



November 7, 2008

RECEIVED

NOV 10 2008

Mr. David Read  
North Permitting Section  
Bureau of Air Regulation  
Division of Air Resource Management  
Florida Department of Environmental Protection  
2600 Blair Stone Road MS 5500  
Tallahassee, Florida 32399-2400

BUREAU OF AIR REGULATION

Re: Bartow Power Plant, Facility ID No. 1030011  
Proposed Bio-Fuel Test Burn  
Air Construction Permit Application

Dear Mr. Read:

On March 24, 2008, Progress Energy Florida (PEF) submitted an application for an air construction permit for a proposed bio-fuel trial burn at the Bartow Power Plant. Specifically, PEF proposed to fire the bio-fuel, referred to as LEG or "liquid e-grass", in one of the existing combustion turbines and/or one of the existing steam units onsite. Subsequently, PEF and another bio-fuel provider, New Generation Bio-fuels or NGB, have determined that their fuel product would also be a viable renewable fuel to support PEF's ongoing efforts to use renewable fuels in a responsible and cost-effective manner. The development of the use of bio-fuels, such as this, will have a positive impact on the reduction of CO<sub>2</sub> emissions as they derive from biomass (CO<sub>2</sub> neutral).

Therefore, the submittal of this supplemental information is filed in support of the use of an additional bio-fuel in the proposed test burn program. Enclosed are an original and three copies of the supplemental information package. PEF would appreciate your timely processing of the application, as the test burn has been tentatively scheduled for early 2009. Please contact me at (727) 820-5962 or Scott Osbourn, P.E. at (813) 287-1717 if you have any questions.

Sincerely,

A handwritten signature in black ink that reads "Chris Bradley".

Chris Bradley  
Senior Environmental Specialist

Enclosure

cc: Ms. Mara Nasca, FDEP SW District (Cover Letter)

Progress Energy Florida, Inc.

P.O. Box 14042

St. Petersburg, FL 33733

***SUPPLEMENTAL INFORMATION SUBMITTAL***

MINOR SOURCE AIR CONSTRUCTION PERMIT APPLICATION  
COMBUSTION OF BIOFUELS  
BARTOW POWER PLANT  
ST. PETERSBURG, PINELLAS COUNTY, FLORIDA

*Submitted to:*

*Florida Power Corporation (d/b/a Progress Energy Florida, Inc.)  
100 Central Avenue  
St. Petersburg, Florida 33701*

*Submitted by:*

*Golder Associates Inc.  
5100 West Lemon Street  
Suite 114  
Tampa, Florida 33609*

**Distribution:**

4 Copies Department of Environmental Protection  
2 Copies Progress Energy Florida  
2 Copies Golder Associates Inc.

November 2008

083-89518

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**PART I**

**FDEP SUPPLEMENTAL INFORMATION FOR AIR PERMIT**



# Department of Environmental Protection

## Division of Air Resource Management

### APPLICATION FOR AIR PERMIT - LONG FORM

#### I. APPLICATION INFORMATION

**Air Construction Permit** – Use this form to apply for an air construction permit for a proposed project:

- subject to prevention of significant deterioration (PSD) review, nonattainment area (NAA) new source review, or maximum achievable control technology (MACT) review; or
- where the applicant proposes to assume a restriction on the potential emissions of one or more pollutants to escape a federal program requirement such as PSD review, NAA new source review, Title V, or MACT; or
- at an existing federally enforceable state air operation permit (FESOP) or Title V permitted facility.

**Air Operation Permit** – Use this form to apply for:

- an initial federally enforceable state air operation permit (FESOP); or
- an initial/revised/renewal Title V air operation permit.

**Air Construction Permit & Revised/Renewal Title V Air Operation Permit (Concurrent Processing Option)**

– Use this form to apply for both an air construction permit and a revised or renewal Title V air operation permit incorporating the proposed project.

To ensure accuracy, please see form instructions.

#### Identification of Facility

1. Facility Owner/Company Name: <b>PROGRESS ENERGY FLORIDA, INC.</b>	
2. Site Name: <b>BARTOW POWER PLANT</b>	
3. Facility Identification Number:	
4. Facility Location...: Street Address or Other Locator: <b>1601 WEEDON ISLAND DR.</b> City: <b>ST. PETERSBURG</b> County: <b>PINELLAS</b> Zip Code: <b>33702</b>	
5. Relocatable Facility? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6. Existing Title V Permitted Facility? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

#### Application Contact

1. Application Contact Name: <b>CHRIS BRADLEY, SENIOR ENVIRONMENTAL SPECIALIST</b>	
2. Application Contact Mailing Address... Organization/Firm: <b>PROGRESS ENERGY FLORIDA</b> Street Address: <b>p.o. Box 14042, MAC PEF-903</b> City: <b>ST. PETERSBURG</b> State: <b>FL</b> Zip Code: <b>33701</b>	
3. Application Contact Telephone Numbers... Telephone: <b>(727) 820-5962</b> ext.      Fax: <b>(727) 820-5229</b>	
4. Application Contact Email Address: <b>CHRIS.BRADLEY@PGNMAIL.COM</b>	

#### Application Processing Information (DEP Use)

1. Date of Receipt of Application:	<i>original application - 3/25/08</i>
2. Project Number(s):	<i>1030011 - 011-AC</i>
3. PSD Number (if applicable):	
4. Siting Number (if applicable):	

## APPLICATION INFORMATION

### Purpose of Application

**This application for air permit is submitted to obtain: (Check one)**

#### **Air Construction Permit**

Air construction permit.

#### **Air Operation Permit**

- Initial Title V air operation permit.
- Title V air operation permit revision.
- Title V air operation permit renewal.
- Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is required.
- Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is not required.

#### **Air Construction Permit and Revised/Renewal Title V Air Operation Permit (Concurrent Processing)**

- Air construction permit and Title V permit revision, incorporating the proposed project.
- Air construction permit and Title V permit renewal, incorporating the proposed project.

**Note: By checking one of the above two boxes, you, the applicant, are requesting concurrent processing pursuant to Rule 62-213.405, F.A.C. In such case, you must also check the following box:**

- I hereby request that the department waive the processing time requirements of the air construction permit to accommodate the processing time frames of the Title V air operation permit.

### Application Comment

On March 24, 2008, Progress Energy Florida (PEF) submitted an application for an air construction permit for a proposed biofuel trial burn at the Bartow Power Plant. Specifically, PEF proposed to fire the biofuel, referred to as LEG or "liquid e-grass", in one of the existing combustion turbines and/or one of the existing steam units onsite. Subsequently, PEF and another biofuel provider, New Generation Biofuels or NGB, have determined that their fuel product would also be a viable renewable fuel to support PEF's ongoing efforts to use renewable fuels in a responsible and cost-effective manner.

Therefore, this supplemental application is filed in support of the use of an additional biofuel in the proposed test burn program. See Part II (the attached report) for details of the proposed trial burn.

The trial burn is proposed to begin in January 2009. PEF requests that the candidate units not be designated in the permit, as unit availability and other circumstances at the time of the trial burn may dictate the use of certain units. Approximately 500 tons of the proposed biofuels will be available for the test burn. The total proposed firing hours will be dependent on the amount of firing within the designated steam unit and the designated CT, as well as whether the biofuel is fired exclusively or co-fired with existing fuels. Therefore, PEF requests that the total biofuel firing be limited only by the total amount of available biofuel (i.e., 500 tons).

**APPLICATION INFORMATION**

**Scope of Application**

<b>Emissions Unit ID Number</b>	<b>Description of Emissions Unit</b>	<b>Air Permit Type</b>	<b>Air Permit Proc. Fee</b>
001	FFSG, Unit 1		NA
002	FFSG, Unit 2		NA
003	FFSG, Unit 3		NA
005	CT 1		NA
006	CT 2		NA
007	CT 3		NA
008	CT 4		NA

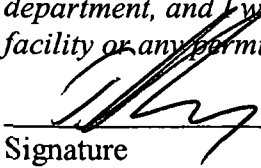
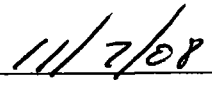
**Application Processing Fee**

**Check one:**  Attached - Amount: \$ \_\_\_\_\_  Not Applicable

**APPLICATION INFORMATION**

**Owner/Authorized Representative Statement**

**Complete if applying for an air construction permit or an initial FESOP.**

1. Owner/Authorized Representative Name :	
<b>TOM LAWERY, PLANT MANAGER</b>	
2. Owner/Authorized Representative Mailing Address...	
Organization/Firm: <b>PROGRESS ENERGY</b>	
Street Address: <b>1601 WEEDON ISLAND DR.</b>	
City: <b>ST PETERSBURG</b> State: <b>FLORIDA</b> Zip Code: <b>33702</b>	
3. Owner/Authorized Representative Telephone Numbers...	
Telephone: <b>(727) 827-6111</b> ext. Fax: <b>(727) 827-6102</b>	
4. Owner/Authorized Representative Email Address: <b>TOM.LAWERY@PGNMAIL.COM</b>	
5. Owner/Authorized Representative Statement:	
<i>I, the undersigned, am the owner or authorized representative of the facility addressed in this air permit application. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof and all other requirements identified in this application to which the facility is subject. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department, and I will promptly notify the department upon sale or legal transfer of the facility or any permitted emissions unit.</i>	
 Signature	 Date



## APPLICATION INFORMATION

### Application Responsible Official Certification

**Complete if applying for an initial/revised/renewal Title V permit or concurrent processing of an air construction permit and a revised/renewal Title V permit. If there are multiple responsible officials, the "application responsible official" need not be the "primary responsible official."**

1. Application Responsible Official Name:
2. Application Responsible Official Qualification (Check one or more of the following options, as applicable): <input type="checkbox"/> For a corporation, the president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit under Chapter 62-213, F.A.C. <input type="checkbox"/> For a partnership or sole proprietorship, a general partner or the proprietor, respectively. <input type="checkbox"/> For a municipality, county, state, federal, or other public agency, either a principal executive officer or ranking elected official. <input type="checkbox"/> The designated representative at an Acid Rain source.
3. Application Responsible Official Mailing Address... Organization/Firm: Street Address: City: State: Zip Code:
4. Application Responsible Official Telephone Numbers... Telephone: ( ) - ext. Fax: ( ) -
5. Application Responsible Official Email Address:
6. Application Responsible Official Certification: I, the undersigned, am a responsible official of the Title V source addressed in this air permit application. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof and all other applicable requirements identified in this application to which the Title V source is subject. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department, and I will promptly notify the department upon sale or legal transfer of the facility or any permitted emissions unit. Finally, I certify that the facility and each emissions unit are in compliance with all applicable requirements to which they are subject, except as identified in compliance plan(s) submitted with this application.  _____ Signature  _____ Date

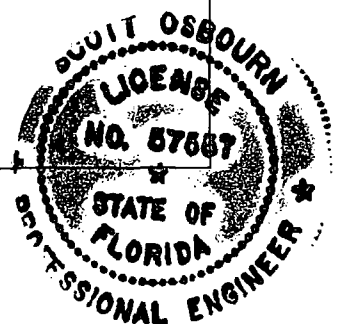
# APPLICATION INFORMATION

## Professional Engineer Certification

1. Professional Engineer Name: <b>SCOTT OSBOURN</b> Registration Number: <b>57557</b>
2. Professional Engineer Mailing Address... Organization/Firm: <b>GOLDER ASSOCIATES, INC.**</b> Street Address: <b>5100 WEST LEMON ST., SUITE 114</b> City: <b>TAMPA</b> State: <b>FL</b> Zip Code: <b>33609</b>
3. Professional Engineer Telephone Numbers... Telephone: <b>(813) 287-1717</b> ext. <b>211</b> Fax: <b>(813) 287-1716</b>
4. Professional Engineer Email Address: <b>SOSBOURN@GOLDER.COM</b>
5. Professional Engineer Statement: <i>I, the undersigned, hereby certify, except as particularly noted herein*, that:</i>  <i>(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this application for air permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and</i>  <i>(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.</i>  <i>(3) If the purpose of this application is to obtain a Title V air operation permit (check here <input type="checkbox"/>, if so), I further certify that each emissions unit described in this application for air permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance plan and schedule is submitted with this application.</i>  <i>(4) If the purpose of this application is to obtain an air construction permit (check here <input checked="" type="checkbox"/>, if so) or concurrently process and obtain an air construction permit and a Title V air operation permit revision or renewal for one or more proposed new or modified emissions units (check here <input type="checkbox"/>, if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.</i>  <i>(5) If the purpose of this application is to obtain an initial air operation permit or operation permit revision or renewal for one or more newly constructed or modified emissions units (check here <input type="checkbox"/>, if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.</i>  _____ Signature  (seal)  _____ Date <i>11/7/08</i>

\* Attach any exception to certification statement.

\*\* Board of Professional Engineers Certificate of Authorization #00001670









**FACILITY INFORMATION**




## FACILITY INFORMATION

### C. FACILITY ADDITIONAL INFORMATION

#### Additional Requirements for All Applications, Except as Otherwise Stated

1. Facility Plot Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Previously Submitted, Date: <u>7/2/04</u>
2. Process Flow Diagram(s): (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Previously Submitted, Date: <u>7/2/04</u>
3. Precautions to Prevent Emissions of Unconfined Particulate Matter: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Previously Submitted, Date: <u>7/2/04</u>

#### Additional Requirements for Air Construction Permit Applications

1. Area Map Showing Facility Location: <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable (existing permitted facility)
2. Description of Proposed Construction or Modification: <input checked="" type="checkbox"/> Attached, Document ID: <u>PART II</u>
3. Rule Applicability Analysis: <input checked="" type="checkbox"/> Attached, Document ID: <u>PART II</u>
4. List of Exempt Emissions Units (Rule 62-210.300(3)(a) or (b)1., F.A.C.): <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable (no exempt units at facility)
5. Fugitive Emissions Identification (Rule 62-212.400(2), F.A.C.): <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
6. Preconstruction Air Quality Monitoring and Analysis (Rule 62-212.400(5)(f), F.A.C.): <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
7. Ambient Impact Analysis (Rule 62-212.400(5)(d), F.A.C.): <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
8. Air Quality Impact since 1977 (Rule 62-212.400(5)(h)5., F.A.C.): <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
9. Additional Impact Analyses (Rules 62-212.400(5)(e)1. and 62-212.500(4)(e), F.A.C.): <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
10. Alternative Analysis Requirement (Rule 62-212.500(4)(g), F.A.C.): <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable





**PART II**

**APPLICATION REPORT**

## 1.0 INTRODUCTION AND EXECUTIVE SUMMARY

On March 24, 2008, Progress Energy Florida (PEF) submitted an application for an air construction permit for a proposed biofuel trial burn at the Bartow Power Plant. Specifically, PEF proposed to fire the biofuel, referred to as LEG or “liquid e-grass”, in one of the existing combustion turbines and/or one of the existing steam units onsite. Subsequently, PEF and another biofuel provider, New Generation Biofuels or NGB, have determined that their fuel product would also be a viable renewable fuel to support PEF’s ongoing efforts to use renewable fuels in a responsible and cost-effective manner. The development of the use of biofuels, such as this, will have a positive impact on the reduction of CO<sub>2</sub> emissions as they derive from biomass (CO<sub>2</sub> neutral).

Therefore, this submittal of supplemental information is filed in support of the use of an additional biofuel in the proposed test burn program. The proposed fuel, manufactured by NGB, is formulated to be used in a multitude of applications where typically No. 2 diesel, related distillates, or biodiesel are used. This particular biofuel product is an emulsion. This is not a distilled petroleum product and glycerin is not created in its manufacturing. A Product Data Sheet is provided in Appendix A to this report.

The proposed Project involves evaluating the firing of several biofuels (i.e., the LEG product previously provided to the Department, as well as the NGB product) in one of the existing combustion turbines and/or one of the existing steam units at PEF’s Bartow Power Plant. This application for a minor source construction permit will allow for a trial burn as a high-level assessment that will assist PEF in the performance of a first-cut evaluation to determine if the proposed biofuel will meet expected performance and environmental criteria. This initiative is part of PEF’s ongoing efforts to use renewable fuels in a responsible and cost-effective manner. The development and the use of bio-fuels, such as this, will have a positive impact on the reduction of CO<sub>2</sub> emissions as they derive from biomass (CO<sub>2</sub> neutral).

The above factors, in addition to the fact that no plant changes to existing process equipment are necessary to test burn the proposed biofuels, are presented as PEF’s position that the Bartow steam units and combustion turbines are “capable of accommodating” this fuel. Therefore, if the test firing demonstrates no increase in air emissions, then there is no modification and the current Title V permit can be revised accordingly to allow for permanent firing of these fuels.

The following sections provide the Project Description (Section 2.0) and the Proposed Project Approach (Section 3.0). The trial burn is proposed to begin in January 2009. Relevant specifications for the LEG biofuel were previously submitted to the Department; the NGB product specifications and a Material Safety data Sheet (MSDS) are provided in Appendix A to this report.

## 2.0 PROJECT DESCRIPTION

PEF has had discussions with the New Generation Biofuels (NGB) Group regarding use of their biofuel. NGB has developed a commercially viable biofuel, consisting primarily of refined soybean oil. As stated previously, a Product Data Sheet, as well as an MSDS, are provided in Appendix A to this report.

PEF intends to test fire approximately 500 total tons of biofuels, the quantity of each type being dependent on the amount of each of the proposed biofuels that may be available. PEF requests that the air construction permit not designate a particular unit for the trial burns, as the choice will be made depending upon unit availability and other circumstances at the time of the test burn.

PEF requests that the air construction permit limit the biofuel test firing to no more than the 500 tons of fuel to be delivered and that there be no restriction on total firing hours. This is because the total proposed firing hours would be dependent on the amount of firing within the designated steam unit and/or the designated CT, as well as whether the bio-fuel is fired exclusively or co-fired with existing fuels. For example, in the selected steam unit, the LEG product may be co-fired with the existing No. 6 oil at a one percent co-firing rate, while the NGB product may be co-fired at a ten percent rate. Firing in the steam units would take place in the igniter lances, which are separate injection ports from the No. 6 oil guns. For proposed use in the CTs, the biofuels would be fired at a 100 percent rate (i.e., no co-firing), as the biofuels are immiscible with petroleum fuels. Appendix B provides a tabular summary of the proposed firing scenarios of the two proposed biofuels in each of the candidate emission units. The Department may want the permit to provide a date certain by which the test firing program is to be concluded. If so, PEF requests up to 180 days to complete firing of the 500 tons of available bio-fuel.

The NGB Product Data Sheet indicates that the fuel consists of very low ash and sulfur content. Therefore, PM and SO<sub>2</sub> emissions would be expected to be lower than corresponding values for both No. 2 oil (used in the CTs) and No. 6 oil (used in the steam units). In addition, fuel bound nitrogen (FBN) is lower than the distillate and residual oils. The high moisture content (~ 20 percent) should serve to inhibit the formation of thermal NO<sub>x</sub>. The low projected thermal NO<sub>x</sub>, combined with the low FBN, should result in lower overall NO<sub>x</sub> emissions compared to the existing use of distillate and residual oils at the site. Emissions of CO may be slightly higher, due to the high fuel moisture

content. However, this is currently unknown and the CO data obtained during this test burn will be useful for future biofuels comparisons.

### 3.0 PROPOSED PROJECT APPROACH

PEF anticipates conducting the test burn over an extended period of time to allow the impact of the biofuels to accumulate in the boiler/CT and other components, so that the effects of the biofuels can be determined. As stated earlier, PEF requests up to 180 days from receipt of the permit to complete the test burn program. A short-term test burn may not show any adverse performance effects that will become evident later when the biofuels are fired on a longer duration.

Section 2.0 provided a summary of the proposed bio-fuel spec sheet (provided in Appendix A). Based on engineering judgment, reflective of the biofuel properties, certain conclusions can be inferred with respect to unit performance and emissions while firing the biofuel.

PEF anticipates the following effects on pollutants of concern:

- SO<sub>2</sub> emissions should be significantly reduced;
- PM/PM<sub>10</sub> emissions should be reduced;
- NO<sub>x</sub> emissions should be reduced;
- CO/VOC emissions should be comparable (to be confirmed through testing); and
- Opacity should be equal to or less than the use of distillate and residual oils.

All conditions of the existing permit related to air pollution emission limits and control equipment will remain in force during the trial burn. For the designated steam unit, CEMS data will be recorded and analyzed for the duration of the trial burn for SO<sub>2</sub>, NO<sub>x</sub> and opacity. An emission test will also be conducted and results reported for CO emissions (EPA Method 10); however, testing will also need to be conducted for the baseline condition, as actual CO emissions are currently unknown (there is no CO limit and AP-42 emission factors have historically been used to report annual CO emissions). CO test results should serve as a representative surrogate for anticipated effects on VOC emissions. Daily records (i.e., mass fuel feed rates and heat input) of the boiler operations when firing the biofuels will be maintained and reported.

The CTs are not equipped with CEMS, however, test ports are available on the unit stacks for emission testing purposes. For test firing in the designated CT, PEF proposes to conduct baseline testing (using No. 2 distillate oil) for NO<sub>x</sub>, CO and opacity. Testing will then be conducted for these pollutants while firing the proposed biofuels. CO test results should serve as a representative

surrogate for anticipated effects on VOC emissions. Daily records (i.e., mass fuel feed rates and heat input) of the CT operations when firing the biofuels will be maintained and reported.

Performance testing will cease as soon as possible if the test boiler/CT operations are not in accordance with current permit conditions or this protocol. Performance testing with these biofuels will not resume until appropriate measures to correct the problem have been implemented. A test report will be submitted to the Department within 45 days of completion of the trial burn.

Finally, the biofuels are very viscous and must be heated to facilitate delivery to the oil gun via a pump. The heating of the biofuels to decrease the viscosity actually hastens the normally slow polymerization process. Therefore, an ethanol flush is required to flush the fuel delivery equipment (pump & lines) before the polymerization process is complete or to remove the polymerized material from the fuel delivery equipment. Each complete flush (after each of the test runs) consist of 35 minutes at 13 gpm (or 455 gallons) of ethanol. Assuming three test runs, approximately 1,365 gallons of ethanol would now be left within an ethanol-biofuel mixture. This mixture could either be recycled back to the biofuel tank or isolated and disposed of in an acceptable manner. Combustion of the biofuel/ethanol mixture would be preferable. As the amount of ethanol would be approximately one percent of the total biofuel in storage (i.e., 500 tons of biofuel at a conservative 7.7 lb/gal is approximately 130,000 gallons of biofuel), this should not be a significant concern.



**APPENDIX A**  
**BIOFUEL PROPERTIES AND SPECIFICATIONS**






# New Generation BIOFUELS

Advanced Renewable Technology

## Product Data Sheet SuperClassic

Test	Units	Test Method	Minimum	Maximum	Maximum
Flash Point (closed cup)	°F	D93		114	
	°C	D93		45.56	
Water and sediment	% volume	D1796 or D2709	0.1		1.0
Kinematic viscosity @ 40°C	cSt	D445	34.5		60
Ash	% mass	D482			0.001
Sulfated ash	% mass	D874			0.001
Sulfur	ppm	D5453	0		<1
Copper strip corrosion	--	D130			1b
Pour point	°F	D97	-0.4	5	-11
	°C	D97	-18	-15	-24
Carbon residue (100% sample)	% mass	D4530	0.05		
Total Acid Number	mg KOH/g	D664	0.04		
Oxidation stability	hours	EN 14112	2.3		
Phosphorus content	ppm	D4951 or IAC - 027	<1.0		6.00
Sodium plus potassium	ppm	EN 14538 or IAC - 027	<1.0		3.00
Calcium and magnesium	ppm	EN 14538 or IAC - 027	<1.0		3.00

Test	Units	Test Method	Typical	Minimum	Maximum
Iodine Number	-	AOCS Cd 1d-62	67.5		
Lubricity, @ 60°C - wear scar diameter	mm	D6079	0.170		
Vapor Pressure @100 °F	psi	D323 proc. A	0.7		
Ultimate Analysis (CHONS)	% mass	D5291	C= 55.7 H =11.8 O= 32.67 N = <0.3 S = 0		
Gravity @ 60°F	Degrees API	D4052	21.06		
Specific gravity@60°F/60°F	-	AOCS Cc 10a-25	0.9339		
Lead	ppm	IAC - 027 mod. B			< 0.1
Copper	ppm	IAC - 027 mod. B			< 0.1
Vanadium	ppm	IAC - 027 mod. B			< 0.05
Gross Heat of Combustion	Btu/lb	D240		11,350	12,750

 <b>Chief Executive Officer</b>  David Gillespie	 <b>Chief Technology Officer</b>  Andrea Festuccia	<b>Date</b>
		10 <sup>th</sup> May 2008
		<b>Rev.</b>
		2



# New Generation BIOFUELS

Advanced Renewable Technology

## Product Description

### Super Classic

New Generation Biofuel's Super Classic formulation provides a renewable biofuel with outstanding environmental and performance characteristics. It is formulated to be utilized in a multitude of applications where typically #2 Diesel, distillates, or biodiesel are used.

Super Classic is very similar to New Generation Biofuel's *Classic* products but it has been formulated to provide several distinct differences to meet customer needs in certain areas:

- Super Classic has a significantly higher flash point (at least 114 °F versus 75+ °F)
- Super Classic has a slightly lower kinematic viscosity (typical 34.5 cSt @ 40 °C versus typical 55 cSt)
- Super Classic has a slightly elevated pour point (-18 °C versus -21 °C)

Super Classic products have many features that set us apart from other fuels:

- **Demonstrated enhanced environmental performance.** Our formulation technology essentially eliminates Sulfur oxides (SO<sub>x</sub>) emissions and can significantly reduce Nitrous oxides (NO<sub>x</sub>). We have demonstrated 40%+ NO<sub>x</sub> reductions in power generation applications.
- **Low temperature flow enhancements.** Our depressed pour point improve handling and operability in colder conditions, helping minimize or eliminate special handling or the chances of product cavitation or starving fuel feed systems.
- **Low metals content.** Our products are formulated to minimize any metals/salts in our products, usually less than one part per million (<1 ppm) concentrations.
- **Enhanced lubricity.**
- **Strong light off/ignition properties.** Whether you start up on our product or do a running switch, SuperClassic will keep your application up and running.

Our manufacturing process for Super Classic...



- ...is a low energy process so we can provide big energy output with little energy input;
- ...does not produce byproducts like other fuel manufacturing processes;
- ...allows us to tailor formulations to enhance certain performance characteristics;
- ...can utilize various feedstocks to address cost and supply issues.

All of these are advantages versus competitive products.

Support blends formulations, along with our other biofuel products, are *emulsions*. *Emulsions* are the combination of products that are normally immiscible but, through our formulation expertise and manufacturing capabilities, can be combined into one homogenous and stable product. That allows us to take the strengths of our raw materials and combine them to provide you unique products with unique solutions for the enhanced performance of your application.

Our Product Data Sheet (PDS) provides guidance on the physical characteristics of our products. You will see some of our tests are similar or identical to other fuels you may be familiar with using. Since we are a new product technology, you will also note that we differ in some tests since our emulsion technology is significantly different than other products.

We do not create *glycerin* in our process, so it is not included. Since we are not a distilled petroleum product a typical *distillation curve* is not applicable. We also include data that shows the strength and stability of our products such as *water & sediment* (demonstrates physical stability of the emulsion), *oxidative stability*, and *iodine number*. *Iodine number* demonstrates saturation levels in the products. Values less than 115 are considered stable products for storage and handling purposes.

*Please note that variations in performance may be experienced based on the application and operating parameters.*

If you have any questions about support blends or New Generation Biofuels, please contact your sales representative. You can also find additional information on our website: [www.newgenerationbiofuels.com](http://www.newgenerationbiofuels.com)

# Material Safety Data Sheet

**Product:** NGB-SuperClassic

**MSDS Date:** 11/15/07 (Rev. 5/13/08)  
**Product Name:** NGB-SuperClassic  
**Manufacturer:** New Generation Biofuels, Inc.

## 1. Product and Company Description

New Generation Biofuels, Inc.  
11111 Katy Freeway  
Suite 910  
Houston, TX 77079

**For Product Information/Emergency:**  
713-973-5720

**Chemical Synonym/Formula:**  
N/A

## 2. Hazards Identification

### Emergency Overview

**Appearance/Odor:** Liquid with slight odor.

### Potential Health Effects:

**Acute Eye:**  
May cause discomfort and irritation with eye contact.

**Acute Skin:**  
May cause skin irritation.

**Acute Inhalation:**  
May cause irritation to the respiratory tract.

**Acute ingestion:**  
Not considered a route of exposure under anticipated use conditions. May cause severe irritation and to the digestive tract if ingested.

**Chronic Exposure:**  
Not determined

**Aggravation of Pre-existing Conditions:**  
Persons with pre-existing skin disorders or eye problems or impaired liver or kidney function may be more susceptible to the effects of the substance.

## 3. Chemical Composition

Component	CAS#	%Composition
Refined Soybean Oil	8001-22-7	50-60

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Water	7732-18-5	20-30
n-Butyl alcohol	71-36-3	9-19
Propylene Glycol	57-55-6	1-5
Sorbitan, tri-9-octadecenoate, (Z,Z,Z)-	26266-58-0	0.5-5

### 4. First Aid Measures

#### First Aid Measures for Accidental:

**Eye Exposure:**

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Seek medical attention.

**Skin Exposure:**

Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

**Inhalation:**

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**Ingestion:**

Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

### 5. Fire Fighting Measures

#### Fire Hazard Data:

**For n-Butyl alcohol:**

**Autoignition:** 343C

**Flash Point:** 35C

**Flammability Limits (vol/vol%):**

**Lower:**  
1.4

**Upper:**  
11.2

**Extinguishing Media:**

Water spray, dry chemical, alcohol foam, or carbon dioxide. Water spray may be used to keep fire exposed containers cool, dilute spills to nonflammable mixtures, protect personnel attempting to stop leak and disperse vapors.

**Special Fire Fighting Procedures:**

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

**Unusual Fire and Explosion Hazards:**

None

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## 6. Accidental Release Measures

### Cleanup and Disposal of Spill:

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer!

## 7. Handling and Storage

### Handling/Storage:

Protect against physical damage. Store in a cool, dry well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from incompatibles. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment, including explosion proof ventilation. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product. Do not attempt to clean empty containers since residue is difficult to remove. Do not pressurize, cut, weld, braze, solder, drill, grind or expose such containers to heat, sparks, flame, static electricity or other sources of ignition: they may explode and cause injury or death.

## 8. Exposure Controls / Personal Protection

### Exposure Guidelines:

Component	ACGIH	NIOSH	OSHA-PELs
Refined Soybean Oil	ND	ND	15 mg/m <sup>3</sup> total particulate 5 mg/m <sup>3</sup> respirable
Water	NA	NA	NA
n-Butyl alcohol	20 ppm TWA	50 ppm Ceiling	50 ppm Ceiling
Propylene Glycol	ND	ND	ND
Sorbitan, tri-9-octadecenoate, (Z,Z,Z)-	ND	ND	ND

### Engineering Controls:

General mechanical ventilation is adequate for normal use. Local exhaust is recommended for confined areas.

### Respiratory Protection:

If the exposure limit is exceeded, wear a supplied air, full-facepiece respirator, airlined hood, or full-facepiece self-contained breathing apparatus.

### Eye / Face Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.



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### **Skin Protection:**

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

## **9. Physical and Chemical Properties**

### **For n-Butyl Alcohol**

**Physical Appearance:** Liquid

**Odor:** Mild alcohol

**pH:** ND

**Specific Gravity:** 0.81

**Water Solubility:** Soluble

**Melting Point:** -90C (-130F)

**Freezing Point:** ND

**Boiling Point:** 118C (244F)

**Vapor Pressure:** 4 mm Hg @ 25C (77F)

**Density:** NA

**Percent Volatiles by Volume:** NA

**Evaporation Rate:** 0.45

**Viscosity:** ND

**Density:** ND

**Autoignition:** 343C

**Flash Point:** 35C

<b>Flammability Limits (vol/vol%):</b>	<b>Lower:</b>	<b>Upper:</b>
	1.4	11.2

## **10. Stability and Reactivity**

### **Chemical Stability:**

Stable

### **Conditions to Avoid:**

Heat, flames, ignition sources and incompatibles.

### **Materials / Chemicals to Be Avoided:**

Heat, flame, strong oxidizers, nitric acid and perchloric acid.

### **Hazardous Decomposition Products:**

Carbon dioxide and carbon monoxide may form when heated to decomposition.

### **Hazardous Polymerization:**

Will not occur.

## **11. Toxicological Information**

### **Acute Effects**

**Water (7732-18-5)**

Oral LD50 Rat: >90 mL/kg

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#### n-Butyl alcohol (71-36-3)

Inhalation LC50 Rat: >17.7 mg/L/4H; Inhalation LC50 Rat:8000 ppm/4H; Oral LD50 Rat:790 mg/kg; Dermal LD50 Rabbit:3400 mg/kg

#### 1,2-Propylene glycol (57-55-6)

Oral LD50 Rat: 20000 mg/kg; Dermal LD50 Rabbit:20800 mg/kg

#### Chronic Effects

Carcinogenicity: None of this product's components are listed by ACGIH, IARC, OSHA, NIOSH, or NTP.

Mutagenicity: No data

Reproductive Effects: No Data

Developmental Effects: No Data

### 12. Ecological Information

#### Environmental Fate:

Not Determined.

#### Environmental Toxicity:

##### n-Butyl alcohol (71-36-3)

Test & Species		Conditions
96 Hr LC50 Pimephales promelas	1510 mg/L [static]	33 days old
96 Hr LC50 Pimephales promelas	1740 mg/L [flow-through]	
96 Hr LC50 Leuciscus idus	1200 mg/L	
96 Hr EC50 Scenedesmus subspicatus	>500 mg/L	
72 Hr EC50 Scenedesmus subspicatus	>500 mg/L	
5 min EC50 Photobacterium phosphoreum	2041.4 mg/L	
30 min EC50 Photobacterium phosphoreum	2186 mg/L	
17 Hr EC50 Pseudomonas putida	4400 mg/L	
24 Hr EC50 Aerobic heterotroph	3980 mg/L	
48 Hr EC50 Daphnia magna	1983 mg/L	

##### 1,2-Propylene glycol (57-55-6)

Test & Species		Conditions
96 Hr LC50 Oncorhynchus mykiss	51600 mg/L [static]	
96 Hr LC50 Pimephales promelas	51400 mg/L [static]	
96 Hr EC50 Selenastrum capricornutum	19000 mg/L	
30 min EC50 Photobacterium phosphoreum	710 mg/L	
48 Hr EC50 water flea	>10000 mg/L	

### 13. Disposal Considerations

#### Waste Disposal Method:

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste

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management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

### 14. Transportation Information

**US Department of Transportation Shipping Name:**

<b>US Department of Transportation</b>	<b>Proper Shipping Name</b>	Flammable Liquids, n.o.s.(contains n-Butyl alcohol)
	<b>Hazard Class</b>	3
	<b>ID Number</b>	UN 1993
	<b>Packaging Group</b>	III

### 15. Regulatory Information

#### Federal Regulations:

##### **SARA Title III Hazard Classes:**

Fire Hazard: Yes  
Reactive Hazard: No  
Release of Pressure: No  
Acute Health Hazard: Yes  
Chronic Health Hazard: Yes

##### **TSCA**

All components of this product are on the TSCA inventory or are exempt from TSCA inventory requirements

#### **Other Regulations:**

None

### 16. Other Information

#### **National Paint & Coating Hazardous Materials Identification System – HMIS(R):**

Health Hazard: 1  
Flammability: 3  
Reactivity: 0

#### **Key Legend Information:**

NA – Not Applicable  
ND – Not Determined  
ACGIH – American Conference of Governmental Industrial Hygienists  
OSHA – Occupational Safety and Health Administration

TLV – Threshold Limit Value  
PEL – Permissible Exposure Limit  
TWA – Time Weighted Average  
STEL – Short Term Exposure Limit  
NTP – National Toxicology Program  
IARC – International Agency for Research on Cancer

**APPENDIX B**  
**BIOFUEL FIRING SCENARIO SUMMARY TABLE**

**BARTOW GENERATING UNITS- PERMITTED FIRING RATES AND RATES WITH BIO-FUELS**

Emission Unit	Permitted Firing Rate		LEG Bio-Oil		NGB Bio-Oil	
	Heat Input (MMBtu/hr)	Fuel Flow (gal/hr)	Fuel Flow (gal/hr)	Heat Input (MMBtu/hr)	Fuel Flow (gal/hr)	Heat Input (MMBtu/hr)
Steam Unit 1 <sup>a</sup>	1,220	8,026	80	1,214	122	1,171
Steam Unit 2 <sup>a</sup>	1,317	8,665	87	1,311	132	1,265
Steam Unit 3 <sup>a</sup>	2,266	14,908	149	2,255	227	2,176
CT 1	714	5,174	5,174	420	5,174	473
CT 2	714	5,174	5,174	420	5,174	473
CT 3	714	5,174	5,174	420	5,174	473
CT 4	714	5,174	5,174	420	5,174	473

<sup>a</sup> Steam unit "permitted" firing rate based on No. 6 oil with a heating value of 152,000 Btu/gal and density of 8.33 lb/gal

<sup>b</sup> CT "permitted" firing rate based on No. 2 fuel oil with a heating value of 138,000 Btu/gal and a density of 7.0 lb/gal

<sup>c</sup> LEG firing rate based on bio-oil with a heating value of ~81,232 Btu/gal and a density of 9.84 lb/gal

Assume 1% co-firing in the steam units and 100% firing in the CTs

<sup>d</sup> NGB firing rate based on bio-fuel with a heating value of ~91,425 (avg) Btu/gal and a density of 7.69 lb/gal

Assume 10% co-firing in the steam units and 100% firing in the CTs