Golder Associates Inc.

6241 NW 23rd Street, Suite 500
Gainesville, FL 32653-1500
Telephone (352) 336-5600
Fax (352) 336-6603

September 29, 2003

0137609-1206

Bureau of Air Regulation
Florida Department of Environmental Protection
2600 Blair Stone Road,
Tallahassee, Florida 32399-2400

Attention: Mr. A. A. Linero, P.E., Administrator of New Source Review Section
Mr. Hamilton S. Oven, Jr., P.E. Administrator, Siting Coordination Office

RE: FLORIDA POWER & LIGHT COMPANY (FPL) – MANATEE UNIT 3 STACK AND LOCATION REFINEMENTS, PSD-FL-328, FDEP FILE NO. 0810010-006-AC,
SITE CERTIFICATION PA 02-44
UPDATES IN NEAR-FIELD AIR QUALITY IMPACTS

Dear Al and Buck:

The descriptive information in the air permit (Section III. Part A) identified stack parameters used in the air impact analyses for Manatee Unit 3. These air impact analyses, which were also included as part of the Site Certification Application, were based on specific stack parameters and locations. With the commencement of construction, certain design enhancements have been made. The design enhancements pertain to slight changes in the air inlet locations relative to the Heat Recovery Steam Generator (HRSG) stacks and increased HRSG stack heights for all units (see Attachment A). On behalf of FPL, an air modeling analysis was conducted to verify if there are any changes in near-field air quality impacts from these enhancements.

The revised near-field significant impact air modeling results are presented in Table 6-8. For convenience, the table retains the same table identification as Chapter 6 of Appendix 10.1.5 [Prevention of Significant Deterioration (PSD) Permit Application] in the Site Certification Application (SCA). Table 6-8 contains the same information as Table 5.6-2 of the SCA. As shown in Table 6-8, the maximum project's impacts, due to the design enhancements, are predicted to be the same or less than the impacts of the original configuration. The information provided in Table 6-8 includes simple cycle operation, which at this time remains an option for the Project.

The revised air modeling files will be transferred to DEP electronically. The referenced tables and revised site plan are attached. If you have any questions or require other information regarding this analysis, please contact David Larocca or me at (352) 336-5600. Thank you for your assistance and attention to this matter.

Sincerely,

GOLDER ASSOCIATES INC.

Kennard F. Kosky, P. E.
Principle

David T. Larocca
Project Engineer

KFK/DTL/nav

Enclosures

cc: Barbara P. Linkiewicz, FPL

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Table 6-8. Summary of Maximum Pollutant Concentrations Predicted for the Project Compared to the EPA Class II Significant Impact Levels -- Old Layout (2/15/02)

Pollutant	Averaging Time	Maximum Predicted Concentration (ug/m^3)		EPA Class II Significant Impact Levels (ug/m^3)
		Simple Cycle Natural Gas	Combined Cycle Natural Gas	
SO_2	Annual	0.01	0.33	1
	24-Hour	1.68	4.23	5
	3-Hour	7.87	17.57	25
PM_{10}	Annual	0.02	0.54	1
	24-Hour	2.22	**6.78**	5
NO_2	Annual	0.08	0.57	1
CO	8-Hour	16.08	57.3	500
	1-Hour	48.34	143.0	2,000

Table 6-8. Summary of Maximum Pollutant Concentrations Predicted for the Project Compared to the EPA Class II Significant Impact Levels -- New Layout (7/13/03)

Pollutant	Averaging Time	Maximum Predicted Concentration (ug/m3)		EPA Class II Significant Impact Levels (ug/m3)
		Simple Cycle Natural Gas	Combined Cycle Natural Gas	
SO2	Annual	0.01	0.24	1
	24-Hour	1.60	2.90	5
	3-Hour	7.61	11.66	25
PM10	Annual	0.01	0.40	1
	24-Hour	1.73	**4.36**	5
NO2	Annual	0.08	0.39	1
CO	8-Hour	15.83	34.8	500
	1-Hour	48.07	106.1	2,000

ATTACHMENT A

Summary of Manatee Unit 3 Enhancements
Unit 3 Cooling Tower Information
Unit 3 BPIP Figures

Table A-2. FPL Manatee Summary of Unit-3 Project Layout Enhancements

	New Layout	Old Layout	Comment	NEW Local Cord (x)	NEW Local Cord. (y)	OLD Local Cord. (x)	OLD Local Cord. (y)
	(m)	(m)		(m)	(m)	(m)	(m)
HRSG A Stack Height	44.2	36.6	New Location	-147	60	-152	55
HRSG B Stack Height	44.2	36.6	New Location	-101.3	60	-107	55
HRSG C Stack Height	44.2	36.6	New Location	-15.3	60	0	55
HRSG D Stack Height	44.2	36.6	New Location	26	60	45.7	55
Bypass A Stack Height	24.38	24.38	New Location	-147	3	-152.7	0
Bypass B Stack Height	24.38	24.38	New Location	-101.3	3	-107	0
Bypass C Stack Height	24.38	24.38	New Location	-15.3	3	0	0
Bypass D Stack Height	24.38	24.38	New Location	26	3	45.7	0
HRSG Height	25.3	25.3					
HRSG Width	9.5	9.5					
HRSG Length	22.7	22.7					
Air Inlet Height	13.72	13.72	Air inlets in new layout are located closer to the bypass stacks, see BPIP figure.				
Air Inlet Width	7.3	7.3					
Air Inlet Length	14.72	14.72					

PROJECT TITLE

D:\manatee\bpip\manatee.bpv

COMMENTS

BUILDINGS

13

SOURCES

8

COMPANY NAME

MODELER

DATE

7/23/03

SCALE

0 0.05 km

PROJECT NO

BPIP View - Lakes Environmental Software

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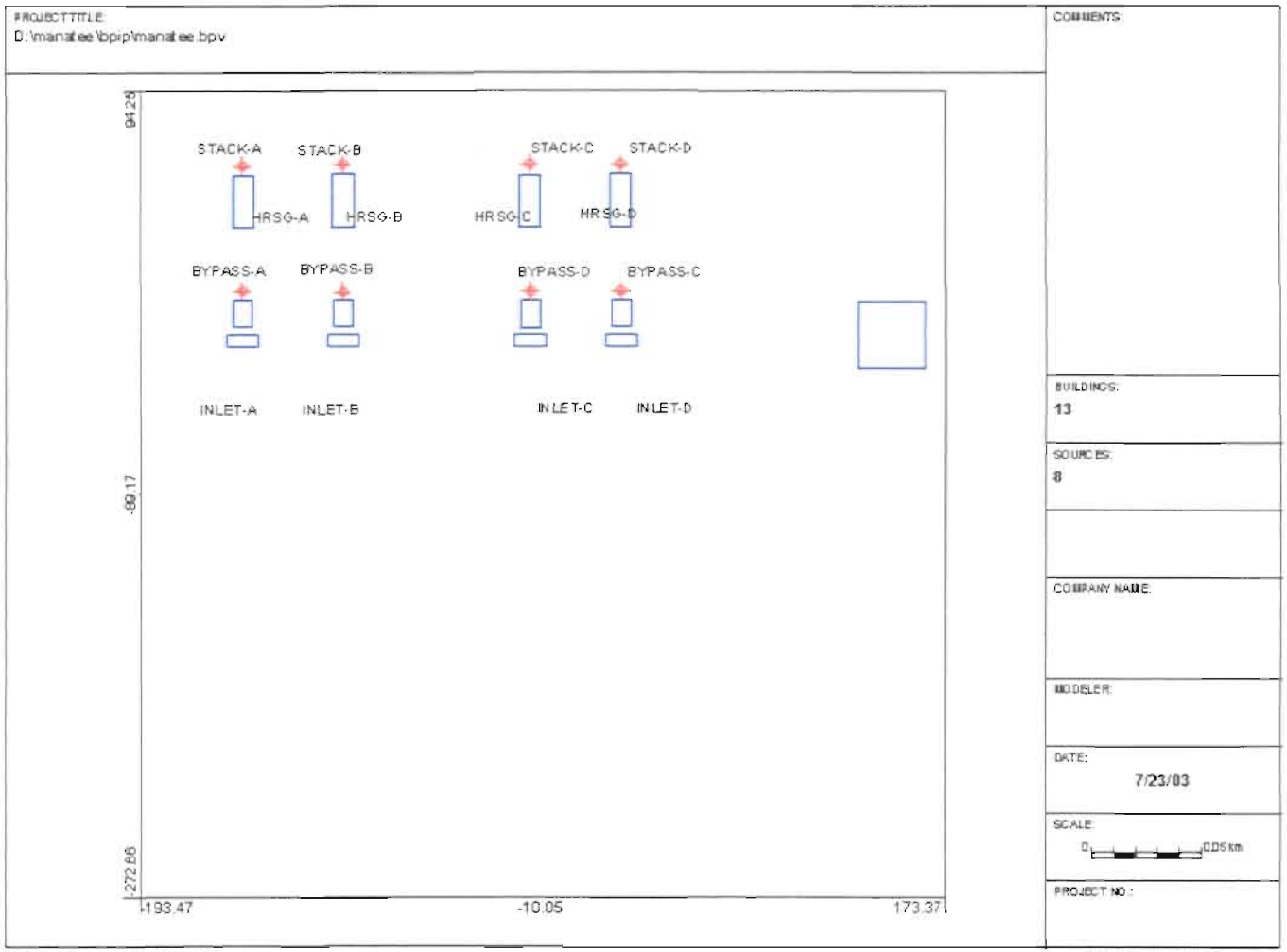
PROJECT TITLE:
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COMMENTS:
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STACK-A
STACK-B
STACK-C
STACK-D
HRSG-A
HRSG-B
HRSG-C
HRSG-D
BYPASS-A
BYPASS-B
BYPASS-D
BYPASS-C
INLET-A
INLET-B
INLET-C
INLET-D
-193.47
-10.05
173.37
BUILDINGS:
13
SOURCES:
8
COMPANY NAME:
MODELER:
DATE:
7/23/03
SCALE:
0
0.05 km
PROJECT NO.:
BPIP Version - Lakes Environmental Software
J:\manatee\manatee.bpv

Golder Associates Inc.

6241 NW 23rd Street, Suite 500
Gainesville, FL 32653-1500
Telephone (352) 336-5600
Fax (352) 336-6603

August 7, 2002

0137609

Mr. C.H. Fancy, P.E., Chief
Bureau of Air Regulation
Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Attention: Mr. Jeff Koerner, New Source Review Section

RE: REVISED REGIONAL HAZE ANALYSIS FOR THE PREVENTION OF SIGNIFICANT DETERIORATION APPLICATION FOR THE FPL MARTIN EXPANSION PROJECT

Dear Jeff:

On behalf of Florida Power and Light Company (FPL), Golder Associates Inc. (Golder) is providing a revised regional haze analysis for the proposed Martin Expansion Project. The revision is due to a change made to the nitrate switch setting in the CALPOST program.

The change results in higher regional haze impacts for the proposed project. The resulting maximum values (i.e., 1.91 percent for simple-cycle operation and 4.90 percent for combined-cycle operation on fuel oil) remain below the Federal Land Manager's visibility screening criteria of 5 percent. There are no other changes to the application.

Attached are the pages that were revised in the Air Construction Permit/PSD application. The revised air modeling computer files are being provided electronically to Cleve Holladay. If you have any questions, please call me at (352) 336-5600 ext 539 or Ken Kosky at ext 516. Thank you.

Sincerely yours,

GOLDER ASSOCIATES INC.

Steven R. Marks, CCM
Associate

Kennard F. Kosky, PE
Project Manager

Attachments

SRM/jkw

cc: K. H. Simmons, FPL
C. Holladay, DEP

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distance due to the scattering and absorption by gases and particles in the atmosphere. A change in the extinction coefficient produces a perceived visual change. An index that simply quantifies the percent change in visibility due to the operation of a source is calculated as:

$$\Delta\% = (b_{exts} / b_{extb}) \times 100$$

where: b_{exts} is the extinction coefficient calculated for the source, and
b_{extb} is the background extinction coefficient.

The purpose of the visibility analysis is to calculate the extinction at each receptor for each day (24-hour period) of the year due to the proposed Project. The criteria to determine if the Project's impacts are potentially significant are based on a change in extinction of 5 percent or greater for any day of the year.

Processing of visibility impairment for this study was performed with the CALPUFF model (see Appendix D) and the CALPUFF post-processing program CALPOST. The analysis was conducted in accordance with the most recent guidance from the FLAG report (December 2000). The CALPUFF postprocessor model CALPOST is used to calculate the combined visibility effects from the different pollutants that are emitted from the Project. Daily background extinction coefficients are calculated on a hour-by-hour basis using hourly relative humidity data from CALMET and hygroscopic and non-hygroscopic extinction components specified in the FLAG document. For the Class I area evaluated, the hygroscopic and non-hygroscopic components are 0.9 and 8.5 inverse mega meter (Mm^{-1}). CALPOST then predicts the percent extinction change for each day of the year.

The regional haze analysis was performed for both simple cycle and combined cycle configurations. For simple cycle configuration, the analysis was performed for two simple cycle units (Units 8C and 8D) since two simple cycle units (Units 8A and 8B) are existing units and modeling was performed for these units when originally permitted. The simple cycle configuration of these units not being modified, but is modified by the combined cycle configuration. For combined cycle configuration, the emissions inventory was adjusted to remove double counting emissions of PM/PM_{10}, sulfur dioxide (SO_2) and sulfuric acid mist. The emissions of these pollutants were determined independently as provided in Appendix A. For PM/PM_{10}, emissions were increased by conservatively assuming that 9.8 percent of the SO_2 was converted to particulate by the reaction of

ammonia used in the SCR system with SO_3 to form ammonium sulfate. Sulfuric acid mist emissions were conservatively assumed to be 10 percent of the SO_2 emissions. The overall conversion of SO_2 to particulate and sulfuric acid mist was assumed to be about 20 percent (i.e., 19.8 percent), which provided very conservative emission rates for individual pollutants. However, no change in the potential SO_2 emission was made and it was assumed that the preferential reaction of ammonia and SO_3 was not controlling. To eliminate double counting of SO_2 conversions in the regional haze analysis when firing oil, the actual sulfuric acid missions and additional particulate emissions were assumed to be one-half of the values when the pollutant formation is considered separately. In addition, the SO_2 emissions are reduced proportionally based on the conversion of PM/PM_{10} and sulfuric acid mist. These assumptions provide conservative emission estimates for the regional haze analysis.

Results

The results of the refined regional haze analysis are presented in Table 7-5. The results indicate that the proposed Project's maximum predicted impact on visibility at the Everglades NP is 4.90 percent for the combined-cycle operation on fuel oil. The maximum predicted impact on visibility when firing natural gas is 1.91 percent. The values are below the FLM's screening criteria of 5 percent change. Therefore, the Project is not expected to have an adverse impact on the existing regional haze in the Everglades NP.

7.4.3 SULFUR AND NITROGEN DEPOSITION

General Methods

As part of the AQRV analyses, total nitrogen (N) and sulfur (S) deposition rates were predicted at the Everglades NP Class I area. The deposition analysis thresholds (DAT) are based on the annual averaging period. The total deposition is estimated in units of kilogram per hectare per year (kg/ha/yr) of nitrogen or sulfur. The CALPUFF model is used to predict wet and dry deposition fluxes of various oxides of these elements.

For N deposition, the species include:

- Particulate ammonium nitrate (from species NO_3), wet and dry deposition;
- Nitric acid (species HNO_3), wet and dry deposition;
- NO_x, dry deposition; and
- Ammonium sulfate (species SO_4), wet and dry deposition.

For S deposition, the species include:

- SO2, wet and dry deposition; and
- SO4, wet and dry deposition.

The CALPUFF model produces results in units of $\mu g/m^2/s$. The modeled deposition rates are then converted to N or S deposition in kg/ha respectively, by using a multiplier equal to the ratio of the molecular weights of the substances (IWAQM Phase II report Section 3.3).

Deposition analysis thresholds (DAT) for nitrogen and sulfur deposition of 0.01 kg/ha/yr were provided by the U.S. Fish and Wildlife Service (January 2002). A DAT is the additional amount of N or S deposition within a Class I area, below which estimated impacts from a proposed new or modified source are considered insignificant. The maximum N and S depositions predicted for the Project are, therefore, compared to these DAT or significant impact levels.

Results

The maximum predicted N and S depositions predicted for the Project in the PSD Class I area of the Everglades NP are summarized in Table 7-6. The maximum N and S deposition rates for the Project are predicted to be 0.0015 and 0.0004 kg/ha/yr, respectively. These maximum deposition rates are below the significant impact levels for N and S of 0.01 kg/ha/yr. As a result, the Project's emissions are not expected to have a significant adverse effect on N and S deposition at the Class I area.

Table 7-5. Maximum 24-hour Average Visibility Impairment Predicted for the Project at the PSD Class I Area of the Everglades NP

Operating Mode	Maximum Visibility Impairment (%) [a]		Visibility Impairment Criteria (%)
	Natural Gas	Fuel Oil	
Combined-Cycle	1.91	4.90	5.0
Simple-Cycle (2 Units)	0.82	3.2	5.0

[a] Concentrations are highest predicted using CALPUFF model and 1990 CALMET wind field for south Florida. Background extinctions calculated using FLAG Document (December 2000) values and hourly relative humidity data.

[b] Concentrations predicted for combined- and simple cycle operation are based on the operating scenario with the maximum hourly emissions. For both natural gas- and oil-firing, maximum emissions are based on the combustion turbines operating for baseload conditions at an ambient temperature of 35°F.

For combined cycle operation and natural gas-firing, duct burner emission are included. For simple cycle operation and natural gas-firing, combustion turbines are assumed to operate at higher power mode.