STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION

OFFICE OF ADJUDICATIONS

IN THE MATTER OF	:	*APPLICATION NOs.:* *DIV-200603081 (Diversion)* *200602249 (Solid Waste)* *200602226 (Air)* *200702055 (Discharge)* *200800492 (Discharge)*
PLAINFIELD RENEWABLE ENERGY	:	*DECEMBER 22, 2008*

PROPOSED FINAL DECISION

I

SUMMARY

Plainfield Renewable Energy, LLC (PRE/applicant) has filed applications with the Department of Environmental Protection (DEP/staff) for various environmental permits required for the construction and operation of its proposed 37.5 megawatt (MW) power plant in Plainfield and associated structures in Canterbury. Specifically, the applicant seeks the following permits: (1) an air point source permit; (2) a permit to construct and operate a solid waste facility; (3) a permit to divert and withdraw water from the Quinebaug River; and (4) a combined National Pollution Discharge Elimination System and state water discharge permit, (the water discharge permit).

The proposed power plant will use fluidized bed gasification to process wood as a source of fuel to produce steam, which will be used to generate a net 37.5 MW of electricity. The power plant facility and wood fuel storage area are proposed for a site at Norwich Road and Mill Brook Road in Plainfield (Facility Site/Gallup's Quarry Property). The pump house and pipeline for the cooling water is proposed for a site off Packer Road in Canterbury (Intake and Discharge Site/Man-Burch Property).

DEP issued a Notice of Tentative Determination and Intent to Issue Various Environmental Permits on April 4, 2008. This notice indicated DEP's intent to issue the required air, solid waste, water diversion, and water discharge permits and included copies of the proposed draft permits.

Friends of the Quinebaug River (FQR/intervening party) submitted timely petitions for hearing signed by at least twenty-five members of the public regarding all four of the proposed permits. After the start of the hearing process, FQR filed a Notice of Intervention and two amended Notices of Intervention. These notices alleged that the proposed activity as authorized by the proposed draft permits would have or is reasonably likely to have the effect of unreasonably polluting, impairing, or destroying the air, water, or other natural resources of the state in violation of the Connecticut Environmental Protection Act (CEPA), General Statutes § 22a-19. FQR was granted party status on July 14, 2008 for the portion of the hearing related to the solid waste, water diversion, and water discharge permits. FQR did not intervene in the air permit hearing. One consolidated hearing was held for all four permits.

The hearing occurred over eight days in August and September 2008, including an evening session held at Plainfield Town Hall for the purpose of collecting public comment on the record. The hearing record was closed on September 4, 2008. The parties submitted post-hearing briefs and proposed findings of fact and conclusions of law on September 29, 2008.

Through the presentation of substantial evidence, the applicant has demonstrated that the proposed activity, if conducted pursuant to the draft permits, will meet the applicable legal and regulatory standards. The intervening party has failed to meet its burden of proof under CEPA. FQR never established a prima facie case that the proposed activity would be reasonably likely to cause unreasonable pollution, impairment, or destruction of the air, water, or other natural resources of the state. The intervening party also failed to demonstrate the existence of a feasible and prudent alternative to the proposed activity.

I recommend that the proposed air (Attachment 1, Exhibit A), solid waste (Attachment 2), and water diversion (Attachment 3) permits be issued to the applicant. As required for the water discharge permit (Attachment 4), I recommend that the Commissioner authorize the applicant to submit plans and specifications of the proposed water treatment system for approval and that upon approval and construction of the facility according to the approved plans and specifications, the proposed water discharge permit be issued.

II

DECISION

A

AIR PERMIT

Unlike the other permits that were part of the consolidated hearing, no party elected to intervene in the hearing on the application for a new air point source permit for the proposed facility. The applicant and the DEP are the only parties to this matter. Both the applicant and DEP presented witnesses to testify on the air permit application and the review and tentative determination to approve that application.

On September 29, 2008, the DEP and the applicant jointly submitted an Agreed Draft Decision (Attachment 1) for my consideration. Regs., Conn. State Agencies § 22a-3a-6(l)(3). I have reviewed this submission and the hearing record, including documentary evidence, oral testimony, and public comment. Based on my review of the record, I find that the application and proposed draft permit meet the applicable statutory and regulatory standards.

The Agreed Draft Decision submitted by the parties sufficiently states, with detailed references to the record, the findings of fact and conclusions of law necessary to support this finding. (Note: Finding of fact number 20 in that agreement erroneously states that "the cooling tower does have potential emissions greater than 15 TPY" (tons per year). This obvious error is corrected in finding number 26, which states that potential emissions from the cooling tower "will be less than 15 TPY." The record as cited in both of these findings clearly demonstrates that finding 26 is accurate.) Therefore, I accept the Agreed Draft Decision and adopt it as my proposed final decision for the air permit.

B

SOLID WASTE, WATER DISCHARGE, AND WATER DIVERSION PERMITS

1

FINDINGS OF FACT

a

The Applicant and the Proposed Project

1. The applicant, Plainfield Renewable Energy, LLC is a joint venture of NuPower LLC of Norwalk, CT and Decker Energy International, Inc. of Winter Park, FL. (Ex. APP-30; test. 8/13/08 and 8/19/08, D. Donovan.[1])

2. The proposed facility is a 37.5 MW, low emission, class I renewable energy facility as defined in General Statutes § 16-1(a)(26)[2] for sustainable biomass as defined in § 16-1(a)(45)[3]. The proposed facility will use staged fluidized-bed gasification to process wood as a source of fuel for the production of steam to generate electricity.[4] (Ex. App-30; test. 8/13/08 and 8/19/08, D. Donovan)

3. The biomass wood fuel will consist of land clearing debris (chipped trees, stumps, branches, brush); recycled wood/clean wood (pallets, spools, packaging materials scraps from newly built wood products); and regulated wood fuels (construction and demolition wood (C&D

[1] The testimony and proceedings in this matter were recorded. No written transcript has been prepared. The audio recording of this hearing is on file with the Office of Adjudications and is the official record of this proceeding.

[2] "Class I renewable energy source" means (A) energy derived from solar power, wind power, a fuel cell, methane gas from landfills, ocean thermal power, wave or tidal power, low emission advanced renewable energy conversion technologies, a run-of-the-river hydropower facility provided such facility has a generating capacity of not more than five megawatts, does not cause an appreciable change in the river flow, and began operation after July 1, 2003, or a sustainable biomass facility with an average emission rate of equal to or less than .075 pounds of nitrogen oxides per million BTU of heat input for the previous calendar quarter, except that energy derived from a sustainable biomass facility with a capacity of less than five hundred kilowatts that began construction before July 1, 2003, may be considered a Class I renewable energy source, or (B) any electrical generation, including distributed generation, generated from a Class I renewable energy source.

[3] "Sustainable biomass" means biomass that is cultivated and harvested in a sustainable manner."Sustainable biomass" does not mean construction and demolition waste, as defined in section 22a-208x, finished biomass products from sawmills, paper mills or stud mills, organic refuse fuel derived separately from municipal solid waste, or biomass from old growth timber stands, except where (A) such biomass is used in a biomass gasification plant that received funding prior to May 1, 2006, from the Renewable Energy Investment Fund established pursuant to section 16-245n, or (B) the energy derived from such biomass is subject to a long-term power purchase contract pursuant to subdivision (2) of subsection (j) of section 16-244c entered into prior to May 1, 2006, or (C) prior to July 1, 2007, such biomass is used in a renewable energy facility that was approved by the department prior to October 1, 2005.

[4] The staged fluidized bed gasification process heats wood in the absence of oxygen to avoid combustion and produces a gas in the first stage that is burned in the second stage to generate the heat to produce the steam and drive the turbine.

wood) that has been sorted to remove plastics, plaster, gypsum, wallboard, asbestos, asphalt shingles, and wood that contains creosote or to which pesticides have been applied. (Ex. APP-30; test. 8/19/08, D. Donovan; 8/20/08, C. Tanovici.)

4. The Connecticut Siting Council approved the project. As it ruled that the project would not have a substantial environmental effect, it did not require a Certificate of Environmental Compatibility by its decision and order dated June 7, 2007. (Ex. APP-35.)

5. The Department of Public Utility Control approved the applicant's price formula and directed the applicant to limit is use of clean wood to a maximum 36% of its output and required the remaining fuel to come from C&D wood. (Ex. APP-34; test. 8/19/08, D. Donovan.)

6. The proposed facility has been approved for funding from the Connecticut Clean Energy Fund as part of the Connecticut Project 100 Program.[5] The project will provide approximately 200 construction jobs and 160 direct and indirect jobs related to the facility. When complete, the use of the property in Plainfield and Canterbury will make PRE among the largest taxpayers in those two towns. (Exs. APP-30; DEP-DIV-31L; test. 8/13/08 and 8/19/08, D. Donovan.)

b

Site Conditions

7. The Facility Site is a vacant, 27-acre parcel of land off Mill Brook Road in Plainfield near the intersection with Rt. 12 (Norwich Road). It will serve as the location of the power block facility and the biomass wood fuel storage area. The site is formerly known as the Gallup's Quarry. It is bordered by the Providence and Worcester Railroad on the west, Route 12 on the east, Town of Plainfield property on Mill Brook on the north, and Mill Brook Road on the south. (Exs. APP-31, 32; test. 8/13/08 and 8/19/08, D. Donovan; 8/20/08, S. Atkin.)

8. The Facility Site's natural resources include six wetlands areas, including two vernal pools, and mapped areas of Hinckley soils, which provide habitat for the eastern spadefoot toad, a state endangered species and the blue spotted salamander, a state threatened species. (Ex. DEP-DIV-31L, Tab K; test. 8/26/08, C. Tomichek; 8/28/08, S. Radasci.)

[5] This program has a goal of producing 100 MW of Connecticut's power from clean renewable (Class I) resources. It has since been amended to be the Connecticut Project 150 (150 MW) program.

9. The Facility Site is listed on the Superfund[6] National Priorities List due to contamination from historical activities unrelated to the proposed development. The remedial approach includes monitoring and natural attenuation and the placement of an Environmental Land Use Restriction (ELUR) on a 1.8 acre portion of the Facility Site. The applicant will not take ownership of this 1.8-acre parcel as the ELUR prohibits its disturbance. The proposed activities will not impact the selected remedy for the site. (Ex. DEP-DIV-15; test. 12/13/08 and 12/19/08, D. Donovan; 12/28/08, M. Lewis.)

10. The cooling water intake structure and associated pumphouse will be located on a 16.5-acre parcel known as the Man-Burch property located off of Packer Road in Canterbury. This Site's resources also include a wetland system and mapped Hinckley soils and it abuts the Quinebaug River on its northwest side. Two contaminated Superfund sites are upstream from this site, the Yaworski lagoon and the Yaworski landfill. There are also smaller closed landfills in this area of Packer Road across the street from the site. (Ex. APP-33; test. 12/19/08, D. Donovan; 12/26/08, S. Atkin, C. Tomichek; 12/28/08, S. Radasci, M. Lewis.)

c

Procedural Background

11. DEP issued a Notice of Tentative Determination and Intent to Issue Various Environmental Permits on April 4, 2008. This notice expressed DEP's intent to issue the draft solid waste, diversion, and discharge permits.[7] The notice, published in the Norwich Bulletin on April 7, 2008, provided a 30-day period for public comment or to request a hearing. (Ex. DEP-5.)

12. The Friends of the Quinebaug River (FQR) filed three petitions for hearings. A petition was submitted to DEP for a hearing on the Water Diversion Permit on January 30, 2008. FQR

[6] The common name for the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 USC 9601 et. Seq. This federal statute governs the liability for and remediation of contaminated property. The National Priorities List is a list of seriously contaminated sites that can only be served by a long-term remediation plan.

[7] This notice and the notice of hearing also referenced the air permit. For findings related to the air permit please see the section above and the attached Agreed Draft Decision.

then submitted two petitions for hearings on the solid waste, air, and water discharge permits on May 7, 2008.[8]

13. DEP issued a Notice of Public Hearing and Site Visit on Various Environmental Permits on July 9, 2008. It was published in the Norwich Bulletin on July 12, 2008. The site visit was held on August 12, 2008. The hearing began with an evening hearing session on August 13, 2008 at Plainfield Town Hall for the purpose of receiving public comment on the record and continued in Hartford on various dates in August and September. The hearing record was closed on September 4, 2008. (Ex. DEP-6.)

14. The parties separately submitted post-hearing filings, including proposed findings of fact and conclusions of law on September 29, 2008. After the close of the hearing record on September 4, 2008, several written comments were received in the Office of Adjudications. Some of these comments were submitted by members of FQR speaking as individuals. These submissions were not timely as the comment period was not extended past the close of the hearing record.

d

Solid Waste Permit

i

Application

15. PRE filed an application with DEP for a permit to construct and operate a solid waste facility on August 11, 2006 (Application No. 200602249). The DEP published notice of this application on August 16, 2006 in the Norwich Bulletin. The application provided all administrative and background information required by General Statutes §22a-208a, including the following subparts regarding the specific proposal:

- an explanation of how the proposal relates to the State Solid Waste Management Plan
- a commitment to post the proper surety

[8] Background materials related to the procedural history not submitted into evidence are in the docket file for this proceeding maintained by the Office of Adjudications.

- detailed drawings and specifications of site structures, including fixed and transport equipment, methods of volume reduction and storage, and a discussion of utility provision
- a copy of the facility operation and maintenance manual, and a discussion of: OSHA requirements and how these requirements will be met, materials and energy balance, proposed performance tests, system reliability and redundancy/backup system, operation and maintenance budget; and
- approximate volume of each waste type to be handled, a list of types of facility users and municipalities served, associated facilities for the ultimate disposal of the wastes, residues, and recycled materials, and contingency plans for periods of shut down or breakdown. (Exs. DEP-SW-1, 2)

16. The DEP notified the applicant that its solid waste permit application was sufficient on August 28, 2006. (Ex. DEP-SW-3; test. 8/20/08, C. Tanovici.)

ii

Solid Waste Quantities and Fuel Specifications

17. The draft permit allows the facility to accept up to 2200 tons of biomass wood fuel per day to support the processing of up to 1360 tons of fuel per day and allow the facility to stockpile up to 45,500 tons of fuel in the dedicated storage area in case of low fuel availability. The storage piles may be up to 35 feet high in the covered storage area and up to 50 feet high in the uncovered storage area. The proposed facility is designed to store enough fuel to provide up to 45 days of processing capacity. (Exs. DEP-SW-1, 14; APP-32; test. 8/20/08, D. Brown and C. Tanovici.)

18. The facility will also be permitted to store 250 tons of ash residue (residue from wood waste), 68 tons of non-ash residue (residue from air pollution equipment), and 46 tons of water solids residue (materials removed from cooling water treatment process). These materials are required to be stored in designated areas and/or containers in the area of the power block facility and will be transported off-site to landfills permitted to receive this waste. (Exs. DEP-SW-1, 14; test. 8/19/08, D. Brown.)

19. The wood chips to be used as fuel are to be processed to the applicant's size specifications off-site. These chips can only include either clean wood or regulated wood fuel. Clean wood is derived from such products or processes as pallets, skids, spools, packaging materials, bulky wood waste (brush, stumps, and landclearing debris), or scraps from newly built wood products provided they are not treated wood or demolition wood. Regulated wood fuel means processed wood from C&D activities that has been sorted to remove plastics, plaster, gypsum, wallboard, asbestos, asphalt shingles, and does not include wood that contains creosote or to which pesticides have been applied or that contains hazardous waste as defined at General Statutes § 22a-115. (Ex. DEP-SW-1, 14; test. 8/20/08, C. Tanovici.)

20. Fuel suppliers must meet prequalification standards and follow quality control procedures before delivering wood chips to the applicant. The applicant has prepared a document titled "Biomass Supply Quality Control Procedures" (QC Document) that details the prequalification standards and quality control procedures for fuel suppliers. This document is incorporated into the draft permit and includes an exhibit titled "Operating, Sampling & Testing Requirements Volume Reduction Facilities Generating C&D Wood Chips for Delivery to PRE" (C&D Protocols). The C&D Protocols detail specialized standards and protocols for the prequalification of suppliers of C&D wood and acceptance of that material as fuel. The prequalification process identified by the applicant will identify suppliers of wood fuel that will perform the necessary segregation and screening to ensure that treated or otherwise preserved wood will not be delivered to the facility. Sampling protocols are designed to remove any hazardous materials from the stream of processed wood to be sent to the applicant's facility. In addition, the applicant will use hand held detection equipment to spot check for wood containing preservatives or pesticides in deliveries made to the site for compliance with the specifications. Finally, ash residues will be sampled for constituents of concern. The draft permit does not permit the storage and handling of hazardous wastes on site. (Exs. DEP-SW-1, Tab N., SW-14; test. 8/20/08, D. Brown, C. Tanovici.)

21. The QC Document describes how PRE must visit and inspect the suppliers of biomass wood fuel prior to prequalification. For prequalification of landclearing debris suppliers, PRE will visit and inspect any fixed facility and review the nature of the operation and the type of materials being handled. Contractual arrangements with this type of supplier will control size, source, storage, and processing methods of the wood fuel to be delivered and detail the materials

to be excluded. Execution of a fuel supply agreement and compliance with its terms will allow the supplier to commence delivery. (Exs. DEP-SW-1, Tab N., SW-14; test. 8/19/08 and 8/20/08, D. Brown.)

22. For prequalification of recycled wood suppliers (pallets, spools, and packaging materials), a potential supplier must provide PRE with descriptions of its wood stream, wood screening, wood handling, and management operations and copies of any permits, registrations or related documents, including operation and maintenance (O&M) plans. PRE must visit and inspect the site once a month over a consecutive three-month period and sample wood proposed to be delivered to the PRE facility. Each sample must be analyzed for various constituents of concern and must meet acceptance limits articulated in the QC Document. Provided the lab results meet the stated limits and PRE is satisfied with the operational component, it may enter into a fuel supply agreement that will incorporate terms including prohibited materials and type of wood fuel eligible for delivery and the supplier may commence delivery. (Exs. DEP-SW-1, Tab N., SW-14; test. 8/20/08, D. Brown.)

23. For prequalification of C&D wood suppliers, a potential supplier will provide PRE with a description of its operation, including sorting approach, storage approach, screening methods, employee training or monitoring, facility management structure, and delivery methods. The potential supplier must also provide copies of any permits for its operations. PRE must visit the supplier twice a month for a three-month period to inspect the facility and its operations for its ability to process, sort, and remove unacceptable materials from acceptable materials and then segregate the acceptable materials for delivery to PRE. At these visits, PRE must also sample wood fuel proposed to be delivered to PRE. The sample must be analyzed for various constituents of concern and must meet acceptance limits articulated in the QC Document. Provided the lab results meet the stated limits and PRE is satisfied with the operational component, it may enter into a fuel supply agreement that must incorporate terms including prohibited materials and type of wood fuel eligible for delivery and the supplier may commence delivery. (Exs. DEP-SW-1, Tab N., SW-14; test. 8/20/08, D. Brown.)

24. The draft permit requires that deliveries from prequalified suppliers will be subject to visual inspection, field analysis, or random sampling and laboratory analysis upon delivery to confirm information provided during the prequalification process and compliance with individual fuel supply agreements. PRE must re-sample wood to be delivered to PRE and conduct ongoing

inspections of all qualified suppliers not less than once each quarter for not less than eight consecutive quarters to ensure operational consistency. (Exs. DEP-SW-1, 14; test. 8/19/08, D. Brown; 8/20/08, C. Tanovici.)

25. For the first year of operation, PRE must take daily samples to form a monthly composite sample, which must be analyzed for compliance with the acceptance limits identified in the QC Document. During the second year, PRE will perform sampling one month per quarter. (Exs. DEP-SW-1, 14.)

26. Suppliers of sorted C&D wood must also meet the standards expressed in the C&D Protocols. This document imposes various operational, personnel, production, monitoring, and sampling requirements on the processor of C&D materials. Suppliers of these materials must meet the requirements outlined in this document to become and remain a supplier to PRE. These requirements will limit the potential for treated wood and other C&D contaminants from being delivered to PRE as fuel. (Ex. DEP-SW-1, 14; test. 8/19/08 and 8/20/08, D. Brown.)

27. Prior to delivery wood must be processed into chips not more than four inches in size with 90% not more than three inches in any dimension. No more than 10% of wood delivered can be smaller than one quarter inch. (Ex. DEP-SW-1, 14; test. 8/19/08 and 8/20/08, D. Brown.)

iii

Operations and Management

28. The intervening party raised concerns about the proliferation of dust from the storage and handling of fuel material. Dust will be limited due to the size specifications for wood fuel and operational protocols. Fuel delivery will be to an enclosed area using a tipping floor and conveyed to the storage area via covered conveyor. Fuel material will only be mixed at ground level by using a bulldozer or front loader. The facility will not use airborne mechanisms such as cranes for the movement and mixing of fuels. The permit does allow wood chipping to occur on a limited basis when size requirements are not met. The proposed activities must comply with Connecticut air pollution regulations and dust, noise, fumes, smoke, vibrations and odors must not exceed background levels at any boundary of the property. The applicant will be under an ongoing requirement to control dust, noise, and other nuisances in compliance with all applicable laws, including regulations related to the abatement of air pollution. Any dust generated through

the proposed activities will be effectively controlled by the use of misting equipment both permanently installed or temporary and portable. Solid waste generated by employees and members of the public will be controlled separately from the wood fuel areas and the residue collection and storage areas. Regular sweeping of interior roadways will also be employed to control dust and litter on-site. Ash and other residues from the process will be stored separately on site and sent off-site for final disposal in a landfill. The movement of ash from the fuel processing area to a storage silo will be via a closed conveyor system to minimize dust. Trucks will be prohibited from idling beyond the three minute limit. Signage reflecting the prohibition on excessive idling will be posted. (Exs. DEP-SW-1, 14; test. 8/19/08 and 8/20/08 D. Brown, 8/20/08, C. Tanovici.)

29. The draft permit requires the applicant to post a sign at the entrance to the facility stating the name of the permittee and hours of use of the facility, the authorized users, required safety precautions, and the number and issuance date of the permit. The draft permit limits deliveries to the facility to weekdays from 6:30 am-7:00 pm and Saturdays from 6:30 am-3:00 pm. No deliveries are allowed on Sundays. Only prequalified suppliers will be provided with access to the site to make deliveries of wood fuel. Access will be controlled through the use of a gate in combination with a scale house that will both screen passenger vehicles and weigh and maintain records of deliveries of wood fuel and removal of residue. (Exs. DEP-SW-1, 14.)

30. Area roads currently provide access to a nearby 1.3 million square foot Lowe's distribution warehouse. Intersections in the area were updated to accommodate the additional truck traffic generated by the Lowe's facility. The applicant completed a traffic study that demonstrates the proposed project would have no impact on the level of service provided by area roadways. (Ex. DEP-SW-1, Tab M; test. 8/19/08, D. Donovan, 8/20/08, D. Brown, C. Tanovici.)

31. The draft permit requires wood fuel to be used by PRE on a first-in, first out basis to limit on site storage time and control odors. Due to seasonal shifts in fuel supplies, there will be periods when little fuel will be delivered and supplies will be consumed. There will also be periods when fuel will be stockpiled to the maximum 45-day supply. Fuel and residues may be stored for longer than 48 hours but the permit restricts the amount of fuel and residues that may be stored on site by weight and also places limits on the dimensions of wood fuel piles in the covered and uncovered fuel storage areas. (Ex. DEP-SW-14; test. 8/20/08 D. Brown, C. Tanovici.)

32. Operations staff will be present on a 24-hour basis working 12-hour shifts. A lead operator will be on site and oversee operations from a control room while supervising two additional operations staff, a plant operator and a fuel handler. Other staff, including the plant manager and the operations supervisor, will be on call 24 hours. (Exs. DEP-SW-1, 14.)

33. The O&M Plan details safety precautions including plans for fire detection and suppression equipment and appropriate protocols for dealing with a fire and the interaction between the facility and local firefighting agencies. The facility will be connected to the public water supply and a minimum of one fire hydrant will be on-site. In addition, the facility will maintain a backup supply for firefighting needs that will come from a portion of the water withdrawn from the Quinebaug River that is not used for cooling water. (Exs. DEP-SW-1, 14; test. 8/20/08, D. Brown.)

34. The applicant must track the tonnage of deliveries to ensure it is compliant with restrictions on the amount of wood fuel delivered to the facility. Delivery trucks will be weighed in at the scale after entering the main gate. Outgoing trucks will also be weighed to determine the net tonnage of wood fuel delivered to the facility. Trucks responsible for removing ash and other residues from the site will also be weighed to confirm tonnage of those by-products before removal. Daily records will be used to calculate the monthly totals. These monthly totals will be reported to DEP on a quarterly basis. (Exs. DEP-SW-1, 14; test. 8/20/08, D. Brown.)

35. The draft permit requires that a surety bond in the amount of $1,835,000 be in place prior to delivery of wood fuel to account for disposal of the maximum quantity of any wood fuel or residue to be stored on site in the event the power plant ceases operation. (Exs. DEP-SW-1, 14.)

iv

Stormwater Controls

36. The draft permit requires the construction of stormwater management infrastructure in the uncovered wood storage area to capture any runoff from the uncovered wood fuel piles. The system will be required to contain over 600,000 gallons of stormwater in two 50,000-gallon underground tanks and a 515,000-gallon above-ground storage tank. The required capacity will allow the facility to contain the runoff from a 100-year precipitation event. The stormwater containment system will have adequate protection and backup infrastructure to insure no

stormwater from the uncovered wood storage area can infiltrate the groundwater or flow into adjacent wetland areas. (Ex. DEP-SW-1; test. 8/20/08, S. Atkin.)

v

Compliance

37. The applicant completed a Draft Community Outreach/Environmental Justice Plan and submitted it to DEP on October 26, 2006. The DEP Environmental Justice Program approved this submittal on January 22, 2007. (Ex. DEP-SW-4; test. 8/20/08 C. Tanovici.)

38. The proposed facility complies with the Solid Waste Management Plan in its form at the time the application was submitted and as revised in December 2006. It promotes beneficial use of biomass and C&D materials. (Ex. DEP-SW-1, Tab E; test. 8/13/08 and 8/19/08, D. Donovan, 8/20/08, D. Brown and C. Tanovici.)

39. The applicant provided environmental compliance information that indicated no history of repeated environmental violations by PRE or its partner Decker Energy. (Ex. DEP-SW-1; test. 8/20/08, C. Tanovici.)

e

Water Diversion Permit

i

The Application

40. The applicant filed an application for a permit to divert water from the Quinebaug River on January 2, 2007 (Application No DIV-200603081). Notice of this application was published in the Norwich Bulletin on December 27, 2006 and again on May 21, 2007. Notice was also provided to the appropriate municipal officials in Canterbury and Plainfield. The application provided all of the information required by General Statutes § 22a-369. (Ex. DEP-DIV-31L.)

ii

Cooling Water Requirements

41. PRE must cool and condense its turbine exhaust steam as part of the energy production process. The applicant chose to use a wet cooling system that uses and recirculates water withdrawn from the Quinebaug River to cool and condense the exhaust steam. (Ex. DEP-DIV-31L; test. 8/26/08, D. Lesneski.)

42. The draft permit will allow the withdrawal of a maximum 893,000 gallons of water per day with an average withdrawal of 718,000 gallons per day from the Quinebaug River. The proposed withdrawal will serve as a supply of cooling water for the facility's cooling tower and a portion of the water for the spray dryer in the air pollution control equipment. (Ex. DEP-DIV-31L; test. 8/26/08, D. Lesneski; 8/27/08, C. Nezianya; 8/28/08, S. Radasci.)

43. The proposed withdrawal is based on the water balance calculation performed by the applicant to compare the cooling and other water needs of the facility with the water output of the facility under various conditions assuming the net output of 37.5 MW. (Ex. DEP-DIV-31L; test. 8/26/08, D. Lesneski.)

iii

Alternatives

44. The applicant analyzed several potential sources for the cooling water as an alternative to the use of Quinebaug River water. The alternate sources included: the public water supply, on-site and off-site groundwater supply wells, wastewater treatment plant effluent, stormwater runoff from the Lowe's facility roof, and Mill Brook surface water withdrawal. The applicant determined that these alternatives were not viable and therefore elected to base its application on the withdrawal of all cooling water and a portion of the spray dryer water from the Quinebaug River. The applicant did not select the use of the public water supply due to CT Siting Council regulations preventing use of potable water as a significant supply for power plants. An on-site groundwater supply well was eliminated due to concerns about adequate supply and effects on the contaminated groundwater plume emanating from the historic contamination of Gallup's Quarry at the northern end of the site. Off-site wells were not selected due to supply concerns,

proximity to drinking water supplies, and their proximity to and effects on nearby contaminated groundwater plumes emanating from the Yaworski landfill and the Yaworski lagoon. Effluent from the wastewater treatment plant was variable in quality and supply and was not studied further. The quantity of stormwater runoff from the nearby Lowe's distribution facility is not sufficient for the proposed facility's cooling needs and was not available for use by the proposed facility. Finally, Mill Brook was eliminated because the facility's water requirements could have significant impacts on this resource during low-flow periods. (Ex. DEP-DIV-31L, Tab M; test. 8/26/08, S. Atkin and D. Lesneski.)

45. The applicant also analyzed air or dry cooling as an alternative technology to the use of cooling water or wet cooling. Dry cooling uses large fans to draw in ambient air to cool and condense turbine exhaust steam. The applicant's analysis showed that dry cooling was not feasible. It found that dry cooling would: result in a more inefficient plant; have greater impact on the Hinckley soils; generate more air pollution; potentially cause more dust and noise problems; and represent a significant cost impact to the development. The applicant could not place air cooling equipment, essentially large fans, on the ground at the site without additional impact to Hinckley soils and the habitat of the eastern spadefoot toad and blue spotted salamander. The intervening party presented the option of using roof mounted equipment. The use of roof mounted equipment would only address the impact of dry cooling on Hinckley soils. It does not address and may exacerbate visual impact, noise, and dust. It also does not address the degree of inefficiency that dry cooling presents, the increased air pollution, and the capital costs of the structure and associated equipment needed to support dry cooling. (Ex. DEP-DIV-31L; test. 8/26/08, D. Lesneski.)

46. The facility is designed to minimize the amount of water withdrawn from the Quinebaug River for cooling water and spray dryer water through the use of various water conservation measures. These measures include: designing the cooling towers to recirculate the water five times; storing over a day's supply of water to avoid peak demand/peak hour withdrawals as a result of a plant outage or maintenance; fulfilling a portion of spray dryer needs through use of stored stormwater from the uncovered wood fuel storage area and boiler blowdown water; and the use of meters at the intake site and the facility to understand any losses occurring in the line between the intake site and the facility. The use of a five-time recirculating system greatly reduces the amount of cooling water needed by the facility. (Ex. DEP-DIV-31L.)

iv

Environmental Impacts

47. The applicant studied and the department reviewed impacts to groundwater resources. The proposed diversion will have no impact on these resources or any planned uses of them as drinking water supplies. The proposed diversion will have no impact on public water supplies or private wells. Groundwater impacts were studied extensively due to the proximity of the withdrawal site to contaminated property and associated groundwater plumes. The contaminated properties, including the Yaworski lagoon and landfill properties upstream from the Man-Burch property, and any associated contaminated groundwater plumes in the vicinity of the Intake/Discharge Site will not be impacted by or impact the diversion. The minimal nature of the withdrawal will not impact downstream hydropower concerns. (Exs. DEP-DIV-15, 16, 31L; test. 8/26/08, S. Atkin; 8/28/08, M. Lewis.)

48. After the mapped Hinckley soils were identified on-site, the applicant altered the power block and storage area layout at the Facility Site to avoid the habitat for the eastern spadefoot toad and the blue spotted salamander. The alterations to the site layout avoided and minimized impact to wetlands areas, species habitat, including the Hinckley soils, and vernal pools. The current site layout provides a 100-foot buffer to the wetland areas on the facility site. There will be no impact to the six identified wetland areas with the exception of mild disturbance from debris removal completed as part of the mitigation and monitoring plan. (Ex. DEP-DIV-31L, Tab Tabs K and M; test. 8/26/08, S. Atkin; 8/28/08, S. Radasci.)

49. The applicant also avoided impacts to Hinckley soils and wetland resources at the Man-Burch Property by altering the location of the pump house. The intake and discharge pipelines will be installed using horizontal directional drilling technology instead of traditional trenching methods. The activities on this property will have no permanent impact on wetlands regulated by the U.S. Army Corps of Engineers. Temporary impacts to Army Corps and Connecticut jurisdictional wetlands totals 0.1417 acres. Permanent impacts to Connecticut jurisdictional wetlands total 0.078 acres. The placement of turbidity screens in the River bottom will address any impact to the River from the installation of the intake and discharge structures. (Exs. DEP-DIV-31L; APP-19; test. 8/26/08 S. Atkin.)

50. DEP calculations demonstrate that the flow of the Quinebaug River at the proposed intake location during 7Q10[9] low-flow conditions is 84.43 cubic feet per second. This figure was adopted by the applicant and used by the department in its review of impacts to instream flow, fisheries resources, and water quality. (Exs. DEP-DIV-14, 31L, Tab R; test. 8/27/08 R. Gatter-Evarts.)

51. DEP staff reviewing the diversion permit application sought and received input from other DEP staff on the impact of the proposed withdrawal on instream flow, fisheries resources, and water quality. Input was also sought regarding the impact of construction and maintenance of structures associated with the withdrawal on wildlife and wetlands. (Exs. DEP-DIV-4, 6, 7, 15, 16, 19, 20, 23; test. 8/28/08, S. Radasci.)

52. The withdrawal equals 0.1% of the average annual flow and 1.6% of the 7Q10 low flow condition. The proposed withdrawal is less than the 5% of the average annual flow as required by federal regulations and less than 25% of the 7Q10 low flow as required by EPA guidance. Under 7Q10 conditions, the proposed withdrawal will reduce the river depth by 0.01 feet. The impact of the proposed withdrawal on instream flow, fisheries resources, and water quality will be negligible, even in low flow conditions. (Exs. APP-30, DEP-DIV-17, 31L, DEP-DIS-19; test. 8/13/08 and 8/19/08, D. Donovan; 8/27/08, B. Murphy; 8/28/08, L. Dunbar and S. Radasci; 8/29/08, J. Kulowiec.)

53. The applicant increased its requested average daily use from 656,000 gallons per day to 718,000 gallons per day. The DEP reviewed the requested change. It will not impact instream flow, water quality, and fisheries resources. (Exs. DEP-DIV-18, 19, 20; test. 8/26/08, C. Tomichek, 8/27/08, B. Murphy, 8/28/08, L. Dunbar & S. Radasci.)

54. The draft permit also places restrictions on timing of construction activities at these sites to minimize impacts to the species of concern on site. The applicant agreed to adhere to any restrictions on construction timing. (Exs. DEP-DIV-31L, 32; test. 8/26/08 C. Tomichek; 8/28/08, S. Radasci.)

55. The intake and upstream discharge structures will be placed at the bottom of the river and have no impact on navigation. The construction of these structures will temporarily limit navigation in this area. (Ex. DEP-DIV-31L, Tab K.)

[9] Representative of low-flow conditions in the river, the 7Q10 is the average of the seven lowest flow days in a ten-year span.

56. The DEP requested modifications to the intake structure to reduce intake velocity to at or below 0.25 feet per second to address concerns regarding impingement and entrainment of fish species. The applicant modified the design of the facility to incorporate wedgewire screens that will meet this standard. (Exs. DEP-DIV-17, DEP-DIV-31L Tab R.; test. 8/26/08, C. Tomichek; 8/27/07, B. Murphy.)

57. The applicant drafted a Wildlife Mitigation and Monitoring Plan to address concerns expressed by DEP Wildlife staff regarding the effects of construction and maintenance of facilities on species of concern, including the endangered spadefoot toad and the threatened blue-spotted salamander. The mitigation efforts for the Facility Site described in the plan include: use of best management practices during construction and site use; debris removal from wetlands; establishment of a 100-foot buffer zone around wetlands 1 and 2; no construction during the species' dormant period from November 1 to April 1; and placement of 15.4 acres (54% of the land area) at the Facility Site under a conservation easement. The mitigation at the Man-Burch property includes: use of best management practices, restoration of disturbed areas, invasive species control and eradication, no construction during the species' dormant period from November 1 to April 1, and placement of 13.9 acres (98% of the land area) at the Man-Burch property under a conservation easement. Finally, the applicant will purchase an off-site property outright or place a conservation easement on it. The off-site property will total approximately 5 acres and is required to have a minimum of 0.25 acres of wetlands to mitigate for any temporary or permanent loss of wetlands resources at the Man-Burch property. The proposed plan is adequate to mitigate impacts to wetlands and wildlife from the proposed construction and use of the Facility Site and the Man-Burch Property. (Exs. DEP-DIV-7, 8, 31L Tab L.; test. 8/27/08, J. Dickson.)

v

Municipal Impacts

58. As a result of the diversion, a pipeline will be constructed from the Man-Burch property to the facility property. The pipeline will be located in the already constructed roadway to avoid any natural resource impacts. The disturbance to the roadways will be mitigated by the resurfacing of Packer Road in Canterbury. (Exs. APP-30, DEP-DIV-31L, test. 8/13/08 and 8/19/08, D. Donovan.)

f

Water Discharge Permit

i

The Application

59. The applicant filed an application for a permit to discharge cooling water to the Quinebaug River and for a permit to discharge to the groundwater. The activities proposed in these two applications have been consolidated into one draft permit. The discharges to the groundwater are covered by a state-only permit. The discharge of cooling water to the surface waters of the Quinebaug River requires a state and National Pollution Discharge Elimination System (NPDES) permit. The application was filed on August 9, 2007 and DEP issued a notice of sufficiency to the applicant on December 11, 2007. By an addendum dated February 19, 2008, the applicant clarified that there would be discharges in addition to the cooling water and that they would be discharged to the ground water through the stormwater system. (Exs. DEP-5, DEP-DIS-3, 4, 25; test. 8/27/08, C. Nezianya.)

60. The water discharge application identifies and the draft water discharge permit authorizes five discharges. DSN 101 is the discharge of treated cooling water blowdown wastewater and will be discharged to the Quinebaug River in a location 100 feet upstream of the cooling water intake structure. DSN 102 is fire pump test wastewater, DSN 103 is fire hydrant test wastewater, DSN 104 is make-up supply tank drain and overflow wastewaters, and DSN 105 is de-mineralized water tank overflow wastewater. DSN 102 through 105 will be made on an intermittent basis without treatment through the proposed facility's stormwater system and are

consistent with applicable groundwater standards. The permit requires these discharges to be monitored on an annual basis for compliance with standards for metals and pH. (Exs. DEP-DIS-4, 23, 27; test. 8/26/08, J. Kulowiec; 8/27/08, C. Nezianya.)

ii

Discharge Characteristics and Impacts

61. Cooling water will be treated to remove sediments so it can be used in the cooling process. It will be recirculated through the cooling system five times and as a result will be five times its original concentration. This treated water will be discharged to the Quinebaug River. The applicant performed toxicity testing on the water treatment chemicals using twice the amount expected to be used for cooling water treatment and there was no acute toxicity. There were also acute and chronic toxicity tests completed on actual Quinebaug River water and on river water at five times concentration with the water treatment chemicals added at proper dosages. There was no toxicity. The draft permit requires toxicity monitoring and provides standards that must be met for the duration of the permit. (Exs. DEP-DIS-4, 27; test. 8/26/08, J. Kulowiec.)

62. The applicant studied the thermal plume anticipated from the discharge of remaining cooling water back to the Quinebaug River and the effect of that plume on the Quinebaug River using EPA modeling techniques. DEP staff accepted the final analysis of the applicant. The thermal plume resulting from a discharge at the maximum instantaneous limit of 84°F would have a negligible impact on the Quinebaug River and its resources, including fish species and would be consistent with water quality standards. (Exs. DEP-DIS-4, 6, DEP-DIV-17; test. 8/26/08 and 8/27/08, J. Kulowiec.)

63. After the notice of tentative determination for the water discharge permit was issued, the applicant sought to revise the maximum instantaneous limit to 90°F. The applicant performed a similar analysis of the thermal plume resulting from a discharge at the proposed maximum limit of 90°F. The modeling showed that the portion of thermal plume from the proposed discharge that was 4°F above the ambient temperature would be less than ten feet long and less than 1% of the cross sectional area of the river. DEP concurred with this analysis and agreed to alter the draft permit to reflect the requested maximum instantaneous limit to 90°F. This revised limit

will have a negligible impact on the river and fish species and is consistent with water quality standards. (Exs. DEP-DIS-4, 5, 26; DEP-AIR-29; APP-37, 38; test. 9/4/08, S. Atkin, R. Gatter-Evarts, C. Nezianya.)

64. Due to concerns about nutrient loading in the Quinebaug River, DEP determined that the facility would not be allowed to use phosphorous based corrosion inhibitors in its cooling water treatment process. DEP acknowledged that the phosphorous discharge would be minimal but could not recommend permitting the discharge of additional phosphorous. PRE agreed to eliminate the phosphorous based treatment chemicals and will not discharge additional phosphorous. Phosphorous already present in the river water will remain and be discharged back to the river as part of DSN 101. During certain conditions, the treatment process for turbidity will remove some of the background phosphorous from the Quinebaug River water withdrawn for cooling water on a mass basis. (Exs. DEP-DIS-8, 9, 10, DEP-DIV-31L, Tab R; test. 8/27/08, J. Kulowiec, R. Gatter-Evarts.)

65. The DEP recently assessed the segment of the Quinebaug River that is the site proposed for the intake and discharge of cooling water as part of its section 303(d)[10] listing of impaired rivers. In the draft 303(d) document, this segment is assessed as impaired due to elevated levels of *e coli*. This listing is linked to the recreational uses of this segment of the river. Elevated levels of *e coli* can impact the use of a river as a recreational resource due to the potential impact to human health. PRE's discharge is not a source of *e coli* and will not contribute to this impairment. (Ex. INT-27; test. 8/27/08, L. Dunbar.)

66. The proposed discharge permits specify instantaneous discharge limits based on grab sampling for total aluminum, total residual chlorine, total suspended solids, total copper, total lead, and total zinc. DEP imposes instantaneous limits for the benefit of inspectors checking a facility's compliance. A grab sample is the only method available for these inspectors to check compliance with permit limits. The applicant is not required to take grab samples and report the results to DEP using the instantaneous limits. A conservative multiplier is applied to arrive at the instantaneous limits to provide statistical assurance that violations of the instantaneous limits reflect violations of the monthly averages and/or maximum daily limits. The permit limits are

[10] Section 303(d) of the federal Clean Water Act (CWA) requires states to inventory waters within the state that do not meet water quality standards and prioritize them for Total Maximum Daily Load development or other management action. It is a subset of the list of all waters of the state compiled to fulfill the requirement of section 305(b) of the CWA. Both lists comprise the integrated report admitted as INT-27.

also stated in terms of concentration and not mass. The use of concentration based limits is appropriate for cooling water-based discharges and will provide a better assessment of discharge quality and its effects. (Exs. DEP-DIV-18, DEP-DIS-5; test. 8/27/08, J. Kulowiec and C. Nezianya.)

67. FQR raised the possibility that ambient airborne contaminants, including dust from the wood fuel storage area, would become "entrained" in the cooling water and discharged to the Quinebaug River. The proposed draft permit requires the applicant to monitor its discharge regularly for several contaminants. The applicant will also perform regular toxicity testing. Instantaneous permit limits tied to the inspection of the facility by DEP staff performing grab samples; and the monitoring and reporting requirements, including toxicity testing, in the draft permit addresses concerns about any additional contamination being entrained in the cooling water discharge. (Ex. DEP-DIS-27.)

iii

Best Technology Available - Alternatives

68. The DEP determined under §316(b)[11] of the federal Clean Water Act (CWA) that the proposed five-time recirculating, wet cooling system represents the best technology available for reducing impact on the environment. The applicant presented an alternatives analysis for DEP's review to facilitate this determination. This alternatives analysis was also presented and reviewed as part of the water diversion application. The alternatives evaluated included: alternatives to the PRE renewable energy facility, including the no-build alternative; off-site alternatives to the facility site; on-site alternatives to the basic facility configuration; cooling technology alternatives, including alternative sources of cooling water; alternative locations and construction techniques for the pipeline from the facility; and interconnect alternatives. (Exs. DEP-DIS-16, 18, 19; DEP-DIV-31L, Tab M; test. 8/26/08, S. Atkin and D. Lesneski; 8/27/08, C. Nezianya; 8/28/08, S. Radasci.)

69. To facilitate the 316(b) determination needed for the water discharge permit the applicant presented a comparative analysis between wet cooling using the proposed five-time recirculating system and dry cooling using a configuration of air cooled condenser equipment. The applicant

[11] 33 U.S.C. § 1326(b)

used a computer program known as Gatecycle to calculate and compare the power plant's heat balance or efficiency when using wet cooling and dry cooling. This analysis determined that use of the dry cooling system would result in a less efficient plant that would consume more fuel and result in more noise and air emissions. This analysis determined that the heat rate for dry cooling was 1.7-6% higher using dry cooling and overall plant efficiency was lower than by 1.77% using dry cooling. (Ex. DEP-DIV-31L, Tab M; test. 8/27/08, D. Lesneski.)

70. The applicant also analyzed the feasibility of using dry cooling equipment on the facility site. The dimensions of the required dry cooling equipment are 41 feet wide by 228 feet long. The dimensions of the wet cooling equipment are 43 feet wide by 87 feet long. The use of air cooling equipment would result in additional impacts to the Hinckley soils on the facility site, known habitat for the endangered Eastern spadefoot toad. The air cooling equipment would occupy an additional 35,750 s.f. of Hinckley soils on the facility site. Due to impacts on Hinckley soils at the Man-Burch property that would only occur if wet cooling is selected, the actual net overall increased impact from air cooling on Hinckley soils would be approximately 16,000 s.f. (Ex. DEP-DIV-31L, Tabs M and R; test. 8/27/08, D. Lesneski.)

71. FQR raised questions and provided materials not admitted into evidence that demonstrated other facilities use air cooling equipment on the roof. FQR maintains that roof-mounted equipment would avoid the need for additional impact to the Hinckley soils. The DEP asked the applicant for additional information on roof-mounted air cooling equipment as an alternative to wet cooling in a letter dated July 10, 2007. The applicant responded in an attachment to its November 9, 2007 submittal. The applicant's response maintains that in addition to the decreased efficiency and additional cost, roof-mounted dry cooling equipment would increase the visual impact of the facility and noise and dust due to the height at which the equipment would be placed and the lack of natural physical barriers at that height. Roof-mounted air cooling equipment would be placed at a height of approximately 180 feet as opposed to a maximum height of 43 feet for the wet cooling tower. Site constraints also limit the use of roof-mounted equipment due to separation distances needed between fans. DEP considered the physical site constraints, the potential noise and air pollution impacts, the decreased efficiency and cost in concluding that the wet cooling was best technology available and the preferred alternative for cooling technology for this power plant due to the minimal impact to instream flow, fisheries resources, and water quality from the diversion and the

associated discharge of treated cooling water. The department approved the applicant's selection of a suite of technologies that will minimize impacts from impingement and entrainment, including the cooling tower, the five time re-circulating system, and the wedgewire screened intake. (Ex. DEP-DIV-31L, Tabs M and R; test. 8/27/08, D. Lesneski.)

g

Claims of Unreasonable Pollution

72. The intervening party, FQR, alleges that the proposed activity violates the Connecticut Environmental Policy Act (CEPA) because it would or is reasonably likely to cause unreasonable pollution. Its specific allegations include: the diversion of water from the Quinebaug River is not needed and therefore violates the Connecticut Water Diversion Policy Act because a viable alternative, namely air cooling exists; fugitive dust will become entrained in the cooling water and become an unnecessary source of pollution to the Quinebaug River; the wood fuels contain hazardous materials and dust from the wood fuel storage area will be entrained in cooling water.[12] In addition, the diversion permit conflicts with Article 11 of the Connecticut Water Quality Standards because the diversion can continue even when the River falls below 7Q10 low-flow conditions. (Notice of Intervention Amendment, 7/2/08 and Closing Brief, FQR, 9/29/08.) [13]

73. To support these claims, FQR presented direct testimony from two witnesses.[14] However, both of these witnesses testified more generally about the impacts of the diversion and to some extent the discharge on the Quinebaug River. Margaret Miner expressed the position of the Rivers Alliance of Connecticut that diversion of river water, as a public trust resource, should

[12] FQR indicated in its post-hearing submission that it lacked the resources to pursue this claim. However, it appears inextricably linked to its first allegation on the entrainment of fugitive dust in cooling water.

[13] Again, materials not in evidence can be found in the docket file in this case.

[14] Randy Stilwell was scheduled to testify about the issues regarding fugitive dust and construction and demolition debris. When provided with an opportunity to call Mr. Stilwell, FQR did not present his testimony. Robert Noiseux was scheduled to testify regarding alternatives to the diversion, including dry cooling and its viability at this site. When presented with this opportunity, Mr. Noiseux declined to testify and rested FQR's case. As FQR's representative, Mr. Noiseux prematurely left the proceeding on August 29, 2008 before the day's testimony was completed due to prior work commitments. FQR also was not represented for the final hearing day on September 4, 2008 due to work commitments. Representatives from FQR at no time requested a continuance to accommodate their schedule. Mr. Noiseux was advised on the record that FQR would take the record as it found it and that it was waiving its opportunity to cross examine witnesses. Mr. Noiseux expressed his understanding of these consequences.

be avoided or minimized when other alternatives exist. Ms. Miner made no specific allegations regarding the materials in the application or on the review by the DEP other than to state her belief that air cooling is a viable alternative and that it or other means of conserving water should be explored. She did not address the environmental impacts of air cooling. (Test. 8/27/08, M. Miner.)

74. Dr. Piotr Parasiewicz presented other general observations about the diversion from the Quinebaug River and the associated discharge based on his study of the River's upper segments and observations of the lower segments. Dr. Parasiewicz is a rivers scientist with no background in power plant design or operation. At the time of his testimony, he had not reviewed the applicant's reports detailing its study of the proposed diversion or the draft permit conditions. Dr. Parasiewicz was concerned about potentially lethal effects of the diversion and associated discharge on fish species and overall health of the River due to thermal impacts during low flow conditions that he believed were not adequately characterized. He opposes any diversion from the Quinebaug River due to its impacted status. His testimony is contrary to that of the applicant's consultant team and DEP staff that concluded the diversion and associated discharge will have minimal impacts on the River. Dr. Parasiewicz provided no evidence on the environmental impacts of the dry cooling alternative. (Ex. INT-24; test. 8/28/08 and 8/29/08, P. Parasiewicz.)

75. FQR presented no evidence and elicited no testimony through cross-examination about the alleged violation of Article 11 of DEP's water quality standards. FQR's post hearing brief restates this allegation and FQR's belief in it but offers no analysis or legal support for its interpretation.

III

CONCLUSIONS OF LAW

A

Solid Waste Permit:
The Application and Draft Permit Comply with
General Statutes §22a-208a and its Implementing Regulations

The applicant is required to secure a permit to construct and operate the proposed solid waste facility. General Statutes § 22a-208a. The Commissioner must determine if the proposed activity can be conducted in compliance with applicable regulations. In order to make this determination, the applicant must submit a complete application with all information required by the applicable regulations. Regs., Conn. State Agencies § 22a-209-4(b). Upon receipt of satisfactory evidence that the applicant will comply with all applicable statutes and regulations; that the proposed facility is consistent with the Solid Waste Management Plan; and that the applicant has not repeatedly violated pertinent statutes, regulations, orders, or permit terms or conditions at any solid waste facility, the Commissioner shall issue a permit to construct or operate the solid waste facility.

1

Regs., Conn. State Agencies § 22a-209-4

The applicant provided the information required by Section 22a-209-4 as supported by the DEP's determination that the application was sufficient. The applicant has had no history of repeated non-compliance at other solid waste facilities.

2

Regs., Conn. State Agencies § 22a-209-10

The application materials, the proposed draft permit, and all other materials and testimony in the record demonstrate the proposed facility's compliance with the following requirements:

The application complied with the requirements of §22a-209-4(b) by submitting a complete application that was deemed sufficient by the DEP. *§22a-209-10(1).*

The application provided specifications for all process equipment and a material and energy balance. *§22a-209-10(2).*

A sign will be posted at the entrance to the facility which states at a minimum the name of the permittee and hours of use of a facility, the authorized users and required safety precautions. *§22a-209-10(3)(A).*

Access to the facility will be controlled through the use of fences, gates, and signs to prevent unauthorized use. *§22a-209-10(3)(B).*

The draft permit authorizes the storage of solid waste for more than 48 hours but only in accordance with strict restrictions on the location of stored materials and specific weight limits for the types of waste to be stored on-site. *§22a-209-10(4).*

Unloading of solid waste will take place within an enclosed structure and stored only in designated areas authorized by the Commissioner. *§22a-209-10(5).*

Solid waste will be confined to the unloading and handling area. The facility and adjacent areas will be kept clean and reasonably free of litter. *§ 22a-209-10(6).*

An operator certified by the Commissioner will be present at the facility at all times during working hours. *§22a-209-10(7).*

Hazardous wastes will be excluded from the facility. *§22a-209-10(8).*

Air emissions, dust, and odors will be controlled to ensure compliance with department regulations regarding the abatement of air pollution. *§ 22a-209-10(9).*

Equipment will be on site to control fires/explosions and arrangements will be made with local fire control agencies to immediately acquire services when needed. *§22a-209-10(10) and (11).*

In the event of plant shutdown, the posted surety bond will ensure that an alternative method will be available for the processing of this waste. *§22a-209-10(12).*

Records of estimated tonnage of materials received and handled on-site will be kept in a manner acceptable to the commissioner and reported to the department on a regular basis. *§22a-209-10(13).*

3

Conclusion

During the course of the hearing, the applicant provided significant evidence to prove that it will construct and operate this facility in accordance with the statute and applicable regulations and the conditions of the proposed draft permit. This position was confirmed by DEP staff with long-standing experience in the review and approval of solid waste facilities. No evidence was presented to suggest otherwise. Provided that the facility is constructed and operated within the framework of the applications and the draft permit, it will comply with General Statutes §22a-208a and its implementing regulations. I recommend that the draft solid waste permit be issued.

B

Water Diversion Permit:
The Application and Draft Permit Comply
with General Statutes §§ 22a-365 through 22a-377
and Implementing Regulations

The proposed withdrawal from the Quinebaug River to serve the facility's need for cooling water and other peripheral uses will have a minimal effect on the River and its resources.

During regular and low-flow conditions, the amount of water to be withdrawn represents a small portion of overall flow such that there will be no impacts to instream flow, fisheries resources, or water quality in the Quinebaug River. The applicant has taken the necessary steps to minimize the impact from the withdrawal as well as demonstrated the need for the withdrawal through a comprehensive study of alternatives to both the chosen technology and the source of the water.

1

Compliance with General Statutes § 22a-369

General Statutes § 22a-369 specifies the minimum information required by the Commissioner in an application to divert waters of the state. The application presented by PRE provided the required information to the DEP for its review. In instances where DEP required additional information, the applicant complied as part of a general response to comments on all four permit applications related to this facility.

2

Compliance with General Statutes §22a-373(b)

The statute requires the Commissioner, in making her decision, to consider the factors listed below. The applicant, in its study of the impacts of the proposed diversion and the potential alternatives to the diversion, adequately addressed these issues in its initial applications and in subsequent submittals responding to DEP staff.

(1) The effect of the proposed diversion on related needs for public water supply including existing and projected uses, safe yield of reservoir systems and reservoir and groundwater development;

The proposed diversion will have no impact on these resources or any planned uses of them as drinking water supplies.

(2) The effect of the proposed diversion on existing and planned water uses in the area affected such as public water supplies, relative density of private wells, hydropower,

flood management, water-based recreation, wetland habitats, waste assimilation and agriculture;

The proposed diversion will have no impact on public water supplies or private wells. The minimal nature of the withdrawal will not impact downstream hydropower concerns. Wetland impacts were avoided or minimized on both the Facility Site and the Man-Burch property by changes to the site layout, the use of horizontal directional drilling, and the wetlands mitigation and monitoring plan.

(3) Compatibility of the proposed diversion with the policies and programs of the state of Connecticut, as adopted or amended, dealing with long-range planning, management, allocation and use of the water resources of the state;

The applicant agreed to eliminate the use of phosphorous as a result of DEP's interpretation that permitting additional sources of phosphorous would violate state water quality standards.

(4) The relationship of the proposed diversion to economic development and the creation of jobs;

Overall the proposed facility will provide significant tax revenue to Canterbury and Plainfield. The facility will provide approximately 200 construction jobs. After construction, there will be 160 direct and indirect jobs associated with the facility.

(5) The effect of the proposed diversion on the existing water conditions, with due regard to watershed characterization, groundwater availability potential, evapotranspiration conditions and water quality;

The proposed diversion will have no impact on water quality. The total withdrawal when compared with the available flow in the River will not detract from the current state of water quality.

(6) The effect, including thermal effect, on fish and wildlife as a result of flow reduction, alteration or augmentation caused by the proposed diversion;

The thermal discharge and minimal changes to instream flow will have no impact on fish and wildlife. The chosen screen technology for the intake structure ensures that there will be no impingement of species and *de minimis* instances of entrainment.

(7) The effect of the proposed diversion on navigation;

There is no permanent impact to navigation. The structures for the diversion intake and the eventual discharge back to the river will be located at or near the bottom of the river in this location. Any impacts to navigation will be temporary and limited to the construction period.

(8) Whether the water to be diverted is necessary and to the extent that it is, whether such water can be derived from other alternatives including but not limited to conservation;

The water to be diverted is necessary. The closed cycle wet cooling alternative selected by the applicant and approved by the DEP represents the best technology available to minimize impact to the environment. The alternate sources of water are not viable. The applicant has maximized the opportunities for water conservation by using the five-time recirculating system and reusing stormwater from the uncovered wood fuel storage area to supply a portion of the water needed for the spray dryer.

The intervening party argues that the diversion is not necessary because of the existence of the alternative of dry cooling. The applicant provided a detailed analysis of this alternative and determined that it was not viable at the site. The increased dimensions of the dry cooling equipment would cause additional impacts on the Hinckley soils and endangered species. The applicant also cited concerns about noise and the decreased efficiency of the plant that results from dry cooling and the resulting increase in air pollution emissions. The applicant also studied the alternative of placing the dry cooling equipment on the roof of the facility. This option would avoid the added impact to Hinckley soils but increased the concern about visual impact and noise due to the height of the equipment. This option also adds the possibility of dust issues due to the updraft caused by the fan equipment. Due to the added environmental concerns, the and the added cost of dry cooling it was eliminated as an alternative to the wet cooling system.

The intervening party provided information on the use of roof-mounted equipment at other facilities. Notably, these facilities were not biomass facilities using wood as a source of fuel. This information, even if presented as evidence or testimony, offers little to support a

conclusion that this equipment is viable at the proposed facility. It also provided no evidence to rebut the impacts of a dry cooling system at the site. Cross examination of the applicant's witnesses likewise elicited no doubts that the proposed wet cooling system is the superior alternative given the minimal impact of the wet cooling system on the Quinebaug River and potential environmental and nuisance impacts of the dry cooling system. Finally, the evidence supports the conclusion that the dry cooling system results in decreased plant efficiency. As a result, the plant would burn more fuel and emit more air pollutants. The evidence supports the selection of the wet cooling option as a means to achieve the cooling needs of the facility with minimal environmental impact.

(9) Consistency of the proposed diversion with action taken by the Attorney General, pursuant to sections 3-126 and 3-127;

This section is inapplicable as there was no evidence of any agreement regarding use of this river with other states.

(10) The interests of all municipalities which would be affected by the proposed diversion.

The disturbance to Packer Road will be adequately addressed by the resurfacing of Packer Road in Canterbury. The use of both properties benefits both Canterbury and Plainfield from a tax revenue standpoint will be a positive impact on both communities.

3
Conclusion

The applicant provided the required information and analysis of the proposed diversion to support it application. DEP's review of the materials considered all relevant factors and the evidence supports the conclusions it reached. I recommend issuance of the proposed draft water diversion permit.

C

Water Discharge Permits

1

The Proposed Treatment System for the Discharge of Water to the Quinebaug River will Protect the Waters of the State from Pollution

General Statutes § 22a-430 requires that of treatment of wastewater discharges will protect the waters of the state from pollution. DSN-101 consists of cooling tower blowdown wastewater that will be discharged after treatment to the Quinebaug River. The limits proposed in the revised draft permit and the required monitoring and reporting will ensure that the water of the state will be protected. The discharge was evaluated for toxicity and did not cause any acute mortality in the organisms. The ongoing monitoring requirements for aquatic toxicity in the draft permit will ensure that the discharge does not affect aquatic organisms. The other permit limits ensure that water quality will not be impacted. The elimination of phosphorous based treatment chemicals during the review of the application resolved any concerns about impact to water quality by the application.

The draft permit contains two conditions within the tables describing the permit limits that the applicant asked to be removed. First, the applicant cites to the portion of the tables that sets an instantaneous limit for the constituents of concerns. The applicant argues that the department does not have the authority to set these instantaneous limits. The applicant cites to Regs., Conn. State Agencies §22a-430-4(s) as the only authority for DEP to insert instantaneous limits as a permit condition. This section includes instantaneous limits for the metal finishing industry. It does not, however, as the applicant suggests set or limit the Commissioner's authority. General Statutes, § 22a-430 provides the Commissioner with broad authority to protect the water of the state from pollution. That broad authority is carried into the implementing regulations. "The commissioner shall establish effluent limitations and/or other permit conditions for all discharges in order to protect the waters of the state from pollution, ensure compliance with Chapter 446k of the Connecticut General Statutes and regulations adopted thereunder and to ensure that his or her actions are consistent with the provisions of the CWA." Regs., Conn. State Agencies §22a-430-4(l)(1)(A). The DEP testified that it uses these limits so compliance inspectors can evaluate a facility's compliance at the time of inspection by

using grab samples. The instantaneous limits are calculated using a multiplier that provides a conservative number for evaluating a system's compliance. The applicant is not required to sample or monitor its activities using these numbers. These conditions are further protective of the waters of the state and therefore within the Commissioner's authority.

The applicant also questioned the Commissioner's authority to express the effluent limitations in terms of concentration rather than mass based limits. The applicant, citing to Regs., Conn. State Agencies § 22a-430-4(l)(4)(A), suggests that permit limitations may only be expressed in terms of mass. As stated above, the Commissioner has broad authority to establish the effluent limitations for a given permit. DEP expressed a reasonable basis for the expression of the effluent limitations for this permit in terms of concentration. The effluent stream does not lend itself to mass based limits and concerns about toxicity require an understanding of the concentration of contaminants to approximate exposure periods.

These two conditions of concern to the applicant are more protective of the waters of the state and are within the Commissioner's broad authority to establish effluent limitations that protect the waters of the state from pollution. I recommend that the draft permit remains unchanged.

a

§ 316(a) – Thermal Plume

The thermal impact from the discharge will be minimal and will only impact less than 1% of the cross section of the River at the point of discharge. DEP's original determination on thermal plume was based on an instantaneous maximum of 84°F. The applicant sought approval of an instantaneous limit of 90°F in its comments on the Notice of Tentative Determination. DEP's review of this request after it received all necessary information and analysis determined that the impact from this limit would also be minimal. The thermal plume at an instantaneous limit of 90°F will not violate water quality standards and complies with the requirements of § 316a of the federal Clean Water Act.

b

§316(b) – Best Technology Available

The applicant performed the analysis required by § 316(b) of the federal Clean Water Act to demonstrate that the proposed five-time recirculating wet cooling system is the best technology available to minimize environmental impact. The water withdrawal will cause minimal impact on the Quinebaug River. The amount of water to be withdrawn would be insignificant during average monthly flows and low flows. The intake structure will employ cylindrical wedgewire screen technology to reduce intake velocities below the EPA standard of 0.5 feet per second to a level to that would virtually eliminate the threat of impingement of fish and minimize the potential for entrainment of any organisms. The proposed cooling tower has a smaller footprint than the dry cooling alternative and would have less impact on the Hinckley soils and associated endangered and threatened species. The roof-mounted dry cooling alternative poses unnecessary impacts in the form of increased noise, dust, height of the building, decreased plant efficiency, and added air emissions. The five time recirculating system will minimize the amount of water needed for cooling purposes and will reduce the amount of water discharged and assimilated into the Quinebaug River. It is the best technology available.

2

The Discharges to the Groundwater Will Not Cause Pollution to the Waters of the State

General Statutes §22a-430 requires that untreated discharges will not cause pollution to the water of the state. The applicant provided sufficient evidence that the proposed discharges to the groundwater will not cause pollution to the waters of the state. DEP's testimony and supporting materials support this conclusion. The draft permit conditions requiring ongoing monitoring on an annual basis for compliance with standards for metals and pH will ensure that the groundwater remains protected.

3

Conclusion

The proposed water discharge permit will ensure that the surface waters of the state are protected from pollution and that the discharges to groundwater will not cause pollution. I recommend that the proposed draft water discharge permit be issued.

D

Intervening Party Did Not Demonstrate Unreasonable Pollution

The Friends of the Quinebaug River (FQR) made several allegations in its Notice of Intervention Amendment. However, it not only failed to prove these allegations, but also failed to make a prima facie case that the proposed activity as authorized and controlled by the proposed draft permits would have or is "reasonably likely to have the effect of unreasonably polluting, impairing or destroying the public trust in the air, water or other natural resources of the state." General Statutes §22a-19(a) (CEPA). FQR failed to provide sufficient direct evidence to support its allegations. Under CEPA, FQR has the burden of establishing a prima facie case that, if the proposed conduct is authorized, unreasonable pollution and impairment will likely result. *Manchester Envtl. Coalition v. Stockton*, 184 Conn. 51, 57-58 (1981). Where the legislature has created a statutory and regulatory scheme that specifically governs the proposed conduct, the question of whether it is unreasonable "must be evaluated through the lens of [that] entire statutory scheme …." *City of Waterbury v. Town of Washington,* 260 Conn. 506, 549-551 (2002). Therefore, to demonstrate that the proposed activity will cause unreasonable pollution, FQR was required to show that it does not comply with the provisions of the statutes governing the proposed permits and their implementing regulations. Id. at 557. It failed to meet its burden.

FQR's case rested primarily on the notion that the existence of an alternative means that any activity with an environmental impact, in this case the withdrawal of water from the Quinebaug River and the associated discharge to the River, represents unreasonable pollution. The mere existence of this alternative alone does not in this case make the proposed activity unreasonable. Moreover, the alternative of dry cooling (as the only alternative presented by FQR) has environmental impacts. The applicant and the department weighed these impacts and

reasonably concluded that the minimal impact of the withdrawal from and discharge to the River represented a better alternative to the potential dust, noise, plant inefficiency, and clean air impacts from operating a dry cooling system. If the equipment for the dry cooling system is configured in a more traditional and proven layout on the ground, then the impact to the Hinckley soils and the habitat of the Eastern spadefoot toad and the blue spotted salamander would increase. The impact to the habitat of these species was of significant concern in the review of the application for the diversion permit. The applicant avoided and minimized the impact on these areas through significant alterations to the original layout; by employing low impact methods such as horizontal directional drilling at the Man-Burch property; and by preparing a mitigation and monitoring plan that the draft permit requires it to implement.

FQR also raised the possibility that ambient airborne contaminants could become entrained in cooling water and discharged to the Quinebaug River. Although FQR provided no evidence on this possibility, this concern is sufficiently addressed by the significant monitoring and reporting requirement within the proposed draft permit. Instantaneous permit limits tied to the inspection of the facility by DEP staff performing grab samples and the monitoring and reporting requirements, including regular toxicity testing, in the draft permit addresses concerns about any additional contamination being entrained in the cooling water discharge.

FQR's allegation about the violation of Article 11 of the water quality standards was never effectively supported. This issue was not addressed by its two witnesses and its post-hearing brief merely restated this claim without legal analysis or support.

The preponderance of the evidence supports a conclusion that the proposed activities comply with the requirements of the relevant statutory and regulatory schemes. The testimony from Ms. Miner and Dr. Parasiewicz does not support FQR's claims. Dr. Parasiewicz was called by FQR as an expert witness. He, however, had not performed a detailed review of the application and testified that any withdrawal from the river should be prohibited due to his conclusions that it is impaired. His concerns about the general health of the River and potential harm from additional impact on the River, while interesting and sincerely stated, do not control the outcome of this proceeding. The same observations apply to Ms. Miner's testimony. The law allows the proposed activity as long as it meets the standards established by the legislature and DEP regulations. In the instant case, FQR has not provided evidence that goes beyond establishing the possibility of impairment. Moreover, even if FQR had established a prima facie

case, there is substantial, persuasive evidence in the record that the proposed activity conducted in accordance with the proposed draft permits will not unreasonably pollute, impair or destroy the public trust in the water and natural resources of the state.

The post-hearing comments submitted by members of FQR speaking as individuals provide information focused on FQR's specific claims, but these comments fail to establish a prima facie case because they are not evidence. These comments came in after the close of the hearing record on September 4, 2008 under a mistaken belief that I would receive and consider written comments up to 30 days after the start of the hearing on August 13, 2008. A diligent review of the record does not indicate such an extension of the comment period. Regardless of any misunderstanding over the deadline for inclusion of public comment in the hearing record, FQR was a party to the proceeding and was offered every opportunity to both cross-examine the applicant's witnesses and DEP's witnesses and provide direct evidence and testimony supporting its claims. It chose not to and cannot correct this choice through the submission of written comments not given under oath, not subject to the scrutiny of cross examination, not subject to rebuttal, and not meeting the standards of evidence.

As indicated in earlier rulings, I am under no obligation to consider these materials in my decision. The concept of written comments is not specifically addressed in the DEP Rules of Practice. However, hearing officers accommodate written comments under Regs., Conn. State Agencies § 22a-3a-6(t), the provision governing speakers providing oral comment on the record. This subsection clearly anticipates that this comment must be received during the course of the hearing.

Nevertheless, I reviewed the most substantive comment, which was submitted by Mr. Noiseux on September 15, 2008 and contained what apparently would have been his testimony. Most of the materials attached to Mr. Noiseux's comment letter were proposed exhibits marked for identification but not admitted. Even if they were admitted as evidence, they are merely factual representations of what has been implemented at other power plants. This coupled with Mr. Noiseux's observations in his comment letter do not provide evidence that the environmental impact of the water withdrawal and the associated discharge is unreasonable. It also does not provide specific evidence that the suggested alternatives have no environmental impact or that the suggested alternatives were not sufficiently weighed by the applicant and DEP staff.

IV

CONCLUSION

Based on substantial evidence in the record, I recommend issuance of the draft air, solid waste, and water diversion permits. For the water discharge permit, I recommend that the applicant be allowed to submit plans and specifications and upon approval and construction of the facility in accordance with approved plans and specifications that the draft discharge permit be issued.

Kenneth M. Collette, Hearing Officer

PARTY LIST

In the matter of **Plainfield Renewable Energy**

PARTY	REPRESENTED BY
Applicant	
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Diversion Permit	Fax – (860) 424-4059
Denise Ruzicka/Sara Radasci	e-mail: gabrielle.frigon@ct.gov
Discharge Permits	
Oswald Inglese/Charles Nezianya	
Solid Waste Permit	
Robert Isner/Gabrielle Frigon/Calin Tanovici	

Intervening Parties	
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Petitioners for Party Status	
Concerned Citizens of Plainfield	Randy Stilwell 97 Kate Downing Road Plainfield, CT 06374 Fax (860) 564-2403 e-mail: wrstilwell@snet.net
Interested Persons	Steven Sadlowski Town of Canterbury e-mail: stevensadlowski@canterbury-ct.org

STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION

In the Matter of	:	**APPLICATION NO. 200602249**
	:	**APPLICATION NO. 200602226**
	:	**APPLICATION NO. DIV-200603081**
PLAINFIELD RENEWABLE	:	**APPLICATION NO. 200702055**
ENERGY, LLC	:	**APPLICATION NO. 200800492**
	:	
	:	**SEPTEMBER 29, 2008**

AGREED DRAFT DECISION ON APPLICATION NO. 200602226

Pursuant to Section 22a-3a-6(l)(3)(A)(ii) of the Rules of Practice of the Connecticut Department of Environmental Protection (DEP), Plainfield Renewable Energy, LLC (the "Applicant" or "PRE") and the DEP Bureau of Air Management, (collectively, the "Parties"), hereby respectfully submit this Agreed Draft Decision in resolution of the above-captioned matter as it relates to PRE's application for an air point source permit, Application No. 200602226 (the "Air Permit Application"). The Parties support the issuance of the proposed Draft Air Permit, as revised and submitted by the DEP Bureau of Air Management, and marked as Exhibit DEP-AIR-29 ("Revised Draft Air Permit"). This Revised Draft Air Permit is attached hereto as Exhibit A.

SUMMARY

The Applicant filed its Air Permit Application in connection with planned construction and operation of a 37.5 megawatt electric power generation facility off Mill Brook Road in Plainfield, Connecticut, using fluidized bed biomass gasification to process wood as a source of fuel (the "Facility"). The proceeding on PRE's Air Permit Application was administratively consolidated with the proceedings on PRE's application for a solid waste facility permit, Application No. 200602249 (the "Solid Waste Permit Application"), PRE's application for a

water discharge permit, Application Nos. 200702055 and 200800492 (the "Water Discharge Permit Application"), and PRE's application for a water diversion permit, Application DIV-200603081 (the "Water Diversion Permit Application") for purposes of the public hearing with respect to these applications. The Friends of the Quinebaug River ("FQR") intervened in the above-captioned matter, except as to the Air Permit Application. Accordingly, this Agreed Draft Decision as to the Air Permit Application alone is being filed and joined in by all parties to the proceeding on the Air Permit Application.

DECISION

Statutory and Regulatory Background

As required by the federal Clean Air Act (CAA), the U.S. Environmental Protection Agency (EPA) has established national ambient air quality standards (NAAQS) that reflect the acceptable concentrations of specific pollutants that protect the public health and welfare 42 U.S.C. Section 7409. The NAAQS, which are based on annual and various other shorter term averaging intervals, have been established for six air pollutants known as "criteria pollutants." These are: Sulfur dioxide (SO_2), particulate matter less than or equal to ten microns in diameter (PM_{10}) and less than and equal to 2.5 microns in diameter ($PM_{2.5}$), nitrogen dioxide (NO_2), carbon monoxide (CO), ozone (O_3), and lead (Pb). 40 C.F.R. Sections 40.4 through 50.13. Connecticut has adopted regulations to require permits for stationary sources of these and other regulated air pollutants. Regs. Conn. State Agencies (R.C.S.A.) Section 22a-174-3a.

The CAA establishes a joint federal and state program to control air pollution and to protect the public health and welfare, including regulatory requirements to ensure that the ambient air quality as impacted by existing and new sources of pollution comply with the NAAQS. Each state is required to designate air quality control regions defined by EPA and may adopt a State Implementation Plan (SIP) that establishes criteria pollutant emissions limitations and procedures to implement, maintain, and enforce the NAAQS for those designated regions 42 U.S.C. Section 7410(a)(2)(A)-(L).

The NAAQS are implemented, in part, through two different programs. The first is a federal program to regulate air pollution in "attainment" or "unclassifiable" areas. 42 U.S.C. Sections 7470-7479. The purpose of this program is the "prevention of significant deterioration" (PSD) of air quality in attainment areas. The program also ensures that economic growth "will occur in a manner consistent with the preservation of existing clean air resources ...." 42 U.S.C. Section 7470. The federal regulations that implement this program call for certain pre-construction permit requirements for new major stationary sources or modifications. 42 U.S.C. Sections 7470-7492. The program also establishes PSD increments, which represent the maximum allowable increase in the concentration of certain air pollutions above baseline concentrations established under the CAA. 40 C.F.R. Section 52.21; R.C.S.A. Section 22a-174-3a(k), Table 3a(k)-2.

Under the PSD regulations, major new sources and modifications must determine and use the "best available control technology" (BACT) to minimize emissions of pollutants from a source that might otherwise exceed the applicable significance levels established by the PSD program. 42 U.S.C. Section 7475(a)(4); 40 C.F.R. Section 51.21(j)(2); Section 22a-1745-3a(k). Applicants are also required to evaluate the impacts form the proposed source combined with other sources and existing background ambient air quality through air dispersion modeling. To show that the new source will not cause or contribute to any air quality violation, the total concentration of any pollutant must be in compliance with the NAAQS and applicable PSD increments. 40 C.F.R. Section 52.21(m).

States, such as Connecticut, that have a federally-approved SIP have been delegated the authority to implement the PSD program. Connecticut's PSD regulations apply to major new sources with potential emission rates greater than the significant emission rate thresholds set forth in Table 3a(k)-1. R.C.S.A. Section 22a-174-3a(k). The regulations that implement the Connecticut SIP, however, not only require New Source Review (NSR) permits for major PSD sources, but also require NSR permits for minor stationary sources. Under the Connecticut SIP, any new source with potential emissions of fifteen or more tons per year (TPY) of an individual air pollutant must apply for a NSR permit and conduct a BACT review for those pollutants with potential emissions in excess of 15 TPY. R.C.S.A. Sections 22a-174-3a(a)(1) and 3a(j).

The CAA also establishes a second program designed to bring non-attainment areas into compliance as soon as practicable. 42 U.S.C. Sections 7410, 7501-7515. Major new sources of non-attainment pollutants, such as the ozone precursors, nitrogen oxides (NO_x) and volatile organic compounds (VOCs), must control such pollutants using the Lowest Achievable Emission Rate (LAER). Such major stationary sources must also obtain certified emission reduction credits (ERCs) to offset the allowable emissions increase for each individual non-attainment air pollutant that exceeds major source thresholds. R.C.S.A. Section 22a-174-3a(l)(4).

FINDINGS OF FACT

1. The Facility is a Class I renewable 37.5 MW biomass power plant located in Plainfield, Connecticut. The Facility will use fluidized bed staged gasification with a closed coupled boiler to power the steam turbine generator. The biomass will come from specified sources, which include forest management residues, land clearing debris, waste wood from industries, and construction and demolition debris. Testimony of Daniel Donovan ("Donovan"), August 13 and 19, 2008, testimony of Michael Holzman ("Holzman"), August 19, 2008 and testimony of James Grillo ("Grillo"), August 13 and 19, 2008. Exh. APP-1, APP-30, APP-31.

2. The Facility will use fuel processed at off-site locations to strict size and quality specifications. The Facility will employ state-of-the-art energy conversion and air quality control equipment. Testimony of Donovan, August 13 and 19, 2008, testimony of Holzman , August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. APP-1, DEP-AIR-8, DEP-AIR-9, DEP-AIR-13c, DEP-AIR-13d, DEP-AIR-13e, DEP-AIR-14, DEP-AIR-15, DEP-AIR-19, DEP-AIR-20 DEP-AIR-21, DEP-AIR-24.

3. Proposed Facility fuels are: land clearing debris (chipped trees, stumps, branches/brush); recycled wood/clean wood (pallets, spools, packaging materials, scraps from newly built wood products); and regulated wood fuel (processed C&D debris comprised of wood that has been sorted to remove plastics, plaster, gypsum wallboard, asbestos, asphalt shingles, and wood which contains creosote or to which pesticides have been applied). During start-up,

the Facility fuel will be 100% biodiesel. Testimony of Donovan, August 13 and 19, 2008, testimony of Holzman, August 19, 2008 and testimony of Grillo, August 19, 2008. Exh. APP-1, APP-30, DEP-AIR-7, DEP-AIR-20, DEP-AIR-29.

Site Description

4. The Facility will be located on a 27-acre parcel off Mill Brook Road in Plainfield, Connecticut. This parcel is currently vacant and industrially zoned. Interstate 395 is very close to this parcel. The Facility parcel is approached form I-395 by existing onto Lathrop Road and then turning south on Route 12. The intersection of Route 12 and Mill Brook Road was improved as part of the construction of the Lowe's distribution center. Vehicles will access the Facility parcel from commercially traveled public highways and routes. The Facility parcel is bordered by the Providence & Worcester Railroad on the west, Route 12 on the east, Town of Plainfield property along Mill Brook on the north and Mill Brook Road on the south. Testimony of Donovan, August 13 and 19, 2008. Exh. APP-30, APP-31.

The Applicant

5. Daniel Donovan testified in his capacity as the managing member of NuPower LLC, which is the joint owner of PRE. PRE is a joint venture of NuPower LLC and Decker Energy International, Inc. NuPower LLC is a Connecticut renewable energy developer. Decker International Energy, Inc. has been involved in the development of six biomass facilities and been the owner of two operating biomass facilities. Testimony of Donovan, August 13, 2008 and August 19, 2008. Exh. APP-1, APP-30.

The Air Permit Application

6. Since the potential emissions from the Facility will be greater than 15 tons per year for PM, SOx, NOx, CO, VOCs and ammonia and it will be a new major stationary source of air pollution for NOx and CO, PRE was required to file the Air Permit Application. Testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. APP-1, DEP-AIR-5, DEP-AIR-6, DEP-AIR-13a, DEP-AIR-13b, DEP-AIR-15, DEP-AIR-21, DEP-AIR-29.

7. By application filed on or about August 8, 2006, as amended thereafter, the Applicant applied to the DEP for an air permit to construct and operate the Facility. The application documents, which, at DEP's request, were collected and compiled in a submittal to DEP in or about March 2008, include, among other things, an executive summary; background information; a premises site plan; USGS map; descriptions of equipment, processes, air pollution controls, stack, fuels, process materials and other technical information; process flow diagram; projected air pollution emissions; proposed control equipment types, size and efficiencies; proposed dates for commencement of construction; BACT/LAER analyses, alternatives analysis, emergency episode standby plan, ambient air quality impact analysis and other required certifications and completed application forms. This Air Permit Application was assigned Application No. 200602226 by DEP Bureau of Air Management Staff ("DEP Staff"). Testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. APP-1, APP-31; DEP-5; DEP-AIR-2, DEP-AIR-4, DEP-AIR-18, DEP-AIR-21, DEP-AIR-23, DEP-AIR-24, DEP-AIR-25, DEP-AIR-26, DEP-AIR-29.

8. Public notice of the filing of the Air Permit Application was published in the *Norwich Bulletin* on August 9, 2006. Testimony of Grillo, August 13 and 19, 2008. Exh. DEP-AIR-3.

9. DEP notified the Applicant that the Air Permit Application was complete on September 13, 2006. Testimony of Grillo, August 13 and 19, 2008; Exh. DEP-AIR-4.

10. On April 4, 2008, DEP issued its Notice of Tentative Determination and Intent to Issue Various Environmental Permits," including the Draft Air Permit. The public was provided thirty (30) days from the publication of this notice on April 7, 2008 in the *Norwich Bulletin* to file comments in writing and to request a public hearing concerning the tentative determination. Testimony of Grillo, August 19, 2008. Exh. DEP-5, DEP-AIR-21, DEP-AIR-22, DEP-AIR-23.

11. DEP received requests for a public hearing in response to the April 4, 2008 notice and determined to hold a consolidated hearing on the Air Permit Application, the Solid Waste Permit Application, the Water Discharge Permit Application and the Water Diversion Permit Application. Testimony of Gabrielle Frigon ("Frigon"), August 13, 2008 and testimony of Grillo, August 19, 2008; Exh. DEP-6.

12. A Notice of Public Hearing and Site Visit on Various Environmental Permits, dated July 9, 2008, was published in the *Norwich Bulletin*. This notice provided for a site visit at the Facility location in Plainfield, Connecticut and the proposed location of the intake structure in Canterbury, Connecticut, on August 12, 2008, that an evening public hearing would be held at the Plainfield Town Hall, Plainfield, Connecticut on August 13, 2008 (and continue on August 14, 2008, if required), and that an adjudicatory hearing would begin on August 19, 2008 in Hartford and continue on additional dates identified therein. Testimony of Grillo, August 13 and 19, 2008. Exh. DEP-6.

13. DEP's Revised Draft Air Permit, which reflects DEP's response to PRE's comments on the Draft Air Permit and which PRE accepts, is dated July 15, 2008. Testimony of Grillo, August 19, 2008 and testimony of Holzman, August 19, 2008. Exh. DEP-AIR-29, DEP-AIR-31, DEP-AIR-32, DEP-AIR-33.

14. Hearing Officer Kenneth Collette heard preliminary testimony and public comment at a public hearing at the Plainfield Town Hall on August 13, 2008. The adjudicatory hearing commenced in Hartford on August 19, 2008 and testimony concluded on September 4, 2008. Testimony of a general nature was heard on August 19, 2008. Testimony specific to the

Air Permit Application was offered by Michael Holzman on behalf of the Applicant on August 19, 2008 and James Grillo on behalf of DEP on August 13 and 19, 2008. Testimony at the evening public hearing on August 13, 2008 and testimony of Donovan, Frigon, Holzman and Grillo on August 19, 2008. Exh. DEP-6.

15. Without objection, on August 19, 2008, Michael Holzman of M.I. Holzman & Associates, LLC was qualified as an expert in environmental engineering, providing air quality related evaluation and engineering services. He has more than 25 years of experience in environmental consulting and air pollution control engineering. His representative services include Air Permitting/Impact Assessment and Air Pollution Control Engineering services. His representative clients include clients in the energy industry. Without objection, on August 19, 2008, James Grillo was qualified as an expert in air permitting. Mr. Grillo is an Air Pollution Control Engineer III in the Engineering and Enforcement Division of DEP's Bureau of Air Management. He has been a permit engineer with DEP for approximately eight (8) years. Mr. Grillo was responsible for the review of PRE's Air Permit Application and related materials and submittals and he participated in the drafting of the Revised Draft Air Permit, including any modifications thereto. Testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. APP-5, DEP-20, DEP-AIR-29.

16. The Air Permit Application identified the operating scenario for the Facility and the Facility's potential to emit (PTE) specific pollutants. Based on the estimate of emissions, the Facility is considered a new major source of air pollution. Testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. APP-1, DEP-AIR-2, DEP-AIR-24.

17. The projected annual emissions rates for individual air pollutants were calculated using information from such sources as stack test results from similar sources, calculations by the Applicant, and manufacturer's data and guarantees. Testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. APP-1, DEP-AIR-2, DEP-AIR-7, DEP-AIR-10, DEP-AIR-13a through 13e, DEP-AIR-14, DEP-AIR-15, DEP-AIR-19, DEP-AIR-24, DEP-AIR-25, DEP-AIR-26, DEP-AIR-29, DEP-AIR-32.

18. The Best Available Control Technology (BACT) analyses for the Facility included determinations for SO_X, CO, VOC, $PM_{10}/PM_{2.5}$ and NH_3 for the fluidized bed gasification (FBG). The Applicant also conducted a Lowest Achievable Emission Rate (LAER) analysis for NOx emissions from the FBG and emergency engine. The Applicant did not conduct a LAER analysis for VOC emissions because potential VOC emissions will be below the level that triggers the requirement for a LAER determination. Testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. APP-1; DEP-AIR-2, DEP-AIR-13a through 13e, DEP-AIR-24, DEP-AIR-25, DEP-AIR-26, DEP-AIR-29.

19. The Applicant conducted the BACT/LAER analyses according to the requirements in R.C.S.A. §22a-174-3a(j) and (l). DEP reviewed the emissions rates and control technologies proposed by the Applicant. For each source, DEP determined BACT to be the most effective emissions control option that has been achieved in practice. Alternative controls that were identified and evaluated by the Applicant and DEP were determined to provide no additional reduction in emissions, to be technically infeasible, or to not have been successfully demonstrated in practice on the same type of process using the same type of fuel as proposed by the Applicant. The Revised Draft Air Permit requires that the Applicant monitor continuously and optimize NO_X and NH_3 slip emissions from the FBG using the selective non-catalytic reduction (SNCR) system during the first year after commencement of operation and then modify the permit limits for NO_X and NH_3 emissions, as necessary, based on the monitored data. DEP determined that the combined engineering review of the Applicant and DEP satisfies the elements of the top-down BACT analysis for all applicable sources and pollutants. Testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. APP-1, DEP-AIR-2, DEP-AIR-13a through 13e, DEP-AIR-14, DEP-AIR-24, DEP-AIR-25, DEP-AIR-26, DEP-AIR-29.

20. Per the Air Permit Application, the sum of allowable emissions from the FBG, emergency generator and cooling tower will exceed the significant rate thresholds set forth in §22a-174-3a(k), Table 3a(k)-1 for PM_{10}, SO_2, NOx, VOC and CO. The entire premises[1] are,

[1] Premises is defined as "the grouping of all stationary sources at any one location and owned or under the control of the same person or persons." §22a-174-1(88).

therefore, subject to PSD review in addition to the BACT determinations required for each individual source. BACT reviews for the engine and the cooling tower were not performed by DEP since the engine will operate under §22a-174-3b(e), (permit-by-rule), and the cooling tower does have potential emissions greater than 15 tons per year (TPY). The PSD review conducted by DEP did include the aggregate emissions from these sources along with the FBG. The review required mathematical modeling of the emissions from the premises to insure that operations will not interfere with the attainment of NAAQS and will not exceed the PSD increments. Testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. APP-1, DEP-AIR-2, DEP-AIR-18, DEP-AIR-24, DEP-AIR-25, DEP-AIR-26, DEP-AIR-29.

21. The Air Permit Application includes an air quality impact analysis. The Applicant submitted a revision to this analysis during the DEP technical review process, demonstrating compliance with the revised 24-hour $PM_{2.5}$ standard promulgated after the original analysis was submitted. The revised analysis also addressed new DEP policy on modeling total filterable and condensable $PM_{2.5}$ to demonstrate compliance with the revised ambient standard[2]. This analysis, as revised by the Applicant, incorporated state and federally-approved methods of air dispersion modeling based on the proposed Facility's impacts, other regional interactive sources, and the existing or "background" ambient air quality. Testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. APP-1, DEP-AIR-5, DEP-AIR-6, DEP-AIR-15, DEP-AIR-18, DEP-AIR-24, DEP-AIR-25, DEP-AIR-26.

22. The Air Permit Application includes information regarding the Applicant's history of compliance with environmental protection laws in Connecticut and in other states and federal jurisdictions. The Applicant has no record of violation of any such laws. Based on this information and given that PRE does not operate any other stationary source of air pollution, DEP concluded that the Applicant has satisfied this review requirement. Testimony of Grillo, August 13 and 19, 2008. Exh. APP-1, DEP-AIR-24.

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[2] DEP Interim $PM_{2.5}$ New Source Review Modeling Policy and Procedures, signed 8/27/07.

23. The Applicant complied with applicable certification and public notice requirements of §22a-174-2a and paid all required application and permit fees. Testimony of Grillo, August 13 and 19, 2008. Exh. APP-1, DEP-AIR-2, DEP-AIR-4, DEP-AIR-21, DEP-AIR-24, DEP-AIR-27.

PSD/BACT Determinations

24. The following control technology determinations and emissions limitations have been established for the FBG:

- The limits on filterable, condensable, and total filterable and condensable $PM_{10}/PM_{2.5}$ emissions from the FBG will be 45.8, 39.0 and 84.8 TPY, respectively.[3] Emissions will be controlled through the use of a multiclone, spray dryer absorber and fabric filter (or baghouse). In addition, opacity[4] will be limited to 10 percent or less utilizing a six-minute block average. Opacity will be continuously monitored with a continuous opacity monitoring system (COMS) and compliance demonstrated based on a 6-minute block average. The Revised Draft Air Permit requires use of a continuous baghouse leak detection monitor to assure the integrity of the filter bags is not compromised during operation. Testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. APP-1, DEP-AIR-2, DEP-AIR-15, DEP-AIR-24, DEP-AIR-25, DEP-AIR-26, DEP-AIR-29.

- SO_X emissions from the FBG will be limited to 81.29 TPY and will be controlled by FBG additives, a spray dryer absorber and fabric filter. The same controls will be used to control HCl emissions from the FBG.[5] SO_X emissions will be continuously monitored

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[3] $PM_{10}/PM_{2.5}$ occurs in two forms. Filterable particulate matter, particulates that can be filtered from exhaust gases and condensable particulate that forms from cooled exhaust gases. Exh. APP-1; DEP-AIR-15.

[4] "'Opacity' means the degree to which emissions reduce the transmission of light and obscure the view of an object in the background." R.C.S.A. §22a-174-1(77).

[5] Although HCl and NH_3 emissions are not regulated by PSD, state BACT regulations apply to any pollutant with uncontrolled potential emissions greater than 15 TPY. R.S.C.A. §22a-174-3a(j)(1)(C).

with an SO_2 CEMS and compliance demonstrated on a 3-hour block average. Testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. APP-1, DEP-AIR-2, DEP-AIR-24, DEP-AIR-25, DEP-AIR-26, DEP-AIR-29.

- CO emissions from the FBG will be limited to 239.47 TPY. This limit is based on the inherent good combustion capabilities of the advanced fluidized bed staged gasification power generation technology. CO emissions will be continuously monitored with a CO CEMS and compliance demonstrated on an 8-hour block average. Testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. APP-1, DEP-AIR-2, DEP-AIR-24, DEP-AIR-25, DEP-AIR-26, DEP-AIR-29.

- VOC emissions from the FBG will be limited to 26.59 TPY. This limit is based on the inherent good combustion capabilities of the advanced fluidized bed staged gasification power generation technology. In addition, the CO CEMS will provide a surrogate means for monitoring compliance with the VOC permit limit. Testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. APP-1, DEP-AIR-2, DEP-AIR-24, DEP-AIR-25, DEP-AIR-26, DEP-AIR-29.

- Pursuant to the Revised Draft Air Permit, NH_3 slip emissions from the FBG SNCR NO_X control system are limited to no more than 20 ppmv, when adjusted to conditions of 7 percent O_2.[5],[6] The Revised Draft Air Permit also requires the Applicant to monitor continuously and optimize NO_X and NH_3 slip emissions from the FBG during the first year after commencement of operation and to modify the permit limits for NO_X and NH_3 emissions, as necessary, based on the monitoring data. Testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. APP-1, DEP-AIR-2, DEP-AIR-10, DEP-AIR-24, DEP-AIR-25, DEP-AIR-26, DEP-AIR-29.

[6] The amount of NH_3 injected into the SNCR must be greater than the stoichiometric ratio to effectively control NO_X emissions. The unreacted NH_3 is called "ammonia slip". Exh. APP-1.

25. The Facility's emergency engine will burn diesel fuel with a sulfur content of 0.0015 percent by weight, and will operate less than 300 hr/yr and only for emergency generation and engine testing purposes. As such, the emergency generator will be operated pursuant to DEP permit exemption criteria in R.C.S.A. §22a-174-3b(e) and will not require a permit to construct and operate. In addition, as an emergency engine to be manufactured after model year 2007, the engine must be certified by the manufacturer to meet the applicable emission standards in 40 C.F.R. Part 89. Testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. APP-1, DEP-AIR-15, DEP-AIR-24, DEP-AIR-25, DEP-AIR-26, DEP-AIR-29.

26. The cooling tower will include drift eliminators to reduce emissions of $PM_{10}/PM_{2.5}$. Potential $PM_{10}/PM_{2.5}$ emissions from the cooling tower will be less than the 15 TPY permit applicability threshold. Testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. APP-1, DEP-AIR-15, DEP-AIR-24, DEP-AIR-25, DEP-AIR-26, DEP-AIR-29.

PSD/Analysis of Impacts of the Project on Ambient Air Quality

27. The Applicant performed mathematical modeling/dispersion studies to determine the impact of the Facility's emissions on air quality. The results of these studies indicate there will be relatively low impacts due to low levels of pollutant emissions. Within the area of the Facility's potential for significant impact, Facility emissions combined with those of other interactive sources are in compliance with PSD increments. The interactive impacts combined with ambient air quality are also in compliance with the NAAQS for all relevant criteria pollutants. Testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. APP-1, DEP-AIR-5, DEP-AIR-6, DEP-AIR-15, DEP-AIR-18, DEP-AIR-24, DEP-AIR-25, DEP-AIR-26, DEP-AIR-29.

28. The Applicant also performed additional impact analyses to determine whether Facility operations would impair visibility, soils or vegetation. The analysis considered commercial and residential growth in the area and the projected ambient air quality impact of

that growth. The results of this analysis indicate that there will be no significant impacts due to growth, no impacts on visibility, and no detrimental impacts on soils and vegetation. Testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. APP-1, DEP-AIR-5, DEP-AIR-6, DEP-AIR-15, DEP-AIR-18, DEP-AIR-24, DEP-AIR-25, DEP-AIR-26, DEP-AIR-29.

Non-attainment

29. The Facility site is located in an area designated as non-attainment for ozone and the premises will be a major stationary source of NO_X, an ozone precursor. The Applicant is therefore required to provide a LAER determination for NO_X emissions, conduct an alternatives analysis, acquire emissions reduction credits (ERCs), and demonstrate compliance with environmental laws. Testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008.

a. LAER Determination[7]

30. NO_X is formed in the FBG through oxidation of nitrogen in the fuel and air. The low operating temperature of the FBG will inhibit the formation of NO_X. The proposed SNCR system will further reduce the quantity of NO_X produced in the FBG. The LAER for NO_X from

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[7] LAER means, for any source, the more stringent rate of emissions based on the following:

(A) The most stringent emissions limitation which is contained in the implementation plan of any State for such class or category of stationary source, unless the owner or operator of the proposed stationary source demonstrates that such limitations are not achievable; or

(B) The most stringent emissions limitation which is achieved in practice by such class or category of stationary sources. This limitation, when applied to a modification, means the lowest achievable emissions rate for the new or modified emissions units within or stationary source. In no event shall the application of the term permit a proposed new or modified stationary source to emit any pollutant in excess of the amount allowable under an applicable new source standard of performance.

R.C.S.A. §22a-174-1(55) and 40 C.F.R. 51.165(a)(1)(xiii).

biomass FBGs of this size and capacity is 0.075 lb/MMBtu[8] when firing biomass. The following factors were considered in arriving at this emission rate:

- The most stringent NO_X emission limitation applicable to biomass energy plants identified in a review by the Applicant and DEP of SIPs comprising the most severe ozone non-attainment areas was 0.14 lb/MMBtu (110 ppmvd @ 3% O_2). The proposed NO_X emission limit in the Revised Draft Air Permit is 0.075 lb/MMBtu (58 ppmvd @ 3% O_2), which is more stringent than the most stringent SIP limitation found.

- Based on the joint review of the EPA's RACT/BACT/LAER Clearinghouse, EPA's NESHAPs Subpart DDDDD database, biomass energy plant air permits and other related documentation, as well as a literature search and discussion with air pollution control vendors, NO_X control techniques identified as applicable to biomass energy plants include SNCR and selective catalytic reduction (SCR). SNCR has been used in combination with fluidized bed combustors (FBC) and FBG biomass power plants as well as with spreader stoker biomass power plants. SCR has not been applied in practice to any operating FBG or FBC, although it has been retrofit on several existing spreader stoker biomass power plants. In each of these retrofit applications, the vendor (Babcock Power) installed the SCR downstream ("cold-side") of particulate controls with a regenerative heat recovery system, a technology called regenerative SCR or RSCR™. The most stringent emission rate identified for FBG or FBC with SNCR or for spreader stokers equipped with SNCR or RSCR is 0.075 lb/MMBtu.

- SCR installed in the "hot-side" of the flue gas train, upstream of acid gas and particulate controls, is not considered to be achieved in practice due to the technical concerns about catalyst deactivation and shortened catalyst life in biomass energy applications, especially those involving use of C&D wood fuel.

- NO_X control with the combination of FBG and RSCR technology has not been demonstrated in practice for this use.

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[8] Pounds per million Btu of heat input.

- Due to the lack of any operating experience in the U.S., the Applicant is unable to obtain a guaranteed NOx emission limit of less than 0.075 lb/MMBtu for the combination of FBG and SCR or RSCR.

- The 0.075 lb/MMBtu emission rate meets LAER criteria by being more stringent than the most stringent emission limit contained in any SIP and equivalent to the most stringent emission rate achieved in practice for a biomass energy plant.

- The Revised Draft Air Permit requires the Applicant to monitor continuously and optimize NO_X and NH_3 slip emissions from the FBG using the SNCR system during the first year after commencement of operation and to modify the permit limits for NO_X and NH_3 emissions, as necessary, based on the monitored data.

Testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. APP-1, DEP-AIR-2, DEP-AIR-10, DEP-AIR-13a through 13e, DEP-AIR-24, DEP-AIR-25, DEP-AIR-26, DEP-AIR-28, DEP-AIR-29, DEP-AIR-31, DEP-AIR-32.

b. Alternatives Analysis

31. The Applicant evaluated various alternatives as required in connection with a non-attainment review. R.C.S.A. §22a-174-3a(l)(2). Potential sites were assessed for community receptivity, need for power, proximity to wood fuel resources, site access for fuel delivery, proximity to electricity transmission grid, availability of water resources, acceptability of environmental impacts, distance from population centers, and availability of properly zoned and sized parcels of land. Testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. APP-1, DEP-AIR-2, DEP-AIR-24.

32. The Applicant eliminated sites based on the selection criteria. There had been active remediation at the subject 27-acre parcel, the Gallup's Quarry Superfund site; it was targeted for industrial development in Plainfield and was identified in this analysis as the most

suitable site. Testimony of Donovan, August 13 and 19, 2008, testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. APP-1, DEP-AIR-2, DEP-AIR-24.

33. The Facility is being developed as a Class I renewable biomass energy project, specifically approved by the DPUC in response to Public Act 03-135. Therefore, alternative fossil-fuel generation was not considered during development. Potential biomass power generation technologies identified during project development included mass burn or spreader-stoker combustion, fluidized bed combustion and fluidized bed staged gasification. Mass burn or spreader-stoker combustion was ruled out early in the technology evaluation process as the technology is not considered state-of-the-art or capable of meeting the criteria for low emission advanced renewable energy conversion technologies for a Class I renewable energy source under Connecticut law. Based on these considerations, the Applicant proposed fluidized bed staged gasification technology for the Facility. Testimony of Donovan, August 13 and 19, 2008, testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. APP-1, APP-30, APP-34, APP-35, DEP-AIR-2, DEP-AIR-24.

34. In consideration of the economies of scale and the amount of available biomass, as determined by fuel supply studies, the Applicant determined that the 37.5 MW (net) power plant was the most suitable size. Testimony of Donovan, August 13 and 19, 2008 and testimony of Holzman, August 19, 2008. Exh. APP-1, DEP-AIR-2, DEP-AIR-24.

35. The Applicant and DEP reviewed alternative environmental controls as part of the BACT and LAER analyses for the Revised Draft Air Permit and as part of the review process for other project permits. DEP has concluded that the proposed controls and limits included in the Revised Draft Air Permit are the most suitable of all alternatives evaluated. Testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. APP-1, DEP-AIR-2, DEP-AIR-24, DEP-AIR-25, DEP-AIR-26, DEP-AIR-29.

36. The Facility will cause certain increases in air pollution in the vicinity of the Facility site. There will be increases in vehicular traffic and there are certain potential dangers

inherent in the operation of a fuel burning source. The Applicant has proposed measures to address these considerations. Testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. APP-1, DEP-AIR-2, DEP-AIR-21, DEP-AIR-24, DEP-AIR-29.

c. Acquisition of Emissions Reduction Credits

37. The Applicant shall be required to obtain 210 tons of certified NOx emission reduction credits (ERCs) prior to final permit issuance. Exh. APP-1.

d. Compliance Requirements

38. The Applicant has submitted completed DEP forms, stating that it has not been convicted, or penalized for any violation of a local, state or federal environmental law. The Applicant has further stated that it has not had any judgment entered against it for violating any environmental law and there is no outstanding order against it issued by a state or federal administrative agency. Exh. APP-1, DEP-AIR-24.

Hazardous Air Pollutants

39. When firing biomass, the FBG may emit Hazardous Air Pollutants (HAPs) that include sulfuric acid, ammonia, arsenic, beryllium, cadmium, chromium, nickel, copper, benzene, titanium, formaldehyde, lead, manganese, mercury, dioxins, selenium, hydrogen chloride, styrene, silver, zinc and other compounds. Testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. APP-1, DEP-AIR-2, DEP-AIR-19, DEP-AIR-24, DEP-AIR-25, DEP-AIR-26, DEP-AIR-29.

40. PRE's initial Air Permit Application submittal identified the Facility as a major source of HAPs and subject to National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial and Institutional Boilers and Process Heaters, the Boiler Maximum Available Control Technology ("Boiler MACT"), 40 C.F.R. Part 63 Subpart DDDDD. Testimony of Grillo on August 13 and 19, 2008; testimony of Holzman on August 19, 2008. Exh. APP-1, DEP-AIR-2.

41. On August 28, 2007, DEP notified PRE that the U.S. Court of Appeals had vacated the Boiler MACT on July 30, 2007 and that the Facility would be subject to review under Section 112(g) of the Clean Air Act and R.C.S.A. Section 22a-174-3a(m), its implementing regulation in Connecticut. Testimony of Grillo, August 19, 2008. Exh. DEP-AIR-16.

42. On October 24, 2007, PRE revised the emission rates for hydrogen chloride, benzene and styrene from the Facility such that potential emissions of each HAP will be limited to less than 10 TPY and emissions of HAPs in the aggregate will be less than 25 TPY. Pursuant to the Revised Draft Air Permit, the Applicant will calculate and record monthly HAPs emissions[9]. The Applicant will control emissions such that no single HAP will be emitted at greater than the more stringent of the MASC and/or ten tons in any period of twelve consecutive calendar months and no combination of HAPs emissions will be emitted at greater than or equal to a total of twenty-five tons in any period of twelve consecutive calendar months. With these limits and rates, the Facility is not considered a major stationary source of HAPs and it is not subject to a MACT determination under R.C.S.A. Section 22a-174-3a(m). Testimony of Holzman of August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. DEP-AIR-19, DEP-AIR-26, DEP-AIR-29.

43. The Applicant is required to demonstrate compliance with the maximum allowable stack concentration (MASC) for each HAP emitted from the Facility. The initial

[9] Those included in the list of hazardous air pollutants established by 42 U.S.C. 7412(b)(1) and listed in Section 112(b) of the Clean Air Act Amendments of 1990, as amended by 40 C.F.R. Part 63, Subpart C.

MASC compliance demonstrations were partially based on estimated hourly emissions rates, exhaust flow rates, the minimum stack distance to property line and emissions factors taken from EPA AP 42, Chapter 1.6 – Wood Residue Combustion in Boilers[10]. Emission factors for some metal compound HAPs were also developed based on mass balance calculations with conservative assumptions about metals partitioning and control efficiency of the spray dryer scrubber and baghouse. Other HAP emission factors were also estimated from review of actual stack test data from existing wood-fired boilers contained in EPA's Boiler MACT emissions database)[11], including those using C&D wood. Testimony of Holzman, August 19, 2008 and testimony of Grillo, August 19, 2008. Exh. APP-1, DEP-AIR-2, DEP-AIR-19, DEP-AIR-24, DEP-AIR-25, DEP-AIR-26, DEP-AIR-29.

Draft Permit

44. The Revised Draft Air Permit identifies state and federal statutes and regulations governing the operation of the Facility, restricting emissions, and establishing the requirements for stack testing, emissions monitoring and record keeping. The Revised Draft Air Permit provides that the Applicant must conduct, maintain and operate the Facility in compliance with all applicable requirements. Testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. DEP-AIR-24, DEP-AIR-25, DEP-AIR-26, DEP-AIR-29.

45. The Revised Draft Air Permit for the FBG specifies the allowable emissions limits for the criteria pollutants, ammonia, and HAPs based on the BACT/LAER and MASC determinations. The Revised Draft Air Permit establishes operational conditions, including the allowable fuel types (Table 1 of Revised Draft Air Permit), maximum biomass consumption rate (495,305 tons/year based on design higher heating value of 4,624 Btu/lb), and maximum fuel

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[10] EPA AP 42, Fifth Edition, *Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources,* Chapter 1.6 – Wood Residue Combustion in Boilers. AP-42 is a compilation of stack test reports prepared primarily during the late 1980s and early 1990s and periodically updated. The data were collected and compiled for EPA to establish emissions factors for many stationary source categories, providing a reference for permitting agencies.

[11] EPA's MACT subpart DDDDD database of test data - http://www.epa.gov/ttn/atw/combust/boiler/boilerpg.html.

sulfur (1%) and chlorine (0.15%) contents. The control equipment is specified as SNCR, multiclone, spray dryer scrubber, fabric filter (baghouse) and bed additive injection. Testimony of Donovan, August 13 and 19, 2008, testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. DEP-AIR-24, DEP-AIR-25, DEP-AIR-26, DEP-AIR-29.

46. Continuous emissions monitoring (CEM) is required for opacity, SO_X, NO_X, CO and NH_3 in accordance with the source monitoring, recordkeeping and reporting requirements of R.C.S.A. §22a-174-4. Other continuous monitoring or measuring devices are required on the FBG, including baghouse leak detection, unit load, baghouse inlet temperature, pressure drop across the baghouse, oxygen, ammonia, and SNCR temperature. The continuous baghouse leak detection monitor will ensure that the integrity of the filter bags is not compromised during operation. Monitoring equipment is to be installed, calibrated and approved by the DEP prior to commercial operation of the FBG. Testimony of Donovan, August 13 and 19, 2008, testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. APP-1, DEP-AIR-24, DEP-AIR-25, DEP-AIR-26, DEP-AIR-29.

47. The Revised Draft Air Permit also requires periodic stack testing for criteria pollutants and HAPs, monitoring, reporting and record-keeping, and assuring compliance with federal New Source Performance Standards. Testimony of Donovan, August 13 and 19, 2008, testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. APP-1, DEP-AIR-24, DEP-AIR-25, DEP-AIR-26, DEP-AIR-29.

48. Additional terms and conditions in the Revised Draft Air Permit require that the Applicant submit a comprehensive written operations and maintenance plan for all air pollution emitting activities and control equipment. Testimony of Donovan, August 13 and 19, 2008, testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. APP-1, DEP-AIR-24, DEP-AIR-25, DEP-AIR-26, DEP-AIR-29.

49. The Air Permits Unit of EPA provided written comments on the Draft Air Permit and asked DEP to address these comments before issuing the final Draft Air Permit. EPA recommended that DEP remove exemptions from the permit limits during periods of startup,

shutdown, malfunction and scheduled maintenance, which are not allowed according to EPA policy under the PSD and non-attainment NSR programs. EPA further recommended that DEP determine and document that compliance with BACT/LAER limits is infeasible during startup, shutdown and maintenance operations and then establish secondary BACT/LAER limits or work practices for those operations. EPA also requested that the secondary limits or work practices be documented to meet BACT/LAER and comply with all other PSD and non-attainment NSR requirements. These changes were incorporated in the Revised Draft Air Permit, including a requirement to develop startup and shutdown emission rates based on CEM data collected over the first year of commercial operation and to obtain additional NO_X offsets and provide additional ambient air quality compliance demonstrations, if necessary. Testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. DEP-AIR-24, DEP-AIR-25, DEP-AIR-26, DEP-AIR-29, DEP-AIR-30.

50. Following issuance of its Tentative Determination, DEP recommended, and the Applicant has agreed to, certain clarifications in the Revised Draft Air Permit for the FBG. Specifically, a condition was added to the Draft Air Permit requiring that the permittee notify DEP of any malfunctions within thirty days following the end of each calendar quarter. In addition, the Revised Draft Air Permit clarifies that only filterable $PM_{2.5}$ stack testing is required initially and that both filterable and condensable $PM_{2.5}$ shall be tested within one year following EPA's promulgation of a condensable $PM_{2.5}$ reference test method. Testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. DEP-AIR-26, DEP-AIR-29, DEP-AIR-33.

51. The Applicant proposed a revision to the Draft Air Permit to clarify that the 3-hour startup period shall not begin until biomass fuel is first introduced into the gasifier chamber and that, in order to minimize unreacted ammonia emissions, ammonia or urea injection into the SNCR system is not required when the FBG is operating outside the manufacturer's recommended temperature range during startup and shutdown. In response, DEP added a condition that the Applicant monitor SNCR temperature for comparison to the manufacturer's recommended operating range. The Applicant also requested that the lb/MMBtu limits for hydrogen chloride and mercury be deleted as the short-term and annual emission limits are

already adequately addressed elsewhere in the Draft Air Permit and could otherwise be interpreted as instantaneous permit limits. Lastly, the Applicant requested that the 3.0E-06 lb/MMBtu mercury emission limit be deleted from the Draft Air Permit, since it was a relic from the vacated Boiler MACT, which is no longer applicable to the FBG. DEP reviewed the Applicant's requests and incorporated modifications into the Revised Draft Air Permit. The Applicant is in agreement with the Draft Air Permit as revised. Testimony of Donovan, August 13 and 19, 2008, testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. DEP-AIR-29, DEP-AIR-26, DEP-AIR-29, DEP-AIR-33.

CONCLUSIONS OF LAW

Jurisdiction

The Commissioner is authorized to adopt and implement regulations to control and prohibit air pollution and to issue permits for the construction and operation of new sources of air pollution in accordance with those regulations. Conn. Gen. Stat. Section 22a-174(a) and (c). The regulations must be consistent with federal law, which provides that any state may develop an acceptable procedure for implementing and enforcing federal standards of performance for new sources of air pollution. 42 U.S.C. Section 7411(c). The Commissioner has promulgated R.C.S.A. Sections 22a-174-1 to 22a-174-100, which include the standards of performance for new sources of air pollution. Section 22a-174-3a specifies the application procedures, criteria and standards for issuing permits to construct and operate stationary sources of air pollution.

Prior to issuing permits to construct and operate the Facility, the Commissioner must determine that the applicable provisions of the new source review regulations have been satisfied. This includes a determination that all emissions rates and operational limits determined to be BACT or LAER are consistent with relevant regulatory requirements. The Applicant must demonstrate that it has complied and will comply with applicable state and federal statutes and regulations, and also applicable permit terms and conditions.

Regulatory Requirements

New Source Permit Application

An application for a permit to construct and operate a regulated source of air pollution must include, among other things, an executive summary, background information pertaining to the owner/operator of the source and other contact information, a premises site plan, technical information, emissions rates for individual air pollutants, BACT and LAER determinations (as applicable), compliance history information, an authorized signatory certification, and all application fees. R.C.S.A. Section 22a-174-3a(c)(1)(A)-(L). The Applicant has provided the information required by Section 22a-174-3a(c).

Standards for Issuing Air Permit

R.C.S.A. Section 22a-174-3a(h) imposes a duty on any owner or operator of a stationary source of pollution to comply with the terms and conditions of any permit issued by the Commissioner. Further, §22a-174-3(d)(2) provides that an air permit will not be issued unless the Commissioner determines that the owner or operator of the subject stationary source will comply with the applicable provisions of §22a-174-3a(d)(3). The Applicant is subject to §22a-174-3a(h) and the following provisions of §22a-174-3a(d)(3).

- *Construct and operate such stationary source ... in accordance with the permit, and operate such stationary source ... in accordance with all applicable and relevant emissions limitations, statutes, regulations, schedules for stack tests, and other order of the Commissioner ... §22a-174-3a(d)(3)(A).*

The Applicant does not object to the relevant regulations or statutes governing its Air Permit Application or to the terms and conditions of the Revised Draft Air Permit as revised by agreement of DEP and the Applicant. Testimony of Donovan, August 13 and 19, 2008, testimony of Holzman, August 19, 2008 and testimony of Grillo, August 13 and 19, 2008. Exh. DEP-AIR-29. The Revised Draft Air Permit specifies emissions limitations, stack testing

requirements and the authority of the Commissioner to revise these conditions, if necessary. The Revised Draft Air Permit provides that the Applicant must construct and operate the Facility in accordance with all applicable requirements. The Applicant has certified the Air Permit Application, including the conformance form. The Applicant has demonstrated to the satisfaction of DEP, as required by applicable law, that it will construct and operate the Facility in accordance with all relevant emissions limitations, stack test requirements and any other requirement of the Commissioner.

- *Operate such stationary source ... without preventing or interfering with the attainment or maintenance of any applicable ambient air quality standards or any Prevention of Significant Deterioration increments under subsection (k) of this section. §22a-174-3a(d)(3)(B)*

The Applicant has provided ambient air quality analyses, source impact analyses and additional impact analyses as required under subsection (k) of §§22a-174-3a and 22a-174-24, all using methods acceptable to the Commissioner. These analyses are based on the emissions and operational limitations as set forth in the Revised Draft Air Permit, as revised by agreement of DEP and the Applicant. DEP-AIR-29. The Revised Draft Air Permit requires the Applicant to monitor emissions in order to maintain the specified emission limitations. The record shows that compliance with the permit terms and conditions will not cause or contribute to the violation of any applicable ambient air quality standards or PSD increments. The Applicant has therefore demonstrated that the Facility will operate in accordance with the requirements of this provision.

- *Operate such stationary source ... without preventing or interfering with the attainment or maintenance of any [NAAQS] in any other state and without interfering with the application of the requirements in any other state's implementation plan... §22a-174-3a(d)(3)(C).*

The Applicant has demonstrated by approved methods of mathematical predictive modeling that compliance with the emissions and operational limits in the Revised Draft Air Permit, as revised by agreement of DEP and the Applicant, will not significantly impact air quality or

interfere with the attainment of any NAAQS. Further, DEP has required of the Applicant acquisition of a sufficient number of certified offsetting emission reduction credits (ERCs) for NO_X emissions prior to final permit issuance. On these facts, it is reasonable to conclude that the Applicant will operate the Facility without preventing, or interfering with, the attainment or maintenance of any NAAQS in Connecticut or elsewhere, or compliance with the SIPs.

- *Operate such stationary source ... in accordance with all applicable emissions standards and standards of performance pursuant to 40 C.F.R. Parts 60, 61, and 63, ... §22a-174-3a(d)(3)(D).*

The fluidized bed gasifier (FBG) is subject to certain standards of performance pursuant to 40 C.F.R. Part 60. The Revised Draft Air Permit for this source incorporates the relevant requirements to ensure that the applicable performance standards are complied with at all times. DEP-AIR-29 Compliance with the terms and conditions of the Revised Draft Air Permit will result in the operation of the Facility in accordance with all applicable emissions standards and standards of performance pursuant to these regulations. In fact, the allowable emission limits in the Revised Draft Air Permit are more restrictive than the applicable federal performance standards in 40 C.F.R. Part 60.

- *Install: (i) sampling ports of a size, number and location as the Commissioner may reasonably require, (ii) instrumentation to monitor and record emission and other parameter data as the Commissioner may require, and (iii) such other sampling and testing facilities as the Commissioner may require...§22a-174-3a(d)(3)(E).*

The Revised Draft Air Permit includes requirements to install and operate continuous emissions monitoring systems, to perform periodic monitoring of emissions and process parameters, to conduct stack emissions testing, and to fulfill specific record keeping requirements. DEP-AIR-29. Compliance with these terms and conditions will result in the installation of sampling ports and monitoring instrumentation and such other sampling and testing facilities as the Commissioner requires.

- *As the Commissioner may require, conduct stack tests ... in accordance with subsection (e) of this section and in accordance with permit conditions and methods prescribed by the Commissioner. Such stack tests shall demonstrate, to the Commissioner's satisfaction, that the requirements of each and every applicable permit ... are being met and that such stationary source ... complies with the Regulations of Connecticut Agencies and federal requirements. §22a-174-3a(d)(3)(F).*

The Revised Draft Air Permit for the FBG sets forth the requirements for initial and periodic stack emissions testing that must be conducted in accordance with the provisions of §22a-174-5 and the DEP *Source Stack Testing General Requirements.* The Revised Draft Air Permit specifies that the Commissioner retains the right to revise these requirements, as necessary, to demonstrate compliance with the permit requirements. DEP-AIR-29. Therefore, the Applicant will conduct stack emissions testing to demonstrate compliance with each permit requirement and the applicable requirements of state and federal law.

- *Pay all fees required by the Department within forty-five (45) days of receipt of a tentative determination of the Commissioner. §22a-174-3a(d)(3)(G).*

The Applicant has paid all fees that were required at the time of issuance of the tentative determination.

- *Incorporate Best Available Control Technology as directed by the Commissioner, for each individual air pollutant subject to, and in accordance with, subsection (j) of this section. §22a-174-3a(3)(d)(3)(H).*

The Applicant has provided numerous BACT determinations for the relevant criteria pollutants and ammonia emissions from the FBG. DEP has reviewed, commented on and approved these determinations. The Revised Draft Air Permit's emissions limits are based on these BACT determinations. The Applicant will incorporate BACT for emissions of NO_2, SO_X, VOC, CO, PM10, PM2.5, and ammonia, as required.

- *Incorporate LAER, as directed by the Commissioner, for each individual air pollutant subject to, and in accordance with, subsection (l) of this section. §22a-174-3a(d)(3)(I).*

The Applicant has provided LAER determinations for NOx emissions from the FBG and the emergency engine. DEP Staff has reviewed and revised these determinations. The Applicant's Facility will meet the requirements of §22-174-3a(l)(4)(A)(ii). The Applicant has demonstrated that "the benefits of the subject source significantly outweigh its adverse environmental impacts, including secondary impacts and cumulative impacts, and social costs imposed as a result of location, [and] construction ..." §22-174-3a(l)(2)(A). The relevant permit emissions limit (NO_x) is based on these LAER determinations and the Revised Draft Air Permit specifies the ERCs to be used to offset NOx emissions. With compliance with the Revised Draft Air Permit's emissions limits and related requirements, the Applicant will comply with LAER for NOx emissions.

- *Incorporate the maximum available control technology (MACT), as directed by the Commissioner, for each individual air pollutant subject to, and in accordance with, subsection (m) of this section. §22a-174-3a(d)(3)(J).*

The Applicant is not subject to the requirements of R.C.S.A. Section 22a-174-3a(d)(3)(J). This subpart does not apply to the Facility because the HAPs emissions limits in the Revised Draft Air Permit are below the levels that require a MACT determination.

- *As required by the Commissioner, install monitoring equipment and perform monitoring to demonstrate compliance with any permit provision. Such monitoring may include, but not be limited to, continuous emission monitoring (CEM). §22a-174-3a(d)(3)(K).*

The Revised Draft Air Permit requires the Applicant to install and calibrate CEM equipment in accordance with the source monitoring, recordkeeping and reporting requirements of §22a-174-4 and to receive DEP approval of that equipment prior to commercial operation of the FBG. Other monitoring or measuring devices are required on the FBG and the emergency engine. The Applicant is also required to maintain records of the results of these monitoring devices in order

to demonstrate compliance with permit provisions. Therefore, the Applicant will install the CEM system and other monitoring equipment necessary to perform the required record keeping and to demonstrate compliance with the Revised Draft Air Permit's provisions.

- *Provide the Commissioner with current information regarding air pollutant emissions from such stationary source ... §22a-74-3a(d)(3)(L).*

The Applicant has demonstrated compliance with all DEP requests to update its emission information on all sources during the technical review of the Air Permit Application. The Applicant has also voluntarily provided DEP with other related information. The Revised Draft Air Permit requires that records must be maintained for purposes of demonstrating compliance with emission limits. The Applicant has complied with the requirements of this regulatory provision.

- *Comply with any applicable maximum allowable stack concentration (MASC) or other emissions limitation of §22a-174-29. §22a-174-3a-(d)(3)(M).*

The Revised Draft Air Permit for the FBG requires that HAPs emissions not exceed any applicable MASCs and that the Applicant comply with the provisions of §22a-174-29. The Applicant is required to conduct stack emissions tests for each HAP to demonstrate compliance with MASC, which is to be calculated in accordance with §22a-174-29, and to maintain records on HAPs emissions. The Applicant will be in compliance with the applicable MASCs for HAPs emissions.

- *Demonstrate that the emission limitation required of such stationary source ... for the control of any air pollutant shall not be affected by that portion of the stack height of such stationary source ... that exceeds good engineering practice [GEP] stack height or by any other dispersion technique. §22a-174-3a(d)(3)(N).*

The approved stack height referenced in the Revised Draft Air Permit is less than the GEP stack height. Therefore, this requirement has been met or, in the alternative, is not applicable.

- *Comply with an approved operation and maintenance plan submitted pursuant to subsection (c)(2) of this section. §22a-174-3a(d)(3)(O).*

The Revised Draft Air Permit requires the Applicant to file an operation and maintenance plan for all air pollution emitting activities and air pollution control equipment. The Applicant will therefore comply with this regulatory provision.

- *Have completed and submitted, on forms prescribed by the Commissioner, a pre-inspection questionnaire, if requested to do so by the Commissioner, which describes the equipment, processes and materials used. §22a-174-3a(d)(3)(P).*

A pre-inspection questionnaire has not been requested of the Applicant. DEP has determined that, with the submittal of information on equipment, processes and other materials as part of the Air Permit Application, the Applicant has complied with this regulatory provision.

- *Make the permit available at the subject premises throughout the period that such permit is in effect. §22a-174-3a-(d)(3)(Q).*

The Revised Draft Air Permit requires that the Applicant comply with applicable statutes and regulations, including this provision.

- *Comply with the applicable provision of this section and any other applicable regulations, permits or order of the Commissioner for such stationary source. §22a-174-3a(d)(3)(R).*

The Revised Draft Air Permit provides that the Applicant has the responsibility to conduct, maintain and operate the Facility in compliance with all applicable requirements of any federal or state agency and in accordance with any federal or state law. The Revised Draft Air Permit also provides that the Commissioner may impose additional conditions to ensure compliance with emission limits and applicable regulations and laws, if necessary. The record shows that the

Applicant has no history of noncompliance with any environmental laws. The evidence supports the conclusion that the Applicant will comply with any applicable regulations, permit terms or conditions, or orders of the Commissioner.

- *The Commissioner may require the applicant to publish notice of the application in media that serves the needs of the community ... R.C.S.A. § 22a-174-2a(b)(2)(A)*

The Applicant has complied with the requirements of R.C.S.A. Section 22a-174-2a(b)(2)(A) by publishing notice of application in the *Norwich Bulletin* on August 10, 2006.

- *In the event the Commissioner requires compliance with subparagraph (a) of this subdivision, the applicant shall submit to the Commissioner a certified copy of the notice ... R.C.S.A. § 22a-174-2a(b)(2)(B)*

The Applicant has complied with the requirements of R.C.S.A. Section 22a-174-2a(b)(2)(B) by submitting a Certification of Notice Form – Notice of Application dated August 16, 2006.

- *With respect to notice of tentative determination for any application for a permit, other than an general permit, the applicant shall comply with the requirements of section 22a-h of the Connecticut General Statutes ... R.C.S.A. § 22a-174-2a(b)(3)*

Conn. Gen. Stat. Section 22a-6h requires that the Commissioner shall publish or cause to be published, at the Applicant's expense, notice of the tentative determination once in a newspaper having a substantial circulation in the affected area. Pursuant to R.C.S.A. Section 22a-174-2a(b)(3), the notice of tentative determination was published in the *Norwich Bulletin* on April 7, 2008.

CONCLUSION

The Applicant has demonstrated by a preponderance of the evidence that it has complied and will comply with all applicable provisions of the Connecticut General Statutes and the Regulations of Connecticut State Agencies governing new sources of air pollution. The Revised Draft Air Permit, as revised by agreement of DEP and the Applicant, provides that the Applicant must conduct its operations in accordance with the relevant sections of subdivision (d) of R.C.S.A. Section 22a-174-3a and the CAA. The Applicant has complied with the regulatory requirements, and has shown that the operation of its Facility will comply with the Revised Draft Air Permit's terms and conditions and will not adversely affect ambient air quality or impede attainment of any NAAQS.

AGREED TO BY:

PLAINFIELD RENEWABLE ENERGY, LLC

By _____

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Its Attorneys
242 Trumbull Street
Hartford, CT 06103-1212
(860) 275-0371

DEPARTMENT OF ENVIRONMENTAL PROTECTION

By _____

Richard A. Pirolli, Assistant Director
Engineering and Enforcement Division
Bureau of Air Management
79 Elm Street, 5th Floor
Hartford, Connecticut 06106

EXHIBIT A

STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR MANAGEMENT

NEW SOURCE REVIEW PERMIT
TO CONSTRUCT AND OPERATE
A STATIONARY SOURCE

Issued pursuant to Title 22a of the Connecticut General Statutes (CGS) and Section 22a-174-3a of the Regulations of Connecticut State Agencies (RCSA).

Owner/Operator:	Plainfield Renewable Energy LLC
Address:	20 Marshall Street, Suite 300 Norwalk, CT 06854
Equipment Location:	Norwich Road, Plainfield, CT 06374
Equipment Description: power	37.5 MW (net) Biomass fluidized bed gasification power plant

Town-Permit Number:	145-0049
Premises Number:	74
Permit Issue Date:	
Expiration Date:	None

Gina McCarthy
Commissioner

Date

PERMIT FOR FUEL BURNING EQUIPMENT

STATE OF CONNECTICUT, DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR MANAGEMENT

The conditions on all pages of this permit and attached appendices shall be verified at all times except those noted as design specifications. Design specifications need not be verified on a continuous basis; however, if requested by the commissioner, demonstration of compliance shall be shown.

PART I. OPERATIONAL CONDITIONS

A. Process Description

The power plant will use a fluidized bed staged gasification process with a close-coupled boiler to power the steam turbine generator. The biomass fuel will come from various sources which includes forest management residues, land clearing debris, waste wood from industries, construction and demolition (C&D) waste.

During startup bio-diesel (B100) is used to supplement the solid fuel supply.

B. Operating Limits

1. Fuel Type(s): Wood biomass[1], bio-diesel (B100)[2]
2. Maximum wood biomass Consumption over any Consecutive 12 Month Period: 495,305 tons/year based on a design higher heating value (HHV) of 4,624 Btu/lb

   The maximum wood biomass fuel consumption rate is based upon the maximum allowable heat input rate to the boiler of 523.1 MMBtu/hr. The actual consumption rate varies as a function of the actual fuel higher heating value.

3. Maximum bio-diesel (B100) consumption[3]: 781 gal/hr based on a design heating value of 128,047 Btu/gal
4. Maximum Fuel Sulfur Content (% by weight, dry basis): 1 (biomass)
5. Maximum Chlorine Content (% by weight, dry basis): 0.15

[1]**Note: Allowable Biomass fuels are described in Table 1 of this permit and may utilize 100% of any of the fuels at any time. The Permittee shall comply with the "Biomass Wood Supply Quality Control Procedures" and "Operating, Sampling & Testing Requirements (Exhibit 1), documents dated 01/18/08, amended from time to time.**

[2]**Note: Bio-diesel (B100) fuel shall be derived from 100% non-fossil fuels.**

[3]**Note: There is no annual restriction on the quantity of Bio-diesel (B100) that can be combusted in this unit.**

PERMIT FOR FUEL BURNING EQUIPMENT

STATE OF CONNECTICUT, DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR MANAGEMENT

PART I. OPERATIONAL CONDITIONS, continued

TABLE 1. Allowable Fuels:

Biomass Wood	Description
Land Clearing debris	Chipped trees, stumps, branches or brush as defined in RCSA 22a-208a-1
Recycled wood or clean wood	Recycled wood or clean wood means any wood or wood fuel which is derived from such products or processes as pallets skids, spools, packaging materials, bulky wood waste or scraps from newly built wood products, provided such wood is not treated wood. [CGS 22a-209a][RCSA 22a-208a-1]
Regulated wood fuel Processed Construction and Demolition wood	Regulated wood fuel means processed wood from construction and demolition activities which has been sorted to remove plastics, plaster, gypsum wallboard, asbestos, asphalt shingles and wood which contains creosote or to which pesticides have been applied or which contains substances defined as hazardous under section CGS 22a-115. [CGS 22a-209a]
Other Clean Wood	Other types if properly sized, clean, uncontaminated wood materials, such as sawdust, chips, bark, tree trimmings or other similar materials

***Note: "Treated wood" means wood which contains an adhesive, paint, stain, fire retardant, pesticide or preservative [CGS 22a-209a(2)]. The use of treated wood containing pesticide or preservatives shall not be considered an allowable fuel pursuant to the definition of "regulated wood fuel" [CGS 22a-209a(4)].**

6. The Permittee shall not cause or allow the bag house unit to operate at a temperature above the manufacturer's recommended design range for the bag material used. The filter media shall use acid resistant coatings.

7. Injection of additives (limestone, lime, dolomite or other materials), as determined during the initial performance test, into the bed material or dry scrubber shall be in sufficient quantities to maintain the SOx emissions rate in Part VI of this permit.

8. "Steady-state" operation shall be defined as operation of the fluid bed gasifier when the rate of change in load (i.e. lbs of steam), with respect to time, is less than 5 percent per hour; except for such operation that occurs during periods of start-up, shutdown, malfunction, fuel switching, and equipment cleaning. Additionally, steady-state operation shall include all modes of operation during which the fluid bed gasifier load exceeds 50% of the manufacturer's specified maximum.

PERMIT FOR FUEL BURNING EQUIPMENT

STATE OF CONNECTICUT, DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR MANAGEMENT

PART I. OPERATIONAL CONDITIONS, continued

9. "Transient" operation shall be defined as operation of the fluid bed gasifier when the rate of change in load, with respect to time, is greater than 5 percent per hour. Additionally, transient operation shall include and describe the operation of the fluid bed gasifier during all phases of start-up, shutdown, fuel switching and equipment cleaning where the load is less than 50% of the manufacturer's specified maximum.

10. "Malfunction" shall be defined as any sudden, infrequent, and not reasonably preventable failure of air pollution control equipment, process equipment or a process to operate in a normal or usual manner. Failures that were caused in part by poor maintenance or careless operation are not malfunctions.

11. Bio-diesel (B100) shall be defined as a petroleum replacement fuel consisting of 100% virgin and/or used vegetable oils (both edible & non-edible) and/or animal fats. No petroleum (distillate) fuel oil shall be blended with the B100 fuel.

12. For one calendar year from the date of commencement of commercial operation, the Permittee shall track emissions of CO, SOx, NOx, VOC and PM-10 during transient operation of the fluid bed gasifier. Emissions of SOx, NOx and CO shall be tracked by means of the required continuous emissions monitoring systems. Emissions of VOC and PM-10 shall be correlated to fuel flow, fluid bed gasifier output or the combination thereof during the initial stack tests performed in accordance with Part VII of this permit. Emissions of VOC and PM-10 shall be tracked during transient operation by monitoring fuel flow, fluid bed gasifier output, or the combination thereof and estimating the resulting emissions according to the correlation developed during the initial stack tests.

PERMIT FOR FUEL BURNING EQUIPMENT

STATE OF CONNECTICUT, DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR MANAGEMENT

PART I. OPERATIONAL CONDITIONS, continued

Within sixty (60) days of the end of one (1) calendar year of commercial operation of the fluid bed gasifier, the Permittee shall submit a report of observed transient emissions and of any operating parameters observed in order to estimate transient emissions. This permit shall be subject to modification to include a table of emission limits for CO, SOx, NOx, VOC and PM-10 during transient operation of the fluid bed gasifier. The permittee may be required to obtain additional NOx offsets and complete additional ambient air quality analysis to show that the NAAQS and PSD increments have not been violated. All transient emissions shall be counted toward the annual emissions limits in Part VI of this permit.

13. The "Administrator" means the Administrator of the United States Environmental Protection Agency. [RCSA 22a-174-1(3)]

14. The "Commissioner" means the Commissioner of the Environmental Protection, or any member of the Department or any local air pollution control official or agency authorized by the commissioner, acting singly or jointly, to whom the commissioner assigns any function arising under the provisions of these regulations. [RCSA 22a-174-1(23)]

C. Design Specifications

Primary fuel

1. Maximum Fuel Firing Rate(s): 1,357 tons/day at a higher heating value (HHV) of 4,624 Btu/lb
2. Maximum Gross Heat Input (MMBTU/hr): 523.1
3. Nominal Steam Production (lbs/hr): 365,000
4. Nominal Electrical Generation (MW): 37.5 (net)

Auxiliary fuel: B100

1. Maximum Fuel Firing Rate(s): 781 gal/hr at a higher heating value (HHV) of 128,047 Btu/gallon
2. Maximum Gross Heat Input (MMBTU/hr): 100

PERMIT FOR FUEL BURNING EQUIPMENT

STATE OF CONNECTICUT, DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR MANAGEMENT

PART I. OPERATIONAL CONDITIONS, continued

D. Stack Parameters

Primary fuel

1. Minimum Stack Height (ft): 155
2. Minimum Exhaust Gas Flow Rate at maximum load (acfm): 206,585 (biomass); 25,992 (B100)
3. Stack Exit Temperature (°F): 253
4. Minimum Distance from Stack to Property Line (ft): 69

E. Expected Control Efficiency

Type of control	Overall control efficiency	Pollutants Controlled
Selective Non-Catalytic Reduction (SNCR)	70%	NOx
Multicyclone	80%	PM
Spray Dryer	90% Efficiency includes bag house	SOx, HCL and metals
Bed Additive Injection	See Note[a]	SOx, HCL, H_2SO_4
Baghouse	99% PM/PM-10/PM-2.5 (filterable); 90% SOx, HCL, and metals	PM/PM-10/PM-2.5 (filterable), SOx, HCL and metals

Note (a): Expected overall control efficiency for combination of bed additive injection and spray dryer shall be as stated for the spray dryer. Bed additive injection shall be used to supplement spray dryer as necessary to achieve emission limits in Part VI.

PART II. CONTROL EQUIPMENT (Applicable if -X- Checked) (See Appendix E for Design Specifications)

A. Type

- ☐ None
- ☒ Scrubber: spray dryer
- ☐ Electrostatic Precipitator
- ☐ Cyclone
- ☒ Multi-Cyclone
- ☐ Thermal DeNOx
- ☒ Selective Non-Catalytic Reduction
- ☐ Selective Catalytic Reduction
- ☐ Low NOx Burner
- ☒ Fabric Filter: Bag House
- ☐ Particulate Trap
- ☒ Bed Additive Injection

PERMIT FOR FUEL BURNING EQUIPMENT

STATE OF CONNECTICUT, DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR MANAGEMENT

PART III. CONTINUOUS EMISSION MONITORING REQUIREMENTS AND ASSOCIATED EMISSION LIMITS (Applicable if -X- Checked)

CEM shall be required for the following pollutant/operational parameters and enforced on the following basis:

Pollutant/Operational Parameter	Averaging Times	Emission Limit	Units
☒ Baghouse leak detection	*	**	
☒ Opacity	six-minute block	10%	
☒ SOx	3 hour block	15.4	ppmvd @ 7% O_2
☒ NOx	24 hour block	45.3	ppmvd @ 7% O_2
☒ CO	8 hour block	103.7	ppmvd @ 7% O_2
☒ O_2	1 hour block		
☒ Ammonia	24 hour block	20	ppmvd @ 7% O_2
☒ Unit Load	4 hour block		steam flow
☒ Baghouse inlet temp.	24 hour block		
☒ Pressure drop across bag house	24 hour block		inches water
☒ SNCR Temperature	1 hour block		

*** Note: Averaging time, sensitivity range, alarm set points and alarm delay time to be determined during the initial adjustment of the system.**

**** Note: The leak detection system emission output data will be determined based on whether the monitor uses a relative or absolute particulate matter output system. The baghouse leak detection data is to be used to ensure the integrity of the bags is not compromised during operation.**

The Permittee shall meet the performance and quality assurance specifications for the operation of CEM equipment pursuant to RCSA Section 22a-174-4.

(See Appendix A for General Requirements)

PERMIT FOR FUEL BURNING EQUIPMENT

STATE OF CONNECTICUT, DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR MANAGEMENT

PART IV. MONITORING, RECORD KEEPING AND REPORTING REQUIREMENTS

A. Monitoring

1. The Permittee shall use a non-resettable totalizing fuel metering device to continuously monitor bio-diesel (B-100) fuel feed to this permitted source.

2. The Permittee shall comply with the monitoring requirements for sulfur dioxide (SO_2) emissions as required in 40 CFR 60.47b.

3. The Permittee shall comply with the monitoring requirements for particulate matter and nitrogen oxides (PM & NOx) emissions as required in 40 CFR 60.48b.

4. The Permittee shall install a bag leak detection system on the baghouse. The system shall be subject to the following:

   i. The bag leak detection system must be certified by the manufacturer to be capable of continuously detecting and recording particulate matter emissions at concentration of 1.0 milligrams per actual cubic meter.
   ii. The bag leak detection system shall provide output of relative or absolute particulate matter loadings.
   iii. The system shall be equipped with an alarm system that will sound an audible alarm when an increase in relative particulate loadings is detected over a preset level.
   iv. The system shall be installed and operated in a manner consistent with available written guidance from the U.S. Environmental Protection Agency or, in the absence of such written guidance, the manufacturer's written specifications and recommendations for installation, operation and adjustment of the system.

PERMIT FOR FUEL BURNING EQUIPMENT

STATE OF CONNECTICUT, DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR MANAGEMENT

PART IV. MONITORING, RECORD KEEPING AND REPORTING REQUIREMENTS, cont.

5. The O&M plan required pursuant to Part IX.D of this permit must include a corrective measures plan that specifies the procedures to be followed in the case of a bag leak detection system alarm. The corrective measures plan must include, at a minimum, the procedures used to determine and record the time and cause of the alarm as well as the corrective measures taken to correct the control device malfunction or minimize emissions as specified below:

   i. the applicant must initiate the procedures used to determine the cause of the alarm within 30 minutes of the time the alarm first sounds; and
   ii. must alleviate the cause of the alarm by taking the necessary corrective measure(s) which may include, but are not to be limited to inspecting the baghouse for air leaks, torn or broken filter elements, or any other malfunctions that may cause an increase in emissions; sealing off defective bags or filter media; replacing defective bags or filter media, or otherwise repairing the control device; sealing off a defective baghouse compartment; cleaning the bag leak detection probe, or otherwise repairing the bag leak detection system; or shutting down the combustor.

B. Record Keeping

1. The Permittee shall keep records of daily and annual fuel consumption. Annual fuel consumption shall be based on any consecutive 12 month time period and shall be determined by adding (for each fuel) the current month's fuel usage to that of the previous 11 months. The Permittee shall make these calculations within 30 days of the end of the previous month.

2. The Permittee shall keep records of the fuel certification for each delivery of bio-diesel (B-100) fuel oil from the fuel supplier or a copy of the current contract with the fuel supplier supplying the fuel used by the equipment. The shipping receipt or contract shall include the date of delivery, the name of the fuel supplier and type of fuel delivered.

PERMIT FOR FUEL BURNING EQUIPMENT

STATE OF CONNECTICUT, DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR MANAGEMENT

PART IV. MONITORING, RECORD KEEPING AND REPORTING REQUIREMENTS, cont.

3. The Permittee shall keep records of all performance tests conducted to determine compliance with the emissions limits in Part VI of this permit.

4. The Permittee shall develop pollution control inspection procedures pursuant to the manufacturer's recommendations. The Permittee shall keep records of all inspections to pollution control devices. These records shall include the date of inspection, any findings of pollution control failures and the time period for corrective action.

5. The Permittee shall develop a written startup, shutdown and malfunction plan.

6. The Permittee shall keep records for the bag leak detection system consisting of the date, time and duration of each alarm, the time corrective action was initiated and completed, a brief description of the cause of the alarm, and the corrective action taken.

7. The Permittee shall comply with the reporting and recordkeeping requirements as required in 40 CFR 60.49b.

8. The Permittee shall record each and every exceedance of an emission limit or operating parameter contained in this permit. Such records shall include the date and time of the exceedance, a description of the exceedance, and the duration of the exceedance. Such report shall contain copies of the exceedance records for the month, an explanation of the likely causes of the exceedances, and an explanation of remedial actions taken to correct the exceedance.

The Permittee shall keep all records required by this permit for a period of no less than five years and may maintain the above records at an off-site location and shall submit such records to the commissioner upon request.

PERMIT FOR FUEL BURNING EQUIPMENT

STATE OF CONNECTICUT, DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR MANAGEMENT

PART IV. MONITORING, RECORD KEEPING AND REPORTING REQUIREMENTS, cont.

C. Reporting

1. The Permittee shall submit all required reports pursuant to RCSA Sec. 22a-174-4(d) and Sec 22a-174-22(l).

2. The Permittee shall notify the commissioner in writing each calendar quarter of any malfunction of the fluidized bed gasifier, the air pollution control equipment or the continuous monitoring system. The Permittee shall submit such notification within thirty days following the end of each calendar quarter. The notification shall include the following:

   a. Description of the malfunction, date and time, the duration and a description of the circumstances surrounding the cause or likely cause of such malfunction and;
   b. Description of all corrective actions and preventative measures taken and/or planned with respect to such malfunction.

PART V. SPECIAL REQUIREMENTS FOR EMERGENCY ENGINES ONLY

Not applicable

PART VI. ALLOWABLE EMISSION LIMITS

The Permittee shall not cause or allow the emissions from this stationary source to exceed the emissions limits stated herein:
A. Steady state, full load operation at ISO conditions.

B. Start-up, Shut-down and Malfunction

1. The Permitee shall develop start-up and shut-down emission rates as required in Part I.B.12 of this permit over the first calendar year of commercial operation.
2. Start-up, shut-down and malfunction shall not exceed 3 hours for each occurrence. The 3-hour start-up period shall not begin until biomass fuel is first introduced into the gasifier chamber.

PERMIT FOR FUEL BURNING EQUIPMENT

STATE OF CONNECTICUT, DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR MANAGEMENT

PART VI. ALLOWABLE EMISSION LIMITS, continued

Primary Fuel: Biomass

Criteria Pollutants	lb/hr	lbs/MMBtu	Enforceable limits for pollutants monitored by CEMS (ppmvd @7% O_2)[a]	tpy
PM-10 (filterable)[b]	10.46	0.021		45.8
PM-2.5 (filterable)[b]	10.46	0.021		45.8
PM-2.5 (condensable)[c]	8.89	0.017		39.0
PM-2.5 (total)[c]	19.35	0.037		84.8
SOx	18.56	0.035[a]	15.4	81.29
NOx	39.23	0.075[a]	45.3	171.84
VOC	6.07	0.012		26.59
CO	54.67	0.105[a]	103.7	239.47
Pb	0.07	0.00014		0.32
Other Pollutants				
Ammonia			20	
Auxiliary Fuel: B100[d]				
PM-10	2.00			
SOx	0.17			
NOx	16.0			
VOC	0.27			
CO	4.0			

Note (a): Equivalent emission rate based on wood F-factor of 9,240 dscf/MMBtu. [40CFR Part 60, Appendix A, Table 19-2]

Note (b): Filterable particulate matter (PM-10 and PM-2.5) as measured by EPA Reference Method 5 or 17.

PERMIT FOR FUEL BURNING EQUIPMENT

STATE OF CONNECTICUT, DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR MANAGEMENT

PART VI. ALLOWABLE EMISSION LIMITS, continued

Note (c): Condensable PM-2.5 and total PM-2.5, including condensables, are estimated based on EPA AP-42 emission factor for condensable PM from wood residue, Table 1.6-1, Fifth Edition, September 2003. Initially, testing for filterable PM-2.5 shall be required. Within one year following the US EPA's promulgation of a condensable PM-2.5 reference test method, the Permittee shall test for both filterable and condensable PM-2.5.

Note (d): The use of B100 is not restricted to start-up operation. The B100 fuel can be fired in the auxiliary burners for initial/maintenance refractory curing and disposal beyond the typical 6-month shelf life.

At all times the Permittee shall comply with the requirements of Section 22a-174-29 of the RCSA, entitled "Hazardous Air Pollutants". The Permittee shall demonstrate compliance for each and every hazardous air pollutant emitted from this unit that is listed on Table 29-1, Table 29-2, or Table 29-3 of Section 22a-174-29 of the RCSA.

Hazardous Air Pollutant[d]	MASC[a] (ug/m^3)	Hazardous Air Pollutant	MASC (ug/m^3)
Sulfuric Acid	3,656	Formaldehyde	2,193.6
Ammonia	65,808.7	Lead	548.4
Arsenic	9.1	Manganese	3,656
Beryllium	1.8	Mercury	182.8
Cadmium	73.1	2,3,7,8-TCDD equivalents[b]	1.3E-04
Chromium	457	Selenium	731
Nickel	54.85	Hydrogen Chloride (HCL)	[c, d]
Copper	3,656	Styrene	2,834[e]
Benzene	2,834[e]	Silver	36.57
Titanium	54,848	Zinc	18,282

Note a: Maximum allowable stack concentration calculated based on maximum design exhaust gas flow rate of 214,655 acfm. For compliance purposes, actual stack concentrations must be compared to MASC values calculated based on exhaust gas volumes from performance testing.

Note b: Dioxin emissions as defined in RCSA § 22a-174-1(29).

Note c: No HLV value exists for HCL, stack testing is still required to determine emission rate.

PERMIT FOR FUEL BURNING EQUIPMENT

STATE OF CONNECTICUT, DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR MANAGEMENT

PART VI. ALLOWABLE EMISSION LIMITS, continued

Note d: The Permittee shall not emit more than 10 tons of any individual HAP or 25 tons of any combination of HAP, on an annual basis, listed in Section 112(b) of the Clean Air Act Amendments of 1990 at this premises.

Note e: The allowable MASC for these pollutants will exceed 10 tpy for each pollutant. These pollutants shall not exceed an actual stack concentrations (ASC) of 2,834 ug/m^3 (10 tons/year).

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

1. CEM data for NOx, SOx, CO, and ammonia
2. Initial and annual stack testing (or fuel testing) for all other pollutants

The above statement shall not preclude the commissioner from requiring other means (e.g. stack testing) to demonstrate compliance with the above emission limits, as allowed by state or federal statute, law or regulation.

PART VII. STACK EMISSION TEST REQUIREMENTS (Applicable if -X- Checked)

Stack emission testing shall be required for the following pollutant(s):

☐ None at this time

☒ PM 10/PM 2.5 See Notes (b & c) page 11/16 ☒ SOx ☒ NOx ☒ CO ☒ VOC ☒ Pb

☒ All hazardous air pollutants listed in Part VI of this permit. Compliance shall be determined by an annual performance test, either by fuel analysis and/or stack testing. Initial performance test shall require fuel sampling for all pollutants in listed in Part VI of this permit to compare the input concentrations to the stack emission rates for these pollutants.

PERMIT FOR FUEL BURNING EQUIPMENT

STATE OF CONNECTICUT, DEPARTMENT OF ENVIRONMENTAL PROTECTION
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PART VII. STACK EMISSION TEST REQUIREMENTS, continued

☒ Initial Performance testing shall include the baseline operating parameters (i.e. flow rate, pressure drop, and temperature) of all control equipment listed in Appendix E of this permit.

NOTE: Stack testing shall be conducted at or above ninety percent (90%) of maximum rated capacity. If the source does not achieve ninety percent maximum rated capacity during the stack test, the Permittee shall apply for a minor modification of this permit to address the actual maximum rated capacity achieved in practice.

All stack emissions tests shall be conducted in accordance with the requirements of Section 22a-174-5 of the RCSA. The Commissioner may attach additional requirements to the requirements of Section 22a-174-5 in order to demonstrate continual compliance with the requirements of this permit.

(See Appendix B for General Requirements)

PART VIII. APPLICABLE REGULATORY REFERENCES

RCSA §§22a-174-3a; 22a-174-4; 22a-174-7; 22a-174-18; 22a-174-19; 22a-174-22; 22a-174-29(b);

These references are not intended to be all inclusive - other sections of the regulations may apply.

PART IX. SPECIAL REQUIREMENTS

A. The Permittee shall possess, at least, 210 tons of external emissions reductions of NOx to offset the quantity of NOx emitted from this source to comply with RCSA Subsection 22a-174-3(l). Such a quantity is sufficient to offset the emissions from the sources listed at a ratio of 1.2 tons of reduction for every 1 ton of NOx emissions allowed under this permit. Such offsets shall have been obtained and approved by the Department prior to the date of issuance of the final construction/operating permit for this unit. The Permittee shall maintain sole ownership and possession of these emissions reductions for the duration of this permit and any subsequent changes to the permit.

PERMIT FOR FUEL BURNING EQUIPMENT

STATE OF CONNECTICUT, DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR MANAGEMENT

PART IX. SPECIAL REQUIREMENTS, continued

B. For one calendar year from the date of commencement of commercial operation, the Permittee shall track emissions of NOx and ammonia slip emissions during transient, steady-state and malfunction operation of the fluid bed gasifier. Emissions of NOx and ammonia shall be tracked by means of the required continuous emissions monitoring systems. During the initial calendar year of operation the permittee shall operate the fluid bed gasifier in a manner to optimize the NOx emissions.

Within sixty (60) days of the end of one (1) calendar year of commercial operation of the fluid bed gasifier, the Permittee shall submit a report of observed NOx and ammonia emissions, the report shall detail the lowest achievable NOx emission rate along with the corresponding ammonia slip emissions. This permit shall be subject to modification to include a change in the allowable emission limits for NOx and ammonia.

C. The permittee shall not exceed an emission rate of more than 0.00436 lbs/MMBtu for any Hazardous Air Pollutant (HAP) listed in Section 112(b) of the Clean Air Act Ammendments of 1990 at this premises.

In addition, the Permittee shall not emit more than 10 tons of any individual HAP or 25 tons of any combination of HAP, on an annual basis, listed in Section 112(b) of the Clean Air Act Amendments of 1990 at this premises.

D. The Permittee shall develop an operating and maintenance plan (O&M) for in accordance with the manufacturer's specifications and written recommendations. Appropriate records shall be made to verify that there is proper operation, monitoring and maintenance of all pollution control devices. The plan shall detail the procedures for operation, inspection, maintenance and corrective measures for all components of the combustor, including all associated pollution control equipment.

PERMIT FOR FUEL BURNING EQUIPMENT

STATE OF CONNECTICUT, DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR MANAGEMENT

PART IX. SPECIAL REQUIREMENTS, continued

E. The Permittee shall operate and maintain pollution control devices in accordance with the manufacture's specifications and written recommendations at all times during normal operation. Additionally, transient operation shall include and describe the operation of the plant during all phases of start-up, shutdown, fuel switching and equipment cleaning where the fluidized bed gasifier load is less than 50% of the manufacturer's specified maximum. During such times of transient operation pollution control devices shall be operated according to the manufacturer's specifications and written recommendations. The bag house can be operated in a by-pass mode during start-up/shut-down to avoid acid gas condensation on the filter media. The fluidized bed gasifier can be operated without SNCR urea or ammonia injection during a start-up/shut-down when the SNCR is not within the manufacture's specified operating temperature range.

F. The Permittee shall comply with the "Biomass Wood Supply Quality Control Procedures" and the "Operating, Sampling & Testing Requirements Volume Reduction/Facilities Generating C&D Wood Chips for Delivery to PRE" documents dated January 18, 2008 as amended from time to time.

G. The Permittee shall comply with all applicable requirements of Section 22a-174-6 of the RCSA, entitled "Air Pollution Emergency Episode Procedures".

H. *Noise (for non-emergency use)*

The Permittee shall operate this facility at all times in a manner so as not to violate or contribute significantly to the violation of any applicable state noise control regulations, as set forth in RCSA Sections 22a-69-1 through 22a-69-7.4.

I. The Permittee shall comply with all applicable sections of the following New Source Performance Standard(s) at all times. (Applicable if -X- checked)

40 CFR Part 60, Subpart: ☒ Db ☐ Dc ☐ GG ☒ A

☐ None

(See Appendix C for Detailed Requirements)

FIRM NAME: Plainfield Renewable Energy LLC
EQUIPMENT LOCATION: Norwich Road, Plainfield, CT 06374
EQUIPMENT DESCRIPTION (MODEL, I.D. #): 37.5 MW (net) biomass fluidized bed gasification power plant

Town No: 145 Premises No: 74 Permit No: 0049 Stack No: 1

PERMIT FOR FUEL BURNING EQUIPMENT

STATE OF CONNECTICUT, DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR MANAGEMENT

PART IX. SPECIAL REQUIREMENTS, continued

J. The Permittee shall comply with all applicable sections of the following National Emission Standards for Hazardous Air Pollutants at all times. (Applicable if -X- checked)

Not Applicable

K. Unless directed otherwise by the Commissioner, if the proposed facility is not constructed within eighteen (18) months from the date of issuance of this permit, the Permittee shall be required to re-certify and conduct further BACT analysis.

PART X. ADDITIONAL TERMS AND CONDITIONS

A. This permit does not relieve the Permittee of the responsibility to conduct, maintain and operate the regulated activity in compliance with all applicable requirements of any federal, municipal or other state agency. Nothing in this permit shall relieve the Permittee of other obligations under applicable federal, state and local law.

B. Any representative of the DEP may enter the Permittee's site in accordance with constitutional limitations at all reasonable times without prior notice, for the purposes of inspecting, monitoring and enforcing the terms and conditions of this permit and applicable state law.

C. This permit may be revoked, suspended, modified or transferred in accordance with applicable law.

D. This permit is subject to and in no way derogates from any present or future property rights or other rights or powers of the State of Connecticut and conveys no property rights in real estate or material, nor any exclusive privileges, and is further subject to any and all public and private rights and to any federal, state or local laws or regulations pertinent to the facility or regulated activity affected thereby. This permit shall neither create nor affect any rights of persons or municipalities who are not parties to this permit.

PERMIT FOR FUEL BURNING EQUIPMENT

STATE OF CONNECTICUT, DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR MANAGEMENT

PART X. ADDITIONAL TERMS AND CONDITIONS, continued

E. Any document, including any notice, which is required to be submitted to the commissioner under this permit shall be signed by a duly authorized representative of the Permittee and by the person who is responsible for actually preparing such document, each of whom shall certify in writing as follows: "I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that any false statement made in the submitted information may be punishable as a criminal offense under section 22a-175 of the Connecticut General Statutes, under section 53a-157b of the Connecticut General Statutes, and in accordance with any applicable statute."

F. Nothing in this permit shall affect the commissioner's authority to institute any proceeding or take any other action to prevent or abate violations of law, prevent or abate pollution, recover costs and natural resource damages, and to impose penalties for violations of law, including but not limited to violations of this or any other permit issued to the Permittee by the commissioner.

G. Within 15 days of the date the Permittee becomes aware of a change in any information submitted to the commissioner under this permit, or that any such information was inaccurate or misleading or that any relevant information was omitted, the Permittee shall submit the correct or omitted information to the commissioner.

H. The date of submission to the commissioner of any document required by this permit shall be the date such document is received by the commissioner. The date of any notice by the commissioner under this permit, including but not limited to notice of approval or disapproval of any document or other action, shall be the date such notice is personally delivered or the date three days after it is mailed by the commissioner, whichever is earlier. Except as otherwise specified in this permit, the word "day" means calendar day. Any document or action which is required by this permit to be submitted or performed by a date which falls on a Saturday, Sunday or legal holiday shall be submitted or performed by the next business day thereafter.

PERMIT FOR FUEL BURNING EQUIPMENT

STATE OF CONNECTICUT, DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR MANAGEMENT

PART X. ADDITIONAL TERMS AND CONDITIONS, continued

I. Any document required to be submitted to the commissioner under this permit shall, unless otherwise specified in writing by the commissioner, be directed to: Office of Director; Engineering & Enforcement Division; Bureau of Air Management; Department of Environmental Protection; 79 Elm Street, 5th Floor; Hartford, Connecticut 06106-5127.

PERMIT FOR FUEL BURNING EQUIPMENT

STATE OF CONNECTICUT, DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR MANAGEMENT

Appendices attached (Applicable if -X- checked):

☒ A Continuous Emission Monitoring Requirements

☒ B Stack Emission Test Requirements

☒ C New Source Performance Standards

☒ E Control Equipment Design Specifications

FIRM NAME: Plainfield Renewable Energy LLC
EQUIPMENT LOCATION: Norwich Road, Plainfield, CT 06374
EQUIPMENT DESCRIPTION (MODEL, I.D. #): 37.5 MW (net) biomass fluidized bed gasification power plant

Town No: 145 Premises No: 74 Permit No: 0049 Stack No: 1

APPENDIX E
Control Equipment Design Specifications

Air Pollution Control Equipment (applicable if -X- checked).

The following specifications need not be verified on a continuous basis, however, if requested by the Bureau, demonstration shall be shown. All specifications are considered to be preliminary until actual operating limits are established during initial performance test. This permit shall be subject to modification to include changes to preliminary design specifications.

☐ None

☒ Scrubber

Make and Model: Wheelabrator, McGill, Research-Cottrell or equivalent
Reagent: Hydrated Lime [$Ca(OH)_2$]
Reagent Flow Rate: 400-700 lb/hr
Pressure Drop (inches H_2O): <3.0
Minimum Gas Flow Rate at Maximum Rated Capacity (acfm): 22,110
PH: To be determined
Design Outlet Grain Loading (gr/dscf): 1.5-2.5 (estimated, depending on multicyclone performance and lime usage)
Design Removal Efficiency (%) : 90% SOx

☐ Electrostatic Precipitator (ESP)

Make and Model:
Number of Fields:
Minimum Gas Flow Rate at Maximum Rated Capacity (acfm):
Design Outlet Grain Loading (gr/dscf):
Design Removal Efficiency (%):

☐ Cyclone ☒ Multicyclone

Make and Model: Barron Industries or equivalent
Pressure Drop (inches H_2O): <3
Minimum Gas Flow Rate at Maximum Rated Capacity (acfm): 348,019

FIRM NAME: Plainfield Renewable Energy LLC
EQUIPMENT LOCATION: Norwich Road, Plainfield, CT 06374
EQUIPMENT DESCRIPTION (MODEL, I.D. #): 37.5 MW (net) biomass fluidized bed gasification power plant

APPENDIX E
Control Equipment Design Specifications

☒ Selective Non-catalytic Reduction (SNCR)

☒ Urea ☒ Ammonia

Make and Model: Energy Products of Idaho (EPI)
Injection Rate at Maximum Rated Capacity (lb/hr): 700-850 lbs/hr @ 32.5% urea solution and/or 750 lbs/hr @ 20% by weight aqueous ammonia solution
Operating Temperature Range (°F): 1600-1800°F (typical)
Minimum Gas Flow Rate at Maximum Rated Capacity (acfm): 636,000
Design Removal Efficiency (%): 70% (max)

☐ Selective Catalytic Reduction (SCR)

Make and Model:
Catalyst Type:
Minimum Gas Flow Rate at Maximum Rated Capacity (acfm):
Pressure Drop (in H_2O):
Ammonia Injection Rate at Maximum Rated Capacity (lb/hr):
Design Removal Efficiency (%):

☐ Low NOx Burner

Make and Model:
Guaranteed NOx Emission Rate (lb/MM BTU):
Design Removal Efficiency (%):

☐ Particulate Trap

Make and Model:
Design Removal Efficiency (%):

☒ Fabric Filter

Make and Model: McGill, Aeropulse, Wheelabrator or equivalent
Number of Bags in Use: TBD
Bag Material: P-84 felt or equivalent
Air/Cloth Ratio: <3.5:1
Net Cloth Area (ft^2): TBD
Cleaning Method: Pulse Jet
Pressure Drop (inches H_2O): 8
Minimum Gas Flow Rate at Maximum Rated Capacity (acfm): 204,507
Design Outlet Grain Loading (gr/dscf): 0.01 (filterable catch)
Design Removal Efficiency (%): 99.9

FIRM NAME: Plainfield Renewable Energy LLC
EQUIPMENT LOCATION: Norwich Road, Plainfield, CT 06374
EQUIPMENT DESCRIPTION (MODEL, I.D. #): 37.5 MW (net) biomass fluidized bed gasification power plant

Town No: 145 Premises No: 74 Permit No: 0049 Stack No: 1

APPENDIX E
Control Equipment Design Specifications

☒ Bed Injection Additive:

Injection of bed additives (limestone, lime, dolomite or other materials), as determined during the initial performance test, into the bed material shall be in sufficient quantities to maintain the SOx emissions rate in Part VI of this permit.

CERTIFICATE OF SERVICE

I, Elizabeth C. Barton, hereby certify that, on September 29, 2008, the foregoing was sent via e-mail to:

Kenneth M. Collette, Esq.
Adjudicator
DEP Office of Adjudications
79 Elm Street
Hartford, CT 06106
kenneth.collette@ct.gov

With a copy hand delivered and/or sent via e-mail to the following:

Gabrielle Frigon
WEED
Department of Environmental Protection
79 Elm Street
Hartford, CT 06106
gabrielle.frigon@ct.gov

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StevenSadlowski@Canterbury-ct.org

Elizabeth C. Barton

DRAFT (4/1//08)

PERMIT TO CONSTRUCT AND OPERATE

PERMITTEE: **Plainfield Renewable Energy, LLC**
FACILITY ADDRESS: **Mill Brook Road / Norwich Road (Route 12) intersection, Plainfield, CT**
PERMIT No. **1090… - PCO**

Pursuant to Section 22a-208a of the Connecticut General Statutes ("CGS") and Section 22a-209-4 of the Regulations of Connecticut State Agencies ("RCSA"), a PERMIT TO CONSTRUCT AND OPERATE IS HEREBY ISSUED by the Commissioner of Environmental Protection ("Commissioner") to Plainfield Renewable Energy, LLC ("Permittee"; "PRE") for a Biomass Wood Gasification Plant consisting of two (2) operational units [(1) a volume reduction plant and (2) a power block facility] located at the intersection of Mill Brook Road and Norwich Road (Rt. 12), Plainfield, CT ("Facility").

This permit consists of sequential authorization sections and is based on all documents and specifications submitted as part of Application No. 200602249, including, but not limited to, the documents and specifications incorporated herein by reference:

1. Application form, signed August 9, 2006 (with various attachments).
2. An "Executive Summary" document.
3. A July 20, 2006 "Traffic Study" document prepared by DSL Consulting Traffic Engineering Services.
4. Two (2) memos from PMA: (a) dated January 25, 2007 (specifying estimated on-site storage volumes); and (b) dated January 26, 2007 (summarizing PRE discussions with various / potential wood suppliers).
5. A letter dated September 5, 2007 from AES and PMA providing clarifications to various issues (surety bond amount; mass/energy balance; property lines; fire emergency systems; wood fuel quality; site ownership; generated residue).
6. An "Operation and Management Plan" (O&MP) document (updated January 2008; received January 23, 2008), prepared by Anchor Engineering Services, Inc. (AES) and Project Management Associates, LLC (PMA) and accompanied by four (4) "general equipment arrangement" drawings prepared by R.W. Beck and Energy Products of Idaho for the Power Block Facility (PBF) component.
7. A report (received January 23, 2008) prepared by AES and incorporating: (a) an explanatory letter dated January 22, 2008; and (b) various sections and documents (submitted for the purpose of clarifying and resolving various issues raised in a December 21, 2007 letter jointly issued by various divisions of the Department), including a document titled "Biomass Wood Supply Quality Control Procedures" dated January 18, 2008, prepared by AES and PMA, with an attached Exhibit #1: "Operating, Sampling & Testing Requirements" (describing the PRE / wood suppliers relationship).
8. A report (received February 20, 2008) prepared by AES and incorporating: (a) an explanatory letter dated February 19, 2008; and (b) various sections and documents (submitted for the purpose of clarifying and resolving various issues raised in a February 11, 2008 letter jointly issued by various divisions of the Department), including: NPDES Addendum (Section A.4.) providing a detailed description of the design for the outdoor wood storage area, the proposed stormwater management and monitoring actions and the features proposed to be constructed (pavement; sealer; curbs; storage buffer zone; catch basins; underground and above ground storage tanks; pump station).
9. A letter dated May 30, 2006 fro Wheelabrator Milbury Inc. providing assurances for long-term final disposal of PRE generated residues at various facilities throughout the Northeast and Mid-Atlantic Region.

10. A set of seven (7) P.E. certified drawings prepared by AES and received on March 31, 2008:
    - Boundary Survey, dated July 10, 2006.
    - Wetlands and Site Plan, revised 3/4/08.
    - Drainage and Grading Plan, revised March 4, 2008.
    - Drainage and Grading Plan, revised March 4, 2008.
    - Erosion and Sedimentation Plan, revised March 4, 2008.
    - Drainage and Erosion & Sediment Control Details, revised February 18, 2008.
    - Proposed Conservation Easement, revised January 21, 2008.

The Permittee shall maintain records of all documents comprising all data pertaining to the application mentioned in this permit, as well as any supplemental information submitted to the Department in connection with such application. Any inaccuracies found in the information submitted by the Permittee may result in revocation, reissuance, or modification of this permit and civil or criminal enforcement actions.

A. GENERAL TERMS AND CONDITIONS

1. As used in this permit, the following definitions apply:

"Wood chips" means grounded wood pre-processed to the PRE specifications which can include either: (a) clean wood; (b) regulated wood fuel; or (c) a mixture of clean and regulated wood fuel.

"Clean wood" (as defined in Section 22a-208a-1 of RCSA) means wood derived from such products or processes as pallets, skid, spools, packaging materials, bulky wood waste (brush; landclearing debris), or scraps from newly built wood products, provided such wood is not treated wood as defined in Section 22a-209a of CGS, or demolition wood.

“Commissioner” means the Commissioner of the Department of Environmental Protection or the Commissioner’s designee.

“Day” means calendar day.

“Department” means the Department of Environmental Protection.

“P.E.” means Professional Engineer licensed in the state of Connecticut.

"Regulated Wood Fuel" [as defined in Section 22a-209a(a)(4) of CGS], means processed wood from construction and demolition activities, which has been sorted to remove plastics, plaster, gypsum wallboard, asbestos, asphalt shingles and wood which contains creosote or to which pesticides have been applied or which contains substances defined as hazardous waste under CGS Section 22a-115.

“Treated Wood” [as defined in Section 22a-209a(a)(2) of CGS], means wood which contains an adhesive, paint, stain, fire retardant, pesticide or preservative.

“Processing” means the practice by which either the physical characteristics or the volume of solid waste accepted at the Facility is being altered through separating, sorting, baling, shredding, crushing, grinding, chipping, compacting, consolidation, transfer or reworking as part of the volume reduction and processing operations of the facility.

“Residue” means all solid waste (as defined in Section 22a-207 of CGS), other than any recovered materials, remaining after handling and processing of the incoming waste stream.

2. The Permittee shall comply with all terms and conditions of this permit. This permit consists of the conditions contained herein and the specifications contained in the application documents, except where such specifications are superseded by the more stringent conditions contained herein. Violation of any provision of this permit is subject to enforcement action pursuant, but not limited, to CGS Sections 22a-6, 22a-208, 22a-225 and 22a-226.

3. To the extent that any term or condition of this permit is deemed to be inconsistent, or in conflict, with any term or condition of any permit previously issued for this Facility, including any modifications thereto, or with any data or information contained in the application, or any other documents incorporated by reference in this permit, the terms and conditions of this permit shall control and remain enforceable against the Permittee.

4. The Permittee shall make no changes to the specifications and requirements of this permit, except in accordance with law.

5. The date of submission to the Commissioner of any document required by this permit shall be the date such document is received by the Commissioner. The date of any notice by the Commissioner under this permit, including but not limited to notice of approval or disapproval of any document or other action, shall be the date such notice is personally delivered or the date three days after it is mailed by the Commissioner, whichever is earlier. Any document or action which is due or required on a Saturday, Sunday or a legal state or federal holiday shall be submitted or performed by the next business day thereafter.

6. The Permittee shall submit for the Commissioner's review and written approval all necessary documentation supporting any proposed physical and/or operational upgrades, improvements and/or minor changes in the Facility design, practices or equipment. The Commissioner may issue a written approval only if, in the Commissioner's judgment, the proposed physical and/or operational upgrades, improvements and/or minor changes: (a) are deemed necessary for a better and more efficient operation of the Facility; (b) are not significantly changing the nature of the Facility, or its impact on the environment; and (c) does not warrant the issuance of a permit or authorization pursuant to CGS Section 22a-208.

7. Any document, including, but not limited to any notice, which is required to be submitted to the Commissioner under this permit shall be signed by a duly authorized representative of the Permittee, as defined in RCSA Section 22a-430-3(b)(2), and by the individual or individuals responsible for actually preparing such documents, each of whom shall certify in writing as follows: "I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and certify that based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief, and I understand that any false statement in the submitted information may be punishable as a criminal offense." Any false statement in any document submitted pursuant to this permit may be punishable as a criminal offense in accordance with CGS Section 22a-6, pursuant to CGS Section 53a-157, and in accordance with any other applicable statute.

8. This permit is subject to and in no way derogates from any present or future property rights or other rights or powers of the State of Connecticut and conveys no property rights in real estate or material nor any exclusive privileges, and is further subject to, any and all public and private rights and to any federal, state or local laws or regulations pertinent to the Facility or activity affected thereby.

9. Nothing in this permit:
   a. Shall affect the Commissioner's authority to institute any proceeding or to take any actions to prevent violations of law, prevent or abate pollution, recover costs and natural resource damages, and to impose penalties for violations of law;
   b. Shall relieve the Permittee of other obligations under applicable federal, state and local laws;
   c. Authorizes any person, municipality or authority to hinder municipal or regional solid waste recycling efforts. All activities conducted by the Permittee at the Facility shall be in accordance with the documents submitted as part of the application and in compliance with the Connecticut State Solid Waste Management Plan in effect on the issuance date of this permit.

B. AUTHORIZATION TO CONSTRUCT

1. The Permittee is authorized to construct the Facility designed to receive, store and process wood chips for purposes of generating steam and 37.5 MW (net) of electric energy.

2. The Permittee is authorized to construct the Facility in accordance with all applicable law, including this permit. The Facility shall consist of two (2) separate operational units:
   (a) A "volume reduction plant" (VRP) where wood chips shall be received through a double truck scale system, unloaded into hoppers, conveyed, handled, stored in piles located in a dedicated area (outdoors and/or under a canopy structure), screened and subsequently conveyed for gasification at the adjacent "power block facility" (PBF). The outdoor storage area shall incorporate: a truck emergency access; a storage buffer zone; a sealed pavement; curbs; and a stormwater control system (catch basins; a pump station; and underground and above ground storage tanks); and
   (b) A "power block facility" (PBF) housing various ancillary equipment, including: a fluidized bed gasification and boiler system designed to process biomass (wood); a bottom ash residue collection system; a fly ash residue collection system; a state-of-the art air pollution system; an induced (ID) fan/stack system; a storage silo for bottom and fly ash residue; a control room / steam turbine generator system; a water treatment system designed to filter, clarify and store cooling water; and a transformer connected to the electrical distribution grid.

3. The Permittee shall control dust, odors, water discharges and noise resulting from the construction of the Facility at all times to assure compliance with applicable requirements of RCSA, and any other applicable laws, including OSHA.

4. The Permittee shall, within thirty (30) days from the completion of the construction of the features described in condition B.2. of this permit, and for the purpose of operating the entire Facility at the processing and storage limits noted in condition No. C.4. of this permit, submit a written notification for the Commissioner’s review and written approval. Such notification shall include, at a minimum, the following documents certified by a P.E.:
   a. A statement certifying that the construction activities have been completed, as approved; and
   b. Appropriate "as-built" drawings identifying all constructed features of the Facility specified under condition No. B.2. of this permit.

C. AUTHORIZATION TO OPERATE

1. The Permittee is authorized to operate any or all of the components specified in condition No. B.2. of this permit upon written approval granted by the Commissioner. Such written approval may be issued only after the Permittee is deemed in full compliance with, but not limited to, the requirements of, Condition No. B.4. of this permit.

2. The Permittee shall not exceed the processing and storage limits established by this permit. Solid waste, other than those listed herein, shall not be accepted, processed, treated, stored, transported or disposed off-site, or otherwise processed at the Facility without prior written approval of the Commissioner.

3. The Permittee is authorized to operate the Facility in accordance with all applicable law, including this permit. Unless otherwise approved in writing by the Commissioner, the Permittee is authorized to operate the Facility as follows:

Receiving activities: Monday - Friday (6:30 am - 7:00 p.m.); Saturday (6:30 am - 3:00 pm)
Processing activities: 24 hours/day - 7 days/week

4. a. The Permittee shall, upon issuance of the written approval specified in condition No. B.4., limit the receiving, on-site storage and processing activities in accordance with, but not limited to, the following maximum limits and specifications:

Processing Capacity	**tons/day**	
Wood chips (*)	2,200	received / conveyed / stored at dedicated VRP area
Wood chips (**)	1,360	conveyed to / processed by the PBF equipment

Storage Capacity	**cy (tons)**	
Wood chips	145,000 (45,500)	piles in dedicated storage areas (***)
Ash residue	500 (250)	covered containers + silo (area #11)
Non-ash residue	90 (68)	covered containers within the PBF area
Water solids residue	60 (46)	covered containers within the PBF area
Total on-site storage:	145,650 (45,864)	

Notes:
(*) Based on PRE specifications, received biomass wood is pre-processed and/or mixed by the suppliers. Limited wood grinding activities can occur, as needed, at the VRP storage area. Treated wood (chips) containing pesticides or preservatives shall not be considered an allowable fuel pursuant to the definition of "regulated wood fuel".
(**) Estimated higher heating value (HHV) of wood chips = @ 4,625 BTU/lb
(***) Area #6 (max. 35 ft. height piles under canopy); Area #5 (max. 50 ft. height pile in outdoor area); Area #2 (small amounts in piles at the unloading/receiving area)

b. **Storage of wood chips** shall take place in containers or piles located only in the dedicated storage area of the VRP. A 15 ft. fire truck emergency access shall be maintained along the western side of the outdoor storage area. The wood chips shall be: (i) conveyed for on-site storage on dedicated area provided with a sealed asphalt pavement (that can support heavy equipment during all seasons) and with various stormwater collection and storage features, designed and constructed in compliance with any other permits and/or applicable stormwater management requirements of Section 22a-430 of RCSA; and (ii) screened, mixed (as needed) and conveyed to, and processed by, the PBF's equipment on a first-in / first-out basis. Any wood chipping activities shall: comply with the requirements of the Connecticut Regulations for Abatement of Air Pollution, Sections 22a-174-18 and 22a-174-23 of RCSA; not generate noise, dust, fumes, smoke, vibrations and odors that exceed background levels thereof at any boundary of the property on which the Facility is located.

c. **Storage of residues** shall comply with the limits and specifications incorporated in the above table.

5. The Permittee shall:
   a. Store solid waste on-site in conformance with proper fire control measures. Routine maintenance and inspections of all fire control equipment shall be conducted in accordance with manufacturer's specifications.
   b. Ensure that all solid waste accepted at the Facility is properly handled on-site, processed, stored and transported to markets or other solid waste processing or disposal facilities permitted to accept such solid waste.
   c. Ensure that any unacceptable or incidental solid waste inadvertently received, or solid waste which is unsuitable for processing at the Facility is: (1) promptly sorted, separated, isolated and temporarily stored in a safe manner prior to off-site transport; (2) recorded and reported in the quarterly report required by condition No. C.9. of this permit; and (3) disposed at a facility lawfully authorized to accept such waste. A spare container shall be available for any storage emergency.
   d. Provide expeditious notification about any emergency incident (explosion, accident, fire, release, or other significant disruptive occurrence) which: (1) significantly damaged equipment or structures; (2) interrupts the operation of the Facility for greater than 24 hours; (3) results in an unscheduled Facility shutdown or forced diversion of solid waste to other solid waste facilities; (4) could reasonably create a source of pollution to the waters of the state; or (5) otherwise threatens public health. Such notification required under this condition shall: (a) be within 24 hours of the emergency incident; (b) be verified to the Solid Waste Enforcement Program in the Waste Engineering and Enforcement Division of the Bureau of Materials Management and Compliance Assurance by phone at (860) 424-3366, or at another current publicly published number for the Waste Engineering and Enforcement Division, or by facsimile at (860) 424-4059; (c) be followed by a written report within 30 days of the emergency incident detailing the cause and effect of the incident, remedial steps taken and emergency backup used or proposed to be implemented; (d) be recorded in a log of emergency incidents. In addition to the notification requirements above, the Permittee shall comply with all other applicable reporting or notification requirements regarding the emergency incident including but not limited to, reporting required by CGS Section 22a-450.
   e. Prevent the spillage of solid waste from transfer containers during on-site maneuvering/storage and off-site transport, cover each loaded container before transportation off-site and instruct the haulers to keep the containers covered during off-site transportation. Remove any litter from the Facility's premises.
   f. Operate the Facility in a safe manner and control fire, odor, noise, spills, vectors, litter and dust emissions levels in continuous compliance with all applicable requirements, including OSHA.
   g. Process, store or otherwise handle at the Facility all solid waste received in such a manner as to avoid any spillage, nuisance and protect the public health and the environment.
   h. Maintain at the Facility's premises, and have available for review by the Commissioner, the manufacturer's operation and maintenance manuals for each major piece of fixed processing equipment installed at the Facility.
   i. Post a sign at the Facility's entrance, incorporating the requirements of RCSA Section 22a-209-10(3) and the number and issuance date of this permit.

6. The Permittee shall:
   a. Control all traffic related with the operation of the Facility in such a way as to mitigate queuing of vehicles off-site and excessive or unsafe traffic impact in the area where the Facility is located.
   b. Unless otherwise exempted, ensure that, pursuant to RCSA Section 22a-174-18(b)(3)(C), trucks shall not be left idling for more than three (3) consecutive minutes.
   c. Prominently post and maintain signs limiting such truck idling time within the Facility (entrance; scale; unloading/loading areas; etc.).

7. The Permittee shall have at a minimum an operator, certified pursuant to RCSA Section 22a-209-6, present at all times during Facility operation. All individuals under the supervision of such certified operator shall have sufficient training to identify waste received at the Facility which is not permitted to be received, or is unsuitable for processing, and take proper action in handling such waste.

8. Unless otherwise specified in writing by the Commissioner, any documents required to be submitted under this permit shall be directed to: Calin V. Tanovici, Sanitary Engineer, Waste Engineering and Enforcement Division, Bureau of Materials Management and Compliance Assurance, Department of Environmental Protection, 79 Elm Street, Hartford, CT 06106-5127. As necessary, such documents will be routed to the appropriate staff for their final evaluation.

9. The Permittee shall maintain daily records as required by RCSA Section 22a-209-10(13) and CGS Sections 22a-208e and 22a-220. Based on such records, the Permittee shall prepare monthly summaries including, but not limited to, the following information:
   a. Origin, type and quantity of solid waste received, including unacceptable waste (non-ash residue).
   b. Type and quantity of solid waste processed by the PBF's equipment.
   c. Destination to which ash residue, non-ash residue and water solids residue were delivered for disposal or recycling, including quantities delivered to each destination.

   The monthly summaries required pursuant this condition shall be submitted quarterly directly to the Bureau of Materials Management and Compliance Assurance, Source Reduction and Recycling Program, no later than January 31, April 30, July 31, and October 31.

10. The Permittee shall, no later that sixty (60) days after the approval letter issued by the Commissioner pursuant to condition No. B.4. of this permit approving the start of the operation of the Facility, post $1,835,000 as a closure surety bond amount, as required by Section 22a-6(a)(7) of CGS in conjunction with the general requirements of Section 22a-209-4(i) of RCSA.

    The Permittee shall acknowledge and accept the following:

    a. The purpose of the financial assurance instrument is to cover the 3rd party cost for handling, transportation and disposal of the maximum amount of unprocessed and processed solid waste proposed to be stored at the Facility, as authorized by this permit and any additional cost of equipment rental, site clean-up, and decontamination/disposal of equipment and of all processing storage areas, if necessary.

    b. The surety documents shall follow the requirements of RCSA Section 22a-209-4(i), Federal Regulation 40 CFR 264.141 to 264.143 inclusive, and 40 CFR Section 264.151, as referenced therein. Appropriate language changes shall be made to reference the handling, transportation and disposal of such stored solid waste, instead of landfill closure and monitoring.

    c. The Department accepts only four (4) types of financial assurance documents: (a) Trust Agreement; (b) Guarantee Bond; (c) Performance Bond; or (d) Letter of Credit.
       Note: A "Stand-By Trust Agreement" is needed along with an (a), (b), or (c) document.
       A "Certification of Acknowledgement" is needed with an (a) document.

    d. The financial assurance instruments shall: (a) be valid for, and be appropriately maintained during, the term of this permit; (b) specify the Permittee's name, the Facility's address and the No. and issuance date of this permit; (c) use the format language specified in the forms provided by the Department (as modified from Title 40 of the Code of Federal Regulations, sections 264.151).

e. The surety bond amount: (a) shall be adjusted within thirty (30) days after each anniversary date of the surety to reflect inflation, any storage capacity increases or changes in the cost of closure [in accordance with the requirements of 40 CFR Section 264.142(b) and/or (c) as revised through March 21, 1990].

f. The financial documents required to be submitted under this condition shall be directed to: Mark Latham, Waste Engineering and Enforcement Division, Bureau of Materials Management and Compliance Assurance, Department of Environmental Protection, 79 Elm Street, Hartford, CT 06106-5127.

11. The Permittee shall, commencing within 60 days after the issuance date of the approval letter granted pursuant condition No. B.4. of this permit, start to perform compliance audits for the life of this permit. The compliance audits shall be subject to the following conditions:

a. The compliance audits shall consist of a thorough and complete assessment of the Permittee's compliance: (i) with the Regulations of Connecticut State Agencies Sections 22a-209-1 through 22a-209-17; and (ii) with all documents, terms and conditions specified in this permit.

b. The audits required pursuant to this permit shall be performed by a professional engineer licensed to practice in Connecticut **(**"consultant") approved in writing by the Commissioner. The Permittee shall, prior to the Commissioner's approval of the named consultant, certify to the Commissioner that such consultant: (i) is not a subsidiary or affiliated corporation; (ii) does not own stock in Permittee or any parent, subsidiary, or affiliated corporation; (iii) have no other direct financial stake in the outcome of the compliance audit(s) outlined in this permit; and (iv) have expertise and competence in environmental auditing and the regulatory programs being addressed through this permit.

c. The results of each compliance audit shall be summarized in a compliance audit report (CAR) which shall be submitted for evaluation to the Enforcement Program, Waste Engineering and Enforcement Division, Bureau of Materials Management and Compliance Assurance, no later than fifteen (15) days after the completion date of such audit. Each such report shall describe in detail Permittee's compliance as noted in condition No. 11.a. of this permit , identify any violations and shall describe actions taken by the Permittee to correct violations identified in each compliance audit. Each such report shall also include Permittee's certification of compliance with the regulations and documentation demonstrating such compliance.

In cases where multiple counts of the same violation are discovered, the report shall include a listing of the multiple counts. The report shall also include a detailed description of the compliance audit, including but not limited to: (i) the names of those individuals who conducted the compliance audit; (ii) the areas of the site inspected; and (iii) the records reviewed to determine compliance.

d. Site inspection and preparation/submittal the related CAR document, shall comply with the following specifications:

- Frequency: Quarterly (for the first 2 years)
  Semi - Annual (for the last 3 years)
- Recording/Reporting: Within 15 days from the inspection date, the CAR document shall be finalized by the Consultant and submitted for Department's evaluation. A copy shall be kept on-site available for further review.

e. The Permittee shall, upon becoming aware of any violation(s) of this permit or applicable statute(s) and regulation(s), immediately correct such violation(s). If the Permittee is not able to correct the violation(s) within seven (7) days of becoming aware of such violation(s), the Permittee shall notify in writing the Commissioner and, within seven (7) days, submit for the Commissioner's review and written approval, a detailed plan and schedule to correct such violation(s). If the Permittee: (1) fails to submit such plan and schedule within seven (7) days of becoming aware of such violation(s); or (2) fails to correct the violation(s) in accordance with such approved plan and schedule, the Permittee shall cease accepting solid waste at the Facility until such violation(s) are corrected to the satisfaction of the Commissioner.

12. This permit shall expire five (5) years from the date of issuance and may be revoked, suspended, modified, renewed or transferred in accordance with applicable laws.

Issued on this day of , 2008.

By _____
Gina McCarthy
Commissioner

Administrative Note
Permit No. 1090…. - PCO
Application No. 200602249
Permittee: Certified Mail No. ……
City/Town Clerk: Certified Mail No. ……..

Attachment 3

WATER DIVERSION PERMIT

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Permittee: Plainfield Renewable Energy, LLC
Permit No.: DIV- 200603081
Permit Type: Water Diversion
Town: Plainfield and Canterbury
Project: Wood gasification biomass power plant facility

Pursuant to Connecticut General Statutes Section 22a-368 the Commissioner of the Department of Environmental Protection hereby grants a permit to Plainfield Renewable Energy, LLC (the "permittee") to divert waters of the state in the town of Canterbury in accordance with its application and plans which are part thereof filed with this Department on December 21, 2006 and revised through April 2008. The purpose of the discharges and proposed diversion is to construct and operate a 37.5 MW wood gasification biomass power plant facility in Plainfield, Connecticut, and install and maintain an intake and discharge pipe to divert cooling water for the facility from the Quinebaug River in Canterbury, Connecticut (the "site").

AUTHORIZED ACTIVITY

Specifically, the permittee is authorized to withdraw water from the Quinebaug River for cooling water use at a wood gasification biomass power plant facility located near the intersection of Mill Brook Road and Route 12 in Plainfield, Connecticut, subject to the following limitations:

1. The annual average day withdrawal shall not exceed 0.718 million gallons per day, and

2. The maximum daily withdrawal shall not exceed 0.893 million gallons of water per day.

The permitee is authorized to conduct activities in accordance with documents submitted under the DIV-200603081 application received December 21, 2006, as amended, including but not limited to plans entitled,

> "Application for Water Diversion Permit for A 37.5 MW Biomass Wood Gasification Power Plant, on behalf of Plainfield Renewable Energy, LLC, 20 Marshall Street, Norwalk, Connecticut", dated March 31, 2008, revised through April 2008 prepared by Anchor Engineering Services, Inc.

The permitee is authorized to impact 0.005 acres of temporary waterway impact to the Quinebaug River. The permitee is authorized to impact 0.078 acres of permanent wetland impact and 0.14 acres of temporary wetland impacts to State regulated wetlands (alluvial floodplain soils). The regulated area includes a total of 0.22 acres of wetland and waterway impact.

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PERMITTEE'S FAILURE TO COMPLY WITH THE TERMS AND CONDITIONS OF THIS PERMIT SHALL SUBJECT PERMITTEE AND PERMITTEE'S CONTRACTOR(S) TO ENFORCEMENT ACTIONS AND PENALTIES AS PROVIDED BY LAW.

This authorization is subject to the following conditions:

SPECIAL CONDITIONS

1. **Metering of Withdrawals.** The permittee shall install and maintain a totalizing flow meter to measure the total amount of water withdrawn from the Quinebaug River and shall for the duration of this permit continuously operate and maintain such meter. In the event of meter malfunction or breakage, the permittee shall repair or replace such meter within 72 hours. The permittee shall secure such meter in a locked facility, with access controlled solely by the permittee or other designee.

2. **Meter Calibration and Reporting.** The permittee shall annually test and calibrate the flow meter to within two percent accuracy as shown through a post-calibration test, and shall submit the results of the accuracy test and calibration for the preceding year annually to the Commissioner no later than January 30th of each year.

3. **Annual Report of Water Use.** Unless otherwise specified by the Commission in permittee's approval of authorization, the permittee shall record on a daily basis the quantity of water that is diverted, and the rate at which it is diverted, pursuant to this permit. The permittee shall submit a copy of such record to the Commissioner on January 30th of the year after the issuance date of such approval of authorization, and shall continue every January 30th thereafter to submit to the Commissioner a copy of such record as it applies to the preceding twelve months. Such record shall be signed by the permittee and the individual(s) responsible for actually preparing such record, each of whom shall certify in writing as follows:

   "I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that a false statement made in this document or its attachments may be punishable as a criminal offense, in accordance with Section 22a-6 of the General Statutes, pursuant to Section 53-157b of the General Statutes, and in accordance with any other applicable statute."

4. **Recording and Reporting Violations.** Within 48 hours after the permittee learns of a

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violation of this permit, report same in writing to the Commissioner. Such report shall include the following information:

(A) the provision(s) of the authorization that has been violated;

(B) the date and time the violation(s) was first discovered and by whom;

(C) the cause of the violation(s), if known;

(D) if the violation(s) has ceased, the duration of the violation(s) and the exact date(s) and time(s) it was corrected;

(E) if the violation(s) has not ceased, the anticipated date when it will be corrected;

(F) steps taken and steps planned to prevent a reoccurrence of the violation(s) and the date(s) such steps were implemented or will be implemented;

(G) the signatures of the permittee and of the individual(s) responsible for actually preparing such report, each of whom shall certify as follows:

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that a false statement made in this document or its attachments may be punishable as a criminal offense, in accordance with Section 22a-6 of the General Statutes, pursuant to Section 53-157b of the General Statutes, and in accordance with any other applicable statute."

5. **Wildlife and Wetland Mitigation Plan.** The permitee shall implement all monitoring and mitigation plan provisions as specified in the mitigation plan entitled, "Plainfield Renewable Energy, LLC, Proposed 37.5MW Biomass Facility, Mitigation and Monitoring Plan", dated January 2008, revised through April 2008, prepared by Kleinschmidt.

6. **Wildlife and Wetland Mitigation Compensation**. Prior to the start of any construction activities, PRE must acquire a parcel of off-site property to be protected through a conservation easement or by obtaining the rights to and placing a conservation easement on a parcel of off-site property. The parcel shall contain a minimum of 5 acres of suitable habitat for Eastern Spadefoot toad and a minimum of 0.25 acre of wetlands. Selection of the property shall be done in consultation with the DEP Bureau of Natural Resources and the DEP Inland Water Resources Division in accord with the wildlife and wetland mitigation plan entitled, "Plainfield Renewable

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Energy, LLC, Proposed 37.5MW Biomass Facility, Mitigation and Monitoring Plan", dated January 2008, revised through April, 2008. Prior to the start of construction activities PRE must submit documentation to the DEP Wildlife Division and the Inland Water Resources Division to confirm that the conservation easement has been executed.

7. **Fisheries**. The permitee shall conduct all unconfined instream activities from June 1 through September 30, inclusive.

GENERAL CONDITIONS

1. The permittee shall notify the Commissioner in writing two weeks prior to: (A) commencing construction or modification of structures or facilities authorized herein; and (B) initiating the diversion authorized herein.

2. The permittee may not make any alterations, except de minimis alterations, to any structure, facility, or activity authorized by this permit unless the permittee apply for and receive a modification of this permit in accordance with the provisions of section 22a-377(c)-2 of the Regulations of Connecticut State Agencies. Except as authorized by subdivision (5) of section 22a-377(b)-1(a) of the Regulations of Connecticut State Agencies, the permittee may not make any de minimis alterations to any structure, facility, or activity authorized by this permit without written permission from the Commissioner. A de minimis alteration means an alteration which does not significantly increase the quantity of water diverted or significantly change the capacity to divert water.

3. All structures, facilities, or activities constructed, maintained, or conducted pursuant hereto shall be consistent with the terms and conditions of this permit, and any structure, facility or activity not specifically authorized by this permit, or exempted pursuant to section 22a-377 of the General Statutes or section 22a-377(b)-1 of the Regulations of Connecticut State Agencies, shall constitute a violation hereof which may result in modification, revocation or suspension of this permit or in the institution of other legal proceedings to enforce its terms and conditions.

4. Unless the permittee maintains in optimal condition any structures or facilities authorized by this permit, the permittee shall remove such structures and facilities and restore the affected waters to their condition prior to construction of such structures or facilities.

5. In issuing this permit, the Commissioner has relied on information provided by the permittee. If such information was false, incomplete, or misleading, this permit may be modified, suspended or revoked and the permittee may be subject to any other remedies or penalties provided by law.

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6. If construction of any structures or facilities authorized herein is not completed within three years of issuance of this permit or within such other time as may be provided by this permit, or if any activity authorized herein is not commenced within three years of issuance of this permit or within such other time as may be provided by this permit, this permit shall expire three years after issuance or at the end of such other time.

7. This permit is subject to and does not derogate any rights or powers of the State of Connecticut, conveys no property rights or exclusive privileges, and is subject to all public and private rights and to all applicable federal, state, and local law. In constructing or maintaining any structure or facility or conducting any activity authorized herein, the permittee may not cause pollution, impairment, or destruction of the air, water, or other natural resources of this State. The issuance of this permit shall not create any presumption that this permit should be renewed.

8. In constructing or maintaining any structure or facility or conducting any activity authorized herein, or in removing any such structure or facility under paragraph 4 hereof, the permittee shall employ best management practices to control storm water discharges, to prevent erosion and sedimentation, and to otherwise prevent pollution of wetlands and other waters of the State. The permittee shall immediately inform the Commissioner of any adverse impact or hazard to the environment which occurs or is likely to occur as the direct result of the construction, maintenance, or conduct of structures, facilities, or activities authorized herein.

9. This permit is not transferable without the prior written consent of the Commissioner.

10. **Expiration of Permit**. The Connecticut Water Diversion Policy Act permit (DIV-200603081) shall expire in 25 years.

11. **Certification of Documents**. Any document, including but not limited to any notice, which is required to be submitted to the Commissioner under this permit shall be signed by the permittee, a responsible corporate officer of the permittee, a general partner of the permittee, or the individual or individuals responsible for actually preparing such document, each of whom shall certify in writing as follows:

    "I have personally examined and am familiar with the information submitted in this document and all attachments and certify that based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief, and I understand that any false statement made in this document or its attachment may be punishable as a criminal offense in accordance with Section 22a-376 under 53a-157 of the Connecticut General Statutes."

12. **Submission of Documents**. Any document or notice required to be submitted to the

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Commissioner under this permit shall, unless otherwise specified in writing by the Commissioner, be directed to:

Director
Department of Environmental Protection
Bureau of Water Management
Inland Water Resources Division
79 Elm Street
Hartford, CT 06106-5127

The date of submission to the Commissioner of any document required by this permit shall be the date such document is received by the Commissioner. The date of any notice by the Commissioner under this permit, including but not limited to notice of approval or disapproval on any document or other action, shall be the date such notice is personally delivered or the date three days after it is mailed by the Commissioner, whichever is earlier. Except as otherwise specified in this permit, the word "day" as used in this permit means any calendar day. Any document or action which is required by this permit to be submitted or performed by a date which falls on a Saturday, Sunday or legal holiday shall be submitted or performed by the nest business day thereafter.

This authorization constitutes the permit required by section 22a-368(b) of the Connecticut General Statutes.

Issued as a permit of the Commissioner of Environmental Protection on

Gina McCarthy
Commissioner

Attachment 4

REVISED DRAFT SEPTEMBER 4, 2008

NPDES AND STATE PERMIT

issued to

Plainfield Renewable Energy, LLC
20 Marshall Street, Suite 300
Norwalk, CT 06854

Location Address:
Norwich Road via Mill Brook Road
Plainfield, CT

Facility ID: 109-110

Permit ID: CT0030473 and SP0002426

Receiving Stream: Quinebaug River

Permit Expires:

SECTION 1: GENERAL PROVISIONS

(A) This permit is issued in accordance with section 22a-430 of Chapter 446k, Connecticut General Statutes ("CGS"), and Regulations of Connecticut State Agencies ("RCSA") adopted thereunder, as amended, and section 402(b) of the Clean Water Act, as amended, 33 USC 1251, et. seq., respectively, and pursuant to an approval dated September 26, 1973, by the Administrator of the United States Environmental Protection Agency for the State of Connecticut to administer an N.P.D.E.S. permit program.

(B) Plainfield Renewable Energy, LLC, ("Permittee"), shall comply with all conditions of this permit including the following sections of the RCSA which have been adopted pursuant to section 22a-430 of the CGS and are hereby incorporated into this permit. Your attention is especially drawn to the notification requirements of subsection (i)(2), (i)(3), (j)(1), (j)(6), (j)(8), (j)(9)(C), (j)(10)(C), (j)(11)(C), (D), (E), and (F), (k)(3) and (4) and (l)(2) of section 22a-430-3.

Section 22a-430-3 General Conditions

(a) Definitions
(b) General
(c) Inspection and Entry
(d) Effect of a Permit
(e) Duty
(f) Proper Operation and Maintenance
(g) Sludge Disposal
(h) Duty to Mitigate
(i) Facility Modifications; Notification
(j) Monitoring, Records and Reporting Requirements
(k) Bypass
(l) Conditions Applicable to POTWs
(m) Effluent Limitation Violations (Upsets)
(n) Enforcement
(o) Resource Conservation
(p) Spill Prevention and Control

(q) Instrumentation, Alarms, Flow Recorders
(r) Equalization

Section 22a-430-4 Procedures and Criteria

(a) Duty to Apply
(b) Duty to Reapply
(c) Application Requirements
(d) Preliminary Review
(e) Tentative Determination
(f) Draft Permits, Fact Sheets
(g) Public Notice, Notice of Hearing
(h) Public Comments
(i) Final Determination
(j) Public Hearings
(k) Submission of Plans and Specifications. Approval.
(l) Establishing Effluent Limitations and Conditions
(m) Case by Case Determinations
(n) Permit issuance or renewal
(o) Permit Transfer
(p) Permit revocation, denial or modification
(q) Variances
(r) Secondary Treatment Requirements
(s) Treatment Requirements for Metals and Cyanide
(t) Discharges to POTWs - Prohibitions

(C) Violations of any of the terms, conditions, or limitations contained in this permit may subject the Permittee to enforcement action including, but not limited to, seeking penalties, injunctions and/or forfeitures pursuant to applicable sections of the CGS and RCSA.

(D) Any false statement in any information submitted pursuant to this permit may be punishable as a criminal offense under section 22a-438 or 22a-131a of the CGS or in accordance with section 22a-6, under section 53a-157b of the CGS.

(E) The authorization to discharge under this permit may not be transferred without prior written approval of the Commissioner of Environmental Protection ("Commissioner"). To request such approval, the Permittee and proposed transferee shall register such proposed transfer with the Commissioner, at least 30 days prior to the transferee becoming legally responsible for creating or maintaining any discharge which is the subject of the permit transfer. Failure, by the transferee, to obtain the Commissioner's approval prior to commencing such discharge(s) may subject the transferee to enforcement action for discharging without a permit pursuant to applicable sections of the CGS and RCSA.

(F) No provision of this permit and no action or inaction by the Commissioner shall be construed to constitute an assurance by the Commissioner that the actions taken by the Permittee pursuant to this permit will result in compliance or prevent or abate pollution.

(G) Nothing in this permit shall relieve the Permittee of other obligations under applicable federal, state and local

law.

(H) An annual fee shall be paid for each year this permit is in effect as set forth in section 22a-430-7 of the Regulations of Connecticut State Agencies.

SECTION 2: DEFINITIONS

(A) The definitions of the terms used in this permit shall be the same as the definitions contained in section 22a-423 of the CGS and section 22a-430-3(a) and 22a-430-6 of the RCSA, except for "No Observable Acute Effect Level (NOAEL)" which is redefined below.

(B) In addition to the above, the following definitions shall apply to this permit:

"-----" in the limits column on the monitoring table means a limit is not specified but a value must be reported on the DMR

"Annual" in the context of any sampling frequency found in Section 5, shall mean the sample must be collected in the month of July. If there is no discharge during the month of July, the Permittee shall report no discharge in the Discharge Monitoring Report (DMR). However, the Permittee shall sample during the next month when a discharge exists.

"Average Monthly Limit" means the maximum allowable "Average Monthly Concentration" as defined in section 22a-430-3(a) of the RCSA when expressed as a concentration (e.g. mg/l); otherwise, it means "Average Monthly Discharge Limitation" as defined in section 22a-430-3(a) of the RCSA.

"Critical Test Concentration (CTC)" means the specified effluent dilution at which the Permittee is to conduct a single-concentration Aquatic Toxicity test.

"Closed-cycle Recirculation System" means a system designed, using minimized makeup and blow-down flows, to withdraw water from a natural or other water source to support contact and/or non-contact cooling uses within the facility. The water is usually sent to a cooling canal or channel, lake, pond or tower to allow waste heat to be dissipated to the atmosphere and then is returned to the system. New source water (make-up water) is added to the system to replenish losses that have occurred due to blow-down, drift and evaporation.

"Cooling water intake structure" means the total physical structure and any associated constructed waterways used to withdraw cooling water from waters of the state. The cooling water intake structure extends from the point at which water is withdrawn from the surface water source up to, and including, the intake pumps.

"Daily Concentration" means the concentration of a substance as measured in a daily composite sample, or, the arithmetic average of all grab sample results defining a grab sample average.

"Daily Quantity" means the quantity of waste discharged during an operating day.

"^{o}F" means degrees Fahrenheit.

"Instantaneous Limit" means the highest allowable concentration of a substance as measured by a grab

sample, or the highest allowable measurement of a parameter as obtained through instantaneous monitoring.

"In stream Waste Concentration (IWC)" means the concentration of a discharge in the receiving water after mixing has occurred in the allocated zone of influence.

"Maximum Daily Limit" means the maximum allowable "Daily Concentration" (defined above) when expressed as a concentration (e.g. mg/l); otherwise, it means the maximum allowable "Daily Quantity" as defined above, unless it is expressed as a flow quantity. If expressed as a flow quantity it means “Maximum Daily Flow” as defined in section 22a-430-3(a) of the RCSA.

"NA" as a Monitoring Table abbreviation means “not applicable”.

"NR" as a Monitoring Table abbreviation means “not required”.

"No Observable Acute Effect Level (NOAEL)" means any concentration equal to or less than the critical test concentration in a single concentration (pass/fail) toxicity test conducted pursuant to section 22a-430-3(j)(7)(A)(i) RCSA demonstrating greater than 50% survival of test organisms in 100% (undiluted) effluent and 90% or greater survival of test organisms at the CTC.

"Quarterly", in the context of a sampling frequency, means sampling is required in the months of January, April, July, and October.

"Range During Month" ("RDM"), as a sample type, means the lowest and the highest values of all of the monitoring data for the reporting month.

"Range During Sampling" ("RDS"), as a sample type, means the maximum and minimum of all values recorded as a result of analyzing each grab sample of; 1) a Composite Sample, or, 2) a Grab Sample Average. For those Permittees with continuous monitoring and recording pH meters, Range During Sampling means the maximum and minimum readings recorded with the continuous monitoring device during the Composite or Grab Sample Average sample collection.

"Twice per Month" when used as a sample frequency, shall mean two samples per calendar month collected no less than 12 days apart.

"ug/l" means micrograms per liter.

SECTION 3: COMMISSIONER'S DECISION

(A) The Commissioner has issued a final determination and found that such discharge will not cause pollution of any of the waters of the state and the proposed system to treat such discharge will protect the waters of the state from pollution. The Commissioner’s decision is based on Application No. 200702055 for permit issuance received on August 9, 2007 and the administrative record established in the processing of that application.

(B) The Commissioner hereby authorizes the Permittee to discharge in accordance with the provisions of this permit, the above referenced application, and all approvals issued by the Commissioner or the Commissioner’s authorized agent for the discharges and/or activities authorized by, or associated with, this permit.

(C) The Commissioner reserves the right to make appropriate revisions to the permit in order to establish any appropriate effluent limitations, schedules of compliance, or other provisions which may be authorized under the Federal Clean Water Act or the CGS or regulations adopted thereunder, as amended. The permit as modified or renewed under this paragraph may also contain any other requirements of the Federal Clean Water Act or CGS or regulations adopted thereunder which are then applicable.

(D) The Commissioner has determined that the location, design, construction and capacity of the cooling water intake structure reflects the Best Technology Available (BTA) for minimizing adverse environmental impact pursuant to Section 316(b) of the Federal Water Pollution Control Act (FWPCA). The Commissioner has also determined that the effluent limitations established herein are consistent with the provisions of Section 316(a) of the FWPCA.

SECTION 4: GENERAL EFFLUENT LIMITATIONS

(A) No discharge shall contain, or cause in the receiving stream, a visible oil sheen or floating solids; or, cause visible discoloration or foaming in the receiving stream.

(B) No discharge shall cause acute or chronic toxicity in the receiving water body beyond any zone of influence specifically allocated to that discharge in this permit.

(C) The temperature of any discharge shall not increase the temperature of the receiving stream above 85^{o}F, or, in any case, raise the normal temperature of the receiving stream more than 4^{o}F.

SECTION 5: SPECIFIC EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

(A) The discharges shall not exceed and shall otherwise conform to the specific terms and conditions listed below. The discharges are restricted by, and shall be monitored in accordance with, the tables below:

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Table A

Discharge Serial Number: 101 | **Monitoring Location:** 1

Wastewater Description: Treated cooling tower blowdown wastewater

Monitoring Location Description: After the temperature monitoring probe prior to discharging into the Quinebaug River via the diffuser

PARAMETER	UNITS	FLOW/TIME BASED MONITORING				INSTANTANEOUS MONITORING			Minimum Level Test[3]
		Average Monthly Limit	Maximum Daily Limit	Sample/Reporting Frequency [2]	Sample Type or Measurement to be reported	Instantaneous limit or required range	Sample/ Reporting Frequency	Sample Type or measurement to be reported	
Aluminum, Total	mg/l	1.42	2.86	Weekly/Monthly	Daily Composite	4.29	NR	NA	
Ammonia	mg/l	-----	------	Weekly/Monthly	Daily Composite	-----	NR	NA	
Boron	mg/l	-----	------	Weekly/Monthly	Daily Composite	-----	NR	NA	
Chlorine, Total Residual	mg/l	0.18	0.36	Weekly/Monthly	Grab Sample Average	0.54	NR	NA	*
Copper, Total	mg/l	0.096	0.19	Weekly/Monthly	Daily Composite	0.28	NR	NA	*
Flow, Average and Maximum [1]	gpd	126,103	173,571	Daily/Monthly	Daily Flow	NA	NR	NA	
Flow, Total	gpd	-----	173,571	Daily/Monthly	Daily Flow	NA	NR	NA	
Iron	mg/l	-----	------	Weekly/Monthly	Daily Composite	-----	NR	NA	
Lead, Total	mg/l	0.019	0.039	Weekly/Monthly	Daily Composite	0.058	NR	NA	*
Phosphorus	mg/l	----	-----	Weekly/Monthly	Daily Composite	NA	NR	NA	
pH	S.U.	NA	NA	NR	NA	6.0 - 9.0	Weekly/ Monthly	RDS	
pH, Continuous	S.U.	NA	NA	NR	NA	6.0 - 9.0	Continuous/ Monthly	RDM	
Temperature, Maximum (See remark 1)	^{o}F	NA	NA	NR	NA	90.0	Hourly	Instantaneous	
Temperature, intake/outlet differential	^{o}F	NA	NA	NR	NA	-----	Hourly	Instantaneous	
Turbidity	NTU	NA	NA	NR	NA	-----	Hourly	Grab	
Total Suspended Solids	mg/l	20.0	30.0	Weekly/Monthly	Daily Composite	45.0	NR	NA	
Zinc, Total	mg/l	0.64	1.3	Weekly/Monthly	Daily Composite	1.95	NR	NA	*

Table Footnotes and Remarks:

Footnotes:

[1] For this parameter the Permittee shall maintain at the facility a record of the total flow for each day of discharge and shall report the Average Daily Flow and the Maximum Daily Flow for each sampling month.

[2] The first entry in this column is the 'Sample Frequency'. If a 'Reporting Frequency' does not follow this entry and the 'Sample Frequency' is more frequent than monthly then the 'Reporting Frequency' is monthly. If the 'Sample frequency' is specified as monthly, or less frequent, then the 'Reporting Frequency' is the same as the 'Sample Frequency'.

[3] Minimum Level Test refers to Section 6 Paragraph A of this permit.

Remarks:

1 The Permittee shall report the maximum and minimum temperature of the discharge for each month.

TABLE B

Discharge Serial Number (DSN): 101				Monitoring Location: T		
Wastewater Description: Treated cooling tower blowdown wastewater						
Monitoring Location Description: After the temperature monitoring probe prior to discharging into the Quinebaug River via the diffuser						
Allocated Zone of Influence (ZOI): 137,750 gph				In stream Waste Concentration (IWC): 5%		
PARAMETER	**Units**	**Maximum Daily Limit**	**Maximum Instantaneous Limit**	**Sampling Frequency**	**Sample Type**	**Minimum Level Analysis See Section 6**
Aquatic Toxicity, Daphnia, Pulex [1] NOAEL = 100%		>90%	NA	Quarterly	Daily Composite	
Aquatic Toxicity, Pimephales promelas [1] NOAEL= 100%		>90%	NA	Quarterly	Daily Composite	
Aquatic Toxicity, Daphnia, Pulex [1] NOAEL = 100%			>90%	NR	Grab	
Aquatic Toxicity, Pimephales promelas [1] NOAEL= 100%			>90%	NR	Grab	
Chronic Toxicity (See Section 6(C) below)	%	NA	NA	Annual	Daily Composite	

TABLE B						
Discharge Serial Number (DSN): 101			Monitoring Location: T			
Wastewater Description: Treated cooling tower blowdown wastewater						
Monitoring Location Description: After the temperature monitoring probe prior to discharging into the Quinebaug River via the diffuser						
Allocated Zone of Influence (ZOI): 137,750 gph				In stream Waste Concentration (IWC): 5%		
PARAMETER	**Units**	**Maximum Daily Limit**	**Maximum Instantaneous Limit**	**Sampling Frequency**	**Sample Type**	**Minimum Level Analysis See Section 6**
Aluminum	mg/l	-----	NA	Quarterly	Daily Composite	
Boron	mg/l	-----	NA	Quarterly	Daily Composite	
Chlorine, Total Residual	mg/l	0.36	NA	Quarterly	Daily Composite	*
Copper, Total	mg/l	0.19	NA	Quarterly	Daily Composite	*
Lead, Total	mg/l	0.039	NA	Quarterly	Daily Composite	*
Iron, total	mg/l	-----	NA	Quarterly	Daily Composite	
Nitrogen, Ammonia (total as N)	mg/l	-----	NA	Quarterly	Daily Composite	
Nitrogen, Nitrate (total as N)	mg/l	------	NA	Quarterly	Daily Composite	
Nitrogen, Nitrite (total as N)	mg/l	------	NA	Quarterly	Daily Composite	
Phosphorus, Total	mg/l	-----	NA	Quarterly	Daily Composite	
Total Suspended Solids	mg/l	30.0	NA	Quarterly	Daily Composite	
Zinc, Total	mg/l	1.3	NA	Quarterly	Daily Composite	*

TABLE B						
Discharge Serial Number (DSN): 101			Monitoring Location: T			
Wastewater Description: Treated cooling tower blowdown wastewater						
Monitoring Location Description: After the temperature monitoring probe prior to discharging into the Quinebaug River via the diffuser						
Allocated Zone of Influence (ZOI): 137,750 gph				In stream Waste Concentration (IWC): 5%		
PARAMETER	**Units**	**Maximum Daily Limit**	**Maximum Instantaneous Limit**	**Sampling Frequency**	**Sample Type**	**Minimum Level Analysis See Section 6**
Remark: All analysis shall be on the same sample. Footnote: [1] The results of the Toxicity Tests shall be recorded in % on the DMR.						

Table C

Monitoring Location: 101-H Intake Cooling Water | **Monitoring Location:** G

Monitoring Location Description: At the pH/temperature/turbidity monitoring location prior to the intake cooling water treatment

PARAMETER	UNITS	FLOW/TIME BASED MONITORING				INSTANTANEOUS MONITORING			Minimum Level Test[3]
		Average Monthly Limit	Maximum Daily Limit	Sample/Reporting Frequency	Sample Type or Measurement to be reported	Instantaneous limit or required range	Sample/ Reporting Frequency	Sample Type or measurement to be reported	
Aluminum, Total	mg/l	NA	NA	NR	NA	-----	Monthly	Grab	
Copper, Total	mg/l	NA	NA	NR	NA	-----	Monthly	Grab	*
Flow, Average and Maximum [1]	gpd	------	893,000	Monthly	Daily Flow	NA	NR	NA	
Flow, Instantaneous	gpm	NA	NA	NR	NA	------	Daily/ Monthly	Instantaneous	
Iron, Total	mg/l	NA	NA	NR	NA	------	Monthly	Grab	
Lead, Total	mg/l	NA	NA	NR	NA	-----	Monthly	Grab	*
Nitrogen, Ammonia (total as N)	mg/l	NA	NA	NR	NA	------	Monthly	Grab	
Nitrogen, Nitrate, (total as N)	mg/l	NA	NA	NR	NA	-----	Monthly	Grab	
Nitrogen, Nitrite, (total as N)	mg/l	NA	NA	NR	NA	-----	Monthly	Grab	
Phosphorus	mg/l	NA	NA	NR	NA	-----	Monthly	Grab	
Temperature (See remark 1 below)	^{o}F	NA	NA	NR	NA	-----	Monthly	Instantaneous	
Turbidity	NTU	NA	NA	NR	NA	------	Monthly	Grab	
Total Suspended Solids	mg/l	NA	NA	NR	NA	------	Monthly	Grab	
Zinc, Total	mg/l	NA	NA	NR	NA	-----	Monthly	Grab	*

Table Footnotes and Remarks:

Footnotes:

[1] For this parameter the permittee shall maintain at the facility a record of the total intake flow for each day of water withdrawal and shall report the Average Daily Flow and Maximum Daily Flow for each month.

[2] The first entry in this column is the 'Sample Frequency'. If this entry is not followed by a 'Reporting Frequency' and the 'Sample Frequency' is more frequent than monthly then the 'Reporting Frequency' is monthly. If the 'Sample frequency' is specified as monthly, or less frequent, then the 'Reporting Frequency' is the same as the 'Sample Frequency'

[3] Minimum Level Test refers to Section 6 Paragraph A of this permit.

Remarks:

1. The Permittee shall report the maximum and minimum temperature of the intake water for each month.

Table D

Discharge Serial Number: 102 | **Monitoring Location:** 1

Wastewater Description: Fire pump test wastewater

Maximum Frequency of Discharge: Once per year

Monitoring Location Description: Prior to discharging into the in-ground stormwater infiltration system located at South end of the site

PARAMETER	UNITS	FLOW/TIME BASED MONITORING				INSTANTANEOUS MONITORING			Minimum Level Test[3]
		Average Monthly Limit	Maximum Daily Limit	Sample/Reporting Frequency [2]	Sample Type or Measurement to be reported	Instantaneous limit or required range	Sample/ Reporting Frequency	Sample Type or measurement to be reported	
Aluminum, Total	mg/l	NA	NA	NR	NA	-----	Annual	Grab	
Boron, Total	mg/l	NA	NA	NR	NA	-----	Annual	Grab	
Copper, Total	mg/l	NA	NA	NR	NA	-----	Annual	Grab	*
Flow, Maximum [1]	gpd	NA	225,000	Annual	Daily Flow	NA	NR	NA	
Iron, Total	mg/l	NA	NA	NR	NA	-----	Annual	Grab	
Lead, Total	mg/l	NA	NA	NR	NA	-----	Annual	Grab	*
pH	S.U.	NA	NA	NR	NA	6.0 - 9.0	Annual	Grab	
Phosphorus	mg/l	NA	NA	NR	NA	-----	Annual	Grab	
Zinc, Total	mg/l	NA	NA	NR	NA	-----	Annual	Grab	*

Table Footnotes and Remarks:

Footnotes:

[1] For this parameter the permittee shall maintain at the facility a record of the total flow for each day of discharge and shall report the Maximum Daily Flow for each sampling month.

[2] The first entry in this column is the 'Sample Frequency'. If this entry is not followed by a 'Reporting Frequency' and the 'Sample Frequency' is more frequent than monthly then the 'Reporting Frequency' is monthly. If the 'Sample frequency' is specified as monthly, or less frequent, then the 'Reporting Frequency' is the same as the 'Sample Frequency'

[3] Minimum Level Test refers to Section 6 Paragraph A of this permit.

Table E

Discharge Serial Number: 103 | **Monitoring Location:** 1

Wastewater Description: Fire hydrant test wastewater

Maximum Frequency of Discharge: Once per year

Monitoring Location Description: Prior to discharging into the in-ground stormwater infiltration system located at South and North end of the site (See remark 1 below)

PARAMETER	UNITS	FLOW/TIME BASED MONITORING				INSTANTANEOUS MONITORING			Minimum Level Test[3]
		Average Monthly Limit	Maximum Daily Limit	Sample/Reporting Frequency [2]	Sample Type or Measurement to be reported	Instantaneous limit or required range	Sample/ Reporting Frequency	Sample Type or measurement to be reported	
Copper, Total	mg/l	NA	NA	NR	NA	-----	Annual	Grab*	*
Flow, Maximum [1]	gpd	NA	1,000	Annual	Daily Flow	NA	NR	NA	
Iron, Total	mg/l	NA	NA	NR	NA	------	Annual	Grab*	
Lead, Total	mg/l	NA	NA	NR	NA	-----	Annual	Grab*	*
pH	S.U.	NA	NA	NR	NA	6.0 - 9.0	Annual	Grab*	
Zinc, Total	mg/l	NA	NA	NR	NA	-----	Annual	Grab*	*

Table Footnotes and Remarks:

Footnotes:

[1] For this parameter the permittee shall maintain at the facility a record of the total flow for each day of discharge and shall report the Maximum Daily Flow for each sampling month.

[2] The first entry in this column is the 'Sample Frequency'. If this entry is not followed by a 'Reporting Frequency' and the 'Sample Frequency' is more frequent than monthly then the 'Reporting Frequency' is monthly. If the 'Sample frequency' is specified as monthly, or less frequent, then the 'Reporting Frequency' is the same as the 'Sample Frequency'

[3] Minimum Level Test refers to Section 6 Paragraph A of this permit.

Remarks:

*1. Sampling for permit compliance shall be collected from either one of the two fire hydrants.

Table F

Discharge Serial Number: 104 | **Monitoring Location:** 1

Wastewater Description: Make-up supply tank drain and overflow wastewaters

Maximum Frequency of Discharge: Once per year

Monitoring Location Description: Prior to discharging into the in-ground stormwater infiltration system located at North end of the site

PARAMETER	UNITS	FLOW/TIME BASED MONITORING				INSTANTANEOUS MONITORING			Minimum Level Test[3]
		Average Monthly Limit	Maximum Daily Limit	Sample/Reporting Frequency [2]	Sample Type or Measurement to be reported	Instantaneous limit or required range	Sample/ Reporting Frequency	Sample Type or measurement to be reported	
Aluminum, Total	mg/l	NA	NA	NR	NA	-----	Annual	Grab	
Boron, Total	mg/l	NA	NA	NR	NA	-----	Annual	Grab	
Copper, Total	mg/l	NA	NA	NR	NA	-----	Annual	Grab	*
Flow, Maximum [1]	gpd	NA	250,000	Annual	Daily Flow	NA	NR	NA	
Iron, Total	mg/l	NA	NA	NR	NA	-----	Annual	Grab	
Lead, Total	mg/l	NA	NA	NR	NA	-----	Annual	Grab	*
pH	S.U.	NA	NA	NR	NA	6.0 - 9.0	Annual	Grab	
Phosphorus	mg/l	NA	NA	NR	NA	-------	Annual	Grab	
Zinc, Total	mg/l	NA	NA	NR	NA	-----	Annual	Grab	*

Table Footnotes and Remarks:
Footnotes:
[1] For this parameter the permittee shall maintain at the facility a record of the total flow for each day of discharge and shall report the Maximum Daily Flow for each sampling month.
[2] The first entry in this column is the 'Sample Frequency'. If this entry is not followed by a 'Reporting Frequency' and the 'Sample Frequency' is more frequent than monthly then the 'Reporting Frequency' is monthly. If the 'Sample frequency' is specified as monthly, or less frequent, then the 'Reporting Frequency' is the same as the 'Sample Frequency'
[3] Minimum Level Test refers to Section 6 Paragraph A of this permit.

Table G

Discharge Serial Number: 105 | **Monitoring Location:** 1

Wastewater Description: Demineralized water tank overflow wastewater

Maximum Frequency of Discharge: Once per year

Monitoring Location Description: Prior to discharging into the in-ground stormwater infiltration system located at North end of the site

PARAMETER	UNITS	FLOW/TIME BASED MONITORING				INSTANTANEOUS MONITORING			Minimum Level Test[3]
		Average Monthly Limit	Maximum Daily Limit	Sample/Reporting Frequency [2]	Sample Type or Measurement to be reported	Instantaneous limit or required range	Sample/ Reporting Frequency	Sample Type or measurement to be reported	
Copper, Total	mg/l	NA	NA	NR	NA	-----	Annual	Grab	*
Flow, Maximum [1]	gpd	NA	10,000	Annual	Daily Flow	NA	NR	NA	
Iron, Total	mg/l	NA	NA	NR	NA	------	Annual	Grab	
Lead, Total	mg/l	NA	NA	NR	NA	-----	Annual	Grab	*
pH	S.U.	NA	NA	NR	NA	6.0 - 9.0	Annual	Grab	
Zinc, Total	mg/l	NA	NA	NR	NA	-----	Annual	Grab	*

Table Footnotes and Remarks:
Footnotes:
[1] For this parameter the permittee shall maintain at the facility a record of the total flow for each day of discharge and shall report the Maximum Daily Flow for each sampling month.

[2] The first entry in this column is the 'Sample Frequency'. If this entry is not followed by a 'Reporting Frequency' and the 'Sample Frequency' is more frequent than monthly then the 'Reporting Frequency' is monthly. If the 'Sample frequency' is specified as monthly, or less frequent, then the 'Reporting Frequency' is the same as the 'Sample Frequency'

[3] Minimum Level Test refers to Section 6 Paragraph A of this permit.

(1) All samples shall be comprised of only the wastewater described in this table. Samples shall be collected prior to combination with receiving waters or wastewater of any other type, and after all approved treatment units, if applicable. All samples collected shall be representative of the discharge during standard operating conditions.

(2) In cases where limits and sample type are specified but sampling is not required by this permit, the limits specified shall apply to all samples which may be collected and analyzed by the Department of Environmental Protection personnel, the Permittee, or other parties.

(3) The limits imposed on the discharges listed in this permit take effect on the issuance date of this permit, hence any sample taken after this date which, upon analysis, shows an exceedance of permit limits will be considered non-compliance.

The monitoring requirements begin on the date of issuance of this permit if the issuance date is on or before the 12th day of a month. For permits issued on or after the 13th day of a month, monitoring requirements begin the 1st day of the following month.

(4) The Permittee is prohibited from discharging polychlorinated biphenyl compounds.

(5) The Permittee is prohibited from using any chemicals that contain phosphorus in any process or activity that may result in a discharge to the waters of the state.

(6) The Permittee shall construct, operate and maintain the cooling water intake structure in accordance with the mitigation and monitoring plan entitled, "Plainfield Renewable Energy, LLC, Proposed 37.5MW Biomass Facility, Mitigation and Monitoring Plan", dated January 2008 and revised through April 1, 2008, prepared by Kleinschmidt.

(7) The Permittee shall construct, operate and maintain the outdoor wood storage area in accordance with the report dated February 19, 2008 and filed with the DEP on February 20, 2008.

SECTION 6: SAMPLE COLLECTION, HANDLING AND ANALYTICAL TECHNIQUES

(A) Chemical Analysis

(1) Chemical analyses to determine compliance with effluent limits and conditions established in this permit shall be performed using the methods approved pursuant to the 40 CFR 136 unless an alternative method has been approved in writing pursuant to 40 CFR 136.4 or as provided in section 22a-430-3(j)(7) of the RCSA. Chemicals which do not have methods of analysis defined in 40 CFR 136 shall be analyzed in accordance with methods specified in this permit.

(2) All metals analyses identified in this permit shall refer to analyses for Total Recoverable Metal as defined in 40 CFR 136 unless otherwise specified.

(3) The Minimum Levels specified below represent the concentrations at which quantification must be achieved and verified during the chemical analyses for the parameters identified in Section 5 Tables A, B, C, D, E, F and G. Analyses for these parameters must include check standards within ten percent of the specified Minimum Level or calibration points equal to or less than the specified Minimum Level.

Parameter	Minimum Level
Chlorine, total residual	20.0 ug/L
Copper	5.0 ug/L
Lead	5.0 ug/L
Zinc	10.0 ug/L

(4) The value of each parameter for which monitoring is required under this permit shall be reported to the maximum level of accuracy and precision possible consistent with the requirements of this section of the permit.

(5) Effluent analyses for which quantification was verified during the analysis at or below the minimum levels specified in this section and which indicate that a parameter was not detected shall be reported as "less than x" where 'x' is the numerical value equivalent to the analytical method detection limit for that analysis.

(6) Results of effluent analyses which indicate that a parameter was not present at a concentration greater than or equal to the Minimum Level specified for that analysis shall be considered equivalent to zero (0.0) for purposes of determining compliance with effluent limitations or conditions specified in this permit.

(B) Acute Aquatic Toxicity Test

(1) Samples for monitoring of Aquatic Toxicity shall be collected and handled as prescribed in "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms" (EPA/821-R-02-012).

(a) Composite samples shall be chilled as they are collected. Grab samples shall be chilled immediately following collection. Samples shall be held at 4 degrees Centigrade until Aquatic Toxicity testing is initiated.

(b) Effluent samples shall not be dechlorinated, filtered, or, modified in any way, prior to testing for Aquatic Toxicity unless specifically approved in writing by the Commissioner for monitoring at this facility.

(c) Chemical analyses of the parameters identified in Section 5 Table B shall be conducted on an aliquot of the same sample tested for Aquatic Toxicity.

(i) At a minimum, pH, specific conductance, total alkalinity, total hardness, and total residual chlorine shall be measured in the effluent sample and, during Aquatic Toxicity tests, in the highest concentration of test solution and in the dilution (control) water at the beginning of the test and at test termination. If Total Residual

Chlorine is not detected at test initiation, it does not need to be measured at test termination. Dissolved oxygen, pH, and temperature shall be measured in the control and all test concentrations at the beginning of the test, daily thereafter, and at test termination.

(d) Tests for Aquatic Toxicity shall be initiated within 36 hours of sample collection.

(2) Monitoring for Aquatic Toxicity to determine compliance with the permit limit and condition on Aquatic Toxicity (invertebrate) above shall be conducted for 48-hours utilizing neonatal Daphnia pulex (less than 24-hours old).

(3) Monitoring for Aquatic Toxicity to determine compliance with the permit limit on Aquatic Toxicity (vertebrate) above shall be conducted for 48-hours utilizing larval Pimephales promelas (1-14 days old with no more than 24-hours range in age).

(4) Tests for Aquatic Toxicity shall be conducted as prescribed for static non-renewal acute tests in "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms" (EPA/821-R-02-012), except as specified below.

(a) For Aquatic Toxicity Limits and for monitoring only conditions, expressed as an NOAEL value, Pass/Fail (single-concentration) tests shall be conducted at a specified Critical Test Concentration (CTC) equal to the Aquatic Toxicity Limit, or 100% in the case of monitoring only conditions, as prescribed in section 22a-430-3(j)(7)(A)(i) of the Regulations of Connecticut State Agencies, except that five replicates of undiluted effluent and five replicates of effluent diluted to the CTC shall be included.

(b) Organisms shall not be fed during the tests.

(c) Copper nitrate shall be used as the reference toxicant in tests with freshwater organisms.

(d) Synthetic freshwater prepared with deionized water adjusted to a hardness of 50 mg/L (plus or minus 5 mg/L) as CaCO3 shall be used as dilution water in tests with freshwater organisms.

(5) Compliance with limits on Aquatic Toxicity shall be determined as follows:

(a) For limits expressed as an NOAEL value, compliance shall be demonstrated when the results of a valid pass/fail Aquatic Toxicity test indicates there is greater than 50% survival in the undiluted effluent and 90% or greater survival in the effluent at the specified CTC.

(C) The Permittee shall annually monitor the chronic toxicity of the DSN 101 in accordance with the following specifications.

(1) Chronic toxicity testing of the discharge shall be conducted annually during July, August, or September of each year.

(2) Chronic toxicity testing shall be performed on the discharge in accordance with the test methodology established in “Short term Methods For Estimating The Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms” (EPA-821-R-02-012) as referenced in 40 CFR 136 for Cerio daphnia

survival and reproduction and Fathead Minnow larval survival and growth.

(3) Chronic toxicity tests shall utilize a minimum of five effluent dilutions prepared using a dilution factor of 0.5 (100% effluent, 50% effluent, 25 % effluent, 12.5 % effluent, 6.25 % effluent, 0 % effluent).

(4) Quinebaug River water collected immediately upstream of the area influenced by the discharge shall be used as site water control (0% effluent) and dilution water in the toxicity tests.

(5) A laboratory water control consisting of synthetic freshwater prepared in accordance with EPA-821-R-02-012 at a hardness of 50±5 mg/l shall be included in the test protocol in addition to the site-water control.

(6) Daily composite samples of the discharge and grab samples of the Quinebaug River for use as site water control and dilution water shall be collected on: day 0, for test solution renewal on day 1 and day 2 of the test; day 2, for test solution renewal on day 3 and day 4 of the test; and day 4, for test solution renewal on day 5, 6, and 7 of the test. Samples shall not be dechlorinated, pH or hardness adjusted, or chemically altered in any way.

(7) All samples of the discharge and the Quinebaug River water used in the chronic toxicity test shall, at a minimum, be analyzed and results reported in accordance with the provisions listed in Section 6(A) of this permit for the following parameters:

pH	Copper (Total recoverable and dissolved)
Hardness	Nickel (Total recoverable and dissolved)
Alkalinity	Nitrogen, Ammonia (total as N)
Conductivity	Nitrogen, Nitrate (total as N)
Chlorine, (Total residual)	Solids, Total Suspended
Iron, Total	Zinc, (Total recoverable and dissolved)
Lead (Total recoverable and dissolved)	
Boron	
Phosphorus, Total	

(8) A complete and thorough report of the results of the chronic toxicity monitoring specified in this section shall be prepared as outlined in section 10 of EPA-821-R-02-012 and submitted to the Department for review on or before December 31 of each calendar year to the address specified in Section 7(B) of this permit.

SECTION 7: REPORTING REQUIREMENTS

(A) The results of chemical analyses and any aquatic toxicity test required above shall be entered on the Discharge Monitoring Report (DMR), provided by this office, and reported to the Bureau of Materials Management and Compliance Assurance (Attn: DMR Processing) at the following address. The report shall also include a detailed explanation of any violations of the limitations specified. The DMR shall be received at this address by the last day of the month following the month in which samples are collected.

Bureau of Materials Management and Compliance Assurance
Water Permitting and Enforcement Division (Attn: DMR Processing)
Connecticut Department of Environmental Protection
79 Elm Street

Hartford, CT 06106-5127

(B) Complete and accurate aquatic toxicity test data, including percent survival of test organisms in each replicate test chamber, LC50 values and 95% confidence intervals for definitive test protocols, and all supporting chemical/physical measurements performed in association with any aquatic toxicity test, including measured daily flow and hours of operation for the 30 consecutive operating days prior to sample collection if compliance with a limit on Aquatic Toxicity is based on toxicity limits based on actual flows described in Section 7, shall be entered on the Aquatic Toxicity Monitoring Report form (ATMR) and sent to the Bureau of Water Protection and Land Reuse at the following address. The ATMR shall be received at this address by the last day of the month following the month in which samples are collected.

Bureau of Water Protection and Land Reuse (Attn: Aquatic Toxicity)
Connecticut Department of Environmental Protection
79 Elm St.
Hartford, CT 06106-5127

(C) If this permit requires monitoring of a discharge on a calendar basis (e.g. Monthly, quarterly, etc.), but a discharge has not occurred within the frequency of sampling specified in the permit, the Permittee must submit the DMR and ATMR, as scheduled, indicating "NO DISCHARGE". For those Permittees whose required monitoring is discharge dependent (e.g. per batch), the minimum reporting frequency is monthly. Therefore, if there is no discharge during a calendar month for a batch discharge, a DMR must be submitted indicating such by the end of the following month.

SECTION 8: RECORDING AND REPORTING OF VIOLATIONS, ADDITIONAL TESTING REQUIREMENTS

(A) If any sample analysis indicates that an Aquatic Toxicity effluent limitation in Section 5 of this permit has been exceeded, or that the test was invalid, another sample of the effluent shall be collected and tested for Aquatic Toxicity and associated chemical parameters, as described above in Section 5 and Section 6, and the results reported to the Bureau of Materials Management and Compliance Assurance (Attn: DMR Processing), at the address listed above, within 30 days of the exceedance or invalid test. Results of all tests, whether valid or invalid, shall be reported.

(B) If any two consecutive test results or any three test results in a twelve month period indicates that an Aquatic Toxicity Limit has been exceeded, the Permittee shall immediately take all reasonable steps to eliminate toxicity wherever possible and shall submit a report to Bureau of Materials Management and Compliance Assurance (Attn: Aquatic Toxicity) for the review and approval of the Commissioner in accordance with section 22a-430-3(j)(10)(c) of the RCSA describing proposed steps to eliminate the toxic impact of the discharge on the receiving water body. Such a report shall include a proposed time schedule to accomplish toxicity reduction and the Permittee shall comply with any schedule approved by the Commissioner.

(C) The Permittee shall notify the Bureau of Materials Management and Compliance Assurance, Water Permitting and Enforcement Division, within 72 hours and in writing within thirty days of the discharge of any substance listed in the application but not listed in the permit if the concentration or quantity of that substance exceeds two times the level listed in the application.

SECTION 9: COMPLIANCE SCHEDULE

(A) On or before sixty (60) days after the initiation of Discharge Serial Numbers (DSNs) 101, 102, 103, 104 and

105, the Permittee shall submit a complete Attachment O (Part B discharge analysis of the permit application) for the Commissioner's review for the final effluent discharged from DSNs 101, 102, 103, 104 and 105. The Permittee must analyze such effluent for all substances listed in Table 1 and for those substances known or suspected present in Tables 2, 3 and 4 of the permit application.

(B) On or before one hundred and eighty (180) days after the initiation of the discharge (DSN 101), the Permittee shall submit for the Commissioner's review and written approval, a scope of study and schedule for performing seasonal thermal field monitoring verification work of such discharge into the Quinebaug River. Monitoring shall be conducted and the results shall be submitted no later three hundred and sixty five (365) days after the approval of the scope of work.

(C) On or before sixty (60) days after the initiation of the discharge (DSN 101), the Permittee shall submit for the Commissioner's review and written approval a comprehensive and thorough scope of study for performing a one-year impingement study and a two-year entrainment monitoring and evaluation of the cooling water intake structure at such time the Commissioner provides written notification to the Permittee that anadromous fish populations are restored in the Quinebaug River upstream of the Aspinook Pond Dam. The scope of study shall provide a detailed schedule that, at a minimum, identifies the initiation and completion dates for the impingement study and entrainment monitoring and evaluation of the cooling water intake structure. A scheduled generating unit shut down shall not occur during the impingement study and entrainment monitoring and evaluation of the cooling water intake structure.

(D) The Permittee shall perform the actions upon the Commissioner’s written notification in accordance with the approved scope of study described in paragraph 9(C) in accordance with the approved schedule(s).

(E) On or before ninety days (90) after completion of the actions described in paragraph 9(D) above, the Permittee shall submit for the Commissioner's review and written approval a comprehensive and thorough report on the findings of the impingement study and entrainment monitoring and evaluation.

(F) After completing one year of entrainment monitoring, the Permittee may submit in writing to the Commissioner a request to consider the entrainment monitoring complete. In making such request, the required report and data associated with the first year of entrainment monitoring must be submitted with such request for the review and written approval of the Commissioner and shall, at a minimum, include a detailed narrative describing the reasons for such request. The Commissioner has the sole discretion to either approve or deny such request.

(G) The Permittee shall use best efforts to submit to the Commissioner all documents required by this section of the permit in a complete and approvable form. If the Commissioner notifies the Permittee that any document or other action is deficient, and does not approve it with conditions or modifications, it is deemed disapproved, and the Permittee shall correct the deficiencies and resubmit it within the time specified by the Commissioner or, if no time is specified by the Commissioner, within thirty days of the Commissioner's notice of deficiencies. In approving any document or other action under this Compliance Schedule, the Commissioner may approve the document or other action as submitted or performed or with such conditions or modifications as the Commissioner deems necessary to carry out the purposes of this section of the permit. Nothing in this paragraph shall excuse noncompliance or delay.

(H) Dates. The date of submission to the Commissioner of any document required by this section of the permit shall be the date such document is received by the Commissioner. The date of any notice by the Commissioner under this section of the permit, including but not limited to notice of approval or disapproval of any document or other action, shall be the date such notice is personally delivered or the date three days after it is mailed by the Commissioner, whichever is earlier. Except as otherwise specified in this permit, the word "day" as used in

this section of the permit means calendar day. Any document or action which is required by this section only of the permit, to be submitted, or performed, by a date which falls on, Saturday, Sunday, or, a legal Connecticut or federal holiday, shall be submitted or performed on or before the next day which is not a Saturday, Sunday, or legal Connecticut or federal holiday.

(I) Notification of noncompliance. In the event that the Permittee becomes aware that it did not or may not comply, or did not or may not comply on time, with any requirement of this section of the permit or of any document required hereunder, the Permittee shall immediately notify the Commissioner and shall take all reasonable steps to ensure that any noncompliance or delay is avoided or, if unavoidable, is minimized to the greatest extent possible. In so notifying the Commissioner, the Permittee shall state in writing the reasons for the noncompliance or delay and propose, for the review and written approval of the Commissioner, dates by which compliance will be achieved, and the Permittee shall comply with any dates that may be approved in writing by the Commissioner. Notification by the Permittee shall not excuse noncompliance or delay, and the Commissioner's approval of any compliance dates proposed shall not excuse noncompliance or delay unless specifically so stated by the Commissioner in writing.

(J) Notice to Commissioner of changes. Within fifteen days of the date the Permittee becomes aware of a change in any information submitted to the Commissioner under this section of the permit, or that any such information was inaccurate or misleading or that any relevant information was omitted, the Permittee shall submit the correct or omitted information to the Commissioner.

(K) Submission of documents. Any document, other than a discharge monitoring report, required to be submitted to the Commissioner under this section of the permit shall, unless otherwise specified in writing by the Commissioner, be directed to:

Charles Nezianya
Department of Environmental Protection
Bureau of Materials Management and Compliance Assurance
Water Permitting and Enforcement Division
79 Elm Street
Hartford, CT 06106-5127

This permit is hereby issued on

DRAFT
Gina McCarthy
Commissioner

GM/cn

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REVISED DRAFT SEPTEMBER 4, 2008

DATA TRACKING AND TECHNICAL FACT SHEET

Permittee: Plainfield Renewable Energy, LLC PAMS Company ID: 123206

PERMIT, ADDRESS, AND FACILITY DATA

PERMIT #: CT0030473 APPLICATION #: 200702055 FACILITY ID. 109-110
Permit #: SP0002426 APPLICATION #: 200800492

Mailing Address:						**Location Address:**					
Street:	20 Marshall Street, Suite 300					**Street:**	Norwich Road via Mill Brook Road				
City:	Norwalk	**ST:**	CT	**Zip:**	06854	**City:**	Plainfield	**ST:**	**CT**	**Zip:**	
Contact Name:	Daniel Donovan					**DMR Contact**	Daniel Donovan				
Phone No.:	(203) 354-1529					**Phone No.:**	(203) 354-1529				

PERMIT INFORMATION

DURATION 5 YEAR _X_ 10 YEAR ___ 30 YEAR ____

TYPE New _X_ Reissuance __ Modification ____

CATEGORIZATION POINT (X) NON-POINT ( ) GIS # __

NPDES (X) PRETREAT () GROUND WATER(UIC) ( ) GROUND WATER (OTHER) (X)

NPDES MAJOR (MA) _____

NPDES SIGNIFICANT MINOR or PRETREAT SIU (SI) _____
NPDES or PRETREATMENT MINOR (MI) ___X___ (See attached NPDES rating sheet)

PRETREAT SIGNIFICANT INDUS USER (SIU) _____
PRETREAT CATEGORICAL (CIU) _____

POLLUTION PREVENTION MANDATE __ ENVIRONMENTAL EQUITY ISSUE ____

COMPLIANCE ISSUES

COMPLIANCE SCHEDULE YES X NO (If yes check off what it is in relation to.)

POLLUTION PREVENTION ___ TREATMENT REQUIREMENT____WATER CONSERVATION

WATER QUALITY REQUIREMENT __X__ REMEDIATION __ OTHER X (Analyze for pollutants of concern and use the analytical report to complete Attachment O of the permit application.)

IS THE PERMITTEE SUBJECT TO A PENDING ENFORCEMENT ACTION? NO_X__ YES __

OWNERSHIP CODE

Private __X__ Federal __ State __ Municipal (town only) __ Other public ____

DEP STAFF ENGINEER Charles Nezianya

PERMIT FEES

Discharge Code	DSN	Annual Fee
101060z	101	$8,175.0
121000b	102	$2,040.0
121000b	103	$0.0
101060n	104	$0.0
1060000	105	$525.0

FOR NPDES DISCHARGES

Drainage basin Code: 3700-Quinebaug River Present/Future Water Quality Standard: B

FOR SEWER DISCHARGES: NA

Discharge to The Regional Authority/Town/City of _____ POTW via Truck/Town of ___/its collection system. Facility ID of the POTW is _____.

FOR GROUNDWATER STATE PERMITS:

Drainage basin Code: 3700 Water Quality Standard: GA Impaired Total Wells __n/a__ Well Type n/a____

NATURE OF BUSINESS GENERATING DISCHARGE

A 37.5 megawatt (MW) generated electricity from steam produced as a result of the gasification of biomass (wood)

PROCESS AND TREATMENT DESCRIPTION (by DSN)

DSN 101 - Maximum Daily Flow = 173,571 gallons per day - Treated cooling tower blowdown wastewater - Addition of sodium bisulfite to the effluent to destroy chlorine, total residual

DSN 102- Maximum Daily Flow = 225,000 gallons per day - Fire pump test wastewater (Intermittent Discharge) -No treatment is necessary

DSN 103 - Maximum Daily Flow = 1,000 gallons per day - Fire hydrant test wastewater (Intermittent Discharge) –No treatment is necessary

DSN 104 - Maximum Daily Flow = 250,000 gallons per day - Make-up supply tank drain and overflow wastewaters (Intermittent Discharge)-No treatment is necessary

DSN 105 - Maximum Daily Flow = 10,000 gallons per day - Demineralized water tank overflow wastewater (Intermittent Discharge) –No treatment is necessary

Monitoring Location 101-H - Maximum Intake Cooling Water = 893,000 gallons per day- (Intake Cooling Water) - Cylindrical wedge wire screen to minimize impingement and entrainment

Intake Cooling Water Treatment (On as needed basis) - Neutralization, Coagulation, Flocculation, Clarification, Filtration

RESOURCES USED TO DRAFT PERMIT

_x_ Federal Effluent Limitation Guideline 40 CFR 423 (not subject to this subpart because fossil fuel will not be used) This subpart was used as a reference in developing effluent monitoring and limitations for this discharge.

__ Performance Standards

__ Federal Development Document
name of category

__ Treatability Manual

_x_ Department File Information

_x_ Connecticut Water Quality Standards

__ Anti-degradation Policy

__ Coastal Management Consistency Review Form

__ Other - Explain

BASIS FOR LIMITATIONS, STANDARDS OR CONDITIONS

x Best Professional Judgment (See Other Comments) - Ammonia, aluminum, total residual chlorine, copper, lead, boron, temperature, turbidity, phosphorus, nitrogen, iron, ph, Total Suspended Solids and zinc

x Case-by-Case Determination (See Other Comments) - - Ammonia, aluminum, total residual chlorine, copper, lead, boron, temperature, turbidity, phosphorus, nitrogen, iron, pH, Total Suspended Solids and zinc

x In order to meet in-stream water quality (See General Comments) - Aluminum, total residual chlorine, copper, lead and zinc

GENERAL COMMENTS

DSN 101

Water quality based discharge limitations were included in this permit for consistency with Connecticut Water Quality Standards and criteria, pursuant to 40 CFR 122.44(d). Each parameter was evaluated for consistency with the available aquatic life criteria (acute and chronic) and human health (fish consumption only) criteria, considering the zone of influence allocated to the facility where appropriate. The statistical procedures outlined in the EPA Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001) were employed to calculate the limits. The most restrictive of the water quality limitations, aquatic life acute, aquatic life chronic, and human health, was compared with limitations developed according to State and Federal Best Available Technology (BAT). Where the water quality based limitations were more restrictive than BAT, the water quality based limitation was included in the permit.

Brief Overview

PRE is proposing to construct a 37.5 MW (megawatt) biomass facility in Plainfield. The facility will be fueled solely by wood (biomass) and will utilize a fluidized bed gasification process with a single close-coupled boiler to power the steam turbine generator. The biomass fuel will come from various sources, which includes forest management residues, land clearing debris, and waste wood from industries and construction and demolition (C&D) waste. Bio-diesel (B100) will be used to supplement the solid fuel supply during startup, refractory curing, and for process stabilization.

Effluent Monitoring and Limitations Requirements

Because this facility will not use fossil fuel, effluent limitations and monitoring requirements specified in 40 CFR 423 (Steam Electric) do not specifically apply. The proposed effluent limitations are based on a case by case determination using the criteria of best professional judgment. Aquatic toxicity monitoring and limits are proposed for DSN 101, water quality based effluent limitations are proposed for aluminum, total residual chlorine, copper, lead and zinc. For DSNs 102, 103, 104 and 105, these discharges are intermittent and will be discharged into the onsite in- ground stormwater infiltration systems.

Monitoring only is being proposed for all chemical parameters required for these discharges except for pH, which has been limited within a specified range.

The Permittee has provided projected effluent quality data in Attachment O of the permit application and additional information provided in the report, dated February 19, 2008 and filed with the Department on February 20, 2008, for the discharges to the groundwater. Department staff has reviewed the information and determined that such discharges are consistent with applicable Ground Water Quality Standards GW2 and GW12(C).

For the withdrawal of cooling water from the Quinebaug River, only monitoring is being proposed for all parameters identified in Table C. This monitoring will be required prior to water treatment for suspended solids removal using coagulation, flocculation and settling.

For DSN 101- Flow meter will be installed to monitor flow.
For DSNs 102, 103, 104 and 105 flow will be estimated using generally acceptable engineering calculations.

Section 316(a) of the Federal Water Pollution Control Act (FWPCA) Determination

PRE is proposing to withdraw a maximum volume of 893,000 gallons per day from Quinebaug River. This non-contact cooling water will be recirculated five times within the cooling tower system and about 20% of this water will be discharged back to the river via a submerged single port diffuser. PRE is planning to use some of this water for various activities within the facility.

PRE is proposing to install and use a single port diffuser (6 inches port diameter) which will be a submerged pipe that will favor rapid dilution and a large bulk mixing ratio for the discharge. The location of the single port outfall pipe was selected and designed to discharge into the center of the river where the water depths are at a maximum and approximately 100 feet downstream from the intake pipe. PRE also stated in the permit application that this design is consistent with the recommendations by the EPA that cooling water systems should optimize the dissipation of heat and minimize the area affected by excessive temperatures. Further, the design is also consistent with EPA's emphasis that thermal discharges should be located in areas with good flushing characteristics and should minimize the addition of heat into receiving waters.

EPA's modeling software "Visual Plumes" was used to model the characteristics of the expected thermal plume associated with the discharge of heated effluent into the Quinebaug River. This software generates a three-dimensional model of the geometry of the thermal plume under the assumption that the discharge and ambient flow conditions are in a steady state.

On May 6, 2008, PRE submitted a request to the DEP to increase the maximum instantaneous discharge temperature limit from 84 degree F to 90 degree F. Please see the tables below from Interoffice memo dated September 3, 2008 from Rosemary Gatter-Evarts, Environmental Analyst III to Charles Nezianya, Sanitary Engineer III on comparing this request to the original submittal in the permit application under low flow and mean flow conditions of the Quinebaug River.

QUINEBAUG RIVER LOW FLOW CONDITIONS

	Original Application	**Revised Application**

River Flow (cfs)	101		84.4		84.4		
Discharge Temp. (degree F)	84		84		90		
Ambient River Temp. (degree F)	77		77		77		
Plume Temp. (degree F)	81	77.25	81	77.25*	85	81	77.25
Length (ft)	0.91	22	0.91	22*	0.77	2.7	36.3
Width/diameter (ft)	0.84	7	0.84	7.1*	0.78	1.47	10.5
Depth to center line (ft)	4.2	0.8	4	0.7*	4	3.9	Near Surface
Cross-sectional Area** (sq ft)	0.5	38	0.6	40.2*	0.5	1.7	87
% River Width [1]	0.4%	3.3%	0.4%	3.3%*	0.4%	0.7%	4.9%
% Cross-sectional Area [2]	0.1%	6.4%	0.1%	6.7%*	0.08%	0.3%	14.4%

*Values estimated for a plume temperature of 77.25 degree F. Model ended at a plume temperature of 77.47 degree F.

**Model assumed that the cross sectional area of the plume is circular hence, area was calculated using the formula $= \pi r^2$

[1] River width was assumed to be 215 ft at the point of discharge.

[2] Cross-sectional area of the river was determined to be 600 sq ft. at 7Q10.

QUINEBAUG RIVER MEAN FLOW CONDITIONS

	Original Application		**Revised Application**		
River Flow (cfs)	1030		1030		
Discharge Temp. (degree F)	70		90		
Ambient River Temp. (degree F)	55		55		
Plume Temp. (degree F)	59	55.02	85	59	55
Length (ft)	3.8	325	0.22	8.7	438
Width/diameter (ft)	1.3	16.2	0.56	2.3	24
Depth to center line (ft)	7.9	0.3	8	7.2	Surface
Cross-sectional Area** (sq ft)	1.3	206	0.2	4.2	441
% River Width [1]	0.6%	7.5%	0.3%	1.1%	11%
% Cross-sectional Area [2]	0.1%	14.4%	0.02%	0.3%	30.7%

*Values estimated for a plume temperature of 55.02 degree F. Model ended at a plume temperature of 55.3 degree F.

**Model assumed that the cross sectional area of the plume is circular hence, area was calculated using the formula $= \pi r^2$

[1] River width was assumed to be 215 ft at the point of discharge.

[2] Cross-sectional area of the river was determined to be 1435 sq ft.

Based on DEP staff comments, this request was revised in a submittal dated September 3, 2008 by Anchor Engineering Services, Inc. on behalf of PRE explaining the thermal plume modeling analysis. The results of this analysis are as follows: under 7Q10 low flow conditions the temperature of the discharge reaches ambient river temperature at a distance of approximately 36.3 feet downstream from the diffuser under August low flow conditions, plume diameter (width) of 10.5 feet, cross-sectional area of plume at 87 sq feet, and percentage of river cross-section of 14.4%. For mean flow conditions, the plume reaches ambient temperature at approximately 438 feet from the diffuser under mean flow conditions, plume diameter (width) of 24 feet, cross-sectional area of plume at 441 sq feet, and percentage of river cross-section at 30.7%.

The temperature of the discharge at the diffuser was projected at 90 degrees F and 77.25 degrees F where the thermal plume reaches ambient river temperature under August low flow conditions. The discharge temperature was projected at 90 degrees F at the diffuser and 55.02 degrees F where the thermal plume reaches ambient river temperature under mean flow conditions.

Due to the rapid dilution of elevated temperatures and open water location of the diffuser, the potential impacts to the local ecosystem is expected to be minimal.

The segment of Quinebaug River where the discharge will be located is classified as a class "B" under the Connecticut Water Quality Standards (WQS). The allowable temperature increase criterion for a class "B" surface water states: "There shall be no changes from natural conditions that would impair any existing or designated uses assigned to this class and, no case exceed 85 degrees F, or in any case raise the temperature of surface water more than 4 degrees F."

Based on the Visual Plumes modeling analysis report dated September 3, 2008 and submitted to the DEP, allocation of the thermal discharge mixing zone for this discharge of 36.3 feet under low flow conditions from the diffuser is needed to meet the WQS criterion for allowable temperature increase. The modeling analysis indicates that the heated discharge dissipates and mixes rapidly with ambient water using the submergible diffuser, which is expected to make the extent of the thermal plume small.

Although PRE submitted a letter requesting a thermal variance under section 316(a) of the FWPCA, Department staff has determined that this is not required since the discharge can meet the water quality standards in the river. Department staff is recommending that the zone of influence of 36.3 feet be granted pursuant to Paragraph 10 of the WQS during low flow conditions.

DEP staff is also requiring that PRE conduct temperature field verification monitoring of the Quinebaug River after the discharge has been initiated to verify the temperature values used in the Visual Plumes modeling analysis data. (See Section 9 Paragraph B of the permit)

Consistent with the WQS, interoffice memorandum from Rosemary Gatter-Evart to Charles Nezianya dated September 3, 2008 and the modeling report dated September 3, 2008 that was submitted to the DEP by the applicant, the proposed maximum instantaneous temperature limitation for DSN 101 is recommended to be modified to 90 degrees F. The monitoring only provision in the draft permit for the temperature differential between the intake water and the discharge shall remain as originally drafted.

Section 316(b) of the FWPCA Determination

PRE is proposing to construct cooling water intake structures to withdraw cooling water from the Quinebaug River and is, therefore, required to comply with Section 316(b) of the FWPCA. Section 316(b) of the FWPCA states: "Any standard established pursuant to section 301 or section 306 of this Act and applicable to a point source shall require that

the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact."

As a new facility, PRE is required to comply with the regulations specified in 40 CFR 125 Subpart I-Requirements Applicable to Cooling Water Intake Structures for New Facilities Under Section 316(b) of the Act, specifically 40 CFR 125.80 (a) and (c), The proposed cooling water withdrawal is below the "threshold" value specified in Track I and Track II of 40 CFR 125.84. The performance standard that applies to this facility is Best Available Technology, which has been interpreted as synonymous with BTA, using is Best Professional Judgment (BPJ) on a "case by case" basis, as specified in 40 CFR 125.80(c), and 40 CFR 125.3(d).

- Cooling Water Intake Structure Location

Department staff has reviewed the PRE permit application and subsequent submittals related to the location of the cooling water intake structure and has determined that that the proposed intake water withdrawal from the Quinebaug River will not have an adverse impact to the environment. Additionally, the intake/discharge meets applicable Surface Water Quality Standards (see WQS Paragraph 10 and Class "B" criteria). *(See Interoffice Memorandum from Brian D. Murphy, Inland Fisheries Division to Sara Radasci, Inland Water Resources Division, dated May 23, 2007).* PRE is required to implement and comply with the mitigation and monitoring plan dated January 22, 2008 that was filed with the Department and to conduct impingement and entrainment monitoring in accordance with Sections 9 Paragraphs C, D, E and F of this permit.

- Cooling Water Intake Structure Design

PRE is proposing to use cylindrical wedgewire screens at the inlet of the cooling water intake structures to minimize impingement and entrainment impact to aquatic organisms in the river.

Cylindrical wedgewire screen is expected to eliminate impingement and reduce entrainment to de minimis levels through a combination of small slot sizes and low approach velocities of 0.5 feet per second or less. The features of the wedgewire screen specifically designed to reduce entrainment and eliminate impingement of fish and invertebrate species include simple passive design, low intake velocity, vee-wire construction, smooth surfaces and in-situ cleaning. Screen backwashing using an airburst system will be available if needed. *(See PRE NPDES permit application on Section 316(b))*

- Cooling Water Intake Structure Construction

The cooling water intake structure will be situated on a 15.5 acre parcel located on Packer Road in the Town of Canterbury approximately two miles west from the facility site. To minimize any adverse impact to the wetlands and rare, threatened, and endangered species identified by the Department from the location, construction, operation and maintenance of cooling water intake structures, PRE is required to implement and comply with the mitigation and monitoring plan entitled, “Plainfield Renewable Energy, LLC, Proposed 37.5MW Biomass Facility, Mitigation and Monitoring Plan”, dated January 2008 and revised through April 1, 2008, prepared by Kleinschmidt. PRE will also be required to comply with such plan to be eligible for coverage under the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities.

- Cooling Water Intake Structure Capacity

The proposed maximum water withdrawal through the cooling water intake structure is 0.893 MGD from the Quinebaug River. PRE will cycle Quinebaug River water through a cooling tower five times and the remaining 20% water will then be discharged back into the center of the river via a submerged single port diffuser.

Based on the Department's staff review, water withdrawal from the Quinebaug River will not result in a significant impact on river flow. Based on a 7-day, 10-year low flow (7Q10) value of 84.43 cubic feet second (cfs), this water withdrawal will be approximately 1.6% of the 7Q10 flow of the river. A "conventional" configuration of shoreline intake traveling screens, and fish return is not required by the virtue of the use of "wedge wire" intake screen, which will not impinge fish, and will not cause significant entrainment.

Based on a case by case determination using the criteria of BPJ pursuant to Section 22a-430-4(m) of the Regulations of Connecticut State Agencies (RCSA) and 40 CFR 125.80(c) and 40 CFR 125.3(d), Department staff is recommending that the Commissioner make a determination that the cooling water intake structure (closed cycle recirculating system) reflects the BTA that can be installed at this facility.