2 LBS/ 1000GAL X 9.843 = 19.7 LBS 19.7 / 2000 = .01 TON	PARTICULATE
COOLING POND	24-hr emissions (lb/hr) = (DR)*(Hr.CR)*(8.34lb/gal)*(C) Where: DR=drift rate of pond (0.000012gal/gal) Hr. CR = water recirculation rate (948,000 gal/hr) C = concentration of chemical of interest (Total dissolved solids) 24-hr emissions (lb/hr)=.000012*948,000*8.34*4314/1,000,000 24-hr emissions (lb/hr)= .41 lbs./hr Based on 8500 hours a year operation the annual total solids emitted by BPC's Cooling Pond EU2 in 2007 was 3479 lb/yr= 1.74 ton/year	TDS

Reporting Year 2007

Source name: <u>Treebrook 1</u>		Permit Number: <u>TP-B-0533</u> <u>TU-OP-008</u>	
Device name: <u>EU 1</u>			
Control Equipment:		Pollutant Thruput Information:	
Type of control: <u>Regenerative Selective Catalytic Reduction (RSCR)</u>			
ID number: <u>PCE 4</u>		Total amount	
Model Number:		Month of use	Inlet NOx (lbs)
Manufacturer: <u>Babcock Power Environmental</u>			Outlet NOx (lbs)
Installation Date: <u>9/12/07</u>		January	35,563
Devices controlled: <u>EU 1 Bridgewater Power Co.</u>		February	29,162
		March	31,248
		April	31,896
		May	32,885
		June	32,477
		July	33,926
		August	30,058
		September	19,800
		October	10,044
		November	9,504
		December	11,904
		Annual totals:	308,462
Efficiency			
Type of capture system: <u>RSCR</u>			
Capture system efficiency (%):			
Method of determination:			
Destruction removal efficiency (%): <u>70</u>			
Date tested:			
If not tested, method of determining DRE: <u>Historic performance compared to installed RSCR performance</u>			
Time on line and operating (%):			
Comments: <u>NOx amount are from CEM data.</u>			

Certification: These records are true and accurate to the best of my knowledge:

  
Signature

Plant Manager  
Title

5/14/08  
Date

Reporting Year 2007

Source name: Tree brook 1  
 Device name: EUI Bridgewater Power Co Permit Number: TV-OP-008, TPB-0533  
 Max heat input rate: 250 mm btu/hr Ozone season heat input rate: 250 mm btu/hr  
 Ozone Season Operating Schedule (Jun 1 thru Aug 31):  
 Hours/Day: 24 Days/Week: 7 Weeks/Season: all  
 Days/Season: all

Month	Fuel used		Sulfur (wt%)	Quantity	Units	MMBTUs	Emission Factor		SO2 (lbs)	NOx (lbs)	Ozone Daily NOx Emissions (lbs/day)	
	Fuel type						Units: SO2	NOx				
Jan.	Primary	Wood		19,882	ton	168,997	.025		4,225	35,502		
	Secondary	#2 F.O.	4.4	1,394	gal	193	.0041		.8			
Feb.	Primary	Wood		17,977	ton	152,804	.025		3,820	27,967		
	Secondary	#2 F.O.	4.4	4,268	gal	592	.0041		2.4			
Mar.	Primary	Wood		18,894	ton	160,599	.025		4,015	29,677		
	Secondary	#2 F.O.	4.4	12,620	gal	1,750	.0041		7.1			
Apr.	Primary	Wood		19,700	ton	167,450	.025		4,186	31,837		
	Secondary	#2 F.O.	4.4	280	gal	39	.0041		.1			
May	Primary	Wood		20,317	ton	172,694	.025		4,317	32,882		
	Secondary	#2 F.O.	4.4	1,006	gal	139	.0041		.5			
June	Primary	Wood		19,639	ton	166,931	.025		4,173	32,404		
	Secondary	#2 F.O.	4.4	613	gal	85	.0041		.3			
July	Primary	Wood		20,183	ton	171,555	.025		4,289	33,587		1,096
	Secondary	#2 F.O.	4.4	266	gal	37	.0041		.1			
Aug.	Primary	Wood		19,369	ton	164,636	.025		4,116	29,923		
	Secondary	#2 F.O.	4.4	410	gal	57	.0041		.2			
Sep.	Primary	Wood		14,823	ton	125,995	.025		3,150	16,402		
	Secondary	#2 F.O.	4.4	2,743	gal	380	.0041		1.5			
Oct.	Primary	Wood		19,403	ton	164,925	.025		4,123	31,645		
	Secondary	#2 F.O.	4.4	3,167	gal	443	.0041		1.8			
Nov.	Primary	Wood		18,613	ton	158,210	.025		3,955	28,937		
	Secondary	#2 F.O.	4.4	2,161	gal	302	.0041		1.2			
Dec.	Primary	Wood		18,412	ton	156,502	.025		3,913	10,986		
	Secondary	#2 F.O.	4.4	3,469	gal	486	.0041		2.0			
Year (total)	Primary	Wood		227,212	ton	1,931,298	.025		48,282	300,149		
	Secondary	#2 F.O.	4.4	32,397	gal	4,503	.0041		18			
Totals:						1,935,801			48,300	300,149		

SO2 lb/mmbtu

Comments: NOx lbs from CEM included primary, secondary and RSCR burners. SO2 from AP42 .025 lb/mmbtu for Wood.

Certification: These records are true and accurate to the best of my knowledge:

*[Signature]*  
Signature

5/19/08  
Date

Reporting Year 2007

Source name: Tree brook 1

Device name: EU 1-RSCR contribution Permit Number: TP-B-0533

Max heat input rate: 2.33 mmbtu/hr Ozone season heat input rate: 0

Ozone Season Operating Schedule (Jun 1 thru Aug 31):

Hours/Day: 0 Days/Week: 0 Weeks/Season: 0

Days/Season: 0

Month	Fuel used		Sulfur (wt%)	Quantity	Units	MMBTUs	Emission Factor		SO2 (lbs)	NOx (lbs)	Ozone Daily NOx Emissions (lbs/day)
	Fuel type						Units: SO2	NOx			
Jan.	Primary										
	Secondary										
Feb.	Primary										
	Secondary										
Mar.	Primary										
	Secondary										
Apr.	Primary										
	Secondary										
May	Primary										
	Secondary										
June	Primary										
	Secondary										
July	Primary										
	Secondary										
Aug.	Primary										
	Secondary										
Sep.	Primary	#2 F.O.		11275	gal	158			.6		
	Secondary										
Oct.	Primary	#2 F.O.		1944	gal	272			1.1		
	Secondary										
Nov.	Primary	#2 F.O.		1881	gal	263			1.0		
	Secondary										
Dec.	Primary	#2 F.O.		1944	gal	272			1.1		
	Secondary										
Year (total)	Primary	#2 F.O.		6,896.5	gal	965			3.9		
	Secondary										
Totals:									3.9		

SO2 lb/mmbtu

Comments: SO2 emission factor from AP42 .568 lb/1000 gal #2 F.O.  
NOx measured by CEM and included in EU1 NOx.

Certification: These records are true and accurate to the best of my knowledge: [Signature] 1/19/08

Signature Date

Reporting Year 2007

Source name: Treebrook 1  
 Device name: Package Boiler Permit Number: TU-OP-008 TP-B-0533  
 Max heat input rate: \_\_\_\_\_ Ozone season heat input rate: \_\_\_\_\_

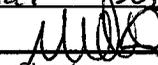
Ozone Season Operating Schedule (Jun 1 thru Aug 31):  
 Hours/Day: 0 Days/Week: 0 Weeks/Season: 0  
 Days/Season: 0

Month	Fuel used		Sulfur (wt%)	Quantity	Units	MMBTUs	Emission Factor		SO2 (lbs)	NOx (lbs)	Ozone Daily NOx Emissions (lbs/day)
	Fuel type						Units: $\frac{lb}{1000gal}$	NOx			
Jan.	Primary	#2 F.O.		2,081	gal		56.8	20	118	42	
	Secondary										
Feb.	Primary	#2 F.O.		2,332	gal		56.8	20	132	47	
	Secondary										
Mar.	Primary	#2 F.O.		1,611	gal		56.8	20	91	32	
	Secondary										
Apr.	Primary	#2 F.O.		820	gal		56.8	20	45	16	
	Secondary										
May	Primary	#2 F.O.		219	gal		56.8	20	124	4	
	Secondary										
June	Primary										
	Secondary										
July	Primary										
	Secondary										
Aug.	Primary										
	Secondary										
Sep.	Primary	#2 F.O.		32	gal		56.8	20	2	1	
	Secondary										
Oct.	Primary	#2 F.O.		783	gal		56.8	20	44	16	
	Secondary										
Nov.	Primary	#2 F.O.		389	gal		56.8	20	22	8	
	Secondary										
Dec.	Primary	#2 F.O.		1556	gal		56.8	20	88	31	
	Secondary										
Year (total)	Primary	#2 F.O.		9,843	gal		56.8	20	666	197	
	Secondary										
Totals:											666 197

SO2 lb/mmbtu

Comments: Emission Factors from AP-42 for External Combustion Sources for boilers <100 mmbtu/hr, NOx = 20 lb/1000gal SO2 = 142 \* .4 = 56.8 lb/1000gal

Certification: These records are true and accurate to the best of my knowledge:

  
Signature

5/19/08  
Date

Reporting Year: 2007

Sourcename: Treebrook I  
 Device name: Diesel Fire Pump, EU3 Permit Number: TU-OP-008  
 Max heat input rate: 1.1 mmbtu/hr Ozone season heat input rate:

Ozone Season Operating Schedule (Jun 1 thru Aug 31):  
 Hours/Day: \_\_\_\_\_ Days/Week: \_\_\_\_\_ Weeks/Season: \_\_\_\_\_  
 Days/Season: \_\_\_\_\_

Month	Fuel used						Emission Factor		SO2 (lbs)	NOx (lbs)	Ozone Daily NOx Emissions (lbs/day)
	Fuel type	Sulfur (wt%)	Quantity	Units	MMBTUs	Units:					
						SO2	NOx				
Jan.	Primary	#2F.O.	4.4	16.25	gal	2.275	.29	4.41	.66	10	
	Secondary										
Feb.	Primary			16.25					.66	10	
	Secondary										
Mar.	Primary			16.25					.66	10	
	Secondary										
Apr.	Primary			16.25					.66	10	
	Secondary										
May	Primary			16.25					.66	10	
	Secondary										
June	Primary			16.25					.66	10	
	Secondary										
July	Primary			16.25					.66	10	.32
	Secondary										
Aug.	Primary			16.25					.66	10	
	Secondary										
Sep.	Primary			16.25					.66	10	
	Secondary										
Oct.	Primary			16.25					.66	10	
	Secondary										
Nov.	Primary			16.25					.66	10	
	Secondary										
Dec.	Primary			16.25					.66	10	
	Secondary										
Year (total)	Primary	#2F.O.	4.4	195	gal	27.3			7.92	120	
	Secondary										
						Totals:	27.3		7.92	120	

SO2 lb/mmbtu

Comments: Emission Factors from AP 42 NOx 4.41<sup>lb</sup>/mmbtu, and SO<sub>2</sub> .29<sup>lb</sup>/mmbtu

Certification: These records are true and accurate to the best of my knowledge: [Signature] 5/19/08

Reporting Year 2007

Source name: Treebrook I

Device name: Emergency Diesel Generator, #2 Permit Number: TU-OP-008

Max heat input rate: 1.8 mmbtu/hr Ozone season heat input rate:

Ozone Season Operating Schedule (Jun 1 thru Aug 31):

Hours/Day: \_\_\_\_\_ Days/Week: \_\_\_\_\_ Weeks/Season: \_\_\_\_\_

Days/Season: \_\_\_\_\_

Month	Fuel used		Sulfur (wt%)	Quantity	Units	MMBTUs	Emission Factor		SO2 (lbs)	NOx (lbs)	Ozone Daily NOx Emissions (lbs/day)
							Units:				
							SO2	NOx			
Jan.	Primary	#2 F.O.	4.4	26	gal	3.64	29	4.41	1	16	
	Secondary										
Feb.	Primary			26		3.64			1	16	
	Secondary										
Mar.	Primary			26		3.64			1	16	
	Secondary										
Apr.	Primary			26		3.64			1	16	
	Secondary										
May	Primary			26		3.64			1	16	
	Secondary										
June	Primary			26		3.64			1	16	
	Secondary										
July	Primary			26		3.64			1	16	
	Secondary									0.51	
Aug.	Primary			26		3.64			1	16	
	Secondary										
Sep.	Primary			84.5		11.83			3	52	
	Secondary										
Oct.	Primary			26		3.64			1	16	
	Secondary										
Nov.	Primary			26		3.64			1	16	
	Secondary										
Dec.	Primary			26		3.64			1	16	
	Secondary										
Year (total)	Primary	#2 F.O.	4.4	370.5	gal	51.87	29	4.41	14	228	
	Secondary										
Totals:						51.87			14	228	

SO2 lb/mmbtu

Comments: Emission Factors from AP42, NOx 4.41 lb/mmbtu and SO2 29 lb/mmbtu.

Certification: These records are true and accurate to the best of my knowledge:

Signature: [Signature] Date: 9/19/07

## Emissions for Insignificant Activities at Bridgewater Power Company 2007

### Package Boiler

Year	#2 F.O. gal.	CO	NO <sub>x</sub>	SO <sub>2</sub>	VOC	P.M	Total LB
2007	9,843	49	197	559	2	20	827
2006	7,265	36	145	413	1	15	610
2005	9,387	47	188	533	2	19	789
2004	13,379	67	268	760	3	27	1125
2003	14,600	73	292	829	3	29	1226

Note: #2 fuel oil consumption for the facility has been being accounted for on the Annual Air Emission Summary as use by Boiler EU1. In 2007 reported 49,702 gallons. Breakdown by device 39,293.5 gallons to EU1, 9,843 to package boiler, 370.5 gallons to diesel generator and 195 gallons to diesel fire pump.

Emission Factors are from AP 42 for External Combustion Sources for boilers < 100 mmbtu/hr.

CO is 5 lb/1000 gal.

NO<sub>x</sub> is 20 lb/1000 gal.

SO<sub>2</sub> is 142 times .4 = 56.8 lb/1000 gal.

PM is 2 lb/1000 gal.

VOC is .2 lb/ 1000 gal. (NMTOC Emission Factor)

### Wood Chip Handling

Refer to 1996 Title 5 application estimate of .61 tons/ year. Section follows.

## Diesel Fire Pump

Year	#2 F.O. mmbtu*	CO	NO <sub>x</sub>	SO <sub>2</sub>	TOC	P.M
2007	27.3(15hr)	26	120	8	10	8
2006	36.4( 20hr)	35	161	11	13	11
2005	23.6(13hr)	22	104	7	8	7
2004	34.6(19hr)	33	153	10	12	11
2003	32.8(18hr)	31	145	10	11	10
<b>Total average = 195 lb./yr</b>						

\*#2 F.O. use based on operating hours times maximum firing rate of 13 gal./hr and 140,000 btu / gal.

TOC is .35 lb / mmbtu input.

CO is .95 lb / mmbtu input.

NO<sub>x</sub> is 4.41 lb / mmbtu input.

SO<sub>2</sub> is .29 lb / mmbtu input.

PM is .31 lb / mmbtu input.

## Cooling Pond

For the years 2004 to 2007 the average conductivity of the cooling pond by year was for 2003- 4226 ppmw TDS, 2004- 4137ppmw TDS, 2005- 4317ppmw TDS, 2006- 4601ppmw TDS, and 2007- 4314ppmw TDS.

In accordance with Env-A 1400 the following is used to evaluate the impact of EU2 (cooling pond) water chemicals on the 24-hour and annual deminimus levels:

$$24\text{-hr emissions (lb/hr)} = (\text{DR}) * (\text{Hr. CR}) * (8.34\text{lb/gal}) * (\text{C})$$

Where:

DR=drift rate of pond (0.000012gal/gal)

Hr. CR = water recirculation rate (948,000 gal/hr)

C = concentration of chemical of interest (Total dissolved solids)

$$24\text{-hr emissions (lb/hr)} = 0.000012 * 948,000 * 8.34 * 4314 / 1,000,000$$

$$24\text{-hr emissions (lb/hr)} = .41 \text{ lbs./hr}$$

Based on 8500 hours a year operation the annual total solids emitted by

BPC's Cooling Pond EU2 in 2007 was **3479 lb/yr= 1.74 ton/year**

BPC's Cooling Pond EU2 in 2006 was **3710 lb/yr= 1.8 ton/year**

BPC's Cooling Pond EU2 in 2005 was **3481 lb/yr= 1.74 ton/year**

BPC's Cooling Pond EU2 in 2004 was **3336 lb/yr= 1.67 ton/year**

BPC's Cooling Pond EU2 in 2003 was **3408 lb/yr= 1.70 ton/year**

## #2 Fuel Oil Tank

From AP42 the formula to calculate the losses from a fixed roof tank is:

$$L_T = L_S + L_W$$

Where:  $L_T$  is the total loss.

$L_S$  is the standing storage losses in lb/yr

$L_W$  is the working losses in lb/yr

Bridgewater power in 2007 took delivery of 49,702 gallons (1555 bbl/yr). Tank is horizontal 16.5 feet long and 10.5 feet in diameter. Tank handles only #2 Fuel Oil, which has a Molecular weight of 130 lb/lb-mole, a true vapor pressure at 60°F of .0065 psi, a liquid density of 7.1 lb/gal and used annual average temperature of 60°F with a 20°F change.

$$L_w = 0.0010 M_v P_{VA} Q K_N K_P$$

$$L_w = 0.0010 * 130 * .0065 * 1555 * 1 * 1$$

$$L_w = 1.3 \text{ lb/yr}$$

$$L_s = 365 W_v V_v K_e K_s$$

$$L_s = 365 * 53.1 * 272 * .003 * .003$$

$$L_s = 47.5 \text{ lb/yr}$$

$$L_{\text{total}} = 1.3 \text{ lb/yr} + 47.5 \text{ lb/yr}$$

$$L_{\text{total}} = \mathbf{48.8 \text{ lb/yr}}$$

Better estimate would be 1996 Title 5 application estimate from TANKS program 2.0 of 1.4 lb/year

**Reference Data Used for Woodyard Particulate Emissions Calculations  
Bridgewater Power Plant  
Ashland, NH**

<b>Paramater</b>	<b>Value Used</b>	<b>Source of Data</b>
Maximum Hours of Operation:	24 hr/day	Assumed Continuous Full Capacity Operation
Potential Days per Year:	365 days/year	Assumed Continuous Full Capacity Operation
particle size multiplier for storage pile handling	0.35	AP-42; 13.24 Aggregate Handling and Storage Piles
mean wind speed	6.7 mph	Climates of U.S. Cities; Used Concord, NH Data
Whole Tree Wood Chips	55 %	Bridgewater Power Company Data
silt content of aggregate	1.0 %	AP-42; Silt Content for Limestone
# of days with > or = 0.01 in of precipitation per year	125	Climates of U.S. Cities; Used Concord, NH Data
% of time unobstructed wind speed exceeds 12 mph at the mean pile height	17 %	1991 & 1992 Surface Observations for Concord, NH

**Potential Particulate Emissions from  
Wood Chip and Bark Loading and Unloading  
Bridgewater Power Plant  
Ashland, NH**

Reference:

Emission Factor (lb PM10/ton material transferred):

AP-42; 13.24 Aggregate Handling and Storage Piles

$E = 0.0032 * k * [u/5]^{1.3} / [m/2]^{1.4}$

k: particle size multiplier for storage pile handling (0.35 for PM10)

u: mean wind speed (mph)

m: material moisture content (%)

Description	# of Associated Drops	k	u (mph)	m (%)	E (lb PM10/ton material)	Maximum Throughput <sup>(1)</sup> (ton/day)	Maximum Throughput (ton/yr)	PM10 <sup>(2)</sup> (ton/yr)
Truck Unloading of Wood Chips	2	0.35	6.7	55	1.58266E-05	3,000	1,095,000	0.02
Conveying of Wood Chips	8	0.35	6.7	55	1.58266E-05	3,000	1,095,000	0.07
Storage Handling of Wood Chips	2	0.35	6.7	55	1.58266E-05	3,000	1,095,000	0.02
<b>Total:</b>								<b>0.10</b>

<sup>(1)</sup> Based on a maximum throughput of wood chips of 125 tons/hr and 24 hr/day of potential operation.

<sup>(2)</sup> PM10 (ton/year) =  $\frac{\# \text{ Associated Drops} \times \text{Maximum Throughput (ton material/year)} \times E \text{ (lb PM10/ton material)}}{1 \text{ ton/2000lb}}$

**Potential Particulate Emissions from  
Wind Erosion of Wood Chip Storage Piles  
Bridgewater Power Plant  
Ashland, NH**

Reference: AP-42; 11.23 ('83) Wind Erosion of Pile Storage

Emission Factor (lb TSP/day/acre):

$$E = 1.7 * (s/1.5) * (365-p/365) * (f/15)$$

s: silt content of aggregate (%)

p: # of days with > or = 0.01 in of precipitation per year

f: % of time unobstructed wind speed exceeds 12 mph at the mean pile height

Description	s (%)	p (days/yr)	f (%)	E (lb TSP/day/acre)	Maximum Acreage <sup>(1)</sup>	TSP <sup>(2)</sup>		PM10 <sup>(3)</sup>		
						(lb/day)	(ton/year)	(lb/day)	(ton/year)	
Wood Chip Storage	1.0	125	17	0.83	4.00	3.3	0.6	3.3	0.6	
<b>TOTAL:</b>							3.32	0.61	3.32	0.61

<sup>(1)</sup> Based on maximum possible storage area.

<sup>(2)</sup> TSP (lb TSP/day) = E (lb TSP/day/acre) x Maximum Acreage (acres)

TSP (ton TSP/year) =  $\frac{\text{TSP (lb/day)} \times \text{Potential Days per Year (days/yr)}}{1 \text{ ton}/2000 \text{ lb}}$

<sup>(3)</sup> Conservatively assumed TSP and PM10 are equal.

TANKS PROGRAM 2.0  
EMISSIONS REPORT - SUMMARY FORMAT  
INDIVIDUAL TANK EMISSION TOTALS

03/05/96  
PAGE 3

Annual Emissions Report

Liquid Contents	Losses (lbs.):		Total
	Standing	Withdrawal	
Distillat fuel oil no. 2	0.12	1.28	1.40
Total:	0.12	1.28	1.40

TANKS PROGRAM 2.0  
 EMISSIONS REPORT - SUMMARY FORMAT  
 LIQUID CONTENTS OF STORAGE TANK

03/05/96  
 PAGE 2

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F)			Liquid Bulk Temp. (deg F)	Vapor Pressures (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Distillate fuel oil no. 2	All	46.73	41.19	52.27	45.32	0.0041	0.0034	0.0050	130.000			130.00	Option 4: A=12.1010, B=8907.0

TANKS PROGRAM 2.0  
EMISSIONS REPORT - SUMMARY FORMAT  
TANK IDENTIFICATION AND PHYSICAL CHARACTERISTICS

03/05/96  
PAGE 1

Identification

Identification No.: BPC-001  
City: Ashland  
State: NH  
Company: Bridgewater Power Company  
Type of Tank: Vertical Fixed Roof

Tank Dimensions

Shell Height (ft): 23  
Diameter (ft): 10  
Liquid Height (ft): 22  
Avg. Liquid Height (ft): 22  
Volume (gallons): 10000  
Turnovers: 10  
Net Throughput (gal/yr): 100000

Paint Characteristics

Shell Color/Shade: White/White  
Shell Condition: Good  
Roof Color/Shade: White/White  
Roof Condition: Good

Roof Characteristics

Type: Cone  
Height (ft): 0.00  
Radius (ft) (Dome Roof): 0.00  
Slope (ft/ft) (Cone Roof): 0.0625

Breather Vent Settings

Vacuum Setting (psig): -0.03  
Pressure Setting (psig): 0.03

eteorological Data Used in Emission Calculations: Concord, New Hampshire

**Moulton, Alan**

**From:** Moulton, Alan  
**Sent:** Wednesday, April 23, 2008 4:13 PM  
**To:** 'molite@metrocast.net'  
**Subject:** Recent Inspection

Mike,

I have owed you some information from the recent compliance inspection.

1. Attached are the NOx Emissions Reporting Forms.
2. According to the Title V Application filed in 1996, the following are listed as insignificant activities:
  - Wood Chip Handling
  - #2 Fuel Oil Storage Tank
  - Package Boiler (Cleaver Brooks, 3 MMBtu/hr, #2 fuel oil)

This is significant because Bridgewater is required to submit emissions for insignificant activities in the Annual Emissions Reports. Can you get information to me going back to 2003 or 2004?

3. Bridgewater is required to report emissions from the significant activities in the Annual Emissions Reports. The current Annual Emissions Reports do not include emissions from the Diesel Fire Pump and the Cooling Pond. The missing emissions need to be added to the amended 2007 Annual Emissions Report. I would also like this data for 2004, 2005, and 2006. To calculate the emissions from the Cooling Pond, you can use the formulas that Craig Clarke supplied to DES ARD when the Permit was being drafted.
4. The NOx and CO emissions from the emergency generator. I am waiting for information from you on why the method was chosen before I make any decision.

That's all I have for now. Is it possible to get the requested information to me with in 30 days? If you have any questions please give me a call.

Alan Moulton  
Air Pollution Control Engineer  
NHDES, Air Resources Division  
29 Hazen Dr., PO Box 95  
Concord, NH 03302-0095  
(603) 271-6797

## **DIRECTIONS TO FACILITY**

**Facility:** Bridgewater Power Company

**Address:** Routes 3 and 25  
Bridgewater, NH 03222

### **Directions:**

From Concord

Take I-93 North to Exit 24 for Routes 3 and 25

At end of exit ramp take a Left and head west towards Bridgewater and Plymouth

After traveling 1 ½ miles, the facility is on the Right.

**Travel Time:** 40 Min.

**Date:** April 18, 2008

**Inspector:** Alan Moulton