October 4, 2001

RECEIVED

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BUREAU OF AIR REGULATION

Mr. Clair H. Fancy, P.E., Chief
Department of Environmental Protection
Bureau of Air Regulation
New Source Review Section
Suite 4, 111 South Magnolia Drive
Tallahassee, Florida 32301

RE: Okeelanta Corporation/Florida Crystals Food Corporation
DEP File No. 0990005-009-AC
Public Notice of Intent to Issue PSD Air Construction Permit
Proof of Publication Affidavit

Dear Mr. Fancy:

Enclosed is the Proof of Publication Affidavit for the Public Notice of Intent to Issue PSD Air Construction Permit as required by the above referenced permit. This notice was published in the Palm Beach Post on Saturday, September 29, 2001.

If you have any questions or comments please contact the undersigned at (561) 996-9072 extension 1658.

Sincerely,

Matthew Capone, P.E.
Director of Environmental Programs

MC/hll

Enclosure

c: R. Lima, Okeelanta Corporation
Florida DEP South District
Palm Beach County Health Department
Q. Kaiser
C. Holladay
B. Worley, EPA
Q. Bunyak, NPS

Okeelanta Corporation
P.O. Box 86 • 21250 U.S. Highway 27 • South Bay, FL 33493 • Phone (561) 993-1600 • Fax (561) 992-7326

THE PALM BEACH POST

Published Daily and Sunday
West Palm Beach, Palm Beach County, Florida

PROOF OF PUBLICATION

STATE OF FLORIDA
COUNTY OF PALM BEACH

Before the undersigned authority personally appeared **Tyler Dixon,** who on oath says that she is **Classified Advertising Manager, Inside Sales** of The Palm Beach Post, a daily and Sunday newspaper published at West Palm Beach in Palm Beach County, Florida; that the attached copy of advertising, being **Notice** in the matter of **Intent** in the --- Court, was published in said newspaper in the issues of **September 29, 2001.**

Affiant further says that the said The Post is a newspaper published at West Palm Beach, in said Palm Beach County, Florida, and that the said newspaper has heretofore been continuously published in said Palm Beach County, Florida, daily and Sunday and has been entered as second class mail matter at the post office in West Palm Beach, in said Palm Beach County, Florida, for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant further says that she/he has neither paid nor promised any person, firm or corporation any discount rebate, commission or refund for the purpose of securing this advertisement for publication in the said newspaper.

Sworn to and subscribed before this 1st day of October, A.D. 2001

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NO. 5703446
PUBLIC NOTICE OF INTENT TO ISSUE PSD AIR CONSTRUCTION PERMIT STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
Project No. 0990005-009-AC
Draft Permit PSD-FL-169A
Okeelanta Corporation
Modification of Existing Mill Boiler No. 16
Emissions Unit No. 014

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit to Okeelanta Corporation to modify existing Boiler No. 16. This boiler is part of Okeelanta Corporation's sugar mill and refinery located approximately six miles south of South Bay on US. Highway 27 in Palm Beach County, Florida. Okeelanta Corporation's authorized representative is Mr. Ricardo Lima, the Vice President and General Manager, and the mailing address is 21250 U.S. Highway 27, South Bay, FL 33493.

The applicant proposes to modify the existing boiler's burner system to accommodate natural gas and very low sulfur distillate oil as authorized fuels. The following summarizes the potential annual pollutant emissions from this project in tons per year (TPY); the Significant Emission Rate in tons per year; whether the potential emissions are significant as specified in Table 62-212.400-2 of Rule 62-212.400 F.A.C.; and whether Best Available Control Technology (BACT) is required. Pollutant CO: Potential Annual Emissions 96 19 TPY; Significant Emissions Rate 100 TPY; Significant? No; BACT Required? No. Pollutant NOx Potential Annual Emissions 113.77 TPY; Significant Emissions Rate 40 TPY; Significant? Yes; BACT Required? Yes. Pollutant PM/PM10: Potential Annual Emissions 22.16 TPY; Significant Emissions Rate 25/15 TPY; Significant? Yes; BACT Required? Yes. Pollutant SO2: Potential Annual Emissions 39.38 TPY; Significant Emissions Rate 40 TPY; Significant? No; BACT Required? Yes.Pollutant VOC: Potential Annual Emissions 27.73 TPY; Significant Emissions Rate 40 TPY; Significant? No; BACT Required? No.

As shown, determinations of the Best Available Control Technology (BACT) were required for emissions of nitrogen oxides (NOx) and particulate matter (PM10) pursuant to Rule 62-212.400, F.A.C., which is part of the preconstruction review program for the Prevention of Significant Deterioration (PSD) of Air Quality. BACT determinations were also required for particulate matter (PM) and sulfur dioxide (SO2) in accordance with Rule 62-296.406, F.A.C., which regulates boilers with a heat input of less than 250 MMBtu per hour. Emissions of carbon monoxide (CO) and volatile organic compounds (VOC) are below the PSD significant emission rates. The Department determined BACT to be the efficient combustion of very low sulfur fuels for emissions of PM/PM10 and SO2. BACT for NOx emissions was determined to be the installation of low NOx burners with flue gas recirculation. Emissions of carbon monoxide (CO) and volatile organic compounds (VOC) will be minimized by the efficient combustion of clean fuels.

An air quality impact analysis was conducted by the applicant and reviewed by the Department. The ambient impact analysis predicted all pollutant emissions to have an insignificant impact on Class I and Class II Areas. Emissions from the facility will not significantly contribute to or cause a violation of any state or federal ambient air quality standard. The Department will issue the Final Permit with the attached conditions unless a response received in accordance with the following procedures results in a different decision or significant change of terms or conditions.

The Department will accept written comments and requests for public meetings concerning the proposed permit issuance action for a period of thirty (30) days from the date of publication of this Public Notice of Intent to Issue Air Construction Permit. Written comments and requests for public meetings should be provided to the Department's Bureau of Air Regulation at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, FL 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in the proposed agency action, the Department shall revise the proposed permit and require, if applicable, another Public Notice.

The Department will issue the permit with the attached conditions unless a timely petition for an administrative hearing is filed pursuant to Sections 120.569 and 120.57, F.S. before the deadline for filing a petition. The procedures for petitioning for a hearing are set forth below. Mediation is not available in this proceeding.

A person whose substantial interests are affected by the proposed permitting decision may petition for an administrative proceeding (hearing) under Sections 120.569 and 120.57, F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000. Petitions filed by the permit applicant or any of the parties listed below must be filed within fourteen (14) days of receipt of this notice of intent. Petitions filed by any persons other than those entitled to written notice under Section 120.60(3), F.S. must be filed within fourteen (14) days of publication of the public notice or within fourteen (14) days of receipt of this notice of intent, whichever occurs first. Under Section 120.60(3), F.S., however, any person who asked the Department for notice of agency action may file a petition within fourteen (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 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 Department'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 how and when petitioner received notice of the agency action or proposed action; (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate; (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; and (g) A statement of the relief sought by the petitioner, stating precisely the action 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 Department'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 Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

A complete project file is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Dept. of Environmental Protection
Bureau of Air Regulation
New Source Review Section
Suite 4, 111 S. Magnolia Drive
Tallahassee, Florida 32301
Telephone: 850/488-0114

Dept. of Environmental Protection
South District Office
Air Resources Section
2295 Victoria Avenue
Suite 364
Fort Myers, Florida 33901-3381
Telephone: 941/332-6975

Palm Beach County
Health Dept.
Environmental Health and Engineering
Air Pollution Control Section
901 Evernia Street
West Palm Beach, Florida 33401
Telephone: 561/355-3136

The complete project file includes the application, Technical Evaluation and Preliminary Determination, Draft Permit, and the information submitted by the responsible official, exclusive of confidential records under section 403.111, F.S. Interested persons may contact the Department's project engineer for additional information at the address and phone numbers listed above.

PUB: The Palm Beach Post

TECHNICAL EVALUATION
&
PRELIMINARY DETERMINATION
(Including Draft BACT Determinations)

PROJECT

Project No. 0990005-009-AC
Draft Permit No. PSD-FL-169A
Conversion of Mill Boiler No. 16 to Natural Gas
(Emissions Unit No. 014)

COUNTY

Palm Beach County

APPLICANT

Okeelanta Corporation
ARMS Facility ID No. 0990005
Existing Sugar Mill and Refinery

PERMITTING AUTHORITY

Florida Department of Environmental Protection
Division of Air Resources Management
Bureau of Air Regulation
New Source Review Section

May 24, 2001

(Filename: 169A BACT and TEPD.DOC)

1. GENERAL PROJECT INFORMATION

1.1 Applicant Name and Address

Okeelanta Corporation
21250 U.S. Highway 27
South Bay, FL 33493

Authorized Representative:
Mr. Ricardo Lima
Vice President and General Manager

1.2 Processing Schedule

03/23/01 Department received the application for a PSD air pollution construction permit; complete.

03/30/01 Department mailed copies to EPA Region 4 and the National Park Service.

1.3 Facility Description and Location

The applicant proposes to modify Boiler No. 16, which is operates at Okeelanta Corporation's existing sugar mill and refinery located approximately six miles south of South Bay on U.S. 27 in Palm Beach County, Florida. The UTM coordinates are Zone 17, 524.9 km East, and 2940.1 km North. This is an area that is in attainment (or designated as unclassifiable) for all air pollutants subject to a National Ambient Air Quality Standard (NAAQS). The location is approximately 92 km from the nearest Class I area, the Everglades National Park.

1.4 Standard Industrial Classification Code (SIC)

The existing facility consists of two plants. An existing mill processes sugarcane to produce raw and refined sugar. An existing cogeneration plant fires biomass to produce steam for the mill and generate electricity for sale to the power grid. These plants have the following SIC codes.

SIC No. 2061 – Sugar Mill

SIC No. 2062 – Sugar Refinery

SIC No. 4911 – Electric Generation

1.5 Regulatory Categories

Title III: Based on the application, the facility is a major source of hazardous air pollutants (HAP).

Title IV: Based on the Title V permit, the existing facility is not subject to the acid rain provisions of the Clean Air Act.

Title V: The facility is a Title V major source of air pollution because potential emissions of at least one regulated pollutant exceed 100 tons per year. Regulated pollutants include pollutants such as carbon monoxide (CO), nitrogen oxides (NOx), particulate matter (PM/PM_{10}), sulfur dioxide (SO_2), and volatile organic compounds (VOC).

PSD: The facility operates units classified as "fossil fuel steam electric plants with more than 250 mmBTU per hour of heat input", which is one of the 28 PSD source categories with lower thresholds. Because potential emissions are greater than 100 tons per year for at least one regulated air pollutant, the facility is a major source of air pollution in accordance with the requirements of the Prevention of Significant Deterioration (PSD) of Air Quality Program (Rule 62-212.400, F.A.C.). Projects resulting in net emissions increases greater than the Significant Emissions Rates specified in Table 62-212.400-2, F.A.C. are subject to the PSD new source preconstruction review requirements.

NSPS: This project modified a package boiler, which is subject to Subpart Db of the New Source Performance Standards in 40 CFR 60.

1.6 Project Description

The applicant proposes to modify the burner system of existing mill Boiler No. 16 (Emissions Unit No. 014) to accommodate natural gas as the primary fuel and very low sulfur distillate oil as an alternate fuel. The applicant proposes the efficient combustion of clean fuels to minimize emissions of CO, PM/PM10, SO2, and VOC. The applicant proposes the installation of low NOx burners with flue gas recirculation to reduce NOx emissions.

1.7 Potential Emissions

Table 1A. This table summarizes PSD applicability for this project based on the application.

Pollutant [a]	Potential Emissions (Tons Per Year)	Significant Emissions Rate (Tons Per Year)	Significant? Table 62-212.400-2, F.A.C.	BACT Required?
CO	96	100	No	No
NOx	96	40	Yes	Yes
PM/PM10	22	25/15	Yes	Yes
SO2	35	40	No	Yes [c]
VOC	28	40	No	No

[a] The application discussed emissions of beryllium, which is no longer a PSD-regulated pollutant.

[b] Potential emissions are based on the requested permit limits and maximum operation. All PM emitted is assumed to be PM10. Applicant assumed zero past actual emissions due to inactivity of boiler over last two years.

[c] Rule 62-296.406, F.A.C. requires PM and SO2 BACT determinations for boilers with heat inputs of 250 mmBTU per hour or less.

2. APPLICABLE REGULATIONS

2.1 State Regulations

This 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 applicable rules and regulations defined in the following Chapters of the Florida Administrative Code.

Chapter	Description
62-4	Permitting Requirements
62-204	Ambient Air Quality Requirements, PSD Increments, and Federal Regulations Adopted by Reference
62-210	Required Permits, Public Notice and Comments, Reports, Stack Height Policy, Circumvention, Excess Emissions, Forms and Instructions,
62-212	Preconstruction Review, PSD Requirements, and BACT Determinations
62-213	Operation Permits for Major Sources of Air Pollution
62-214	Acid Rain Program Requirements
62-296	Emission Limiting Standards
	Rule 62-296.406 – Fossil Fuel Steam Generations with Less Than 250 mmBTU per Hour of Heat Input
62-297	Test Methods and Procedures, Continuous Monitoring Specifications, and Alternate Sampling Procedures

2.2 Federal Regulations

This project is also subject to the applicable federal provisions regarding air quality as established by the EPA in the following sections of the Code of Federal Regulations (CFR).

Title 40, CFR	Description
Section 51.166	Requirements for State Implementation Plans, Prevention of Significant Deterioration
Section 52.21	Approval of State Implementation Plans, Prevention of Significant Deterioration
Part 60	Subpart A - General Provisions for NSPS Sources
	NSPS Subpart Db - Stationary Gas Turbines
	Applicable Appendices

2.3 General PSD Applicability

The Department regulates major air pollution sources in accordance with Florida's Prevention of Significant Deterioration (PSD) program, as approved by the EPA in Florida's State Implementation Plan and defined in Rule 62-212.400, F.A.C. A PSD review is required only in areas currently in attainment with the National Ambient Air Quality Standard (AAQS) or areas designated as "unclassifiable" for a given pollutant. A new facility is considered "major" with respect to PSD if it 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 PSD Major Facility Categories (Table 62-212.400-1, F.A.C.), or
- 5 tons per year of lead.

For new projects at PSD-major sources, each regulated pollutant is reviewed for PSD applicability based on emissions thresholds known as the Significant Emission Rates listed in Table 62-212.400-2, F.A.C. Pollutant emissions from the project exceeding these rates are considered "significant" and the applicant must employ the Best Available Control Technology (BACT) to minimize emissions of each such pollutant and evaluate the air quality impacts. Although a facility may be "major" with respect to PSD for only one regulated pollutant, it may be required to install BACT controls for several "significant" regulated pollutants

2.4 PSD Preconstruction Review Requirements

PSD preconstruction review consists of two parts. The first part requires an Air Quality Analysis consisting of: an air dispersion modeling analysis to predict ambient impacts from the project; a comparison of predicted ambient impacts from the project with National Ambient Air Quality Standards and PSD Increments; an evaluation of the air quality impacts from the project upon soils, vegetation, wildlife, and visibility; and an assessment of the air quality impacts resulting from associated commercial, residential, and industrial growth related to the proposed project. The purpose of the Air Quality Analysis is to determine whether or not the proposed project will have a significant impact on Class I and Class II Areas and determine whether or not emissions from the project contribute significantly to, or cause a violation of, any state or federal ambient air quality standards.

The second part requires the Department to establish the Best Available Control Technology (BACT) for each pollutant emitted in excess of the PSD Significant Emission Rates. The applicant reviews current control technologies and techniques for similar projects and proposes control options and emissions standards for the project. The Department reviews the information provided by the applicant with all other available information and makes a determination of the Best Available Control Technology (BACT) for each "significant" regulated pollutant. The BACT determination must be based on the maximum degree of emissions reduction that the Department determines is achievable through application of production processes and available methods, systems, and techniques for control of each such pollutant. The

Department's determination is made on a case-by-case basis for each proposed project, taking into account energy, environmental and economic impacts. The Department shall also give consideration to:

- Any EPA determination of BACT pursuant to Section 169 of the Clean Air Act, and any emission limitation contained in 40 CFR Part 60 (NSPS) or 40 CFR Part 61 (NESHAP).
- All scientific, engineering, and technical material and other information available to the Department.
- The emission limiting standards or BACT determinations of any other state.
- The social and economic impacts of the application of such technology.

The EPA currently directs that BACT should be determined using the "top-down" approach. In this approach, available control technologies are ranked in order of control effectiveness for the emissions unit under review. The most stringent control option is evaluated first and selected as BACT unless it is technically infeasible for the proposed project or rejected due to adverse energy, environmental or economic impacts. If the control option is eliminated, the next most stringent alternative is considered. This top-down approach continues until BACT is determined.

BACT determinations must result in the selection of control technologies capable of achieving at least the applicable emission standards regulated by 40 CFR Part 60 (NSPS) or 40 CFR Part 61 (NESHAP). The Department will consider the control or reduction of "non-regulated" air pollutants when determining the BACT limit for regulated pollutants, and will weigh control of non-regulated air pollutants favorably when considering control technologies for regulated pollutants. The Department will also favorably consider control technologies that utilize pollution prevention strategies. These approaches are consistent with EPA's consideration of environmental impacts and stated policy for pollution prevention.

2.5 PSD Applicability for Project

The proposed project is located in Palm Beach County, Florida, an area that is in attainment (or designated as unclassifiable) for all air pollutants subject to a National Ambient Air Quality Standard (NAAQS). As previously discussed, the facility is an existing PSD-major source and is subject to the new source preconstruction review requirements. BACT determinations are required for NOx, and PM_{10} because potential emissions of these pollutants exceed the PSD Significant Emission Rates in Table 62-212.400-2. BACT determinations are also required for PM and SO_2 in accordance with Rule 62-296.406, F.A.C. The Department is required to make BACT determinations for these pollutants and review the applicant's air quality impact analysis.

3. DRAFT BACT DETERMINATIONS

3.1 Available Information

In addition to the information submitted by the applicant, the Department also relied on the following information to make these determinations:

- Informal comments received from the National Park Service;
- Alternative Control Techniques Document – NOx Emissions from Stationary Gas Turbines (1993);
- Emissions guarantees from Coen for the low-NOx burners;
- Actual emissions test results for existing Boiler No. 16 when firing distillate oil containing 0.3% sulfur by weight.
- BACT Clearinghouse Web Site for the California Air Resources Bureau;

In addition, the Department reviewed recent BACT determinations posted in EPA's RACT/BACT/LAER Clearinghouse for consistency. A list of recent determinations regarding similar projects in the United States is provided in the following table.

Table 3A. Summary of Recent CO and NOx BACT Standards
Boilers and Heaters, ≈ 200 mmBTU per Hour of Heat Input

Facility	RBLC ID	Permit Date	Capacity mmBTU/hr	CO Emissions lb/mmBTU	NOx Emissions lb/mmBTU	Controls
Alabama Power Co.	AL-0128	03/99	220	0.165, gas	0.053, gas	LNB w/FGR
American Soda LLP	CO-0040	05/99	81	0.09, gas	0.050, gas	LNB System
Cargill-Eddyville	IA-0050	04/99	182	NA	0.050, gas	LNB w/FGR
Champion International	FL-0217	06/99	≈ 50	0.18, gas	0.10, gas	LNB System
Conoco, Heater (H-24)	LA-0119	8/99	264	0.08, gas	0.06, gas	LNB System
Conoco, Heater (H-1103)	LA-0119	8/99	100	0.08, gas	0.06, gas	LNB System
Conoco, Heater (H-20002)	LA-0119	8/99	150	0.08, gas	0.03, gas	LNB System
Conoco, Heater (H-40001)	LA-0119	8/99	237	0.08, gas	0.03, gas	LNB System
McCaine Food, Inc.	ME-0017	12/98	99	0.16, res. oil	0.30, res. oil	LNB w/FGR
Mid-Georgia Cogen.	GA-0063	04/96	60	0.05, gas	0.10, gas	LNB w/FGR
Mid-Georgia Cogen.	GA-0063	04/96	60	0.09, oil	0.15, oil	LNB w/FGR
Occidental Chemical	LA-0118	03/99	355	0.08, gas	0.08, gas	LNB System
Rayonier, Inc.	FL-0182	09/98	212	NA	0.425, res. oil	LNB w/FGR (Note: temporary boiler)

Notes: Information was compiled from EPA's RACT, BACT, LAER Clearinghouse Database for similarly sized boilers firing natural gas or oil and permitted in 1996 or later.

3.2 Nitrogen Oxides (NOx)

Discussion of NOx Emissions

Emissions of NOx are a result of the thermal fixation nitrogen in the combustion air (thermal NOx) and the oxidation of nitrogen in the fuel (fuel NOx). *Thermal NOx* is primarily a function of peak flame temperature and available oxygen, which are factors that depend on boiler size, firing configuration, and operating practices. *Fuel NOx* is a function of nitrogen in the fuel and the available oxygen. About 50% of the fuel nitrogen is converted to NOx, which means that fuel NOx emissions from firing natural gas or distillate oil is almost negligible because these fuels contain only trace amounts of fuel-bound nitrogen.

Description of Available NOx Controls

The following technologies were identified as potentially applicable for the control of NOx from boilers firing natural gas and distillate oil.

Low NOx burners with Flue Gas Recirculation (LNB w/FGR): The following description is an excerpt from the July 1998 edition of Section 1.4.4 in AP-42.

> "The two most prevalent combustion control techniques used to reduce NOx emissions from natural gas-fired boilers are flue gas recirculation (FGR) and low NOx burners. In an FGR system, a portion of the flue gas is recycled from the stack to the burner windbox. Upon entering the windbox, the recirculated gas is mixed with combustion air prior to being fed to the burner. The recycled flue gas consists of combustion products which act as inerts during combustion of the fuel/air mixture. The FGR system reduces NOx emissions by two mechanisms. Primarily, the recirculated gas acts as a dilutent to reduce combustion temperatures, thus suppressing the thermal NOx mechanism. To a lesser extent, FGR also reduces NOx formation by lowering the oxygen concentration in the primary flame zone. The amount of recirculated flue gas is a key operating parameter influencing NOx emission rates for these systems. An FGR system is normally used in combination with specially designed low NOx burners capable of sustaining a stable flame with the increased inert gas flow resulting from the use of FGR. When low

NOx burners and FGR are used in combination, these techniques are capable of reducing NOx emissions by 60 to 90 percent.

Low NOx burners reduce NOx by accomplishing the combustion process in stages. Staging partially delays the combustion process, resulting in a cooler flame which suppresses thermal NOx formation. The two most common types of low NOx burners being applied to natural gas-fired boilers are staged air burners and staged fuel burners. NOx emission reductions of 40 to 85 percent (relative to uncontrolled emission levels) have been observed with low NOx burners."

Selective Catalytic Reduction (SCR): This is an add-on control technology in which ammonia is injected into the exhaust gas stream in the presence of a catalyst bed to combine with NOx in a reduction reaction forming nitrogen and water. For this reaction to proceed satisfactorily, the exhaust gas temperature must be maintained between approximately 450° F and 850° F. SCR is a commercially available and demonstrated control technology with numerous applications nationwide. Conventional SCR is technically feasible for this project with a control efficiency of approximately 75% to 85%.

Selective Non-Catalytic Reduction (SNCR): In the SNCR process, ammonia or urea is injected at high temperatures without a catalyst to reduce NOx emissions to nitrogen and water vapor. The exhaust temperature must typically be maintained above 1600°F to allow the reaction to occur; otherwise uncontrolled NOx will be emitted as well as unreacted ammonia. Also, the exhaust temperature must not exceed 2000°F or ammonia will actually be oxidized creating additional NOx emissions. New catalysts are available that can extend this temperature range to approximately 1000° F to 1950° F. For boilers, SNCR has achieved control efficiencies in the 25% to 75% range and is technically feasible for this project.

SCONOx™: This technology is a NOx and CO control system developed by Goal Line Environmental Technologies and distributed by ABB for large gas turbine projects. Specialized potassium carbonate catalyst beds reduce CO and NOx emissions using an oxidation-absorption-regeneration cycle. The required operating temperature range is between 300°F and 700°F, which requires a heat recovery steam generator for use with a combined cycle gas turbine. SCONOx™ can achieve a control efficiency greater than 90% and is technically feasible for this project.

Cannon Technology's Low Temperature Oxidation (LTO): This technology involves injecting ozone into a gas stream (approximately 300° F) to oxidize CO, NOx, and SO_2 to carbonates, nitrates, and sulfates, which are then absorbed by a dilute nitric acid solution in a scrubber. The system was developed for steam boilers and test results show NOx emissions below 4 ppmvd at 3% oxygen for gas firing. However, only very small units (< 20 mmBTU per hour) have been tested. Because the exhaust gas will be approximately 400° F and the modified boiler is nearly ten times that of the largest tested unit with LTO, this technology was not evaluated further.

Applicant's Proposed NOx Controls

The applicant ranked the control technologies in the following order:

Rank	Technology	Control Effciency (%)	Emissions Rate (lb/mmBTU) [c]	Annual Emissions TPY
1	SCR and LNB w/FGR [a]	92%	0.03	22.8
2	SNCR and LNB w/FGR [b]	72%	0.105	79.6
3	LNB w/FGR	60%	0.15	113.8
Base	Existing Boiler No. 16	Base	0.135 [d]	121.2

[a] - SCR alone can achieve approximately 80% reduction.

[b] - SNCR alone can achieve approximately 30% reduction.

[c] - Emissions rate for oil firing. NOx limit is 0.18 lb/mmBTU.

[d] - Based on actual average emissions from Boiler No. 16.

The applicant states that SCR and SNCR would result in the following adverse impacts.

Energy Impacts: The applicant states that installation of SCR would result in energy penalties due to the pressure drop across the catalyst, energy required to operate the ammonia injection system, and possibly energy to reheat the exhaust gas. Similarly, SNCR would result in energy penalties to operate the system.

Environmental Impacts: The applicant indicates that installation of SCR would result in unreacted ammonia "slipping" past the catalyst, potential ammonia emissions from an accidental release, and solid waste disposal of the spent catalyst. Similarly, SNCR could result in urea emissions from an accidental release.

Economic Impacts: The applicant estimates that the installation of SCR would result in a capital cost of $2.8 million, and annualized cost of $686,807, and a cost effectiveness of $7546 per ton of NOx removed. The applicant estimates that the installation of SNCR would result in a capital cost of $950,000, and annualized cost of $282,011, and a cost effectiveness of $8263 per ton of NOx removed.

Applicant's Proposal: Based on the estimated high capital and operating costs associated with the add on control systems, the applicant rejected both SCR and SNCR and proposes the following NOx standards based on LNB with FGR:

Gas: NOx emissions shall not exceed 0.055 lb/mmBTU of heat input

Oil: NOx emissions shall not exceed 0.15 lb/mmBTU of heat input

Department's Draft NOx BACT Determination

The Department does not necessarily endorse the applicant's cost evaluations, but generally agrees that neither SCR nor SNCR are cost effective for this project, which consists of a burner system modification to fire natural gas. It is noted that the costs of a SCONOx™ system were not estimated. However, costs for a comparable SCONOx™ system are typically higher than SCR and it is not expected that this technology would be cost effective for the project.

Draft NOx BACT Determination: The Department determines NOx BACT to be low-NOx burners with flue gas recirculation. The following limits represent BACT for NOx emissions.

Gas: NOx emissions shall not exceed 0.06 lb/mmBTU of heat input, 24-hour daily CEMS average

Oil: NOx emissions shall not exceed 0.12 lb/mmBTU of heat input, 24-hour daily CEMS average

As shown in Table 3A, this determination is consistent with recent BACT determinations for similarly sized boilers. The NOx limit for firing natural gas was rounded up because a shorter compliance averaging period than requested was specified. The result is a less than 10% increase. The NOx limit for firing distillate oil was based on the proposed burner manufacturer's guarantee, assuming that the fuel nitrogen content will be less than 0.02% by weight. Recent data on very low sulfur No. 2 distillate oil indicates a *maximum* nitrogen content of 0.015% by weight. Compliance will be demonstrated by data collected from the certified NOx continuous emissions monitoring system (CEMS). In making this determination, the Department gave consideration to the project as a modification of an existing oil-fired boiler to accommodate natural gas as a primary fuel. The draft BACT standards are much more stringent than the NSPS standards in Subpart Db of 40 CFR 60.

3.3 Carbon Monoxide CO

Discussion of CO Emissions

Emissions of carbon monoxide (CO) will result from incomplete fuel combustion. In general, CO emissions are inversely proportional to NOx emissions. However, new advanced burner designs have also been able to lower CO emissions concurrently with reduced NOx emissions.

Applicant's Initial Proposed CO Controls

The applicant reviewed recent CO BACT determinations and noted that no add-on controls were required for similarly sized package boilers. In addition, the applicant believes that the proposed emission standards are within the general range of these recent BACT determinations.

Applicant's Initial Proposal: The applicant proposed the following CO standards.

Gas: CO emissions shall not exceed 0.15 lb/mmBTU of heat input

Oil: CO emissions shall not exceed 0.16 lb/mmBTU of heat input

Department's CO Determination

The Department discussed the feasibility of lower CO emissions rates for the modified boiler with the applicant. After additional discussions with the burner manufacturer, the applicant agreed to the following CO emissions standards that would avoid a BACT determination.

Gas: CO emissions shall not exceed 0.10 lb/mmBTU of heat input, 3-hour test average

Oil: CO emissions shall not exceed 0.11 lb/mmBTU of heat input, 3-hour test average

The Department believes that a new boiler would be able to achieve a CO standard of 0.06 to 0.10 lb/mmBTU. The requested emissions standard appears reasonable, considering that the applicant's primary purpose in retrofitting the existing boiler's burner system was to accommodate natural gas as an additional fuel. Compliance with the emissions standards shall be demonstrated by conducting initial and annual performance tests in accordance with EPA Method 10 at permitted capacity.

3.4 Particulate Matter (PM/PM_{10}) and Sulfur Dioxide (SO_2)

Discussion of PM/PM_{10} and SO_2

Emissions of particulate matter (PM/PM_{10}) and sulfur dioxide (SO_2) will result from the combustion of natural gas and distillate oil. Particulate matter emissions increase with incomplete fuel combustion as well as with higher concentrations of ash, sulfur, and trace elements in the fuel. Sulfur dioxide emissions will increase with higher fuel sulfur contents. However, natural gas and very low sulfur distillate oil contain little ash, sulfur, or other contaminants.

Applicant's Proposed PM/PM_{10} and SO_2 Controls

The applicant indicates that post-control devices are not typically applied to package boilers and would be cost prohibitive.

Applicant's Proposal: For both PM/PM_{10} and SO_2, the applicant proposes the following fuel specifications and opacity standard.

Gas: Pipeline-quality natural gas

Oil: No. 2 distillate oil with a maximum of 0.05% sulfur by weight

Gas or Oil: Opacity shall not exceed 20%, except for one 6-minute period per hour not to exceed 27%

Department's Draft PM/PM_{10} and SO_2 BACT Determinations

The Department identifies several available control technologies for particulate matter removal including centrifugal collectors, electrostatic precipitators, fabric filters, and wet scrubbers. However, particulate emissions are estimated to be much less than 0.01 grains per dscf of exhaust gas, which is approximately the level of controlled emissions from a baghouse. Similarly, there is acid gas scrubbing equipment available to further reduce SO_2 emissions. The applicant proposes to fire pipeline-quality natural gas and very low sulfur distillate oil as the primary fuels with as a backup fuel. The Department agrees with the applicant that further control of particulate matter and sulfur dioxide emissions with any of these add-on control technologies would be cost prohibitive due to the very low uncontrolled emissions. The fuel sulfur contents

proposed are clearly more stringent than the NSPS Subpart Db standard of 0.5% sulfur by weight. The specification of clean fuels constitutes a pollution prevention technique and is given favorable consideration in this case.

Draft PM/PM10 and SO2 BACT Determinations: The Department establishes the following fuel specifications as BACT for PM/PM10 and SO2.

Gas: Pipeline-quality natural gas with a maximum sulfur content of 2 grains of sulfur per 100 SCF

Oil: No. 2 distillate oil with a maximum of 0.05% sulfur by weight

The Department notes that pipeline-quality natural gas typically contains much less than 0.5 grains per 100 SCF of natural gas. Compliance with the fuel sulfur limit for distillate oil shall be demonstrated by an initial test and maintaining the fuel quality records provided by the vendor for each shipment. Limiting the fuel sulfur content also effectively limits the potential emissions of SAM and SO2, so that additional emissions standards are unnecessary. In conjunction with the above fuel specifications, the Department also establishes the following standards as BACT for PM/PM10.

Oil: PM emissions shall not exceed 0.03 lb/mmBTU of heat input

Gas or Oil: Opacity shall not exceed 10%, except for one 6-minute period per hour not to exceed 20%

The Department notes that the oil firing particulate matter standard is well below the NSPS standard in 40 CFR 60.43b of 0.10 lb/mmBTU of heat input. PM emissions should be well below the proposed PM standard based on previous tests conducted when firing oil with a sulfur content of 0.3% by weight and the fact that a very low sulfur (<0.05% sulfur by weight) distillate oil is proposed for the project. No PM limit will be specified for gas firing, but the maximum expected emission rate will be identified as 0.002 lb/mmBTU of heat input. An initial compliance test (EPA Method 5) will be required for firing distillate oil. Compliance with the opacity standard will be demonstrated by data collected from the required continuous opacity monitoring system (COMS). Note: The applicant requested a higher opacity standard based on the requirements in NSPS Subpart Db. However, that standard was based on firing distillate oil containing up to 0.5% sulfur by weight. The proposed fuels are natural gas and distillate oil containing no more than 0.05% by weight. It is expected that there will be no visible emissions plume from the stack because these fuels contain very little sulfur, ash, or other contaminants. After the initial performance test, the opacity standard will also serve as an indicator of efficient combustion and compliance with the particulate matter standards.

3.5 PSD-Synthetic Minor Limits for Volatile Organic Compounds (VOC)

VOC emissions result from incomplete combustion when firing natural gas or distillate oil. The package boiler offers relatively high temperatures for the efficient combustion of the clean fuels, which results in low VOC emissions. Based on the applicant's request, the Department establishes the following standard as a PSD-synthetic minor limit for VOC emissions.

Gas or Oil: the efficient combustion of clean fuels

Compliance with the CO standards and opacity limits shall serve as indicators of good combustion. The maximum expected VOC emission rate will be identified as 0.03 lb/mmBTU of heat input for either fuel. No performance tests will be required, however, the Department reserves the right to require special compliance tests in accordance with Rule 62-297.310(7)(b), F.A.C. VOC emissions should be reported in terms of methane, as determined by EPA Method 25A. Optionally, EPA Method 18 may also be conducted concurrently with EPA Method 25A to deduct non-regulated emissions of methane and ethane.

3.6 Excess Emissions

Based on the design of the boiler and Rules 62-210.700 and 62-4.130, F.A.C., the following conditions address periods of excess emissions.

Excess Emissions Prohibited: Excess emissions caused entirely or in part by poor maintenance, poor operation or any other equipment or process failure that may reasonably be prevented during startup, shutdown or malfunction shall be prohibited. All such emissions shall be included in the calculation of the continuous compliance average for opacity and NOx emissions.

Excess Emissions Defined: During startup, shutdown, and documented unavoidable malfunction, the following permit conditions allow excess emissions or the exclusion of monitoring data for specifically defined periods of operation. These conditions apply only if operators employ the best operational practices to minimize the amount and duration of excess emissions during such incidents.

a. Opacity shall be recorded by the COMS during all episodes of startup, shutdown and malfunction. During startup, visible emissions shall not exceed 20% opacity, based on a 6-minute average.

b. NOx emissions data shall be recorded by the CEMS during all episodes of startup, shutdown and malfunction. Individual hourly average NOx emission rate values recorded during such episodes may be excluded from the continuous NOx compliance determination. No more than two (2) hourly average emission rate values shall be excluded in any 24-hour (daily) period due to all startups, shutdowns, or unavoidable malfunctions.

4. AIR QUALITY IMPACT ANALYSIS

4.1 Introduction

The applicant predicts the proposed project will increase PM_{10}, NO_2 and CO emissions at levels in excess of PSD significant amounts. PM_{10} and NO_2 are criteria pollutants and have national and state ambient air quality standards (AAQS), PSD increments, and significant impact levels defined for them. CO is a criteria pollutant and has only AAQS and significant impact levels defined for it. The applicant's initial Class II PM_{10}, NO_2, and CO analyses predicted no significant impacts in the area surrounding the proposed facility; therefore, full impact Class II AAQS and PSD Class II increment analyses were not required for these pollutants. The nearest Class I area is the Everglades National Park (ENP) which is located approximately 92 km south of the project site. The applicant's PSD Class I air quality analyses showed no significant impacts; therefore cumulative impact analyses were not required in these Class I areas. Also, the maximum predicted impacts for all four pollutants were below their respective *de minimis* ambient impact levels. Therefore, pre-construction monitoring at the proposed site was not required for this project. Based on the preceding discussion, the air quality impact analyses required by the PSD regulations for this project include:

- A Class II significant impact analysis for PM_{10}, NO_2, and CO;
- A Class I significant impact analysis for PM_{10} and NO_2;
- An analysis of impacts on soils, vegetation, and visibility and of growth-related air quality modeling impacts.

Based on the required analyses, the Department has reasonable assurance that the proposed project, as described in this report and subject to the conditions of approval proposed herein, will not cause or significantly contribute to a violation of any AAQS or PSD increment. However, the following EPA-directed stack height language is included: "In approving this permit, the Department has determined that the application complies with the applicable provisions of the stack height regulations as revised by EPA on July 8, 1985 (50 FR 27892). Portions of the regulations have been remanded by a panel of the U.S. Court of Appeals for the D.C. Circuit in NRDC v. Thomas, 838 F. 2d 1224 (D.C. Cir. 1988). Consequently, this permit may be subject to modification if and when EPA revises the regulation in response to the court decision. This may result in revised emission limitations or may affect other actions taken by the source owners or operators." A discussion of the required analyses follows.

4.2 Analysis of Existing Air Quality

Preconstruction ambient air quality monitoring is required for all pollutants subject to PSD review unless otherwise exempted or satisfied. The monitoring requirement may be satisfied by using existing representative monitoring data, if available. An exemption to the monitoring requirement may be obtained if the maximum air quality impact resulting from the projected emissions increase, as determined by air quality modeling, is less than a pollutant-specific de minimis concentration. The table below shows that predicted impacts from the combustion turbines are substantially less than the respective de minimis levels; therefore, preconstruction ambient air quality monitoring is not required for any pollutant.

Maximum Project Air Quality Impacts Compared to De Minimis Ambient Impact Levels

Pollutant	Averaging Time	Max. Predicted Impact ($\mu g/m^3$)	De Minimis Level ($\mu g/m^3$)	Impact Greater Than De Minimis?
NO2	Annual	0.5	14	No
CO	8-hour	20	575	No
PM10	24-hour	1	10	No

4.3 Models and Meteorological Data Used in Significant Impact, PSD Increment and AAQS Analyses

PSD Class II Area Model

The EPA-approved Industrial Source Complex Short-Term (ISCST3) dispersion model was used to evaluate the pollutant emissions from the proposed project and other existing major facilities. The model determines ground-level concentrations of inert gases or small particles emitted into the atmosphere by point, area, and volume sources. The model incorporates elements for plume rise, transport by the mean wind, Gaussian dispersion, and pollutant removal mechanisms such as deposition. The ISCST3 model allows for the separation of sources, building wake downwash, and various other input and output features. A series of specific model features, recommended by the EPA, are referred to as the regulatory options. The applicant used the EPA recommended regulatory options in each modeling scenario. Direction-specific downwash parameters were used for all sources for which downwash was considered. The stacks associated with this project will not exceed the good engineering practice (GEP) stack height criteria.

Meteorological data used in the ISCST3 model consisted of a concurrent 5-year period of hourly surface weather observations and twice-daily upper air soundings from the National Weather Service (NWS) station at West Palm Beach, Florida. The 5-year period of meteorological data was from 1987 through 1991. This NWS station was selected for use in the study because it is the closest primary weather station to the study area and is most representative of the project site. The surface observations included wind direction, wind speed, temperature, cloud cover, and cloud ceiling.

Because five years of data are used in ISCST3, the highest-second-high (HSH) short-term predicted concentrations were compared with the appropriate AAQS or PSD increments. For the annual averages, the highest predicted yearly average was compared with the standards. For determining the project's significant impact area in the vicinity of the facility, and for determining if there are significant impacts occur from the project on any PSD Class I area, both the highest short-term predicted concentrations and the highest predicted yearly averages were compared to their respective significant impact levels.

PSD Class I Area Model

Since the entire PSD Class I Everglades National Park (ENP) area is greater than 50 km from the proposed project, long-range transport modeling was also required for the Class I impact assessment. The California Puff (CALPUFF) dispersion model was used to evaluate the potential impact of the proposed pollutant emissions on the PSD Class I increments and regional haze. CALPUFF is a non-steady state, Lagrangian, long-range transport model that incorporates Gaussian puff dispersion algorithms. This model determines

ground-level concentrations of inert gases or small particles emitted into the atmosphere by point, line, area, and volume sources. The CALPUFF model has the capability to treat time-varying sources. It is also suitable for modeling domains from tens of meters to hundreds of kilometers, and has mechanisms to handle rough or complex terrain situations. Finally, the CALPUFF model is applicable for inert pollutants as well as pollutants that are subject to linear removal and chemical conversion mechanisms.

The meteorological data used in the CALPUFF model was processed by the California Meteorological (CALMET) model. The CALMET model utilizes data from multiple meteorological stations and produces a three-dimensional modeling grid domain of hourly temperature and wind fields. The wind field is enhanced by the use of terrain data, which is also input into the model. Two-dimensional fields such as mixing heights, dispersion properties, and surface characteristics are produced by the CALMET model as well. For this project, the CALMET model produced a modeling domain that is approximately 470 km in the north-south direction by 450 km in the east-west direction. The southwest corner is the origin of the modeling domain and is located at 23.75 N degrees latitude and 83.5 W longitude. This modeling domain was produced by utilizing 1990 meteorological data from 3 sea surface, 3 upper air, 8 land surface, and 23 precipitation stations located throughout Florida and adjacent waters.

4.4 Significant Impact Analysis

Preliminary modeling is conducted using only the proposed project's worst-case emission scenario for each pollutant and applicable averaging time. Over 500 receptors were placed along the facility's restricted property line and out to 10 km from the facility, which is located in a PSD Class II area. This grid had both discrete and gridded polar receptors. The number of discrete receptors was 393. These receptors were spaced at 100-meter intervals along the property boundary. The other 114 receptors were included in a polar grid, with 36 radials extending out from the origin. Along each radial, receptors were located at distances of 4.0, 5.0, 7.0 and 10 km from the origin. There were 126 receptors were placed in the Everglades National Park (ENP) PSD Class I area. For each pollutant subject to PSD and also subject to PSD increment and/or AAQS analyses, this modeling compares maximum predicted impacts due to the project with PSD significant impact levels to determine whether significant impacts due to the project were predicted in a PSD Class II area in the vicinity of the facility or in any PSD Class I area. In the event that the maximum predicted impact of a proposed project is less than the appropriate significant impact level, a full impact analysis for that pollutant is not required. Full impact modeling is modeling that considers not only the impact of the project but also other major sources, including background concentrations, located within the vicinity of the project to determine whether all applicable AAQS or PSD increments are predicted to be met for that pollutant. Consequently, a preliminary modeling analysis, which shows an insignificant impact, is accepted as the required air quality analysis (AAQS and PSD increments) for that pollutant and no further modeling for comparison to the AAQS and PSD increments is required for that pollutant. The tables below show the results of this modeling. The radius of significant impact, if any, for each pollutant and applicable pollutant averaging time is also shown in the tables below.

Maximum Air Quality Impacts from the Project Compared to the PSD Class II Significant Impact Levels in the Vicinity of the Facility

Pollutant	Averaging Time	Maximum Predicted Impact ($\mu g/m^3$)	Significant Impact Level ($\mu g/m^3$)	Significant Impact?	Radius of Significant Impact (km)
PM10	Annual	0.1	1	No	----
	24-hr	1	5	No	----
CO	8-hr	20	500	No	----
	1-hr	40	2,000	No	----
NO2	Annual	0.5	1	No	----

Maximum Air Quality Impacts from the Project Compared to the PSD Class I Significant Impact Levels for the Everglades National Park

Pollutant	Averaging Time	Maximum Predicted Impact ($\mu g/m^3$)	Significant Impact Level ($\mu g/m^3$)	Significant Impact?
PM10	Annual	0.001	0.2	No
	24-hr	0.02	0.3	No
NO2	Annual	0.001	0.1	No

As shown in the tables there are no maximum predicted air quality impacts due to any emissions from the proposed project which are greater than the PSD significant impact levels. Therefore, under the PSD program, no further air quality impact analysis (PSD increment or AAQS analysis) is required for this project.

4.5 Additional Impacts Analysis

Impacts On Soils, Vegetation, Wildlife, and Visibility

The maximum ground-level concentrations predicted to occur due to PM10, NO2 and CO emissions as a result of the proposed project, including all other nearby sources, will be below the associated AAQS. The AAQS are designed to protect both the public health and welfare. As such, this project is not expected to have a harmful impact on soils and vegetation in the PSD Class II area. An air quality related values (AQRV) analysis was done by the applicant for the Class I area. No significant impacts on this area are expected. A regional haze analysis using the long-range transport model CALPUFF was done for the ENP Class I area. This analysis showed no significant impact on visibility in this area.

Growth-Related Air Quality Impacts

There will be no growth associated with this project because equipment is only being replaced.

5. 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 determination is based on a technical review of the complete PSD application, reasonable assurances provided by the applicant, the draft determinations of Best Available Control Technology (BACT), review of the Air Quality Analysis, and the specific conditions of the draft permit. Cleve Holladay is the project meteorologist responsible for reviewing and validating the Air Quality Analysis for the project. Jeff Koerner is the project engineer responsible for reviewing the application, recommending the BACT determinations, and drafting the permit. Additional details of this analysis may be obtained by contacting the project engineer at the Department's Bureau of Air Regulation at Mail Station #5505, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.