

# Florida Department of Environmental Protection

## Memorandum

TO: Trina Vielhauer, Bureau of Air Regulation  
THRU: Al Linero, Special Projects Section *aal*  
FROM: David Ready *DR*  
DATE: September 30, 2008

SUBJECT: Project No. 0870003-010-AC  
Keys Energy Services  
Stock Island Power Plant  
Biodiesel Test Firing

This project is not subject to a PSD preconstruction review but is subject to a minor source preconstruction review. Attached for your review are the following items:

- Written Intent to Issue Air Permit;
- Public Notice of Intent to Issue Air Permit;
- Technical Evaluation and Preliminary Determination;
- Draft Permit; and
- PE Certification.

This draft permit is to allow the test firing of biodiesel fuel (~250,000 gallons) in addition to the currently used Number (No.) 2 distillate fuel oil in combustion turbines Nos. 1, 2, and 3 at the Stock Island Power Plant to assess operational and emissions issues. The power plant is located 6900 Front Street Extended, Stock Island, Monroe County, Florida.

I recommend your approval of the attached Draft Permit.

Attachments



# Florida Department of Environmental Protection

Bob Martinez Center  
2600 Blairstone Road  
Tallahassee, Florida 32399-2400

Charlie Crist  
Governor  
Jeff Kottkamp  
Lt. Governor  
Michael W. Sole  
Secretary

September 30, 2008

*Electronically Sent – Received Receipt Requested*

edward.garcia@keysenergy.com

Mr. Edward Garcia, Director of Generation

Keys Energy Services

1001 James Street

Post Office Box 6100

Key West, Florida 33041-6100

Re: DEP File No. 0870003-010-AC

Stock Island Power Plant

Biodiesel Test Firing

Dear Mr. Garcia:

On April 22, 2008 you submitted an application to allow the test firing of a biodiesel fuel in combustion turbines (CT) Nos. 1, 2 and 3 at the Stock Island Power Plant located in Monroe County, Florida.

Enclosed are the following documents:

- The Technical Evaluation and Preliminary Determination;
- Draft Air Permit;
- Written Notice of Intent to Issue Air Permit; and
- Public Notice of Intent to Issue Air Permit. This is the actual notice you must have published in the legal advertisement section of a newspaper of general circulation in the area affected by this project.

If you have any questions, please contact David Read at 850-414-7268 or Alvaro Linero at 850-921-9523.

Sincerely,

Trina Vielhauer, Chief  
Bureau of Air Regulation

Enclosures

TLV/aal/dlr

## WRITTEN NOTICE OF INTENT TO ISSUE AIR PERMIT

In the Matter of an  
Application for Air Permit by:

Mr. Edward Garcia, Director of Generation  
Keys Energy Services  
1001 James Street  
Post Office Box 6100  
Key West, Florida 33041-6100

Air Permit No. 0870003-010-AC  
Stock Island Power Plant  
Biodiesel Test Firing  
Monroe County, Florida

**Facility Location:** The applicant, Keys Energy Services, is proposing to conduct a test firing of a biodiesel fuel at the Stock Island Power Plant which is located on 6900 Front Street Extended, Stock Island, Monroe County, Florida.

**Project:** On April 22, 2008, Keys Energy Services submitted an application for an air construction permit to allow the test firing of a biodiesel fuel (~250,000 gallons) in combustion turbines (CT) Nos. 1, 2 and 3 at the Stock Island Power Plant to assess operational and emissions issues. Details of the project are provided in the application and the enclosed Technical Evaluation and Preliminary Determination.

**Permitting Authority:** Applications for air construction permits are subject to review in accordance with the provisions of Chapter 403, Florida Statutes (F.S.) and Chapters 62-4, 62-210 and 62-212 of the Florida Administrative Code (F.A.C.). The proposed project is not exempt from air permitting requirements and an air permit is required to perform the proposed work. The Florida Department of Environmental Protection's Bureau of Air Regulation is the Permitting Authority responsible for making a permit determination for this project. The Permitting Authority's physical address is: 111 South Magnolia Drive, Suite 4, Tallahassee, Florida. The Permitting Authority's mailing address is: 2600 Blair Stone Road, Mail Station (MS) 5505, Tallahassee, Florida 32399-2400. The Permitting Authority's telephone number is 850/488-0114.

**Project File:** A complete project file is available for public inspection during the normal business hours of 8:00 a.m. to 5:00 p.m., Monday through Friday (except legal holidays), at the address indicated above for the Permitting Authority. The complete project file includes the Draft Permit, the Technical Evaluation and Preliminary Determination, the application and the information submitted by the applicant, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Permitting Authority's project review engineer for additional information at the address or phone number listed above. In addition, electronic copies of these documents are available by entering the file number provided above where indicated on the following web page:

<http://www.dep.state.fl.us/air/eproducts/apds/default.asp>

**Notice of Intent to Issue Air Permit:** The Permitting Authority gives notice of its intent to issue an air permit to the applicant for the project described above. The applicant has provided reasonable assurance that operation of the proposed equipment will not adversely impact air quality and that the project will comply with all appropriate provisions of Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297, F.A.C. The Permitting Authority will issue a final permit in accordance with the conditions of the proposed Draft Permit unless a timely petition for an administrative hearing is filed under Sections 120.569 and 120.57, F.S. or unless public comment received in accordance with this notice results in a different decision or a significant change of terms or conditions.

## WRITTEN NOTICE OF INTENT TO ISSUE AIR PERMIT

**Public Notice:** Pursuant to Section 403.815, F.S. and Rules 62-110.106 and 62-210.350, F.A.C., you (the applicant) are required to publish at your own expense the enclosed Public Notice of Intent to Issue Air Permit (Public Notice). The Public Notice shall be published one time only as soon as possible in the legal advertisement section of a newspaper of general circulation in the area affected by this project. The newspaper used must meet the requirements of Sections 50.011 and 50.031, F.S. in the county where the activity is to take place. If you are uncertain that a newspaper meets these requirements, please contact the Permitting Authority at above address or phone number. Pursuant to Rule 62-110.106(5) and (9), F.A.C., the applicant shall provide proof of publication to the Permitting Authority at the above address within 7 days of publication. Failure to publish the notice and provide proof of publication may result in the denial of the permit pursuant to Rule 62-110.106(11), F.A.C.

**Comments:** The Permitting Authority will accept written comments concerning the proposed Draft Permit for a period of 14 days from the date of publication of the Public Notice. Written comments must be received by the Permitting Authority by close of business (5:00 p.m.) on or before the end of this 14-day period. If written comments result in a significant change to the Draft Permit, the Permitting Authority will issue a revised Draft Permit and require, if applicable, another Public Notice. All comments filed will be made available for public inspection.

**Petitions:** A person whose substantial interests are affected by the proposed permitting decision may petition for an administrative hearing in accordance with Sections 120.569 and 120.57, F.S. The petition must contain the information set forth below and must be filed with (received by) the Department's Agency Clerk in the Office of General Counsel of the Department of Environmental Protection, 3900 Commonwealth Boulevard, MS 35, Tallahassee, Florida 32399-3000 (telephone: 850/245-2241; fax: 850/245-2303). Petitions filed by the applicant or any of the parties listed below must be filed within 14 days of receipt of this Written Notice of Intent to Issue Air Permit. Petitions filed by any persons other than those entitled to written notice under Section 120.60(3), F.S., must be filed within 14 days of publication of the attached Public Notice or within 14 days of receipt of this Written Notice of Intent to Issue Air Permit, whichever occurs first. Under Section 120.60(3), F.S., however, any person who asked the Permitting Authority for notice of agency action may file a petition within 14 days of receipt of that notice, regardless of the date of publication. A petitioner shall mail a copy of the petition to the applicant at the address indicated above, at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57, F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention (in a proceeding initiated by another party) will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205, F.A.C.

A petition that disputes the material facts on which the Permitting Authority's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address, and telephone number of the petitioner; the name, address and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination; (c) A statement of when and how each petitioner received notice of the agency action or proposed decision; (d) A statement of all disputed issues of material fact. If there are none, the petition must so state; (e) A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the agency's proposed action; (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the

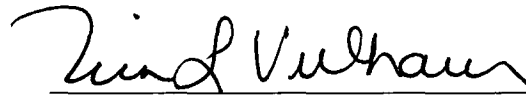
**WRITTEN NOTICE OF INTENT TO ISSUE AIR PERMIT**

agency's proposed action including an explanation of how the alleged facts relate to the specific rules or statutes; and, (g) A statement of the relief sought by the petitioner, stating precisely the action the petitioner wishes the agency to take with respect to the agency's proposed action. A petition that does not dispute the material facts upon which the Permitting Authority's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 28-106.301, F.A.C.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Permitting Authority's final action may be different from the position taken by it in this Written Notice of Intent to Issue Air Permit. Persons whose substantial interests will be affected by any such final decision of the Permitting Authority on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

**Mediation:** Mediation is not available in this proceeding.

Executed in Tallahassee, Florida.



Trina Vielhauer, Chief  
Bureau of Air Regulation

**CERTIFICATE OF SERVICE**

The undersigned duly designated deputy agency clerk hereby certifies that this Notice of Intent to Issue Air Permit package (including the Written Notice of Intent to Issue Air Permit, the Public Notice of Intent to Issue Air Permit, the Technical Evaluation and Preliminary Determination, and the Draft Air Permit) was sent by electronic mail (or a link to these documents made available electronically on a publicly available server) with received receipt requested before the close of business on 9/30/08 to the persons listed below.

Edward Garcia, Keys Energy Services: [edward.garcia@keysenergy.com](mailto:edward.garcia@keysenergy.com)

Kennard F. Kosky, P.E., Golder Associates, Inc.: [kkosky@golder.com](mailto:kkosky@golder.com)

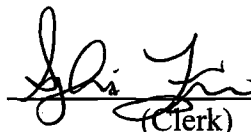
A. J. Satyal, South District Office: [ajaya.satyal@dep.state.fl.us](mailto:ajaya.satyal@dep.state.fl.us)

Katy Forney, EPA Region 4: [forney.kathleen@epa.gov](mailto:forney.kathleen@epa.gov)

Ms. Vickie Gibson, DEP BAR: [Victoria.Gibson@dep.state.fl.us](mailto:Victoria.Gibson@dep.state.fl.us) (for read file)

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)

9/30/08  
(Date)

## PUBLIC NOTICE OF INTENT TO ISSUE AIR PERMIT

Florida Department of Environmental Protection  
Division of Air Resource Management, Bureau of Air Regulation  
Draft Air Permit No. 0870003-010-AC  
Keys Energy Services  
Stock Island Power Plant  
Monroe County, Florida

**Applicant:** The applicant for this project is Keys Energy Services. The applicant's authorized representative and mailing address is: Mr. Edward Garcia, Director of Generation, 1001 James Street, Post Office Box 6100, Key West, Florida 33041-6100.

**Facility Location:** The applicant, Keys Energy Services, is proposing to conduct a test firing of a biodiesel fuel at the Stock Island Power Plant which is located at 6900 Front Street Extended, Stock Island in Monroe County, Florida.

**Project:** Keys Energy Services submitted an application for an air construction permit to allow the test firing of a biodiesel fuel (~250,000 gallons) in combustion turbines (CT) Nos. 1, 2 and 3 at the Stock Island Power Plant. The project is a field test to determine the feasibility with regard to pollutant emissions and operational considerations of firing this renewable bio-fuel (biodiesel) in the CT. If the test is successful, Keys Energy Services will be able to replace some of the current fossil fuel usage at this plant with a renewable energy source. Keys Energy Services anticipates that the pollutant emissions when using the biodiesel fuel will be less than or equivalent (to be confirmed through testing), to firing No. 2 distillate fuel oil with a sulfur content of 0.05 percent in the CT which is the currently permitted fuel used at the facility. For comparison purposes, biodiesel fuel typically has a sulfur content of 0.0015 percent or less.

Based on the required analyses, the Department has reasonable assurance that the proposed project will not cause or significantly contribute to a violation of any ambient air quality standards.

**Permitting Authority:** Applications for air construction permits are subject to review in accordance with the provisions of Chapter 403, Florida Statutes (F.S.) and Chapters 62-4, 62-210 and 62-212 of the Florida Administrative Code (F.A.C.). The proposed project is not exempt from air permitting requirements and an air permit is required to perform the proposed work. The Florida Department of Environmental Protection's Bureau of Air Regulation is the Permitting Authority responsible for making a permit determination for this project. The Permitting Authority's physical address is: 111 South Magnolia Drive, Suite #4, Tallahassee, Florida. The Permitting Authority's mailing address is: 2600 Blair Stone Road, Mail Station 5505, Tallahassee, Florida 32399-2400. The Permitting Authority's telephone number is 850/488-0114.

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[www.dep.state.fl.us/air/eproducts/apds/default.asp](http://www.dep.state.fl.us/air/eproducts/apds/default.asp)

**Notice of Intent to Issue Air Permit:** The Permitting Authority gives notice of its intent to issue an air permit to the applicant for the project described above. The applicant has provided reasonable assurance that operation of proposed equipment will not adversely impact air quality and that the project will comply with all appropriate provisions of Chapters 62-4, 62-204, 62-210, 62-212, 62-296 and 62-297, F.A.C. The Permitting Authority will issue a Final Permit in accordance with the conditions of the proposed Draft Permit unless a timely petition for an administrative hearing is filed under Sections

120.569 and 120.57, F.S. or unless public comment received in accordance with this notice results in a different decision or a significant change of terms or conditions.

**Comments:** The Permitting Authority will accept written comments concerning the proposed Draft Permit for a period of 14 days from the date of publication of the Public Notice. Written comments must be received by the Permitting Authority by close of business (5:00 p.m.) on or before the end of this 14-day period. If written comments result in a significant change to the Draft Permit, the Permitting Authority will issue a revised Draft Permit and require, if applicable, another Public Notice. All comments filed will be made available for public inspection.

**Petitions:** A person whose substantial interests are affected by the proposed permitting decision may petition for an administrative hearing in accordance with Sections 120.569 and 120.57, F.S. The petition must contain the information set forth below and must be filed with (received by) the Department's Agency Clerk in the Office of General Counsel of the Department of Environmental Protection at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000 (telephone: 850/245-2241; fax: 850/245-2303). Petitions filed by any persons other than those entitled to written notice under Section 120.60(3), F.S. must be filed within 14 days of publication of this Public Notice or receipt of a written notice, whichever occurs first. Under Section 120.60(3), F.S., however, any person who asked the Permitting Authority for notice of agency action may file a petition within 14 days of receipt of that notice, regardless of the date of publication.

A petitioner shall mail a copy of the petition to the applicant at the address indicated above, at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57, F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention (in a proceeding initiated by another party) will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205, F.A.C.

A petition that disputes the material facts on which the Permitting Authority's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address and telephone number of the petitioner; the name address and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial rights will be affected by the agency determination; (c) A statement of when and how the petitioner received notice of the agency action or proposed decision; (d) A statement of all disputed issues of material fact. If there are none, the petition must so state; (e) A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the agency's proposed action; (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency's proposed action including an explanation of how the alleged facts relate to the specific rules or statutes; and, (g) A statement of the relief sought by the petitioner, stating precisely the action the petitioner wishes the agency to take with respect to the agency's proposed action. A petition that does not dispute the material facts upon which the Permitting Authority's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 28-106.301, F.A.C.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Permitting Authority's final action may be different from the position taken by it in this Public Notice of Intent to Issue an Air Permit. Persons whose substantial interests will be affected by any such final decision of the Permitting Authority on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

**Mediation:** Mediation is not available for this proceeding.

# TECHNICAL EVALUATION

Keys Energy Services  
Stock Island Power Plant

Biodiesel Test Firing

Monroe County

DEP File No. 0870003-010-AC



Department of Environmental Protection  
Division of Air Resource Management  
Bureau of Air Regulation

September 29, 2008



TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

I. APPLICATION INFORMATION

A. APPLICANT NAME AND ADDRESS

Keys Energy Services  
1001 James Street  
Post Office Box 6100  
Key West, Florida 33041-6100

Authorized Representative:  
Edward Garcia, Director of Generation

B. PROCESSING SCHEDULE

- Received construction permit application (0870003-010-AC) on April 22, 2008 to allow test firing of a biodiesel fuel in combustion turbines (CT) Nos. 1, 2, and 3 at the Stock Island Power Plant.
- Deemed the application complete on May 22, 2008.
- Received waiver of clock until August 21, 2008 on August 7, 2008.
- Received waiver of clock until September 30, 2008 on August 19, 2008.
- Posted the draft construction permit package on September 30, 2008.

C. FACILITY LOCATION

Keys Energy Services proposes to conduct test firing of the biodiesel fuel in CT 1, 2 and 3 at the Stock Island Power Plant located 6900 Front Street Extended, Stock Island, Key West, Monroe County, Florida. The location of Key West relative to the Florida peninsula is shown in Figure 1. The location of Stock Island with respect to Key West is shown in Figure 2.



Figure 1. Location of Key West.



Figure 2. Location of Stock Island.

The plant is located approximately 90 km southwest of the Class I Everglades National Park Wilderness Area.

D. FACILITY CLASSIFICATION CODE (SIC)

Industry No.	4911	Electric Services
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## TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

### E. REGULATORY CATEGORIES

Title III HAP: This facility is not a "Major Source" of hazardous air pollutants (HAP).

Title IV Acid Rain: The facility operates units subject to the Acid Rain provisions of the Clean Air Act (CAA).

Title V Major Source: The facility is a Title V or "Major Source" of air pollution because the potential emissions of at least one regulated pollutant exceed 100 tons per year (tpy). Regulated pollutants include pollutants such as carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), particulate matter (PM/PM<sub>10</sub>), sulfur dioxide (SO<sub>2</sub>) and volatile organic compounds (VOC).

PSD Major Source: The project is located in an area designated as "attainment," "maintenance" or "unclassifiable" for each pollutant subject to the National Ambient Air Quality Standard (NAAQS). The facility is not one of the 28 Prevention of Significant Deterioration (PSD) source categories, and is subject to the PSD applicability threshold of 250 tpy. Potential emissions of at least one regulated pollutant exceed 250 tpy. Therefore, the facility is classified as a PSD-major source of air pollution with respect to Rule 62-212.400, Florida Administrative Code (F.A.C.), PSD of Air Quality.

NSPS Sources: The combustion turbines specified in this project, are subject to regulation under the new Source Performance Standards (NSPS) for Stationary Gas Turbines, 40 Code of Federal Regulation (CFR), Subpart GG.

NESHAP: The National Emissions Standards for Hazardous Air Pollutants (NESHAP) Subpart YYYYY for combustion turbines does not apply because the facility is not a major source of HAP.

Siting: The facility is not a steam electrical generating plant and is not subject to the power plant siting provisions of Chapter 62-17, F.A.C.

### II. PROPOSED PROJECT

#### A. BIODIESEL DESCRIPTION

According to information provided in the application, biodiesel is a renewable, clean burning, oxygenated fuel made from vegetable oils or animal fats. Standard forms of biodiesel feed stock include soybean, rapeseed and palm oils, animal fats and grease. Biodiesel is produced by reacting alcohol (typically methanol) with these natural fats, oils, or grease in a chemical process called transesterification. The resultant product from this process, i.e., biodiesel, consists of mono alkyl esters of long-chained fatty acids. The American Society of Testing and Materials (ASTM) specification for 100-percent biodiesel (B100) is ASTM D6751-07b and is provided in Table 1.

**Table 1. B100 Biodiesel Fuel Specifications<sup>1</sup>.**

Property	ASTM	Limits*	Units	Property	ASTM	Limits*	Units
Flash Point	D93	130.0 min.	°C	Acid Number	D664	0.50 max.	mg KOH/gm
Water & Sediment	D2709	0.050 max.	% vol.	Free Glycerin	D6584	0.020 max.	% mass
Kinematic Viscosity	D445	1.9 - 6.0	mm <sup>2</sup> /sec	Total Glycerin	D6584	0.240 max.	% mass
Sulfated Ash	D874	0.020 max.	% mass	Phosphorous	D4951	0.001 max.	% mass
Total Sulfur	D5453	15 max.	ppm	Distillation Temp.	D1160	360 max.	°C
Copper Strip	D130	No. 3 max.	--	Calcium/Magnesium	UOP 389	5 max.	ppm
Cetane	D163	47 min.	--	Oxidative Stability	D2274	3 min.	hours
Cloud Point	D2500	Customer	°C	Sodium and Potassium Metals	UOP391-91	5 max.	ppm
Carbon Residue	D4530**	0.050 max.	% mass				

\* Limiting requirements may be agreed upon between purchaser, seller and manufacturers due special operating conditions.

\*\* Carbon residue shall be run on a B100 sample, not B20 or B80 which are the most common biodiesel blends.

## TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

Biodiesel can be blended with fossil based diesel to produce blends. For example, 20 percent biodiesel blended with 80 percent diesel is called B20. More information about biodiesel can be found at the following web site: [http://www.biodiesel.org/resources/biodiesel\\_basics/](http://www.biodiesel.org/resources/biodiesel_basics/).

According to the application, a specific biodiesel available for this project has the following critical specifications:

- Carbon residue maximum = 0.05 percent; typically <0.01 percent
- Water and sediment maximum = 0.05 percent; typically 0.005 percent
- Sulfated ash 0.02 percent maximum; typically <0.001 percent
- Sodium and Potassium <1 ppm combined
- Calcium and Magnesium <1 ppm combined
- Sulfur = 15 ppm; typically <1 ppm
- Lower Heating Value (LHV) = 115,000 to 117,000 British thermal units per gallon (BTU/gal)
- Higher Heating Value (HHV) = 122,000 to 126,000 Btu/gal
- For comparison HHV of No. 2 fuel oil is 137,000 Btu/gal (typical)

### B. PROJECT DESCRIPTION

The proposed project will involve the test firing of up to 250,000 gallons of biodiesel (B100 or blends) in combustion turbines (CT) Nos. 1, 2, and 3 (Emission Unit IDs 007, 008, and 009, respectively) at the Stock Island Power Plant to determine performance and emissions information. These CT are General Electric (GE) Frame 5 models that utilize No. 2 distillate fuel oil (0.05 percent sulfur content) and use water injection to control nitrous oxide (NO<sub>x</sub>) emissions. Specifically, CT No.1 is a 23.5 megawatt (MW) GE Model PG5341 while CT Nos. 2 and 3 are 19.77 MW GE Model MS-5001R. According to the application, since biodiesel has a significantly lower sulfur content (typically 0.0015 percent) than the No. 2 fuel oil used at the facility, SO<sub>2</sub> emissions should be lower. According to tests conducted by the Environmental Protection Agency (EPA) on reciprocating diesel engines firing biodiesel versus No. 2 fuel oil, particulate matter (PM), carbon monoxide (CO), and volatile organic compounds (VOC) emissions were lower, but nitrogen oxide (NO<sub>x</sub>) emissions were greater when firing biodiesel than when firing No.2 fuel oil.<sup>2</sup> The Department obtained results of this study which are summarized in Figure 3 below. In addition, biodiesel was tested in a GE LM6000 CT at the Brookfield Power Carr Street Generating Plant in Syracuse New York with test results indicating lower NO<sub>x</sub> and PM emissions compared to No. 2 fuel oil.<sup>3</sup>

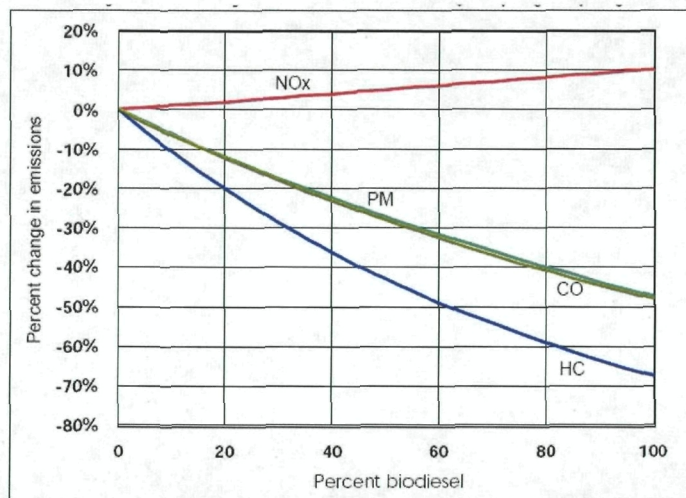


Figure 3. EPA Test Results of Biodiesel Used in Diesel Engines<sup>2</sup>.

## TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

In summary, the applicant anticipates that firing biodiesel in CT Nos. 1, 2 and 3 will result in lower or equivalent hourly emissions of CO, PM and VOC, while significantly reducing emissions of SO<sub>2</sub>. Emissions of NO<sub>x</sub> should be equivalent or slightly higher when firing biodiesel compared to firing No. 2 fuel oil. This test project will allow these assumptions to be verified.

Since testing of biodiesel in a GE Frame 5 CT has not been performed, the applicant provided several tables which are combined in Table 2 below. This table provides operation and estimated emissions when using 250,000 gallons of biodiesel in CT Nos. 1, 2 or 3 assuming that short term maximum emission rates are the same as when using 0.05 percent sulfur No. 2 distillate fuel oil. Due to the difference in sulfur content between biodiesel and No. 2 fuel oil, SO<sub>2</sub> emission estimates presented in the table are reduced from normal operational conditions. Additionally, in the table, the emissions resulting from using the biodiesel in the CT are compared to the PSD significant emission rates (SER) thresholds. As seen from the table, according to the applicant, all emissions are less than SER thresholds.

In summary, the applicant has requested the following conditions in the air construction (AC) permit for the test firing of biodiesel at the Stock Island Power Plant:

- Allow storage of the biodiesel in either one of the two 500,000 gallon storage tanks (Emission Unit ID No. 010) that currently store No. 2 diesel fuel oil and provide fuel to CT Nos. 1, 2 and 3 during their operation;
- Allow the test firing of biodiesel-fuel at the facility;
- Fire the biodiesel in CT Nos. 1, 2, and 3 with the most likely candidate being CT No. 3;
- No limit to the number of hours that the biodiesel can be fired in the test units. However, the duration of the test firing will be limited by the duration of the air construction permit for the project;
- The ability to blend the biodiesel with No. 2 distillate fuel oil currently used in the CT; and,
- To limit the use of biodiesel during the duration of the project to 250,000 gallons in total for all CT combined.

**Table 2. Estimated Emissions From CT When Firing Biodiesel.<sup>4</sup>**

Parameter	Units	CT-1	CT-2	CT-3	Comments
Heat Input	MMBtu/hr	312.00	305.00	305.00	CT-1 @ 59 °F
Test Heat Input	MMBtu	30,500.00	30,500.00	30,500.00	Equivalent of 250,000 gallons
	Hours	97.76	100.00	100.00	Equivalent hours for 250,000 gallons
Emissions					
PM10 (15)**	lb/hour	18.00	16.00	16.00	Permit 0870003-008-AV Based on hours of biodiesel @ max. output
	tons/yr	0.88	0.83	0.83	
SO <sub>2</sub> (40)**	lb/hour	0.49	0.48	0.48	Permit 0870003-008-AV Based on hours of biodiesel @ max. output
	tons/yr	0.02	0.02	0.02	
NO <sub>x</sub> (40)**	lb/hour	96.00	93.80	93.80	Permit 0870003-008-AV Based on hours of biodiesel @ max. output
	tons/yr	4.69	4.69	4.69	
CO (100)**	lb/hour	64.00	25.20	25.20	Permit 0870003-008-AV Based on hours of biodiesel @ max. output
	tons/yr	3.13	1.26	1.26	
VOC (40)**	lb/hour	6.00	5.55	5.55	Permit 0870003-008-AV Based on hours of biodiesel @ max. output
	tons/yr	0.29	0.28	0.28	

\* Biodiesel Calculations: (122,000 Btu/gal (HHV) x 250,000 gallons)/ 1,000,000 Btu/MMBtu = 30,500 MMBtu

\*\* PSD SER thresholds in tpy

# TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

## RULE APPLICABILITY

### A. FEDERAL REGULATIONS

This project is subject to certain applicable federal provisions regarding air quality as established by the EPA in the Code of Federal Regulations (CFR) and summarized below.

Title 40	Description
Part 60	New Source Performance Standards (NSPS)
Part 72	Acid Rain - Permits Regulation
Part 73	Acid Rain – Sulfur Dioxide Allowance System
Part 75	Acid Rain - Continuous Emissions Monitoring
Part 76	Acid Rain - Nitrogen Oxides Emissions Reduction Program
Part 77	Acid Rain - Excess Emissions

*Note: Acid rain requirements are included in the Title V air operation permit.*

### B. STATE REGULATIONS

The project is subject to the applicable environmental laws specified in Section 403 of the Florida Statutes (F.S.). The Florida Statutes authorize the Department of Environmental Protection to establish rules and regulations regarding air quality as part of the Florida Administrative Code (F.A.C.). This project is subject to the following rules in the F.A.C.

Chapter	Description
62-4	Permitting Requirements
62-204	State Implementation Plan (AAQS, PSD Increments, adoption of Federal Regulations)
62-210	Stationary Sources of Air Pollution – General Requirements
62-212	Preconstruction Review (including PSD Requirements)
62-213	Operation Permits for Major Sources of Air Pollution
62-214	Acid Rain Program Requirements
62-296	Emission Limiting Standards
62-297	Emissions Monitoring

### C. PREVENTION OF SIGNIFICANT DETERIORATION (PSD) APPLICABILITY

The Department regulates major stationary sources in accordance with Florida's PSD program, as defined in Rule 62-210.200, F.A.C. and approved by EPA in the State Implementation Plan (SIP). A PSD review is only required in areas that are currently in attainment with the NAAQS for a given pollutant or areas designated as "unclassifiable" for the pollutant. A facility is considered "major" with respect to PSD if the facility emits or has the potential to emit:

- 250 tons per year or more of any regulated air pollutant, or
- 100 tons per year or more of any regulated air pollutant and the facility belongs to one of the 28 Major Facility Categories as defined in Section 62-210.200, F.A.C., or
- 5 tons per year of lead.

For new projects at existing PSD-major sources, each regulated pollutant is reviewed for PSD applicability based on emissions thresholds known as the Significant Emission Rates listed in 62-210.200 (Definitions, Significant Emission Rate), F.A.C. Projects that result in a significant net emissions increase are considered "major modifications." For each significant pollutant, the applicant must not only employ Best Available Control Technology (BACT) to minimize emissions but also conduct an appropriate ambient impact analyses. Although a facility may be

## TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

“major” with respect to PSD for only one regulated pollutant, it may be required to install BACT controls for several significant regulated pollutants.

As previously established, this facility is a “major source” with respect to the PSD regulations. However, this temporary field-test to fire biodiesel-fuel is not a “major modification” to the existing major source. The test firing of the biodiesel is a limited and a relatively short-term evaluation to determine: (1) emission changes of pollutants (SO<sub>2</sub>, NO<sub>x</sub>, CO and PM/PM<sub>10</sub>) that may result from firing the biodiesel and (2) whether firing the biodiesel over the duration of the project results in any operational problems. The current emission limits are not waived during the field test, and neither emissions nor heat rates in excess of the current permit limits are allowed during the biodiesel test firing.

Because no long-term, permanent modification, or increase in potential emissions are being authorized, the Department does not consider this field-test to be a “major modification” for purposes of the PSD regulations.

### III. DEPARTMENT REVIEW

#### A. OVERVIEW

This test project will allow the practicality of using a biodiesel fuel, with regards to emissions and operational factors, to be assessed when firing of the biodiesel fuel in a GE Frame 5 type CT.<sup>5</sup>

#### B. BIODIESEL EMISSIONS COMPARED TO NO. 2 DISTILLATE FUEL OIL

To assess the possible effects on air emissions from using this biodiesel fuel at the Stock Island Power Plant, the Department developed Table 3 which compares the typical major specifications of No. 2 distillate fuel oil to biodiesel. Based on the fuel specifications presented in Table 3, four points become apparent. First, sulfur emissions when firing biodiesel should be significantly less due to its very low sulfur content. Second, operational issues when using biodiesel could be minimized if the viscosity of the biodiesel used in the project falls toward the low end of the cited range. Third, it is unknown whether the pH of the biodiesel will cause any long-term operational problems. Finally, due to the lower energy content of biodiesel of roughly 90 percent (HHV) when compared to No. 2 fuel oil (124,000 Btu/gal of biodiesel versus 137,000 Btu/gal of No. 2 fuel oil) more biodiesel will have to be burned to generate the same amount of electrical power.

**Table 3. Biodiesel Compared to No. 2 Fuel Oil.**<sup>678910</sup>

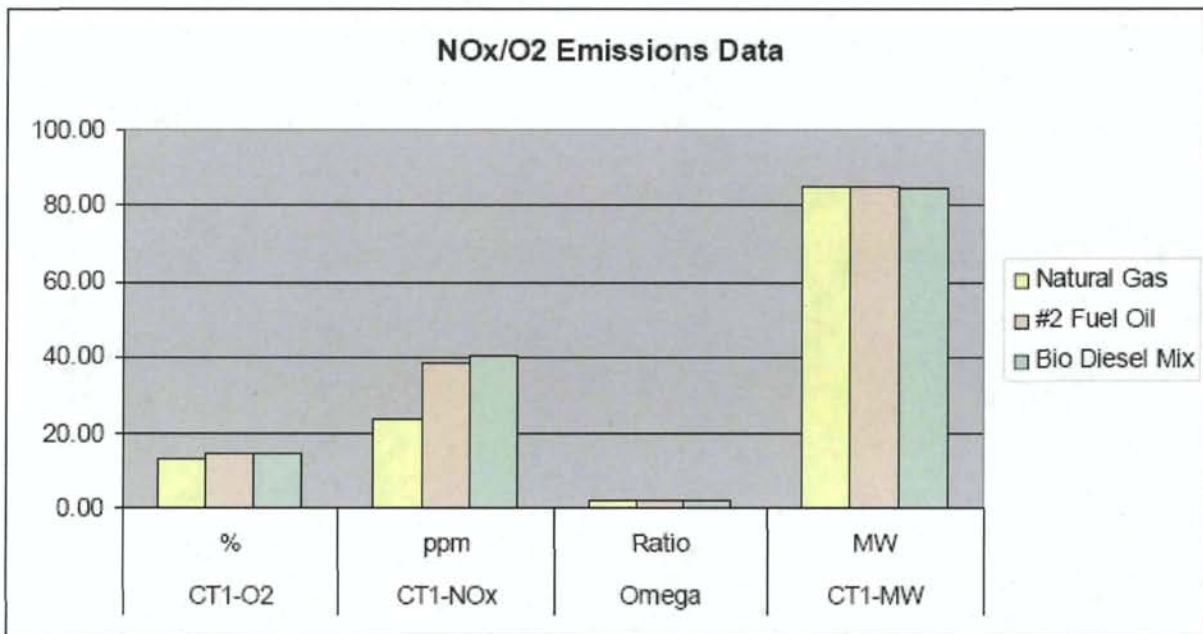
Property	No. 2	Biodiesel	Units
Flash Point	126	266 min.	°F
Water & Sediment	0.05 max.	0.05 max.	Vol. %
Carbon Residue	0.35 max.	0.05 max.	Wt. %
Sulfated Ash	0.10 max.	0.02 max.	Wt. %
Viscosity	1.9 <sup>(a)</sup>	1.9-6.5 <sup>(a)</sup>	mm <sup>2</sup> /sec
Sulfur	0.05 max.	0.0015 typ..	Wt. %
Cetane	40 min	40 min	--
90% Distillation Range Temp.	540-640	Not Distilled	°F
Copper Corrosion	No 3 max.	No. 3b max.	--
Total Glycerin	No Given	2400	ppm
Specific Gravity	0.88 <sup>(b)</sup>	0.88 <sup>(b)</sup>	
LHV <sup>(c)</sup>	132,000	116,000	Btu/gal
HHV <sup>(c)</sup>	137,000	124,000	Btu/gal
pH <sup>(d)</sup>	--	6 to 8 typical	--

**TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION**

FBN <sup>(e)</sup>	<1000	10	ppm
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- (a) Viscosity given at 104 °F.
- (b) Specific gravity given at 60 °F.
- (c) Approximate values and can vary by source (fuel oil) and feedstock (biodiesel).
- (d) The measurement of pH is not applicable to liquid fossil fuels. For biodiesel which is hygroscopic the pH range can vary significantly depending on the water content and if washing for purification was used.
- (e) Typical values of fuel based nitrogen (FBN).

In addition to the biodiesel test firing in a GE LM6000 CT cited in the application (Reference 4), where NO<sub>x</sub> and PM were reduced when using 99.9 percent biodiesel, the Department was able to find two more instances of biodiesel test firings in CT<sup>1112</sup>. In the first instance, a 25 percent blend of biodiesel (B25) was burned in a 115 MW Alstom GT 11N CT at the Hopewell Cogeneration Facility in Virginia in August of 2006. Results from this test are summarized in Figures 3 and 4 below. As seen from the Figure 3, oxygen (O<sub>2</sub>) emissions are essentially unchanged when firing the B25 blend versus No. 2 fuel oil while NO<sub>x</sub> emissions are up by approximately 5 percent. The omega ratio, which is an indicator of steam injection, is unchanged as is the power output. Based on Figure 4, there is a significant drop in SO<sub>2</sub> emission when firing the B25 bend versus No. 2 fuel oil.



**Figure 3. NO<sub>x</sub> and O<sub>2</sub> Emissions.**

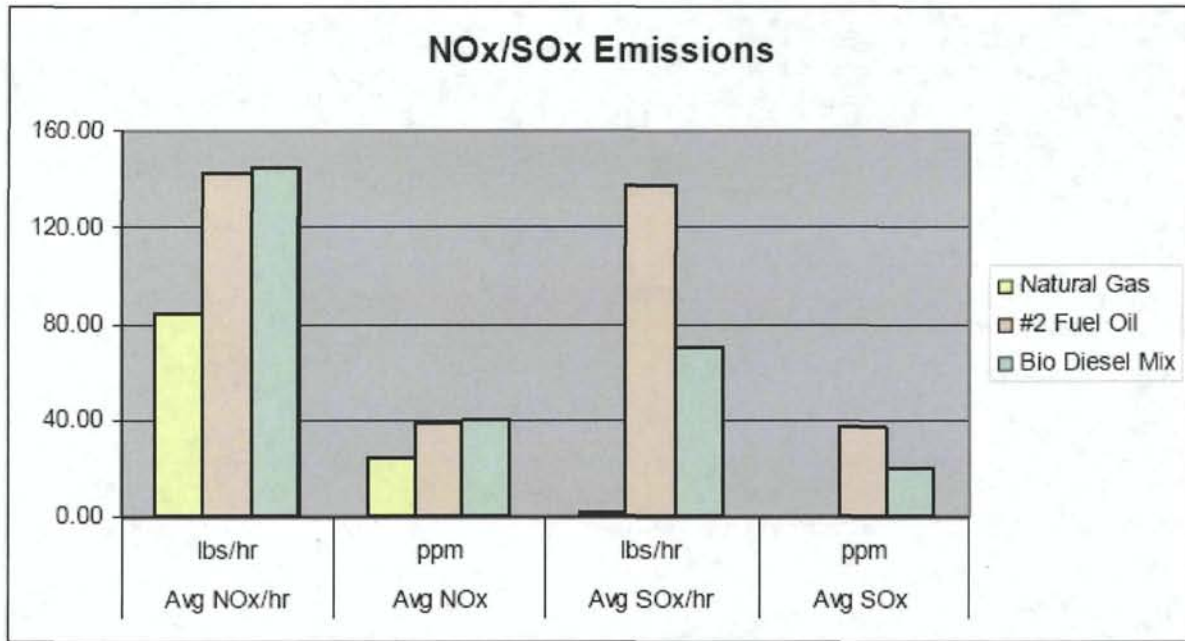


Figure 4. NO<sub>x</sub> and SO<sub>2</sub> Emissions.

The second test firing of biodiesel in a CT identified by the Department, which was completed in early July of this year, was conducted by Duke Energy at its Mill Creek peaking CT plant in Blacksburg, South Carolina. As part of this test, biodiesel blends of B100, B80, B50 and B20 were burned in an 81.7 MW GE 7EA CT with dry Low NO<sub>x</sub> technology. Early results are promising, with a reduction in all measured pollutant emissions, but the data will not be fully analyzed nor a report issued for several months. However, no significant operational problems were observed when firing any of biodiesel blends in the CT.

In summary, the limited test firing (250,000 gallons total) of biodiesel in the Stock Island Power Plant CT Nos. 1, 2 and 3 should result in emissions of CO, PM/PM<sub>10</sub> and VOC that are equal or slightly less than when firing No. 2 fuel oil. NO<sub>x</sub> emissions should be equal or slightly higher than when firing fuel oil while SO<sub>2</sub> emissions should be significantly less. Anticipated emissions increases/decreases resulting from the test firing of biodiesel are summarized in Table 4. Finally, any emissions increases should be well below PSD SER thresholds.

Table 4. Summary of Expected Effects of Biodiesel Fuel on Emissions.

Pollutant	Emission Effect
SO <sub>2</sub>	much less
NO <sub>x</sub>	slight increase or equal
CO	less/equal
VOC	less/equal
PM/PM <sub>10</sub>	less/equal

In Table 5 below, the actual emissions from the CT for the last five years are presented in tons per year. As seen from the table, the emissions from none of the CT are near annual permitted limits. In all but two cases, which are highlighted, each unit's annual hours of operation are less than 400 hours. This further illustrates that the test firing of the limited amount of biodiesel proposed for this project should not pose any danger with regard to exceeding the permitted annual emission limits. However, it should be noted that as per **condition E.10** of the facility's Title V Operation Permit (0870003-008-AV) annual compliance testing of stack emissions are not required if the hours of operation for each individual unit do not exceed 400 hours. Under such circumstances,



## TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

the Environmental Protection Agency (EPA) AP-42 emissions factors are used to calculate annual emissions. Consequently, most pollutants emissions presented in Table 5 are estimates.

**Table 5. Actual Annual Pollutant Emissions at the Stock Island Power Plant.**

CT-1 (EU 007)					
Year	NO <sub>x</sub>	CO	PM/PM <sub>10</sub>	Annual Hours	
2007	17.1	10.7	6.0	407	
2006	11.2	7.0	4.0	258	
2005	8.1	5.1	2.9	193	
2004	8.3	5.2	3.0	227	
2003	9.0	5.6	3.2	233	
<b>Permit Limit</b>	138	152	43	2888.5	
CT-2 (EU 008)					
Year	NO <sub>x</sub>	CO	PM	PM <sub>10</sub>	Annual Hours
2007	4.8	1.2	0.9	0.8	129
2006	1.5	0.4	0.3	0.2	43
2005	10.5	2.7	2.0	1.7	283
2004	6.1	1.6	1.2	1.0	233
2003	2.6	0.7	0.5	0.4	81
<b>Permit Limits</b>	172	101	55	45	4000*
CT-3 (EU 009)					
Year	NO <sub>x</sub>	CO	PM	PM <sub>10</sub>	Annual Hours
2007	0.2	0.1	0.1	0.1	3
2006	2.3	0.6	0.4	0.4	68
2005	9.1	2.4	1.8	1.5	270
2004	6.7	1.7	1.3	1.1	227
2003	24.3	6.3	4.2	3.9	735
<b>Permit Limits</b>	172	101	55	45	4000*

Finally, as previously mentioned, the energy content of biodiesel (Btu/gal) based on HHV is approximately 90 percent of No. 2 fuel oil. Accordingly, for the same power output, 10 percent more biodiesel by volume would be required to be fired to equal the same power output. This additional fuel throughput in a CT could increase emissions of NO<sub>x</sub> on a mass basis reducing the benefit of using the biodiesel. Results from this test firing should help clarify whether this energy content difference is a significant problem.

### C. CONCLUSIONS

While the department does not necessarily agree with the applicant's assumptions with regard to overall pollution emissions reductions that will occur when firing the biodiesel, it does not believe that any significant increase in pollutant emissions will result from firing the limited amount of biodiesel (250,000 gallons) requested for this project. This conclusion is supported by the Department's analysis described in **Subsection III-B** above. The Department also agrees that the quantity of emissions from firing the biodiesel as a supplemental fuel and any operational factors compared to operating the facility without the biodiesel fuel, can only be determined by a test firing.

The use of up to 250,000 gallons of biodiesel during the test firing period is authorized by the Department. A successful firing of the biodiesel will help in achieving the renewable energy goals of the state.

### IV. PRELIMINARY DETERMINATION

The Department makes a preliminary determination that the proposed project will comply with all applicable State and Federal air pollution regulations as conditioned by the Draft Permit. This

## TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

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conclusion is based on a technical review of the information submitted by the applicant, other reasonable assurances provided by the applicant, a review of the available literature and the conditions specified in the draft permit. David Read is responsible for reviewing the application, preparing the technical evaluation, and drafting the permit. Al Linero, P.E. is the engineer overseeing the project and will be responsible for sealing the evaluation. Additional details of this analysis may be obtained by contacting the project engineer at (850) 414-7268 or the Department's Bureau of Air Regulation at Mail Station #5505, 2600 Blair Stone Road, Tallahassee, Florida, 32399-2400.

### References

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- <sup>1</sup> ASTM International Biodiesel Specification (ASTM 6751-07b).
- <sup>2</sup> United States Environmental Protection Agency Report, "A Comprehensive Analysis of Biodiesel Impacts on Exhaust Emissions", Report No. EPA420-P-02-001, October 2002.
- <sup>3</sup> Daratech, Inc., Press Release, "Biodiesel Test Expands GE Energy's Aeroderivative Gas Turbine Fuel Capability", September 21, 2007.
- <sup>4</sup> Air Permit Application, Golder and Associates.
- <sup>5</sup> Electric Power Research Institute (EPRI), "Bio-Diesel for Gas Turbines", Project ID 1014867, April 2007, [www.epri.com](http://www.epri.com).
- <sup>6</sup> Kinast, J. A., National Renewable Energy Laboratory, "Production of Biodiesel from Multiple Feedstocks and Properties of Biodiesel and Biodiesel/Diesel Blends", Final Report (1 of 6), March 2003.
- <sup>7</sup> Pacific Biofuels Fact Sheet, Carson Oil Company, 2007, [www.pacific-biofuels.com/staenergy.asp?id=res&subid=staenergy](http://www.pacific-biofuels.com/staenergy.asp?id=res&subid=staenergy).
- <sup>8</sup> Fuel and Marine Marketing, Industrial Fuel Oil Specifications, Table 1 – Detailed Requirements for Fuel Oils, [www.fammpnw.com/indus\\_specs1.htm](http://www.fammpnw.com/indus_specs1.htm).
- <sup>9</sup> Industrial Fuel Oil Specifications, ASTM D 396, [www.fammpnw.com/indus\\_specs1.htm](http://www.fammpnw.com/indus_specs1.htm).
- <sup>10</sup> Engine Manufacturers Association, Test Specification - Biodiesel Fuel, [www.enginemanufacturers.org](http://www.enginemanufacturers.org), May 2006.
- <sup>11</sup> Suez Energy Generation NA, "Biodiesel Test on an Alstom GT 11N", August 15, 2006, [www.resourcesaver.com/file/toolmanager/CustomO124C402F97595.pdf](http://www.resourcesaver.com/file/toolmanager/CustomO124C402F97595.pdf).
- <sup>12</sup> Henderson, B., The Charlotte Observer, "Duke Energy Tries Biodiesel Blends", July 17, 2008, [www.newsobserver.com/business/story/636953.html](http://www.newsobserver.com/business/story/636953.html).

# DRAFT PERMIT

## PERMITTEE:

Keys Energy Services  
1001 James Street  
Post Office Box 6100  
Key West, Florida 33041-6100

*Authorized Representative:*  
Edward Garcia, Director of Generation

DEP File No. 0870003-010-AC  
Stock Island Power Plant  
Combustion Turbines (CT) Nos. 1, 2 and 3  
SIC No. 4911  
Biodiesel Test Firing  
Expires December 31, 2009

## PROJECT AND LOCATION

This permit authorizes Keys Energy Services to conduct test firing of up to 250,000 gallons of biodiesel fuel in CT Nos. 1, 2 and 3 at the Stock Island Power Plant located 6900 Front Street Extended, Stock Island, Key West, Monroe County, Florida. The map coordinates are: UTM Zone 17, 425.65 km East and 2716.67 km North.

## 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 work specified 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 permit supplements the current Title V operations permit (Permit No. 0870003-008-AV) for the subject emissions units and does not alter any requirements from previously issued air permits.

## CONTENTS

- Section 1. Facility Information
- Section 2. Administrative Requirements
- Section 3. Emissions Unit (EU) Specific Conditions EU 007 - CT No. 1
- Section 4. Emissions Units Specific Conditions EU 008 and 009 - CT Nos. 2 and 3
- Section 5. Emissions Unit Specific Conditions EU 010 - Unregulated Emissions Units and Activities
- Section 6. Appendices

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Joseph Kahn, Director (Date)  
Division of Air Resources Management

## SECTION I. FACILITY INFORMATION (DRAFT)

### FACILITY DESCRIPTION

Keys Energy Services operates the Stock Island Power Plant located 6900 Front Street Extended, Stock Island, Key West, Monroe County, Florida.

This facility consists of six key regulated emission units with a total generating capacity of 128.7 megawatt (MW). There are two regulated diesel generators, four simple cycle combustion turbines, and miscellaneous unregulated units. To reduce pollution, a combination of control techniques are used including water injection, ignition timing retardation and low sulfur fuel oil.

### EMISSION UNITS

This facility consists of the following emission units (EU) listed below.

<b>E.U. ID No.</b>	<b>Brief Description</b>
005	8.8 MW Medium Speed Diesel Generator [Unit #1; EPA ID #D-1]
006	8.8 MW Medium Speed Diesel Generator [Unit #2; EPA ID #D-2]
007	23.5 MW Simple Cycle Combustion Turbine [CT-1]
008	19.77 MW Simple Cycle Combustion Turbine [CT-2]
009	19.77 MW Simple Cycle Combustion Turbine [CT-3]
010	Unregulated Emissions Units
011	48.00 MW Simple Cycle Combustion Turbine [CT-4]
Emission units 002, 003, 004 and 012 were moved to emissions unit 010.	

### PROJECT

This project will involve the test firing of up to 250,000 gallons of biodiesel fuel (B100 or blends) in combustion turbines (CT) Nos. 1, 2 and 3 at the Stock Island Power Plant to determine performance and emissions information. These CT are General Electric (GE) Frame 5 models that utilize No. 2 distillate fuel oil (0.05 percent sulfur content) and use water injection to control nitrous oxide (NO<sub>x</sub>) emissions. The following emissions units are affected by this permit.

<b>ID No.</b>	<b>Emission Units Description</b>
007	23.5 MW Simple Cycle Combustion Turbine [CT-1]
008	19.77 MW Simple Cycle Combustion Turbine [CT-2]
009	19.77 MW Simple Cycle Combustion Turbine [CT-3]
010	Unregulated Emission Units and Activities*

\* Either one of the two 500,000 gallon storage tanks included in EU ID No. 010 that currently store No. 2 fuel oil and provide fuel during operation of CT Nos. 1, 2 and 3 will be used to store the biodiesel during the test firing.

### REGULATORY CLASSIFICATION

Regulatory classification and applicable requirements are listed in the applicable Title V Operation Permit and the previously-issued construction permit.

**Title III HAP:** This facility is not a "Major Source" of hazardous air pollutants (HAP).

**Title IV Acid Rain:** The facility operates units subject to the Acid Rain provisions of the Clean Air Act (CAA).

## SECTION I. FACILITY INFORMATION (DRAFT)

Title V Major Source: The facility is a Title V or “Major Source” of air pollution because the potential emissions of at least one regulated pollutant exceed 100 tons per year (tpy). Regulated pollutants include pollutants such as carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), particulate matter (PM/PM<sub>10</sub>), sulfur dioxide (SO<sub>2</sub>) and volatile organic compounds (VOC).

PSD Major Source: The project is located in an area designated as “attainment,” “maintenance” or “unclassifiable” for each pollutant subject to the National Ambient Air Quality Standard (NAAQS). The facility is not one of the 28 Prevention of Significant Deterioration (PSD) source categories, and is subject to the PSD applicability threshold of 250 tpy. Potential emissions of at least one regulated pollutant exceed 250 tpy. Therefore, the facility is classified as a PSD-major source of air pollution with respect to Rule 62-212.400, Florida Administrative Code (F.A.C.), PSD of Air Quality.

NSPS Sources: The combustion turbines specified in this project, are subject to regulation under the new Source Performance Standards (NSPS) for Stationary Gas Turbines, 40 Code of Federal Regulation (CFR), Subpart GG.

NESHAP: The National Emissions Standards for Hazardous Air Pollutants (NESHAP) Subpart YYY for combustion turbines does not apply because the facility is not a major source of HAP.

Siting: The facility is not a steam electrical generating plant and is not subject to the power plant siting provisions of Chapter 62-17, F.A.C.

### RELEVANT DOCUMENTS

- Current Title V Operation Permit 0870003-008-AV issued December 27, 2007;
- Application submitted by Keys Energy Services, received April 22, 2008; and,
- Department’s Technical Evaluation and Final Determination dated September 30, 2008.

## SECTION II. ADMINISTRATIVE REQUIREMENTS (DRAFT)

### GENERAL AND ADMINISTRATIVE REQUIREMENTS

1. Permitting Authority: All documents related to applications for permits to construct, modify or operate this emissions unit shall be submitted to the Bureau of Air Regulation (BAR), Florida Department of Environmental Protection (“Department”), at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400 and phone number 850/488-0114. Copies of these documents shall be submitted to the Compliance Authority.
2. Compliance Authority: All documents related to compliance activities such as reports, tests, and notifications should be submitted to the Air Resource Section of the South District Office, Florida Department of Environmental Protection, 2295 Victoria Avenue, Suite 364, Fort Myers, Florida 33901-3381. The phone number is 239/332-6975 and the fax number is 239/332-6969.
3. Terminology: The terms used in this permit have specific meanings as defined in the applicable chapters of the Florida Administrative Code (F.A.C.).
4. General Conditions: The owner and operator are subject to, and shall operate under, the attached General Conditions listed in *Appendix GC* of this permit. General Conditions are binding and enforceable pursuant to Chapter 403, F.S. [Rule 62-4.160, F.A.C.]
5. Applicable Regulations, Forms and Application Procedures: Unless otherwise indicated in this permit, the construction and operation of this project 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. The permittee shall use the applicable forms listed in Rule 62-210.900, F.A.C. and follow the application procedures in Chapter 62-4, F.A.C. Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state or local permitting or regulations. [Rules 62-204.800, 62-210.300 and 62-210.900, F.A.C.]
6. Permit Expiration: For good cause, the permittee may request that this air construction permit be extended. Such a request shall be submitted to the Department’s Bureau of Air Regulation at least sixty (60) days prior to the expiration of this permit. [Rules 62-4.070(4), 62-4.080 and 62-210.300(1), F.A.C.]
7. 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.]
8. Modifications: No emissions unit or facility subject to this permit shall be constructed or 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.]
9. Title VI Permit: The scope of the temporary project included in this permit (biodiesel test firing in CT Nos. 1, 2 and 3) is to develop information (operational and pollutant emissions) in support of another project requesting permanent use of biodiesel in the CT. Any future authorization to fire biodiesel fuel at the facility would require a revision to the Title V air operation permit. [Rules 62-4.030, 62-4.050, 62-4.220 and Chapter 62-213, F.A.C.]

SECTION III. EMISSIONS UNIT SPECIFIC CONDITIONS (DRAFT)

EU 007 - CT No. 1

This section of the permit addresses the following emissions unit:

ID No.	Emission Unit Description
007	23.5 MW Simple Cycle Combustion Turbine [CT-1]

ADMINISTRATIVE REQUIREMENTS

Previous Permit Conditions: This permit authorizes the firing of up to 250,000 gallons of biodiesel as an alternative fuel in EU 007. The biodiesel can be fired as 100 percent biodiesel or as a blend with No. 2 distillate fuel oil. However, no more than a total 250,000 gallons of biodiesel can be fired in this CT or in combination with in any other CT at the Stock Island Power Plant during the biodiesel test firing project. The following conditions are in addition to those of previous air construction permits and the facility Title V Operation Permit. Unless otherwise specified, the emissions unit remains subject to all applicable conditions from previous air construction permits and the Title V Operation Permit. [Rule 62-4.070(3), F.A.C.]

ESSENTIAL POTENTIAL TO EMIT (PTE) PARAMETERS

- Permitted Capacity:** The maximum heat input to the GE combustion turbine (CT) at an ambient temperature of 59° F shall not exceed 312 MMBtu/hr while firing fuel oil, biodiesel or blends of biodiesel and No. 2 fuel oil. Heat input may vary depending on ambient conditions and the CT characteristics. The approved manufacturer's curves shall be used to establish heat input rates over a range of temperatures for the purpose of compliance determination. [Rule 62-210.200, F.A.C., AC44-245399/PSD-FL-210]
- Methods of Operation – Fuels:** The only fuels to be burned in this unit are new No. 2 fuel oil, biodiesel or blends of biodiesel. The sulfur content of the No. 2 fuel oil shall not exceed 0.050 percent by weight. [Rules 62-4.160(2), 62-210.200 and 62-213.440(1), F.A.C., AC44-245399/PSD-FL-210]
- Hours of Operation/Fuel Consumption:** The maximum No. 2 fuel oil consumption allowed to be burned in the CT is 7.1 million gallons per year, which is equivalent to 2,888.5 hours per year at full-load; the CT may operate for more than this if operating at part-load. However, as a result of this test firing of biodiesel in the CT (EU 007), the 7.1 million gallons per year limit of No.2 fuel oil must be reduced using a ratio of 0.9 gallons of biodiesel which equals 1 gallon of No.2 fuel oil. Thus, for every 1000 gallons of biodiesel burned the allowable fuel consumption limit of No. 2 fuel oil must be reduced by 900 gallons. [Rule 62-212.500(56), F.A.C., AC44-245399, PSD-FL-210]

CONSTRUCTION ACTIVITIES

- Biodiesel Test Firing:** No physical construction activities will be conducted in association with the biodiesel testing firing project. However, tanker trucks may be used to facilitate the blending of biodiesel with No. 2 fuel oil. [Application]

EMISSION REQUIREMENTS

- Emission Testing:** When firing biodiesel or blends of biodiesel in the CT (EU 007) tests shall be conducted to determine emissions of particulate matter (PM/PM<sub>10</sub>), nitrogen oxides (NO<sub>x</sub>) and carbon monoxide (CO). The emissions tests shall be conducted using the approved methods of the Title V Operation Permit. At least one complete 3-run test at 95 percent or greater of full-load shall be conducted when firing biodiesel fuel. The test must be conducted within seven days of the commencement of firing the biodiesel in the CT. Additionally, one complete 3-run test shall be conducted at 95 percent or greater of full-load when the blend of biodiesel being fired in the CT changes by 20 percent or more, e.g., B20 to B40 or B100 to B80. The emissions of sulfur dioxide shall be determined through the analysis of the biodiesel fuel or certification of the supplier. [Rule 62-4.070(3), F.A.C.]

**SECTION III. EMISSIONS UNIT SPECIFIC CONDITIONS (DRAFT)**

**EU 007 - CT No. 1**

**NOTIFICATIONS AND REPORTS**

6. Notifications: One week prior to the start of biodiesel firing in the CT, the permittee shall notify the Compliance Authority that the testing firing is about to commence and provide a general schedule of the biodiesel firing, including when emissions testing will occur. [Rule 62-4.210, F.A.C.]
7. Reports: The results of the emissions tests shall be submitted to the Department no later than 45 days after the completion of emissions testing. At a minimum, the test report shall provide the applicable information listed in Rule 62-297.310(8)(c), F.A.C.  
[Rule 62-297.310(8), F.A.C.]

**DRAFT PERMIT**



**SECTION IV. EMISSIONS UNITS SPECIFIC CONDITIONS (DRAFT)**

**EU 008 AND 009 - CT NOS. 2 AND 3**

This section of the permit addresses the following emissions unit:

ID No.	Emission Unit Description
008	19.77 MW Simple Cycle Combustion Turbine [CT-2]
009	19.77 MW Simple Cycle Combustion Turbine [CT-3]

**ADMINISTRATIVE REQUIREMENTS**

**Previous Permit Conditions:** This permit authorizes the firing of up to 250,000 gallons of biodiesel as an alternative fuel in EU 008 and 009. The biodiesel can be fired as 100 percent biodiesel or as a blend with No. 2 distillate fuel oil. However, no more than a total 250,000 gallons of biodiesel can be fire in these CT or in combination with in any other CT at the Stock Island Power Plant during the biodiesel test firing project. The following conditions are in addition to those of previous air construction permits and the facility Title V Operation Permit. Unless otherwise specified, the these emissions units remain subject to all applicable conditions from previous air construction permits and the Title V Operation Permit. [Rule 62-4.070(3), F.A.C.]

**ESSENTIAL POTENTIAL TO EMIT (PTE) PARAMETERS**

1. **Method of Operation – Fuels:** Only No. 2 fuel oil, biodiesel or blends of biodiesel can be fired in the combustion turbines. The maximum sulfur content of the No. 2 fuel oil shall not exceed 0.05 percent, by weight. [AC-870003-003]
2. **Permitted Capacity.** The maximum heat input rate to each combustion turbine shall not exceed 305 million Btu per hour (MMBtu/hr). [AC-870003-003]
3. **Fuel Consumption.** The maximum No. 2 fuel oil consumption allowed to be burned in either emission unit No.008 or emission unit No. 009 is 8,840,000 gallons per year, which is equivalent to 4,000 hours per year of operation at full load. The combined fuel oil consumption for both units shall be limited to 8,840,000 gallons per year. However, as a result of this test firing of biodiesel in the CT (EU 008 and 009), the 8,840,000 million gallons per year limit of No.2 fuel oil for each CT or in combination must be reduced using a ratio of 0.9 gallons of biodiesel which equals 1 gallon of No.2 fuel oil. Thus, for every 1000 gallons of biodiesel burned the allowable fuel consumption limit of No. 2 fuel oil must be reduced by 900 gallons. [AC-870003-003]

**CONSTRUCTION ACTIVITIES**

4. **Biodiesel Test Firing:** No physical construction activities will be conducted in association with the biodiesel testing firing project. However, tanker trucks may be used to facilitate the blending of biodiesel with No. 2 fuel oil. [Application]

**EMISSION REQUIREMENTS**

5. **Emission Testing:** When firing biodiesel or blends of biodiesel in the CT (EU 008 or 009) tests shall be conducted to determine emissions of particulate matter (PM/PM<sub>10</sub>), nitrogen oxides (NO<sub>x</sub>) and carbon monoxide (CO). The emissions tests shall be conducted using the approved methods of the Title V Operation Permit. At least one complete 3-run test at 95 percent or greater of full-load shall be conducted when firing the biodiesel fuel. The test must be conducted within seven days of the commencement of firing the biodiesel in the CT. Additionally, one complete 3-run test shall be conducted at 95 percent or greater of full-load when the blend of biodiesel being fired in the CT changes by 20 percent or more, e.g., B20 to B40 or B100 to B80. The emissions of sulfur dioxide shall be determined through the analysis of the biodiesel fuel or certification of the supplier. [Rule 62-4.070(3), F.A.C.]

**SECTION IV. EMISSIONS UNITS SPECIFIC CONDITIONS (DRAFT)**

**EU 008 AND 009 - CT NOS. 2 AND 3**

*{Permitting Note: Emissions tests need only be conducted on one of the CT (EU 008 or 009) even if both are used to fire biodiesel due to the identical nature of the CT.}*

**NOTIFICATIONS AND REPORTS**

6. Notifications: One week prior to the start of biodiesel firing in the CT, the permittee shall notify the Compliance Authority that the testing firing is about to commence and provide a general schedule of the biodiesel firing, including when emissions testing will occur. [Rule 62-4.210, F.A.C.]
7. Reports: The results of the emissions tests shall be submitted to the Department no later than 45 days after the completion of emissions testing. At a minimum, the test report shall provide the applicable information listed in Rule 62-297.310(8)(c), F.A.C.  
[Rule 62-297.310(8), F.A.C.]

**DRAFT PERMIT**

**SECTION V. EMISSIONS UNITS SPECIFIC CONDITIONS (DRAFT)**

**EU 010 – UNREGULATED EMISSIONS UNITS AND ACTIVITIES**

This section of the permit addresses the following emissions unit:

ID No.	Emission Unit Description
010	Two No. 2 Fuel Oil Storage Tanks - 500,000 gallons each*; subject only to 40 CFR 60.116b (a) and (b)
	No. 2 Fuel Oil Storage Tank - 1.9 million gallons; no applicable standards
	Two No. 2 Fuel Oil Storage “day” Tanks - 16,000 gallons each
	Four Vehicular Fleet Fuel Tanks - 2,000 gallons each
	Three Diesel Peaking Generators (2 MW): Unit 10 (formerly E.U. 002, 003 and 004)
	No. 2 Fuel Oil Storage Tank - 1,000,000 gallon; not subject to 40 CFR 60, Subpart Kb*

\*One of these tanks will be used to store the biodiesel fuel.

**ADMINISTRATIVE REQUIREMENTS**

Previous Permit Conditions: This permit authorizes the storage of up to 250,000 gallons of biodiesel in either one or the other of the two 500,000 gallon storage tanks included in EU ID No. 010 that currently store No. 2 diesel fuel oil and provide fuel for CT Nos. 1, 2 and 3 during operation. No more than a total 250,000 gallons of biodiesel can be stored in one of these tanks. Only one tank can be used for the storage of the biodiesel. Upon expiration of this construction permit, any biodiesel remaining in the tank selected for storage must be disposed of following appropriate regulations.

## SECTION VI. APPENDICES

### APPENDIX GC – GENERAL CONDITIONS

- G.1. The terms, conditions, requirements, limitations and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.
- G.2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings or exhibits, specifications or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.
- G.3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey and vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.
- G.4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.
- G.5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.
- G.6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.
- G.7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:
- Have access to and copy records that must be kept under the conditions of the permit;
  - Inspect the facility, equipment, practices or operations regulated or required under this permit, and
  - Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.
- Reasonable time may depend on the nature of the concern being investigated.
- G.8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:
- A description of and cause of non-compliance; and
  - The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

The permittee shall be responsible for any and all damages, which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

## SECTION VI. APPENDICES

### APPENDIX GC – GENERAL CONDITIONS

- G.9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.73 and 403.111, Florida Statutes. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.
- G.10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.
- G.11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 62-4.120 and 62-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.
- G.12. This permit or a copy thereof shall be kept at the work site of the permitted activity.
- G.13. This permit also constitutes:
- (a) Determination of Best Available Control Technology (not applicable to project);
  - (b) Determination of Prevention of Significant Deterioration (not applicable to project); and
  - (c) Compliance with New Source Performance Standards (not applicable to project).
- G.14. The permittee shall comply with the following:
- (a) Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.
  - (b) The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application or this permit. These materials shall be retained at least three years from the date of the sample, measurement, report or application unless otherwise specified by Department rule.
  - (c) Records of monitoring information shall include:
    - 1. The date, exact place, and time of sampling or measurements;
    - 2. The person responsible for performing the sampling or measurements;
    - 3. The dates analyses were performed;
    - 4. The person responsible for performing the analyses;
    - 5. The analytical techniques or methods used; and
    - 6. The results of such analyses.
- G.15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law, which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

**Livingston, Sylvania**

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**From:** Garcia, Edward [Edward.Garcia@KeysEnergy.com]  
**Sent:** Tuesday, September 30, 2008 4:39 PM  
**To:** Livingston, Sylvania  
**Subject:** RE: Keys Energy Services - Stock Island Power Plant; 0870003-010-AC

Hello,

Keys Energy received the letter of intent.

Edward Garcia

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**From:** Livingston, Sylvania [mailto:Sylvia.Livingston@dep.state.fl.us]  
**Sent:** Tuesday, September 30, 2008 1:16 PM  
**To:** Garcia, Edward  
**Cc:** kkosky@golder.com; Satyal, Ajaya; forney.kathleen@epa.gov; Gibson, Victoria; Linero, Alvaro; Read, David; Walker, Elizabeth (AIR)  
**Subject:** Keys Energy Services - Stock Island Power Plant; 0870003-010-AC

Dear Sir/Madam:

Attached is the official *Written Notice of Intent to Issue* for the project referenced below. Click on the link displayed below to access the permit project documents and send a "reply" message verifying receipt of the document(s) provided in the link; this may be done by selecting "Reply" on the menu bar of your e-mail software, *noting that you can view the documents*, and then selecting "Send". **We must receive verification that you are able to access the documents.** Your immediate reply will preclude subsequent e-mail transmissions to verify accessibility of the document(s).

**Click on the following link to access the permit project documents:**

[http://ARM-PERMIT2K.dep.state.fl.us/adh/prod/pdf\\_permit\\_zip\\_files/0870003.010.AC.D\\_pdf.zip](http://ARM-PERMIT2K.dep.state.fl.us/adh/prod/pdf_permit_zip_files/0870003.010.AC.D_pdf.zip)

**Owner/Company Name:** KEYS ENERGY SERVICES  
**Facility Name:** STOCK ISLAND POWER PLANT  
**Project Number:** 0870003-010-AC  
**Permit Status:** DRAFT  
**Permit Activity:** CONSTRUCTION/ BIODIESEL TEST FIRING IN CT UNITS 1, 2, AND 3  
**Facility County:** MONROE  
**Processor:** David Read/ Al Linero

The Bureau of Air Regulation is issuing electronic documents for permits, notices and other correspondence in lieu of hard copies through the United States Postal System, to provide greater service to the applicant and the engineering community. Access these documents by clicking on the link provided above, or search for other project documents using the "Air Permit Documents Search" website at <http://www.dep.state.fl.us/air/eproducts/apds/default.asp>.

Permit project documents addressed in this email may require immediate action within a specified time frame. Please open and review the document(s) as soon as possible, and verify that they are accessible. Please advise this office of any changes to your e-mail address or that of the Engineer-of-Record. If you have any problems opening the documents or would like further information, please contact the Florida Department of Environmental Protection, Bureau of Air Regulation at (850)488-0114.

Thank you,

10/16/2008

## Livingston, Sylvia

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**From:** Satyal, Ajaya  
**Sent:** Thursday, October 16, 2008 10:40 AM  
**To:** Livingston, Sylvia  
**Subject:** RE: Keys Energy Services - Stock Island Power Plant; 0870003-010-AC

Received. Thanks.

AJ

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**From:** Livingston, Sylvia  
**Sent:** Tuesday, September 30, 2008 1:16 PM  
**To:** 'edward.garcia@keysenergy.com'  
**Cc:** 'kkosky@golder.com'; Satyal, Ajaya; 'forney.kathleen@epa.gov'; Gibson, Victoria; Linero, Alvaro; Read, David; Walker, Elizabeth (AIR)  
**Subject:** Keys Energy Services - Stock Island Power Plant; 0870003-010-AC

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[http://ARM-PERMIT2K.dep.state.fl.us/adh/prod/pdf\\_permit\\_zip\\_files/0870003.010.AC.D\\_pdf.zip](http://ARM-PERMIT2K.dep.state.fl.us/adh/prod/pdf_permit_zip_files/0870003.010.AC.D_pdf.zip)

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Thank you,