Florida Department of Environmental Protection

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PERMITTEE

Northwest Florida Renewable Energy Center, LLC
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Authorized Representative:
John Diesch, Authorized Representative

Air Permit No. 0450012-002-AC
Expires: December 31, 2015
Northwest Florida Renewable Energy Center (NWFREC)
Biomass Fed Gasification Combined Cycle Unit
Facility ID No. 0450012
Gulf County

PROJECT AND LOCATION

This is the final air construction permit authorizing the construction of a nominal 55 megawatts (MWnet) biomass fed gasification and combined cycle (BGCC) power plant called the NWFREC. The new NWFREC facility is categorized under Standard Industrial Classification (SIC) No. 4911 for electrical services. The proposed project location is 521 Premier Drive in Port St. Joe, Gulf County, Florida. The UTM coordinates for this site are Zone 16; 664.16 kilometers (km) East and 3,301.96 km North.

This final permit is organized into the following sections: Section 1 (General Information); Section 2 (Administrative Requirements); Section 3 (Emissions Unit Specific Conditions); and Section 4 (Appendices). Because of the technical nature of the project, the permit contains numerous acronyms and abbreviations which are defined in Appendix CF of Section 4 of this permit.

STATEMENT OF BASIS

This air pollution construction permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.), and Chapters 62-4, 62-204, 62-210, 62-212, 62-296 and 62-297 of the Florida Administrative Code (F.A.C.). The permittee is authorized to conduct the proposed work in accordance with the conditions of this permit and as described in the application, approved drawings, plans, and other documents on file with the Department. This project is subject to the general preconstruction review requirements in Rule 62-212.300, F.A.C.

Upon issuance of this final permit, any party to this order has the right to seek judicial review of it under Section 120.68 of the Florida Statutes by filing a notice of appeal under Rule 9.110 of the Florida Rules of Appellate Procedure with the clerk of the Department of Environmental Protection in the Office of General Counsel (Mail Station #35, 3900 Commonwealth Boulevard, Tallahassee, Florida, 32399-3000) and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The notice must be filed within 30 days after this order is filed with the clerk of the Department.

Executed in Tallahassee, Florida

_____ _____

Michael P. Halpin, P.E., Director (Date)
Division of Air Resource Management

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this Final Air Permit package (including the Final Determination and Final Permit with Appendices) was sent by US mail, electronic mail, or a link to these documents made available electronically on a publicly accessible server, with received receipt requested before the close of business on _____ to the persons listed below.

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Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to §120.52, Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

_____ _____

(Clerk) (Date)

FACILITY AND PROJECT DESCRIPTION

The proposed facility is a nominal 55 MW BGCC power plant called the NWFREC. The fuel source for the facility will be untreated woody biomass that consists primarily of wood chips but may also include agricultural crops and byproducts and logging and lumber mill residues as well as yard waste. Municipal solid waste (MSW) other than yard waste as defined in § 60.51b is expressly prohibited as a fuel source for the NWFREC.

The woody biomass will be dried and fed into a gasifier vessel containing a heated bed of circulating sand where the woody biomass will be gasified and converted to biomass product gas (BPG). The BPG will be cleaned, compressed and used as fuel in three 15.7 MW SOLAR Model Number T-130 combustion turbine-electrical generators (CTG) or one 45.6 MW General Electric (GE) Model MS6001B CTG. Heat from the CTG exhaust gas will be recovered in three (SOLAR CTG option) or one (GE CTG option) heat recovery steam generator(s) (HRSG). The resulting steam from the HRSG will drive a single 19.5 MW (GE CTG option) or 19.6 MW (SOLAR CTG option) steam turbine electrical generator (STG). After subtracting parasitic electrical loads at the facility of 11.3 MW, the net electrical output to be supplied to the power grid is 54.7 to 55.4 MW.

This project creates the following new emissions units. If the GE Model MS6001B CTG is selected by the permittee as EU-009 instead of the SOLAR Model Number T-130 CTG, the remaining two SOLAR CTG (EU-010 and -011) will not be installed at the NWFREC.

ID No.	Emission Unit Description
001	Biomass handling, storage and drying system
002	Biomass gasifier with natural gas (NG) startup burner
003	Char combustor sand heater with NG startup burner and sand handling equipment
004	BPG Cleanup System and Flare/TO System
005	Compressor and STG cooling towers
006	Auxiliary boiler with a maximum heat input rate of 62 mmBtu/hour from firing NG
007	500 kilowatt (kW) Emergency Generator firing ultra low sulfur distillate (ULSD) fuel oil containing 0.0015% sulfur or less or biodiesel
008	250 kW Emergency Fire Water Pump firing ULSD fuel oil or biodiesel
009	15.7 MW SOLAR Model No. T-130 BPG-fueled CTG and HRSG **or** 45.6 MW GE Model MS6001B BPG-fueled CTG and HRSG
010	15.7 MW SOLAR Model No. T-130 BPG-fueled CTG and HRSG
011	15.7 MW SOLAR Model No. T-130 BPG-fueled CTG and HRSG

FACILITY REGULATORY CLASSIFICATION

- The facility is not a major source of hazardous air pollutants (HAP).
- The facility operates units subject to the acid rain provisions of the Clean Air Act (CAA).
- The facility is a Title V major source of air pollution in accordance with Chapter 213, F.A.C.
- The facility is not a major stationary source in accordance with Rule 62-212.400(PSD), F.A.C.
- If the GE CTG option is selected, the facility is subject to the provisions of the Clean Air Interstate Rule (CAIR), including applicable portions of Chapters 62-204, 62-210 and 62-296, F.A.C.
- The facility is subject to Chapter 62-204.800, F.A.C for New Source Performance Standards (NSPS) under Section 111 of the CAA and National Emissions Standards for Hazardous Air Pollutants (NESHAP) under Section 112 of the CAA.

SECTION 2. ADMINISTRATIVE REQUIREMENTS

1. Permitting Authority: The permitting authority for this project is the Bureau of Air Regulation, Division of Air Resource Management, Florida Department of Environmental Protection (Department). The Bureau of Air Regulation's mailing address is 2600 Blair Stone Road (MS #5505), Tallahassee, Florida 32399-2400. All documents related to applications for permits to operate an emissions unit shall be submitted to the Title V Section of the same office.

2. Compliance Authority: All documents related to compliance activities such as reports, tests, and notifications shall be submitted to the Air Resource Section of the Department's Northwest District Office at 160 Governmental Center, Suite 308, Pensacola, Florida 32502-5794. The telephone number of the district office is 850/595-8300. Copies of these documents shall also be submitted to the Northwest District's Branch Office at 3800 Commonwealth Blvd., Tallahassee, Florida 32301. The telephone number of the branch office is 850/245-2984.

3. Appendices: The following Appendices are attached as part of this permit and must be complied with by the permittee:
   a. Appendix A: Identification of General Provisions - NSPS 40 CFR 60, Subpart A and NSHAP 40 CFR 63, Subpart A;
   b. Appendix ASTM: ASTM Standard D6751-09 for Biodiesel;
   c. Appendix BMP: Best Management Practices Plan;
   d. Appendix CC: Common Conditions;
   e. Appendix CEMS: Continuous Emissions Monitoring System (CEMS) Requirements;
   f. Appendix CF: Citation Formats and Glossary of Common Terms;
   g. Appendix CTR: Common Testing Requirements;
   h. Appendix Db: NSPS, 40 CFR 60, Subpart Db - Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units;
   i. Appendix Dc: NSPS, 40 CFR 60, Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units;
   j. Appendix GC: General Conditions;
   k. Appendix IIII: NSPS, Subpart IIII - Stationary Compression Ignition Internal Combustion Engines;
   l. Appendix JJJJJJ: NESHAP 40 CFR 63, Subpart JJJJJJ - National Emission Standards for Hazardous Air Pollutants for Area Sources: Industrial, Commercial, and Institutional Boilers;
   m. Appendix KKKK: NSPS – Standards of Performance for Stationary Combustion Turbines; and,
   n. Appendix ZZZZ: NESHAP, Subpart ZZZZ - Stationary Reciprocating Internal Combustion Engines (RICE).

4. Applicable Regulations, Forms and Application Procedures: Unless otherwise specified in this permit, the construction and operation of the subject emissions units shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of: Chapter 403, F.S.; and Chapters 62-4, 62-204, 62-210, 62-212, 62-213, 62-296, and 62-297, F.A.C. Issuance of this permit does not relieve the permittee from compliance with any applicable federal, state, or local permitting or regulations.

5. New or Additional Conditions: For good cause shown and after notice and an administrative hearing, if requested, the Department may require the permittee to conform to new or additional conditions. The Department shall allow the permittee a reasonable time to conform to the new or additional conditions, and on application of the permittee, the Department may grant additional time. [Rule 62-4.080, F.A.C.]

6. Modifications: The permittee shall notify the Compliance Authority upon commencement of construction. No new emissions unit shall be constructed and no existing emissions unit shall be

modified without obtaining an air construction permit from the Department. Such permit shall be obtained prior to beginning construction or modification. [Rules 62-210.300(1) and 62-212.300(1)(a), F.A.C.]

7. Source Obligation:

(a) Authorization to construct shall expire if construction is not commenced within 18 months after receipt of the permit, if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable time. This provision does not apply to the time period between construction of the approved phases of a phased construction project except that each phase must commence construction within 18 months of the commencement date established by the Department in the permit.

(b) At such time that a particular source or modification becomes a major stationary source or major modification (as these terms were defined at the time the source obtained the enforceable limitation) solely by virtue of a relaxation in any enforceable limitation which was established after August 7, 1980, on the capacity of the source or modification otherwise to emit a pollutant, such as a restriction on hours of operation, then the requirements of subsections 62-212.400(4) through (12), F.A.C., shall apply to the source or modification as though construction had not yet commenced on the source or modification.

(c) At such time that a particular source or modification becomes a major stationary source or major modification (as these terms were defined at the time the source obtained the enforceable limitation) solely by exceeding its projected actual emissions, then the requirements of subsections 62-212.400(4) through (12), F.A.C., shall apply to the source or modification as though construction had not yet commenced on the source or modification.

[Rule 62-212.400(12), F.A.C.]

8. Application for Title V Permit: This permit authorizes construction of the permitted emissions units and initial operation to determine compliance with Department rules. A Title V air operation permit is required for regular operation of the permitted emissions unit. The permittee shall apply for a Title V air operation permit at least 90 days prior to expiration of this permit, but no later than 180 days after commencing operation. To apply for a Title V operation permit, the applicant shall submit the appropriate application form, compliance test results, and such additional information as the Department may by law require. The application shall be submitted to the appropriate Permitting Authority with copies to the Compliance Authority. [Rules 62-4.030, 62-4.050, 62-4.220 and Chapter 62-213, F.A.C.]

9. Objectionable Odors Prohibited: No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor. [Rule 62-296.320(2), F.A.C.]

   {Permitting Note: An objectionable odor is defined in Rule 62-210.200(Definitions), F.A.C., as any odor present in the outdoor atmosphere which by itself or in combination with other odors, is or may be harmful or injurious to human health or welfare, which unreasonably interferes with the comfortable use and enjoyment of life or property, or which creates a nuisance.}

10. Open Burning Prohibited: No person shall ignite, cause to be ignited, or permit to be ignited, any material which will result in any prohibited open burning as regulated by chapter 62-256, F.A.C.; nor shall any person suffer, allow, conduct or maintain any prohibited open burning. [Rule 62-256.300, F.A.C.]

11. Unconfined Emissions of Particulate Matter: No person shall cause, let, permit, suffer or allow the emissions of unconfined particulate matter from any activity, including vehicular movement; transportation of materials; construction, alteration, demolition or wrecking; or industrially related activities such as loading, unloading, storing or handling; without taking reasonable precautions to prevent such emissions. Any permit issued to a facility with emissions of unconfined particulate matter

shall specify the reasonable precautions to be taken by that facility to control the emissions of unconfined particulate matter. Appendix BMP of this permit provides a Best Management Plan (BMP) of reasonable precautions specific to the NWFREC facility to control fugitive PM emissions. Reasonable precautions include the following: a) Paving and maintenance of roads, parking areas and yards; b) Application of water or chemicals to control emissions from such activities as demolition of buildings, grading roads, construction, and land clearing; c) Application of asphalt, water, oil, chemicals or other dust suppressants to unpaved roads, yards, open stock piles and similar activities; d) Removal of particulate matter from roads and other paved areas under the control of the owner or operator of the facility to prevent re-entrainment, and from buildings or work areas to prevent particulate from becoming airborne; e) Landscaping or planting of vegetation; f) Use of hoods, fans, filters, and similar equipment to contain, capture and/or vent particulate matter; g) Confining abrasive blasting where possible; and, h) Enclosure or covering of conveyor systems. In determining what constitutes reasonable precautions for a particular facility, the Department shall consider the cost of the control technique or work practice, the environmental impacts of the technique or practice, and the degree of reduction of emissions expected from a particular technique or practice. [Rule 62-296.320(4)(c), F.A.C.]

12. Excess Emissions: Except as required by specific conditions of this permit dealing with excess emissions with regard to individual emission units, the following conditions apply to excess emissions at NWFREC.
    a. Allowed: Excess emissions resulting from startup, shutdown or malfunction of any emissions unit shall be permitted providing best operational practices to minimize emissions are adhered to and the duration of excess emissions shall be minimized but in no case exceed two hours in any 24 hour period unless specifically authorized by the Department for longer duration.
    b. Malfunction: Excess emissions which are caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure which may reasonably be prevented during startup, shutdown, or malfunction shall be prohibited.
    c. Department Discretion: Considering operational variations in types of industrial equipment operations affected by this rule, the Department may adjust maximum and minimum factors to provide reasonable and practical regulatory controls consistent with the public interest.
    d. Department Notification: In case of excess emissions resulting from malfunctions, each owner or operator shall notify the Department in accordance with Rule 62-4.130, F.A.C. A full written report on the malfunctions shall be submitted in a quarterly report, if requested by the Department.

    [Rule 62-210.700, F.A.C.]

13. Facility-wide Emissions Report: The owner or operator shall submit an Annual Operating Report (AOR) for Air Pollutant Emitting Facility (DEP Form No. 62-210.900(5)) to the Department annually pursuant to Rule 62-210.370(3), F.A.C. Using the computation methods described in Rule 62-210.370(2), F.A.C., the required AOR shall also include a demonstration that facility emissions of NO_X, CO, SO_2, VOC and PM/PM_{10} are each less than 250 tons per year (TPY). [Rule 62-210.370, F.A.C.]

A. Biomass Handling, Storage and Drying System (EU-001)

This section of the permit addresses the following emissions unit.

ID No.	Emission Unit Description
001	Biomass handling, storage and drying system: This EU consists of two principal components each of which is briefly described below. The term biomass used throughout the subsection includes yard waste as defined in § 60.51b of NSPS 40 CFR 60, subpart Eb. • *Biomass Stackout*: Biomass fuels that are allowed at the NWFREC are described in **Specific Condition 6** of this subsection and in the best management practices (BMP) given in Appendix BMP. The BMP includes the woody biomass and fuel crop feedstock properties along with a plan for quality control. Deliveries of biomass fuel will be made via truck to the site. The trucks will be unloaded via a truck receiving system equipped with two 75 foot platforms that dump into two 5,000 cubic feet (ft^3) receiving hoppers. The hoppers will have a very slow moving chain drag to minimize dust. Tramp metal will be removed using a suspended self-cleaning magnet from the material stream prior to stockpiling the fuel. From the bottom of the two collection hoppers, the wood chips will be discharged onto a take-away belt conveyor. Material will discharge from the take-away conveyor into a horizontal scalping screen. Any oversized materials will be directed to a vertical hammer hog designed to produce 2-inch or smaller material. The hog and ancillary conveyors will be supported in a common tower with applicable chute work and the dust generated controlled by a baghouse. Material will discharge from the hog onto a covered collection conveyor and then transition to the circular stacker. The circular stacker will form a kidney shaped pile approximately 2 million ft^3 in capacity at an average height of 40 feet. • *Biomass Reclaim*: Biomass will be reclaimed using a stacker reclaimer from the storage pile via a drag chain by three covered conveyors. Prior to entering the powerhouse the fuel will be conveyed via the last conveyer, which is controlled by a baghouse, to a dryer where the moisture is reduced from as high as 45 percent (%) to approximately 23%. Covered belt conveyors will then transport the feedstock to a 12-hour storage silo (day bin) adjacent to the gasifier. The belt conveyors will be equipped with belt covers to protect the material from the weather and to prevent the wind from blowing material off the conveyor belt during transport to the storage silo. Material will be reclaimed from the storage silo via an internal screw discharger, which will deposit the material on a belt conveyor contained primarily inside the silo structure. This belt conveyor will transfer the wood fuel to a vertical elevator that will discharge the fuel via an enclosed chute system to the gasifier fuel feed bin. All transfer systems from conveyor to conveyor employ totally enclosed head boxes, chutes, and skirt board systems to contain the fuel and any dust that may be produced at the transfer points. The day bin has a bin vent on top of it to filter the air displaced by transfer of wood into the bin. All conveyors will be covered to reduce particulate emissions. A baghouse will control emissions from the dyer.

EQUIPMENT

1. Equipment: The permittee is authorized to construct a biomass handling, storage and drying system consisting of the following major pieces of equipment.
   a. Truck Unloading System: The truck unloading system dumps into two receiving hoppers and shall be designed to minimize the generation of fugitive dust.
   b. Biomass Belt Conveyor Systems: All belt conveyor systems shall be enclosed and have totally enclosed head boxes, chutes and skirtboard systems to contain the fuel as well as prevent dust generation at the transfer points.
   c. Biomass Storage Pile: The biomass storage pile shall be managed in accordance with Appendix BMP.

d. Biomass Dryer: The biomass dryer shall use thermal heat transfer (no additional combustion) to dry biomass, if needed, prior to gasification.

e. Storage/Feeder Bin: The storage/feeder bin shall be enclosed and include a spreader conveyor, a bin vent filter and a bottom screw feeder for unloading.

f. Bucket Elevator: The bucket elevator shall be enclosed.

g. Baghouses: Based on the preliminary design, the permittee shall install the following baghouses. Each baghouse shall be designed and maintained to achieve an outlet dust loading rate of 0.01 grains per dry standard cubic feet (gr/dscf) in its exhaust. Based on the final engineering design needs, additional baghouses may be installed as necessary to control fugitive dust from material handling and storage. The Compliance Authority shall be notified 180 days before NWFREC becomes operational of any final engineering design changes. Should the preliminary design change, the permittee shall provide final design details for all baghouses in the application for a Title V air operation permit along with a concurrent modification of this air construction permit.

   1) *Hog Mill Baghouse* shall control dust from the screen to the hog mill and the hog mill will exhaust to the atmosphere at ambient temperature.

   2) *Reclaim Baghouse #1* shall control dust from Reclaim Conveyor 2 to Supply Conveyor 3 and exhausted to the atmosphere at ambient temperature.

   3) *Reclaim Baghouse #2* shall control dust from the thermal heat biomass dryer at a design volumetric flow rate of 110,000 standard cubic feet per minute (scfm) exhausted to the atmosphere at approximately 175 degrees Fahrenheit (°F).

h. Bin Vent Filter: A bin vent filter shall control dust from the storage/feeder bin. The filter shall be designed and maintained to control at least 99.8% of the inlet dust loading for a designed feed rate of 900 tons per day (TPD) on a dry basis.

{Permitting Note: The term dry basis when pertaining to biomass means 0% moisture. The biomass coming from the dryer will usually be at a moisture content of approximately 23%, but for design purposes the mass of processed biomass has been normalized to 900 TPD on a dry basis.}

{Permitting Note: Enclosed conveyors means that the conveyance belt for the biomass is totally enclosed from above thus preventing wind from causing fugitive dust emissions from the belt. However, the bottom of the conveyance belt shall be accessible for maintenance and repairs.}

[Application No. 0450012-002-AC; Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

2. Circumvention: The permittee shall not circumvent the air pollution control equipment or allow the emission of air pollutants without this equipment operating properly. [Rule 62-210.650, F.A.C.]

3. Best Management Practice (BMP) Plan: A BMP plan shall be utilized to minimize fugitive PM emissions from receiving, handling, storage and processing of woody biomass. Best management practices shall be utilized to reduce the potential for spontaneous combustion of stored woody biomass and odors. A preliminary BMP plan is contained in Appendix BMP of this permit. This plan also includes quality control and assurance (Q&A) procedures to ensure woody biomass delivered by vendors and suppliers to the NWFREC meet the requirements given in **Specific Condition 6** of this subsection. No later than 180 days before the NWFREC becomes operational, a final BMP plan shall be filed with the Compliance Authority to reflect the final engineering designs of the biomass receiving, handling, storage and processing systems. The final BMP plan will also be incorporated into the Title V operating permit.
[Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

PERFORMANCE RESTRICTIONS

4. Approximate Capacities: Each truck dumper will unload approximately 150 tons per hour (TPH) of biomass with an estimated moisture content of 45%. The storage area will hold approximately 12 to 14

days of biomass feedstock (approximately 20,000 tons on a wet basis). The dryer will dry approximately 1,285 TPD of wet biomass (assumes moisture content of 30%) and the feeder will transfer approximately 900 TPD of dry biomass feedstock to the gasifier on a dry basis. [Application No. 0450012-002-AC and Rule 62-210.200(PTE), F.A.C.]

5. Hours of Operation: The hours of operation of this emission unit are not limited (8,760 hours per year). [Application No. 0450012-002-AC; Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

6. Woody Biomass Fuels: With the exception of yard waste as defined in § 60.51b (NSPS Subpart Eb - Standards of Performance for Large Municipal Waste Combustors), Municipal Solid Waste (MSW) is prohibited from use at this facility. The fuel shall consist of untreated woody biomass as described in this permit condition and in Appendix-BMP of this permit. Inspection and testing procedures describe in Appendix-BMP shall be followed to insure that appropriate woody biomass is used as fuel. A maximum of 30 TPD of yard waste as defined in § 60.51b can be used as a biomass fuel for the gasifier (EU 002) at the NWFREC.

   The biomass feedstock will consist of clean woody biomass that will be processed at a remote fuel preparation area (or areas) where it will be sorted, screened and chipped to size. NWFREC has identified the following possible, available feedstock types for their facility, including:

Fuel Type	Fuel Group Description
Pine Trees (slash, sand, loblolly)	Wood chips from slash, sand and loblolly pine trees
Saw Dust	Saw dust and other waste from cutting/milling whole green trees
Hogged Fuel	Land clearing debris that has either been processed, run through a tub grinder, or a horizontal mill at a specific private forest clearing site.
Processed Butt Cuts	Round wood residues that are either of oversized or undersized non processible materials from post or pole manufacturers.
Fuel (vegetative) Crop	Examples include: Arundo donax and eucalyptus
Yard Waste	Grass, grass clippings, bushes, shrubs, and clippings from bushes and shrubs that are generated by residential, commercial/retail, institutional, and/or industrial sources as part of maintenance activities associated with yards or other private or public lands.

   [Application No. 0450012-002-AC; 62-4.070(3) F.A.C.; NSPS 40 CFR 60, Subpart Eb]

7. Paved Roadways and Gravel Areas: Fugitive dust emissions from the plant's paved roadways and gravel areas shall be controlled in accordance with **Specific Condition 11 of Section 2** of this permit. [Rules 62-4.070 and 62-296.320, F.A.C.]

EMISSIONS STANDARDS

8. Opacity: As determined by EPA Method 9, there shall be no visible emissions (VE) greater than 10% opacity, except for one 6 minute period no greater than 20% from the outlets of the drop points, transfer points, vent screens and baghouses associated with this emission unit. [Rules 62-4.070(3), 62-297.310(7)(c), and 62-212.400(5)(c), F.A.C.]

TESTING AND MONITORING REQUIREMENTS

9. Initial VE Compliance Tests: The outlets of the drop points, transfer points, silo vent screens associated with the fuel bins and dust collectors of this emissions unit shall be tested to demonstrate initial compliance with the emissions standards for opacity given in **Specific Condition 8** of this subsection. The initial tests shall be conducted within 60 days after achieving permitted capacity, but not later than 180 days after

initial operation of the emission unit. [Rules 62-4.070(3) and 62-297.310(7)(a)1, F.A.C.]

10. Annual VE Compliance Tests: During each federal fiscal year (October 1st to September 30th), the outlets of the drop points, transfer points, silo vent screens associated with the fuel bins and dust collectors of this emissions unit shall be tested to demonstrate compliance with the emissions standards for opacity given in **Specific Condition 8** of this subsection. [Rule 62-297.310(7)(a)4, F.A.C.]

11. Test Requirements: The permittee shall notify the Compliance Authority in writing at least 15 days prior to any required tests. Tests shall be conducted in accordance with the applicable requirements specified in Appendix CTR (Common Testing Requirements) of this permit. [Rule 62-297.310(7)(a)9, F.A.C.]

12. Test Methods: Required tests shall be performed in accordance with the following reference methods.

Method	Description of Method and Comments
EPA 9	Visual Determination of the Opacity of Emissions from Stationary Sources

The above method is described in Appendix A of 40 CFR 60 which is included as Appendix A of this permit and is adopted by reference in Rule 62-204.800, F.A.C. No other methods may be used unless prior written approval is received from the Department.
[Rules 62-204.800 and 62-297.100, F.A.C.; Appendix A of 40 CFR 60]

RECORDS AND REPORTS

13. Test Reports: The permittee shall prepare and submit reports for all required tests in accordance with the requirements specified in Appendix CTR (Common Testing Requirements) of this permit. For each test run, the report shall also indicate the operating rate. [Rule 62-297.310(8), F.A.C.]

B. Biomass Gasifier with NG Startup Burner (EU-002)

This section of the permit addresses the following emissions unit.

ID No.	Emission Unit Description
002	Biomass gasifier with NG startup burner: The biomass feedstock will be converted in the gasifier by pyrolysis to BPG in a circulating fluidized bed (CFB) of hot sand that uses steam as the fluidization medium. During the process, the sand cools and the biomass feedstock breaks down to produce BPG including tar, char and ash. Cooled sand and char are captured in the gasifier cyclones and returned to the char combustor (EU 003) to support combustion and reheat the sand. The BPG from the gasifier cyclone is cooled in a heat exchanger and then cleaned as described in EU 004. The BPG is then combusted in the SOLAR T-130 CTG (EU 009, 010 and 011), GE MS6001B CTG (EU 009) or combusted in the Flare/TO System (EU 004). During some operational scenarios, such as emergency shutdown of the gasifier, the BPG may not be cleaned prior to flaring.

EQUIPMENT

1. Equipment: The permittee is authorized to construct a gasifier consisting of the following equipment: CFB gasifier vessel; NG-fueled startup burner; cyclones; ash handling system; and heat exchangers.
[Application No. 0450012-002-AC; Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

2. Cyclone Separators: One cyclone separator shall be designed, installed and maintained to remove char and sand from the raw BPG and recirculate it to the char combustor (EU 003) for combustion of the char and reheating of the sand. Another cyclone separator shall be designed, installed and maintained to remove the remaining coarse solid ash prior to BPG cleanup or flaring.
[Application No. 0450012-002-AC; Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

PERFORMANCE RESTRICTIONS

3. Gasifier Capacity: The design rate of biomass feed to the gasifier is 900 TPD on a dry basis. The gasifier fuel feed rate shall be measured and recorded by permanently installed equipment including but not limited to a belt scale to measure the actual mass flow, and daily gasifier feedstock sampling and analysis to determine the as-fed moisture content. The moisture content shall be obtained by using an accepted American Society of Testing and Materials (ASTM) method suitable for wood or woody biomass when used as a fuel. An accepted method suitable for wood or woody biomass as a fuel from the American Society of Mechanical Engineers (ASME) or the American Boiler Manufacturers Association (ABMA) can be used in lieu of an ASTM method. Records of daily feed rate and moisture content shall be available, and retained as accessible records.
[Application No. 0450012-002-AC; Rules 62-210.200(PTE) and 62-4.070, F.A.C.]

4. Gasifier Startup Burner Capacity: The design heat input rate of the NG fueled startup burner is 25 mmBtu per hour (mmBtu/hour) on a lower heating value (LHV) basis.
[Application No. 0450012-002-AC and Rule 62-210.200(PTE), F.A.C.]

5. Hours of Operation: The hours of operation of the gasifier are not limited (8,760 hours per year). The gasifier startup burner may be used only for the purpose of starting up the gasifier.
[Application No. 0450012-002-AC and Rule 62-210.200(PTE), F.A.C.]

NSPS APPLICABILITY

6. NSPS Subpart Dc and Subpart A Applicability: The gasifier startup burner is subject to all applicable requirements of 40 CFR 60, Subpart Dc which applies to Small Industrial, Commercial or Institutional Boilers and Subpart A, General Provisions. Specifically, this emission unit shall comply with 40 CFR 60.48c Reporting and Recordkeeping Requirements. The applicable conditions are given in Appendices A and Dc of this permit.
[Rule 62-204.800(7)(b); 40 CFR 60, NSPS-Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units and 40 CFR 60 Subpart A, General Provisions]

C. Char Combustor Sand Heater with NG Startup Burner (EU-003)

This section of the permit addresses the following emissions unit.

ID No.	Emission Unit Description
003	Char combustor sand heater with NG startup burner and sand handling equipment: Sand and char captured in the gasifier cyclones and tars (returned from downstream BPG cleaning system) are fed to the char combustor. Air is introduced at the bottom of the vessel and supports combustion of the char and tars in a CFB of sand. Heated sand is captured in the char combustor cyclones and returned to the gasifier to sustain pyrolysis. Exhaust gas from the char combustor passes through a sand cyclone and a hot ash cyclone, is cooled in a heat exchanger and then filtered in a baghouse.

EQUIPMENT

1. Equipment: The permittee is authorized to construct a char combustor and sand heater system consisting of the following equipment: Sand storage silo; CFB char combustor vessel; NG fueled startup burner; cyclones; heat exchangers; and a fabric filter baghouse.
[Application No. 0450012-002-AC; Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

2. Cyclone Separators: One cyclone separator shall be designed, installed and maintained to remove the heated sand from the char combustor exhaust and recycle it back to the gasifier (EU 002). Another cyclone separator shall be designed, installed and maintained to remove most of the hot gasification ash prior to further particulate removal in ash cyclone separator fabric filter baghouses described in **Specific Condition 3b** of this subsection. [Application No. 0450012-002-AC; Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

3. Fabric Filter Baghouses: The permittee shall install and maintain the following baghouses. Exhaust from these baghouses discharges directly to the ambient air. Should the preliminary design of the baghouses change, the permittee shall provide final design details for all baghouses and controls in the application for a Title V air operation permit along with a concurrent modification of this air construction permit. The Compliance Authority shall be notified 180 days before NWFREC becomes operational of any final engineering design changes.

   a. *Sand Storage Silo*: Exhaust from the sand storage silo shall be controlled by a baghouse designed and maintained to limit PM/PM_{10} emissions to 0.01 gr/dscf or better in the baghouse exhaust.

   b. *Ash Cyclone Separator*: Exhaust from the second char combustor cyclone (ash) separator shall be further controlled by a separate baghouse designed and maintained to 0.005 gr/dscf or better in the baghouse exhaust.

   [Application No. 0450012-002-AC; Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

4. Selective Non- Catalytic Reduction (SNCR) System: The permittee shall design, install, operate, and maintain an ammonia based SNCR system to reduce NO_X emissions in the char combustor flue gas exhaust and achieve the NO_X emissions standards specified in this subsection. The SNCR shall be on line and functioning properly whenever its operation is necessary to meet the NO_X emission standards given in this subsection as established by the CEMS output data.
[Application No. 0450012-002-AC; Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

5. Circumvention: The permittee shall not circumvent the air pollution control equipment or allow the emissions of air pollutants without this equipment operating properly. [Rule 62-210.650, F.A.C.]

   *{Permitting Note: The char combustor SNCR system only needs to be operated when necessary to meet the NO_X emission standards given in **Specific Condition 14** of this subsection. Not operating the SNCR system so long as the NO_X emission standards are met does not constitute Circumvention of the SNCR system.}*

PERFORMANCE RESTRICTIONS

6. Char Combustor Capacity: The design heat input rate of the char combustor is 155 mmBtu/hour. [Application No. 0450012-002-ACand Rule 62-210.200(PTE), F.A.C.]

7. Char Combustor Startup Burner Capacity: The design heat input rate of the NG fueled startup combustor burner is 17 mmBtu/hour on a LHV basis. [Application No. 0450012-002-AC and Rule 62-210.200(PTE), F.A.C.]

8. Hours of Operation: The hours of operation of this emissions unit are not limited (8,760 hours per year). The char combustor startup burner may be used only for the purpose of starting up the char combustor. [Application No. 0450012-002-AC and Rule 62-210.200(PTE), F.A.C.]

NSPS APPLICABILITY

9. NSPS Subpart Db and Subpart A Applicability: The char combustor is subject to all applicable requirements of 40 CFR 60, Subpart Db which applies to Industrial, Commercial or Institutional Steam Generating Units and Subpart A, General Provisions. The applicable conditions are given in Appendices A and Db of this permit. [Rule 62-204.800(7)(b)3, F.A.C.; NSPS 40 CFR 60, Subpart Db and 40 CFR 60 Subpart A]

NESHAP APPLICABILITY

10. NESHAP Subpart JJJJJJ and Subpart A Applicability: The char combustor is subject to all applicable requirements of 40 CFR 63, Subpart JJJJJJ National Emission Standards for Hazardous Air Pollutants for Area Sources: Industrial, Commercial, and Institutional Boilers and Subpart A, General Provisions. [Rule 62-204.800(7)(b)3, F.A.C.; NESHAP 40 CFR 63, Subpart JJJJJJ and 40 CFR 63 Subpart A]

EMISSIONS STANDARDS

11. Char Combustor Baghouse – Opacity Standard: An initial char combustor stack test of 3 hours duration in accordance with §60.48b and utilizing EPA method 9 shall not exceed 5% opacity on a 6-minute block average except for one six minute period per hour of 20%. Subsequently, compliance shall be demonstrated by continuous opacity monitoring system (COMS). Based on the COMS, opacity shall not exceed 5% on a 6-minute block average except for one six minute period per hour of 20%. [Application No. 0450012-002-AC; Rules 62-4.070(3) and 62-297.310(7)(c), F.A.C.]

12. Sand Silo Baghouse – Opacity Standard: In accordance with EPA Method 9, VE from the sand silo baghouse shall not exceed 5% opacity based on a 6-minute average. [Rules 62-4.070(3) and 62-297.310(7)(c), F.A.C.]

13. Particulate Matter (PM/PM_{10}) Emissions Limits:

    a. *NSPS Subpart Db and NESHAP Subpart JJJJJJ Limits*: PM/PM_{10} emissions from the char combustor exhaust stack shall not exceed 0.030 pounds per mmBtu (lb/mmBtu) as demonstrated by initial and annual compliance tests. [NSPS 40 CFR 60, Subpart Db and NESHAP 40 CFR 63, Subpart JJJJJJ]

    b. *Additional Limit*: PM/PM_{10} emissions from the char combustor exhaust stack shall not exceed 2.5 pounds per hour (lbs/hr) which is equivalent to 0.016 lb/mmBtu as demonstrated by initial and annual compliance tests. [Application No. 0450012-002-AC; Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

14. Nitrogen Oxides (NO_X) Emissions Limits:

    a. *NSPS Subpart Db Limit*: NO_X emissions from the char combustor exhaust stack shall not exceed 0.30 lb/mmBtu on a 30 day rolling average basis as demonstrated by a continuous emission monitoring system (CEMS). [NSPS 40 CFR, Subpart Db]

b. *Additional Limit*: NO_X emissions from the char combustor exhaust stack shall not exceed 9.6 lb/hr (0.062 lb/mmBtu) on a 30 day rolling average basis as demonstrated by a CEMS. [Application No. 0450012-002-AC; Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

15. Sulfur Dioxide (SO_2) Emissions Limits:

a. *NSPS Subpart Db Limit*: Units firing gaseous fuels, or a mixture of gaseous fuels with other fuels with a potential SO_2 emission rate of 0.32 lb/mmBtu heat input or less are exempt from the SO_2 emission limit of 0.20 lb/mmBtu given in § 60.42b(k)(2). According to the applicant, SO_2 emissions from the char combustor stack are 0.09 lb/mmBtu and consequently the char combustor satisfies the SO_2 emission limit exemption given in NSPS Subpart Db. [NSPS 40 CFR 60, Subpart Db]

b. *Additional Limit*: SO_2 emissions from the char combustor exhaust stack shall not exceed 13.5 lb/hr (0.087 lb/mmBtu) as demonstrated by initial and annual compliance tests. Meeting this SO_2 this emission limit shows compliance with the uncontrolled SO_2 emissions exemption of 0.32 lb/mmBtu given in § 60.42b(k)(2) of NSPS 40 CFR 60, Subpart Db. [Application No. 0450012-002-AC; Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.; and NSPS 40 CFR 60, Subpart Db]

16. Carbon Monoxide (CO) Standard and Emissions Limit:

a. *NESHAP Subpart JJJJJJ Standard*: The permittee shall conduct a tune-up of the char combustor biennially as specified in §63.11223(b) to demonstrate continuous compliance with the work practice and management practice standards. [Application No. 0450012-002-AC; Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.; NESHAP 40 CFR 63, Subpart JJJJJJ]

b. *Additional Limit*: Emissions of CO from the char combustor exhaust stack shall not exceed 15.5 lb/hr (0.10 lb/mmBtu) or approximately 94 ppmvd) on a 30 day rolling average basis as demonstrated by a CEMS.
[Application No. 0450012-002-AC; Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

17. Ammonia (NH_3) Slip: NH_3 emissions (slip) from the char combustor exhaust stack shall not exceed 10 ppmv @ 7% O_2 as demonstrated by initial and annual compliance tests. [Application No. 0450012-002-AC; Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

TESTING AND MONITORING REQUIREMENTS

18. Continuous Monitoring Requirements: The permittee shall install, calibrate, maintain and operate a CO and NO_X CEMS, a COMS and a diluent monitor for carbon dioxide (CO_2) or oxygen (O_2) on the char combustor stack. The COMS, NO_X and CO CEMS shall be used to demonstrate continuous compliance with the opacity, NO_X and CO emission standards given in **Specific Conditions 11**, **14 and 16**, respectively above. Each CEMS, COMS and diluent monitor shall be installed, calibrated and properly functioning within 60 calendar days of achieving permitted capacity as defined in Rule 62-297.310(2), F.A.C., but no later than 180 calendar days after initial startup and prior to the initial performance tests. Within one working day of discovering emissions in excess of a CO, NO_X or opacity emission limits (and subject to the specified averaging period) the permittee shall notify the Compliance Authority. The permittee shall comply with the CEMS, COMS and other continuous monitoring requirements specified in Appendix CEMS of this permit.

a. NO_X CEMS: The NO_X CEMS shall be certified, operated, and maintained in accordance with the requirements of 40 CFR Part 75 in a manner sufficient to demonstrate continuous compliance with the NO_X emission limit specified in **Specific Condition 14** of this subsection. Recordkeeping and reporting shall be conducted pursuant to Subpart Db in 40 CFR 60 and Subparts F and G in 40 CFR 75. [Rule 62-4.070(3), F.A.C. and NSPS 40 CFR 60, Subpart Db]

b. CO CEMS: The CO CEMS shall be certified pursuant to 40 CFR 60, Appendix B, Performance Specification 4 or 4A in a manner sufficient to demonstrate continuous compliance with the CO

emission limit specified in **Specific Condition 16** of this subsection. Quality assurance procedures shall conform to the requirements of 40 CFR 60, Appendix F, and the Data Assessment Report of Section 7 shall be made each calendar quarter, and reported semiannually to the Compliance Authority. The RATA tests required for the CO monitor shall be performed using EPA Method 10 in Appendix A of 40 CFR 60 and shall be based on a continuous sampling train. The CO monitor span values shall be set appropriately, considering the allowable methods of operation and corresponding emission standards. [Application No. 0450012-002-AC; Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

c. COMS: The COMS shall be installed, calibrated, operated, and maintained in the char combustor exhaust stack in a manner sufficient to demonstrate continuous compliance with the opacity standard specified in **Specific Condition 11** of this subsection. For the COMS, the 6-minute block averages shall begin at the top of each hour. Recordkeeping and reporting shall be conducted pursuant to Subpart Db in 40 CFR 60. [Rule 62-4.070(3), F.A.C.; NSPS 40 CFR 60, Subpart Db]

d. Diluent Monitor: The O_2 or CO_2 content of the flue gas shall be monitored at the locations where NO_X, CO and opacity are continuously monitored or measured. Each monitor shall comply with the performance and quality assurance requirements of 40 CFR Part 75.

19. Pressure Drop: The permittee shall maintain and calibrate a device which continuously measures and records the pressure drop across each baghouse compartment controlling the PM emissions from the char combustor. Records shall be maintained on site and made available upon request. [Rule 62-4.070(3)]

20. Bag Leak Detection: The permittee shall maintain continuous operation of bag leak detection systems on the char combustor baghouse including keeping records of the systems measurements. Baghouse leak detection records shall be kept on site and made available upon request. [Rule 62-4.070(3) F.A.C.].

21. SNCR Ammonia Injection: In accordance with the manufacturer's specifications, the permittee shall install, calibrate, operate and maintain a flow meter to measure and record the ammonia injection rate for the SNCR system for the char combustor. The permittee shall document the general range of NH_3 flow rates required to meet the NO_X limit given in **Specific Condition 14** above over the range of load conditions by comparing NO_X emissions with ammonia flow rates. During NO_X CEMS downtimes or malfunctions, the permittee shall operate at an NH_3 flow rate that is consistent with the documented flow rate for the given load condition. Records shall be maintained on site and made available upon request. [Rule 62-4.070(3) F.A.C.]

22. Opacity Compliance Tests: The sand silo (during sand loading) and char combustor stack shall be tested for a duration of 3 hours in accordance with §60.48b to demonstrate initial compliance with the opacity standard specified in **Specific Conditions 11 and 12** of this subsection within 60 days after achieving permitted capacity, but no later than 180 days after initial operation of the unit. During each federal fiscal year (October 1st to September 30th), the sand silo baghouse shall be tested for duration of 3 hours during sand loading in accordance with EPA Method 9 to demonstrate compliance with the opacity standard. After the initial test, compliance with the opacity limit for the char combustor stack shall be by COMS. [Rules 62-4.070(3) and 62-297.310(7)(a)1, F.A.C.]

23. NH_3, CO, PM/PM_{10}, NO_X and SO_2 Compliance Tests: The char combustor exhaust stack shall be tested to demonstrate initial compliance with the NH_3 slip, CO, PM/PM_{10}, NO_X and SO_2 emission limits within 60 days after achieving permitted capacity, but no later than 180 days after initial operation of the unit. During each federal fiscal year (October 1st to September 30th), the char combustor stack shall be tested to demonstrate compliance with the NH_3, PM/PM_{10} and SO_2 emission limits. [Rule 62-4.070(3), F.A.C.]

24. Test Requirements: The permittee shall notify the Compliance Authority in writing at least 15 days prior to any required tests. Tests shall be conducted in accordance with the applicable requirements specified in Appendix CTR (Common Testing Requirements) of this permit. [Rule 62-297.310(7)(a)9, F.A.C.]

25. Test Methods: Any required stack tests shall be performed in accordance with the following methods.

C. Char Combustor Sand Heater with NG Startup Burner (EU-003)

Method	Description of Method and Comments
EPA 1 - 4	Determination of Traverse Points, Velocity and Flow Rate, Gas Analysis and Moisture Content. Methods shall be performed as necessary to support other methods.
EPA 5, 5B, 17	Determination of Particulate Emissions.
EPA 6C	Measurement of SO_2 Emissions (Instrumental).
EPA 7E	Determination of NO_X Emissions (Instrumental).
EPA 9	Visual Determination of Opacity.
EPA 10	Measurement of Carbon Monoxide Emissions (Instrumental).
EPA 18	Measurement of Gaseous Organic Compound Emissions (Gas Chromatography). *{For concurrent use with EPA Method 25A to deduct emissions of methane and ethane from the THC emissions measured by Method 25A.}*
EPA 19	Calculation Method for NO_X, PM, and SO_2 Emission Rates.
CTM-027	Procedure for Collection and Analysis of Ammonia in Stationary Source.

RECORDS AND REPORTS

26. Test Reports: The permittee shall prepare and submit reports for all required tests in accordance with the requirements specified in Appendix CTR (Common Testing Requirements) of this permit. For each test run, the report shall also indicate the operating rate. [Rule 62-297.310(8), F.A.C.]

D. BPG Cleanup System and Flare/TO System (EU-004)

This section of the permit addresses the following emissions unit.

ID No.	Emission Unit Description
004	BPG Cleanup System and Flare/TO System: This EU consists of two principal components each of which is briefly described below. • *BPG Cleanup System*: The BPG cleanup system consists of specialized oil scrubbers and an aqueous scrubber with a caustic section. The cooled raw BPG from the gasifier/coarse solids cyclone (EU-002) is treated to remove tars and finer particles in an oil-based gas washer. Tars are returned to support combustion in the char combustor (EU-003). Removal of ammonia (NH_3), hydrogen sulfide (H_2S) and hydrogen chloride (HCl) is accomplished in a wet scrubber that will include a section that will scrub H_2S using caustic soda (NaOH). Cooled, sweetened, and cleaned BPG is then compressed or boosted for delivery to the SOLAR T-130 CTG (EU-011,012 and 013), GE MS6001B CTG (EU 009) or flare/TO system (EU-004). • *BPG flare or TO system*: The flare or TO system shall only be used to combust BPG during startup, planned shutdown and emergency shutdown (e.g. CTG/DB or gasifier trips). Raw (uncleaned) BPG from the biomass gasifier (EU-002) may be combusted in the flare/TO and not sent to the BPG cleanup system (EU-005) for a maximum of 200 hours per year during startup, planned shutdown, and emergency shutdown (e.g. CTG or gasifier trips)as stipulated in **Specific Condition 4** of this subsection. Cleaned, sweetened BPG from the cleanup system may be combusted in the flare/TO for up to 200 hours per year during startup, planned shutdown, and emergency shutdown (e.g. CTG or gasifier trips) as stipulated in **Specific Condition 4** of this subsection and not further processed for use in the SOLAR T-130 CTG (EU-011,012 and 013), GE MS6001B CTG (EU 009). The 200 hours per year operation limit for the flare system is the combined usage when flaring "raw" or "clean" BPG.

EQUIPMENT

1. BPG Cleanup System: The permittee is required to construct a BPG cleanup system consisting of the following control equipment. None of the control equipment shall discharge directly to the ambient air.

   a. Oil Based Scrubber: A two-stage scrubber that utilizes specialized oils and is designed to remove heavy tars in the first stage and light tars in the second stage. The heavy and light tars are then recycled back to the char combustor.

   b. Aqueous Scrubber: An aqueous scrubber that is designed to remove inorganic impurities.

   [Application No. 0450012-002-AC and Rule 62-4.070(3), F.A.C.]

2. Flare/TO System: The permittee is authorized to construct a BPG flare or TO system to combust the raw BPG or "cleaned" BPG. Each system shall have continuous pilots and combustion chambers to destroy unused BPG. The presence of a flare/TO pilot flame shall be monitored using a thermocouple or any other equivalent device to detect the presence of a flame.
   [Application No. 0450012-0021-AC; Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

PERFORMANCE RESTRICTIONS

3. Maximum Capacity: The flare or TO system shall combust BPG with a maximum heat input rate of 518.0 mmBtu/hour. NG shall be used as fuel for the pilots and to sustain complete combustion when the heat content of the BPG is low. [Application No. 0450012-002-AC and Rule 62-210.200(PTE), F.A.C.]

4. Hours of Operation: The hours of operation of the BPG cleanup system are not limited. The hours of operation of the flare or TO system are limited to 200 hours per year (hr/yr) at the maximum capacity in any consecutive 12 month period. If the flare/TO is fired at less than the maximum capacity the operational hours shall be prorated. For example, if the flare is operated at 80% capacity for 20 hours the prorated

hours for compliance purposes is 16 hours (20 x 0.8 = 16). The flare or TO system shall only be used to combust BPG gas during startup, planned shutdown, and emergency shutdown (e.g. CTG or gasifier trips). [Application No. 0450012-002-AC; Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

5. Circumvention: The permittee shall not circumvent the BPG cleanup system except during startup, planned shutdown, and emergency shutdown (e.g. CTG or gasifier trips).
[Application No. 0450012-002-AC; Rules 62-4.070(3) and 62-210.650, F.A.C.]

TAR HANDLING AND STORAGE

6. Tars shall be returned to the char combustor. [Application No. 0450012-002-AC and Rule 62-4.070(3), F.A.C.]

EMISSIONS STANDARDS

7. Visible Emissions (VE) Standard: The flare or TO system shall be designed for and operated with a VE of 10% opacity. [Rule 62-4.070(3), F.A.C.]

TESTING AND MONITORING REQUIREMENTS

8. VE Compliance Tests: The flare or TO exhaust shall be tested to demonstrate initial compliance with the VE standard given in **Specific Condition 7** of this subsection within 60 days after achieving permitted capacity, but no later than 180 days after initial operation of the unit and during each federal fiscal year (October 1st to September 30th) thereafter. An EPA Method 9 or 22 VE compliance test shall be used to determine the compliance of the TO or flare system, respectively, with the VE standard. The observation period is 3 hours and shall be used according to Method 9 or 22. [Rule 62-4.070(3), F.A.C.]

9. Test Requirements: The permittee shall notify the Compliance Authority in writing at least 15 days prior to any required tests. Tests shall be conducted in accordance with the applicable requirements specified in Appendix CTR (Common Testing Requirements) of this permit. [Rule 62-297.310(7)(a)9, F.A.C.]

10. Test Methods: Any required flare/TO tests shall be performed in accordance with the following methods:

Method	Description of Method and Comments
EPA 9	Visual Determination of the Opacity of Emissions from Stationary Sources
EPA 22	Visual Determination of Fugitive Emissions from Material Sources and Smoke Emissions from Flares 2 Hour Duration

11. Work Practice: Good combustion practices will be utilized at all times to ensure emissions from the flare or TO system are minimized. Therefore, all operators and supervisors shall be properly trained to operate and ensure maintenance of these systems in accordance with the guidelines and procedures established by the manufacturer. The training shall include good operating practices as well as methods for minimizing excess emissions. The flare/TO pilots shall be operated with a flame present at all times.
[Rules 62-4.070(3) F.A.C.]

RECORDS AND REPORTS

12. Records: The permittee shall record in a written log the duration of each flare/TO event and the reason for flaring. If requested by the Compliance Authority, the permittee shall provide a copy of these records or a summary of these records. [Rule 62-4.070(3), F.A.C.]

13. Test Reports: The permittee shall prepare and submit reports for all required tests in accordance with the requirements specified in Appendix CTR (Common Testing Requirements) of this permit.
[Rule 62-297.310(8), F.A.C.]

E. Compressor and STG Cooling Towers (EU-005)

This section of the permit addresses the following emissions unit.

ID No.	Emission Unit Description
005	Compressor and STG cooling towers

EQUIPMENT DESIGN

1. Cooling Tower Design: The permittee is authorized to construct a cooling tower system consisting of two cooling towers. One tower is for the STG while the other is for the cooling of compressor gases. The power block cooling tower is based on a wet surface air condenser with a water flow rate of approximately 7,050 gallons per minute (gpm). The compressor gases cooling tower is based on a traditional surface heat exchanger with a water flow rate of approximately 3,800 gpm. The STG cooling tower uses mist eliminators and shall have a drift rate of 0.002% of the circulating water flow rate while the compressor gases cooling tower uses mist eliminators and shall have a drift rate of 0.005%. The difference in condenser technology accounts for the differences in design drift rates.

   [Application No. 0450012-001-AC; and Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

PERFORMANCE REQUIREMENTS

2. Hours of Operation: Operation of the cooling towers is not restricted (8,760 hours per year). [Application No. 0450012-001-AC and Rule 62-210.200 (PTE), F.A.C.]

3. Circulating Water Flow Rate: Upon request, the applicant shall provide a means for determining the circulating water flow rate through each cooling tower. [Rule 62-4.070, F.A.C.]

4. Drift Rate: The permittee shall provide certification along with the application for Title V air operation permit that the cooling towers were constructed and installed to the meet the drift rates specified in **Specific Condition 1** of this subsection. After this certification is provided, the cooling tower will be considered an unregulated emissions unit. [Rules 62-4.070 and 62-210.200 (PTE), F.A.C.]

5. Chromium-Based Water Treatment Chemicals: To avoid being subject to NESHAP 40 CFR 63, Subpart Q - National Emission Standards for Hazardous Air Pollutants for Industrial Process Cooling Towers, use of chromium-based water treatment chemicals in the cooling tower water is prohibited. [Rule 62-4.070, F.A.C. and NESHAP40 CFR 63, Subpart Q]

F. Auxiliary Boiler (EU-006)

This section of the permit addresses the following emissions unit.

ID No.	Emission Unit Description
006	Auxiliary boiler: The auxiliary boiler fires NG with a maximum heat input rate of 62 mmBtu/hour to start up the biomass gasification system. Exhaust gases exit a stack with design parameters of 2.75 feet in diameter, 50 feet in height, and a flow rate of 29,000 actual cubic feet per minute (acfm) and an exit temperature of 296 degrees °F.

EQUIPMENT

1. Auxiliary Boiler: The permittee is authorized to install an auxiliary boiler rated at 62 mmBtu/hour of heat input from firing NG, biodiesel or ULSD fuel oil. The auxiliary boiler shall be operated for purposes of starting up and shutting down. [Application No. 0450012-002-AC]

PERFORMANCE RESTRICTIONS

2. Authorized Fuel: The auxiliary boiler shall fire only NG with a maximum fuel sulfur content of 2 grains/100 scf. [Application No. 0450012-002-AC; Rules 62-210.200(PTE) and 62-296.406(BACT) F.A.C.]

3. Permitted Capacity: The maximum heat input rate of the auxiliary boiler is 62 mmBtu/hour (LHV for NG) based on a 4-hour rolling average. [Application No. 0450012-002-AC and Rule 62-210.200(PTE), F.A.C.]

4. Hours of Operation: The auxiliary boiler shall operate no more than 500 hours at permitted capacity in any consecutive 12 month period. If the boiler is fired at less than the permitted capacity the operational hours shall be prorated. For example, if the boiler is operated at 80% capacity for 20 hours the prorated hours for compliance purposes is 16 hours (20 x 0.8 = 16). [Application No. 0450012-002-AC; Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

REGULATORY APPLICABILITY

5. Small Boiler BACT: The auxiliary boiler is subject to the requirements of Rule 62-296.406, F.A.C., which includes a determination of the Best Available Control Technology (BACT) for PM and SO_2 emissions. For this project, BACT for PM and SO_2 emissions is determine to be the firing of NG with a maximum fuel sulfur content of 2 grains/100 scf as the only authorized fuel. [Rule 62-296.406, F.A.C.]

6. NSPS Subpart Dc and Subpart A Applicability: The auxiliary boiler is subject to all applicable requirements of 40 CFR 60, Subpart Dc which applies to Small Industrial, Commercial or Institutional Boilers and Subpart A, General Provisions. Specifically, this emission unit shall comply with 40 CFR 60.48c Reporting and Recordkeeping Requirements. The applicable conditions are given in Appendices A and Dc of this permit.
[Rule 62-204.800(7)(b) and 40 CFR 60, NSPS-Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units and 40 CFR 60 Subpart A, General Provisions]

EMISSIONS STANDARDS

7. Opacity Standard: In accordance with EPA Method 9, for a test duration of three hours, VE shall not exceed 5% opacity except for one 6-minute period per hour that shall not exceed 15% opacity. [Application No. 0450012-002-AC and Rule 62-4.070(3) F.A.C.]

TESTING AND MONITORING REQUIREMENTS

8. Initial Compliance Tests: As determined by EPA Method 9, the emissions unit shall be tested to demonstrate initial compliance with the opacity standard given in **Specific Condition 7** of this subsection within 60 days after achieving permitted capacity, but no later than 180 days after initial operation of the unit. [Rules 62-4.070(3) and 62-297.310(7)(a)1, F.A.C.]

9. Annual Compliance Tests: During each federal fiscal year (October 1st to September 30th), the emissions unit shall be tested in accordance with EPA Method 9 to demonstrate compliance with the opacity standard given in **Specific Condition 7** of this subsection. [Rule 62-297.310(7)(a)4, F.A.C.]

10. Test Requirements: The permittee shall notify the Compliance Authority in writing at least 15 days prior to any required tests. Tests shall be conducted in accordance with the applicable requirements specified in Appendix CTR (Common Testing Requirements) of this permit. [Rule 62-297.310(7)(a)9, F.A.C.]

RECORDS AND REPORTS

11. Test Reports: The permittee shall prepare and submit reports for all required tests in accordance with the requirements specified in Appendix CTR (Common Testing Requirements) of this permit. For each test run, the report shall also indicate the heat input rate. [Rule 62-297.310(8), F.A.C.]

G. Emergency Generator (EU-007)

This section of the permit addresses the following emissions units.

EU ID No.	Emission Unit Description
007	One emergency diesel generator with a maximum design rating of 500 kilowatts (kW)

EQUIPMENT

1. Emergency Generator: The permittee is authorized to install, operate, and maintain one emergency generator with a maximum design rating of 500 kW (671 horsepower (hp)) or smaller. [Application No. 0450012-002-AC; Rule 62-210.200 (PTE), F.A.C.]

2. Biodiesel and ULSD Fuel Oil Storage Tanks: The permittee is authorized to construct tanks to store biodiesel and ULSD fuel oil for use in the emergency generator. [Applicant request and 62-4.070(3), Reasonable Assurance]

   {Permitting Note: The biodiesel and ULSD fuel oil storage tanks for use in the emergency generator at the NWFREC facility are not subject to NSPS Subpart Kb because each stores a liquid (biodiesel and ULSD fuel oil) with a maximum true vapor pressure less than 3.5 kPa (0.51 pounds per square inch (psi)). Accordingly the tanks are unregulated emissions units.} [40 CFR 60.110b(a) and (c); Rule 62-204.800(7)(b), F.A.C.]

NSPS AND NESHAP APPLICABILITY

3. NSPS Subpart IIII Applicability: This emergency generator is a Stationary Compression Ignition Internal Combustion Engine (Stationary ICE) and shall comply with applicable provisions of 40 CFR 60, Subpart IIII, including emission testing or certification. [40 CFR 60, Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines]

4. NESHAPS Subpart ZZZZ Applicability: The emergency generator is a Liquid Fueled Reciprocating Internal Combustion Engines (RICE) and shall comply with applicable provisions of 40 CFR 63, Subpart ZZZZ. Pursuant to 40 CFR 63.6590(c) the generators must meet the requirements of Subpart ZZZZ by meeting the requirements of 40 CFR 60, Subpart IIII.
   [40 CFR 63, Subpart ZZZZ - National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE)]

PERFORMANCE RESTRICTIONS

5. Hours of Operation: The emergency generator may operate up to 500 hours per year for maintenance and testing purposes. [Application No. 0450012-002-AC and Rule 62-210.200 (PTE), F.A.C.]

6. Authorized Fuel: The emergency generator shall fire biodiesel or ULSD fuel oil only. The biodiesel must meet the ASTM specification given in Appendix ASTM of this permit.
   [Application No. 0450012-002-AC and Rule 62-210.200 (PTE), F.A.C.]

EMISSION STANDARDS

7. Emissions Limits: The emergency generator shall comply with the following emission limits and demonstrate compliance in accordance with the procedures given in 40 CFR 60, Subpart IIII. A link to the full text of Subpart IIII is given in Appendix IIII of this permit. Manufacturer certification, when using USLD fuel oil and, if available, biodiesel, can be provided to the Department in lieu of actual stack testing.

Emergency Generator (≥ 450 kW and ≤ 560 kW)	**CO** (g/kW-hr)[1]	**PM** (g/kW-hr)	**SO_2**[2] **(% S)**	**NMHC**[3]**+NO_X** (g/kW-hr)
Subpart IIII (2007 and later)	3.5	0.2	0.0015	4.0

1. g/kW-hr means grams per kilowatt-hour
2. SO_2 emission standard will be met by using biodiesel or ULSD fuel oil in the emergency generator with vendor certification of sulfur (S) content of 0.0015% or less.
3. NMHC means Non-Methane Hydrocarbons.

[Application No. 0450012-002-AC; NSPS 40 CFR 60, Subpart IIII; Rule 62-4.070(3), F.A.C.]

RECORDS AND REPORTS

8. Notification, Recordkeeping and Reporting Requirements: The permittee shall adhere to the compliance testing and certification requirements listed in 40 CFR 60.4211 and maintain records demonstrating fuel usage and quality. [40 CFR 60.4211]

H. Emergency Fire Pump Engine (EU-008)

This section of the permit addresses the following emissions unit.

EU ID No.	Emission Unit Description
008	One emergency diesel fire pump engine with a maximum design rating of 250 kW

EQUIPMENT

1. Engine Driven Fire Pump: The permittee is authorized to install, operate, and maintain one emergency fire pump engine. The pump engine will have a maximum rating of 250 kW (335 hp) or smaller. [Application No. 0450012-002-AC and Rule 62-210.200(PTE), F.A.C.]

2. Biodiesel and ULSD Fuel Oil Storage Tanks: The permittee is authorized to construct tanks to store biodiesel and ULSD fuel oil for use in the emergency fire pump engine.
[Applicant request and 62-4.070(3), Reasonable Assurance]

   {Permitting Note: The biodiesel and ULSD fuel oil storage tanks for use in the emergency fire pump engine at the NWFREC facility are not subject to NSPS Subpart Kb because each stores a liquid (biodiesel and ULSD fuel oil) with a maximum true vapor pressure less than 3.5 kPa (0.51 pounds per square inch (psi)). Accordingly the tanks are unregulated emissions units.} [40 CFR 60.110b(a) and (c); Rule 62-204.800(7)(b), F.A.C.]

NSPS AND NESHAP APPLICABILITY

3. NSPS Subpart IIII Applicability: The emergency fire pump engine is an Emergency Stationary Compression Ignition Internal Combustion Engine (Stationary ICE) and shall comply with applicable provisions of 40 CFR 60, Subpart IIII.
[40 CFR 60, Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines]

4. NESHAP Subpart ZZZZ Applicability: The emergency fire pump engine is a Liquid Fueled Reciprocating Internal Combustion Engines (RICE) and shall comply with applicable provisions of 40 CFR 63, Subpart ZZZZ. Pursuant to 40 CFR 63.6590(c) the emergency fire pump engine must meet the requirements of Subpart ZZZZ by meeting the requirements of 40 CFR 60, Subpart IIII.
[40 CFR 63, Subpart ZZZZ - National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE)]

PERFORMANCE RESTRICTIONS

5. Hours of Operation: The emergency fire pump engine may operate up to 250 hours per year for maintenance and testing purposes. [Application No. 0450012-002-AC and Rule 62-210.200 (PTE), F.A.C.]

6. Authorized Fuel: This unit shall fire biodiesel or ULSD fuel oil only. The biodiesel must meet the ASTM specification given in Appendix ASTM of this permit.
[Application No. 0450012-002-AC and Rule 62-210.200 (PTE), F.A.C.]

EMISSION STANDARDS

7. Emissions Limits: The emergency fire pump engine shall comply with the following emission limits and demonstrate compliance in accordance with the procedures given in 40 CFR 60, Subpart IIII. A link to the full text of Subpart IIII is given in Appendix IIII of this permit. Manufacturer certification, when using ULSD fuel oil and, if available, biodiesel, may be provided to the Department in lieu of actual testing. [40 CFR 60.4211 and Rule 62-4.070(3), F.A.C.]

Emergency Pumps (≥ 300 hp and < 600 hp)	**CO** (g/hp-hr)[1]	**PM** (g/hp-hr)	**SO_2**[2] **(% S)**	**NMHC+NO_X** (g/hp-hr)
Subpart IIII (2009 and later)	2.6	0.15	0.0015	3.0

1. g/hp-hr means grams per horsepower-hour.
2. SO_2 emission standard will be met by using biodiesel or ULSD fuel oil in the fire pump engine with vendor certification of S content of 0.0015% or less.

[Application No. 0450012-002-AC; 40 CFR 60, NSPS 40 CFR 60, Subpart IIII; Rule 62-4.070(3), F.A.C.]

RECORDS AND REPORTS

8. Notification, Recordkeeping and Reporting Requirements: The permittee shall adhere to the compliance testing and certification requirements listed in 40 CFR 60.4211 and maintain records demonstrating fuel usage and quality. [40 CFR 60.4211]

I. BPG-Fueled CTG and HRSG (EU-009, EU-010 and EU-011)

This section of the permit addresses the following emissions units.

ID No.	Emission Unit Description
009	One 15.7 MW BPG-fueled SOLAR T-130 CTG and HRSG **or** one 45.6 MW BPG-fueled GE Model MS6001B CTG and HRSG. Steam from the HRSG is used in the shared 19.5 (GE) or 19.6 (SOLAR) MW STG
010	One 15.7 MW BPG-fueled SOLAR T-130 CTG and HRSG. Steam from the HRSG is used in the shared 19.6 MW STG.
011	One 15.7 MW BPG-fueled SOLAR T-130 CTG and HRSG. Steam from the HRSG is used in the shared 19.6 MW STG.

EQUIPMENT

1. CTG/HRSG Unit Options:

   a. *SOLAR CTG Option*: The permittee is authorized to install, tune, operate and maintain a combined cycle CTG system consisting of the following equipment: a BPG compressor system; three 15.7 MW BPG-fueled SOLAR T-130 CTG; three inlet air filtration and chiller systems; three automated CTG control systems; three HRSG; three HRSG stacks; and a shared 19.6 MW STG. Biodiesel or ULSD fuel oil will be used during commissioning and during startups, malfunctions and shutdowns. [Application No. 0450012-002-AC and Rule 62-4.070(3), F.A.C.]

   b. *GE CTG Option*: In lieu of the SOLAR CTG option given in **Specific Condition 1a** above of this subsection, the permittee is authorized to install, tune, operate and maintain a combined cycle CTG system consisting of the following equipment: a BPG and NG compressor system; one 45.6 MW BPG-fueled GE Model MS6001B CTG; an inlet air filtration and chiller system; an automated CTG control system; one HRSG; one HRSG stack; and a 19.5 MW STG. NG will be used during commissioning and during startups, malfunctions and shutdowns. [Application No. 0450012-002-AC and Rule 62-4.070(3), F.A.C.]

2. Wet Injection: The permittee shall install, operate, and maintain a wet injection system (water or steam) to reduce NO_X emissions from each SOLAR CTG or the GE CTG. Prior to the initial emissions performance tests required for a CTG, the wet injection system shall be tuned to achieve sufficiently low CO and NO_X values to meet the CO and NO_X limits with the additional oxidation catalyst and SCR control technology described below. Thereafter, the CTG(s) shall be maintained and tuned in accordance with the manufacturer's recommendations. [Application No. 0450012-002-AC; Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

3. Selective Catalytic Reduction (SCR) Systems: The permittee shall install an SCR system for each CTG/HRSG exhaust stream to control NO_X emissions. Each SCR system will consist of an ammonia injection grid, catalyst, ammonia storage, monitoring and control system, electrical, piping and other ancillary equipment. Each SCR system shall be designed, constructed and operated to achieve the permitted levels of NO_X emissions indicated in this subsection. The SCR systems shall be designed to achieve a maximum ammonia slip level of 10 parts per million by volume dry (ppmvd) @ 15% oxygen. [Application No. 0450012-002-AC; Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

   {Permitting Note: In accordance with 40 CFR 60.130, the storage of ammonia shall comply with all applicable requirements of the Chemical Accident Prevention Provisions in 40 CFR 68.}

4. Oxidation Catalyst Systems: The permittee shall install an oxidation catalyst system for each CTG/HRSG exhaust stream to control CO and VOC emissions. Each oxidation catalyst system shall be designed, constructed and operated to achieve the permitted levels of CO and VOC emissions specified in the

subsection.
[Application No. 0450012-002-AC; Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

5. Circumvention: The permittee shall not circumvent the air pollution control equipment or allow the emission of air pollutants without this equipment operating properly. Ammonia shall be injected as necessary to ensure compliance with the permitted levels of NO_X emissions specified in this subsection.
[Rules 62-210.650 and 62-4.070(3), F.A.C.]

6. Biodiesel and ULSD Fuel Oil Storage Tanks: The permittee is authorized to construct tanks to store biodiesel and ULSD fuel oil for use during CTG during startup.
[Applicant request and 62-4.070(3), Reasonable Assurance]

{Permitting Note: The biodiesel and ULSD fuel oil storage tanks for CTG startup at the NWFREC facility are not subject to NSPS Subpart Kb because each stores a liquid (biodiesel and ULSD fuel oil) with a maximum true vapor pressure less than 3.5 kPa (0.51 pounds per square inch (psi)). Accordingly, the tanks are unregulated emissions units.} [40 CFR 60.110b(a) and (c); Rule 62-204.800(7)(b), F.A.C.]

7. NO_X CEMS: In accordance with §60.4335(b) and §60.4345, the permittee shall install, calibrate, operate and maintain a CEMS to continuously monitor and record NO_X emissions from the CTG exhaust stream within 60 calendar days after achieving permitted capacity but no later than 180 calendar days after initial startup.
[Application No. 0450012-002-AC; Rule 62-4.070(3), F.A.C.; and NSPS 40 CFR 60, Subpart KKKK in 40 CFR 60]

8. CO CEMS: The permittee shall install, calibrate, operate and maintain a CEMS to continuously monitor and record CO emissions from the CTG exhaust stream within 60 calendar days after achieving permitted capacity but no later than 180 calendar days after initial startup.
[Application No. 0450012-002-AC and Rule 62-4.070(3), F.A.C]

PERFORMANCE RESTRICTIONS

9. Authorized Fuels: The only authorized fuels for the CTG are: BPG from the cleanup system; NG; biodiesel (if available); and, ULSD fuel oil. The biodiesel must meet the ASTM specification given in Appendix ASTM of this permit.
[Application No. 0450012-002-AC; Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

10. Permitted CTG Capacities: The maximum heat input rate of each SOLAR CTG is 173 mmBtu/hour on a 1 hour average basis. The maximum heat input rate of the GE CTG is 514 mmBtu/hour on a 1 hour average basis. These heat rates are based on a compressor inlet temperature of 59 °F, International Organization for Standardization (ISO) conditions, and the lower heating value (LHV) of the BPG or NG. Heat input rates will vary depending upon CTG characteristics, ambient conditions and alternate methods of operation. The permittee shall provide manufacturer's performance curves (or equations) that correct for site conditions to the Permitting and Compliance Authorities within 45 days of completing the initial compliance testing. Operating data may be adjusted for the appropriate site conditions in accordance with the performance curves and/or equations on file with the Department.
[Application No. 0450012-002-AC; Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

{Permitting Note: The estimated LHV for BPG is 435 British thermal unit per standard cubic foot (Btu/scf) and 980 Btu/scf for NG. On average, the LHV of ULSD fuel oil is 128,450 Btu/gal and 119,550 Btu/gal for biodiesel.}

11. Hours of Operation: The CTG shall fire NG, biodiesel or ULSD fuel oil for the purpose of startup no more than a combined 750 hours at permitted capacity during any consecutive 12 month period. When firing the CTG at less than the permitted capacity, fuel usage shall be prorated over the hours of operation by reducing the hours when firing the fuel based on the percentage of the fired capacity compared to the

maximum, e.g. 90 percent (5 hours x 0.9 = 4.5 hours of fuel firing). The hours of operation are not otherwise limited (8,760 hours per year).
[Application No. 0450012-002-AC; Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

12. Authorized Method of Operation: The CTG are permitted to operate only as part of a combined cycle system. [Application No. 0450012-002-AC]

NSPS APPLICABILITY

13. NSPS Subpart KKKK and Subpart A Applicability: The CTG (SOLAR or GE) are subject to all applicable requirements of 40 CFR 60, Subpart KKKK - Standards of Performance for Stationary Combustion Turbines which applies to CTG constructed after February 18, 2005 and Subpart A, General Provisions. [Rule 62-204.800(7)(b), F.A.C.; 40 CFR 60.4300, NSPS - Subpart KKKK - Standards of Performance for Stationary Combustion Turbines (see Appendix KKKK of this permit) and 40 CFR 60 Subpart A, General Provisions (see Appendix A of this permit)].

EMISSION LIMITS

14. Emission Standards: The following standards are at least as stringent as the Subpart KKKK limits described in **Specific Condition 13** of this subsection and in Appendix KKKK of this permit. These also include more stringent limits to insure that the facility PSD pollutant emissions are less than the respective major stationary source thresholds. Emissions shall not exceed the following standards for each CTG/HRSG unit option (SOLAR or GE).

For each SOLAR Model T-130 CTG/HRSG Unit			
Parameter	**Limit [a]**	**Basis**	**Compliance**
NO_X [b]	74 ppmvd @ 7% O_2	NSPS Subpart KKKK	30 day rolling average by CEMS
	25 ppmvd @ 7% O_2	NSPS Subpart KKKK	30 day rolling average by CEMS
	8.99 lb/hr/118.1 TPY	Applicant Request	30 day rolling average by CEMS
SO_2/SAM [c]	0.15 lb/mmBtu	NSPS Subpart KKKK	Total Sulfur (TS) Fuel Monitoring
	0.060 lb/mmBtu	NSPS Subpart KKKK	Fuel Monitoring Exemption Limit
	0.91 lb/hr/11.9 TPY	Applicant Request	TS Fuel Monitoring
CO [d]	5.5 lb/hr/72.3 TPY	Applicant Request	30 day rolling average by CEMS
PM/PM_{10} (filterable) [e]	4.7 lb/hr/61.8 TPY	Applicant Request	Initial and Annual Stack Test
Visual Emission (VE)	VE shall not exceed 10% opacity for each 6-minute block average.	Rule 62-4.070(3), F.A.C.	Initial and Annual Stack Test
VOC [f]	1.0 lb/hr	Applicant Request	Initial and Annual Stack Test
NH_3 Slip [g]	10 ppmvd @ 7% O_2	Rule 62-4.070(3), F.A.C.	Initial and Annual Stack Test
Heat Input Rate	173 mmBtu/hour	Rule 62-210.200(PTE), F.A.C.	1-hour rolling average @ 59 °F, Heat Input per 40 CFR 75, App. F
For the GE Model MS6001B CTG/HRSG Unit			
Parameter	**Limit [a]**	**Basis**	**Compliance**
NO_X [b]	74 ppmvd @ 7% O_2	NSPS Subpart KKKK	30 day rolling average by CEMS
	25 ppmvd @ 7% O_2	NSPS Subpart KKKK	30 day rolling average by CEMS
	26.97 lb/hr/118.1 TPY	Applicant Request	30 day rolling average by CEMS
SO_2/SAM [c]	0.15 lb/mmBtu	NSPS Subpart KKKK	TS Fuel Monitoring
	0.060 lb/mmBtu	NSPS Subpart KKKK	Fuel Monitoring Exemption Limit
	2.73 lb/hr/11.9 TPY	Applicant Request	TS Fuel Monitoring

CO [d]	16.5 lb/hr/72.3 TPY	Applicant Request	30 day rolling average by CEMS
Parameter	**Limit [a]**	**Basis**	**Compliance**
PM/PM_{10} (filterable) [e]	14.1 lb/hr/61.8 TPY	Applicant Request	Initial and Annual Stack Test
VE [f]	VE shall not exceed 10% opacity for each 6-minute block average.	Rule 62-4.070(3), F.A.C.	Initial and Annual Stack Test
VOC [g]	3.0 lb/h/13.1 TPY	Applicant Request	Initial and Annual Stack Test
NH_3 Slip [h]	10 ppmvd @ 7% O_2	Rule 62-4.070(3), F.A.C.	Initial and Annual Stack Test
Heat Input Rate	514 mmBtu/hour	Rule 62-210.200(PTE), F.A.C.	1-hour rolling average @ 59 °F, Heat Input per 40 CFR 75, App. F

a. The mass emission rate standards are based on a turbine inlet condition of 59 °F. Mass emission rate may be adjusted to actual test conditions in accordance with the performance curves and/or equations on file with the Department. The TPY limits are total from all three SOLAR CTG or single GE CTG.
b. NO_X: ppmvd @ 7% O_2 means parts per million by volume dry adjusted to 7 percent oxygen. Pound per hour limit for NO_X ensures that NWFREC will not trigger PSD for this pollutant. The 74 ppmvd limit is the Subpart KKKK limit when CTG is firing BPG while the 25 ppmvd limit is when the CTG is firing NG.
c. The 0.15 lb SO_2/mmBtu NSPS Subpart KKKK limit is for units firing 50% or more of biogas. This limit is met by monitoring TS content of the biogas fuel per § 60.4360. If permittee can demonstrate that the SO_2 emission rate for a fuel fired in a unit is 0.060 lb SO_2/mmBtu or less, then TS fuel monitoring is not required by Subpart KKKK for that fuel (See **Specific Condition 19** of this subsection). The TS fuel monitoring effectively limits the potential emissions of SAM and SO_2 from the CTG. To demonstrate that annual SO_2 emissions are less than the major source threshold of 250 TPY, TS fuel monitoring must be conducted per § 60.4360 to show that SO_2 emissions are less than or equal to 0.91 lb/hr on an annualized basis (See **Specific Condition 19** of this subsection). In lieu of fuel testing, the permittee can accept fuel supplier/vendor reports on fuel TS content for NG, biodiesel and ULSD fuel oil.
d. Pound per hour limit for CO ensures that NWFREC will not trigger PSD for this pollutant.
e. Filterable (F) fraction as measured by EPA Method 5. An initial test using EPA Methods 5 and 202 will be conducted to determine the F and condensable (C) PM emission rate, but no emission limit will be set for (F+C) PM.
f. Compliance with the visible emissions standard shall be demonstrated by conducting tests in accordance with EPA Method 9.
g. Pound per hour limit for VOC ensures that NWFREC will not trigger PSD for this pollutant.
h. Ammonia slip caused by the SCR system. Compliance with the ammonia slip standard shall be demonstrated by conducting tests in accordance with EPA Method CTM-027 or EPA Method 320.

[Application No. 0450012-002-AC; Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

EXCESS EMISSIONS

15. Excess Emissions Calculations: The following conditions apply only to the SIP based emissions standards specified above in this subsection. Rule 62-210.700, F.A.C. (Excess Emissions) cannot vary or supersede any federal NSPS, NESHAP, or Acid Rain provision. As provided by the authority in Rule 62-210.700(5), F.A.C., the following conditions supersede the provisions in Rule 62-210.700(1), F.A.C.
    a. *CO Emissions Standards*: Due to the long term nature of the CO limit (30 day rolling average), no excess emissions provisions are made for excess CO emissions.
    b. *NO_X Emissions*: Excess NO_X emissions based on the 30 day rolling average standard shall be calculated in accordance with the NSPS Subpart KKKK provisions.
    c. *Opacity*: As determined by EPA Method 9, visible emissions from the CTG during startup and shutdown shall not exceed 20% opacity based on 6-minute averages. Excess visible emissions resulting from malfunction shall be permitted providing: (1) best operational practices to minimize emissions are adhered to, and (2) the duration of excess emissions shall be minimized but in no case exceed two hours in any 24-hour period.
16. Definitions Related to Excess Emissions: Rule 62-210.200(Definitions), F.A.C. defines the following terms.
    a. *Startup* is defined as the commencement of operation of any emissions unit which has shut down or ceased operation for a period of time sufficient to cause temperature, pressure, chemical or pollution control device imbalances, which result in excess emissions.
    b. *Shutdown* is the cessation of the operation of an emissions unit for any purpose.

c. *Malfunction* is defined as any unavoidable mechanical and/or electrical failure of air pollution control equipment or process equipment or of a process resulting in operation in an abnormal or unusual manner.

17. Excess Emissions Prohibited: Excess emissions caused entirely or in part by poor maintenance, poor operation or any other equipment or process failure that may reasonably be prevented during startup, shutdown or malfunction shall be prohibited. All such preventable emissions shall be included in any compliance determinations based on CEMS data. [Rule 62-210.700(4), F.A.C.]

CONTINUOUS MONITORING REQUIREMENTS

18. CEMS: The permittee shall install, calibrate, maintain and operate CEMS and a diluent monitor to measure and record the emissions of CO and NO_X and oxygen (O_2) or carbon dioxide (CO_2) from each CTG in a manner sufficient to demonstrate continuous compliance with the CEMS emission standards of this section. Each monitoring system shall be installed, calibrated and properly functioning within 60 calendar days of achieving permitted capacity as defined in Rule 62-297.310(2), F.A.C., but no later than 180 calendar days after initial startup and prior to the initial performance tests. Within one working day of discovering emissions in excess of the CO or NO_X standards (and subject to the specified averaging period), the permittee shall notify the Compliance Authority. See Appendix CEMS of this permit for additional CEMS requirements.

a. *NO_X CEMS:* The NO_X CEMS shall be certified, operated, and maintained in accordance with the requirements of 40 CFR 75. Record keeping and reporting shall be conducted pursuant to Subparts F and G in 40 CFR 75. The RATA tests required for the NO_X monitor shall be performed using EPA Method 20 or 7E in Appendix A of 40 CFR 60.

b. *CO CEMS:* The CO CEMS shall be certified pursuant to 40 CFR 60, Appendix B, Performance Specification 4 or 4A. Quality assurance procedures shall conform to the requirements of 40 CFR 60, Appendix F, and the Data Assessment Report of Section 7 shall be made each calendar quarter, and reported semiannually to the Compliance Authority. The RATA tests required for the CO monitor shall be performed using EPA Method 10 in Appendix A of 40 CFR 60 and shall be based on a continuous sampling train. The CO monitor span values shall be set appropriately, considering the allowable methods of operation and corresponding emission standards.

c. *Diluent Monitor:* The O_2 or CO_2 content of the flue gas shall be monitored at the location where CO and NO_X are monitored to correct the measured emissions rates to 15% oxygen. If a CO_2 monitor is installed, the oxygen content of the flue gas shall be calculated using F-factors that are appropriate for the fuel fired. Each monitor shall comply with the performance and quality assurance requirements of 40 CFR 75.

GENERAL MONITORING REQUIREMENTS

19. Fuel Sulfur Monitoring: The permittee shall conduct total sulfur testing for each authorized fuel (see **Specific Condition 9** of this subsection) fired in the CTG to demonstrate compliance with the fuel total sulfur (TS) provisions of § 60.4360 in NSPS 40 CFR 60, Subpart KKKK. In addition, the permittee shall sample and analyze the BPG for heating value at least once per week utilizing ASTM Method D3588 - 98(2003) Standard Practice for Calculating Heat Value, Compressibility Factor, and Relative Density of Gaseous Fuels or an equivalent method approved by the Compliance Authority.

Per § 60.4365, the permittee may elect **not** to monitor the TS content of each fuel combusted in the CTG, if each fuel is demonstrated not to exceed a potential sulfur emission rate of 0.060 lb SO_2/mmBtu of heat input. To demonstrate for each fuel that the sulfur emission rate does not exceed 0.060 lb SO_2/mmBtu of heat input, representative fuel sampling data is required that at a minimum meets the requirements of Section 2.3.1.4 or 2.3.2.4 of 40 CFR 75, Appendix D – Optional SO_2 Emissions Data Protocol for Gas-Fired and Oil-Fired Units.

To demonstrate that annual SO_2 emissions are less than the 250 TPY major source threshold, TS fuel monitoring must be conducted per § 60.4360 to show that SO_2 emissions are less than or equal to 0.91 lb/hr for each SOLAR CTG or 2.73 lb/hr for GE CTG on an annualized basis. In lieu of fuel testing, the permittee can accept fuel supplier/vendor reports on fuel TS content for NG, biodiesel and ULSD fuel oil. [Application No. 0450012-002-AC; Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.; NSPS 40 CFR 60, Subpart KKKK]

20. Ammonia Monitoring Requirements: In accordance with the manufacturer's specifications, the permittee shall install, calibrate, operate and maintain an ammonia flow meter to measure and record the ammonia injection rate to each SCR system prior to the initial compliance tests. The permittee shall document and periodically update the general range of ammonia flow rates required to meet permitted emissions levels over the range of load conditions allowed by this permit by comparing NO_X emissions recorded by the CEM system with ammonia flow rates recorded using the ammonia flow meter. During NO_X monitor downtimes or malfunctions, the permittee shall operate at the ammonia flow rate that is consistent with the documented flow rate for the CTG load condition. [Rules 62-4.070(3)]

PERFORMANCE TESTS

21. Initial Compliance Tests: Each CTG shall be tested to demonstrate initial compliance with the emissions standards for CO, NO_X, PM/PM_{10}, VE, VOC and ammonia slip. The initial tests shall be conducted within 60 days after achieving permitted capacity, but not later than 180 days after initial operation of the unit. Each CTG shall demonstrate compliance with the NO_X standard in accordance with the methods specified in NSPS Subpart KKKK of 40 CFR 60. [Rules 62-4.070(3) and 62-297.310(7)(a)1, F.A.C.]

22. Annual Compliance Tests: During each federal fiscal year (October 1st to September 30th), each CTG shall be tested to demonstrate compliance with the emissions standards for VOC, PM/PM_{10}, VE and ammonia slip. [Rule 62-297.310(7)(a)4, F.A.C.]

23. Test Requirements: The permittee shall notify the Compliance Authority in writing at least 15 days prior to any required tests. Tests shall be conducted in accordance with the applicable requirements specified in Appendix CTR (Common Testing Requirements) of this permit. [Rule 62-297.310(7)(a)9, F.A.C.]

24. Test Methods: Required tests shall be performed in accordance with the following reference methods.

Method	Description of Method and Comments
EPA 1-4	Traverse Points, Velocity and Flow Rate, Gas Analysis, and Moisture Content
EPA 7E	Determination of NO_X Emissions from Stationary Sources
EPA 9	Visual Determination of the Opacity of Emissions from Stationary Sources.
EPA 10	Determination of CO Emissions from Stationary Sources
EPA 18	Measurement of Gaseous Organic Compound Emissions by Gas Chromatography
EPA 19	Determination of SO_2 Removal Efficiency and PM, SO_2 and NO_X Emission Rates Optional F-factor method may be used to determine flow rate and gas analysis to calculate mass emissions in lieu of Methods 1-4.
EPA 25	Gaseous Nonmethane Organic Emissions
CTM-027	Procedure for Collection and Analysis of Ammonia in Stationary Source
EPA 320	
EPA 201	Determination of PM_{10} Emissions (Exhaust Gas Recycle Procedure)

The above methods are described in Appendix A of 40 CFR 60 and are adopted by reference in Rule 62-204.800, F.A.C. No other methods may be used unless prior written approval is received from the Department. [Rules 62-204.800 and 62-297.100, F.A.C.; and Appendix A of 40 CFR 60]

RECORDS AND REPORTS

25. Monitoring of Capacity: The permittee shall monitor and record the operating rate of each CTG on a daily average basis, considering the number of hours of operation during each day (including the times of startup, shutdown and malfunction). This shall be achieved through monitoring daily rates of consumption and heat content of each allowable fuel in accordance with the provisions of Appendix D in 40 CFR 75 and recording the data using a monitoring component of the CEMS system required above. [Rule 62-4.070(3), F.A.C. and 40 CFR 75]

26. Monthly Operations Summary: By the fifth calendar day of each month, the permittee shall record the following for each fuel in a written or electronic log for the previous month and the previous consecutive 12 months: total heat input rate to each CTG from each fuel (mmBtu); the 30 day rolling average in lb/hr of NO_X and CO; and the 12 month rolling total of NO_X and CO emissions in tons. Annual NO_X and CO emissions shall be determined in accordance with Rule 62-210.370, F.A.C. Information recorded and stored as an electronic file shall be available for inspection and printing within at least three days of a request by the Department. Fuel consumption shall be monitored in accordance with the provisions of Appendix D in 40 CFR 75. [Rules 62-4.070(3), F.A.C.]

27. Stack Test Reports: The owner or operator of an emissions unit for which a compliance test is required shall file a report with the Compliance Authority on the results of each such test. The required test report shall be filed with the Compliance Authority as soon as practical but no later than 45 days after the last sampling run of each test is completed. The test report shall provide sufficient detail on the emissions unit tested and the test procedures used to allow the Compliance Authority to determine if the test was properly conducted and the test results properly computed. As a minimum, the test report shall provide the applicable information specified in Rule 62-297.310(8), F.A.C. and summarized in Appendix D in 40 CFR 75. [Rule 62-297.310(8), F.A.C.]