Department of
Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

November 30, 2000

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. John A. Fanjul, Vice President and General Manager
Atlantic Sugar Association, Inc.
P.O. Box 1570
Belle Glade, FL 33440

Re: Request for Additional Information No. 4
DEP File No. 0990016-004-AC (PSD-FL-078A, *Formerly PSD-FL-279*)
Increased Operation of Boiler No. 5

Dear Mr. Fanjul:

On November 3, 2000, the Department received some of the additional information requested on August 4, 2000 for the above referenced project. The application remains incomplete. The following additional information is needed in order to continue processing your application. Should your response to any of the below items require new calculations, please submit the new calculations, assumptions, reference material and appropriate revised pages of the application form. The items are numbered as in the original request.

1. The Department has received the summary tables for the revised modeling analysis, but no revised modeling files. Please submit the revised modeling files for review.

The Department will resume processing your application after receipt of the requested information. Rule 62-4.050(3), F.A.C. requires that all applications for a Department permit must be certified by a professional engineer registered in the State of Florida. This requirement also applies to responses to Department requests for additional information of an engineering nature. A new certification statement by the authorized representative or responsible official must accompany any material changes to the application. Rule 62-4.055(1), F.A.C. now requires applicants to respond to requests for information within 90 days. If there are any questions, please call me at 850/414-7268. Matters regarding modeling issues should be directed to Cleve Holladay (meteorologist) at 850/921-8986.

Sincerely,

Jeffery F. Koerner, P.E.
New Source Review Section

JFK/jfk

cc: Mr. Hector Cardentey, ASA
Mr. David Buff, P.E., Golder Associates
Mr. Gregg Worley, EPA
Mr. John Bunyak, NPS
Mr. David Knowles, South Florida District DEP
Mr. Jim Stormer, PBCHD

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1. Article Addressed to:

Mr. John A. Fanjul
Vice President and Gen. Mgr.
Atlantic Sugar Assn.
P. O. Box 1570
Belle Glade, FL 33440

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Street, Apt. No.; or PO Box No.
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City, State, ZIP+4
Belle Glade, FL 33440

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FLORIDA DEPARTMENT OF HEALTH

Jeb Bush
Governor

Robert G. Brooks, M.D.
Secretary

Mr. Jeff Koerner, P.E.
Florida Department of Environmental Protection
Bureau of Air Regulation
New Source Review Section
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

November 17, 2000

Re: Atlantic Sugar Association
PSD Permit Application for Boiler No. 5
FDEP File No. 0990016-004-AC

Dear Mr. Koerner,

As required, I have reviewed the applicant's November 2, 2000 response to the Department's third Request for Additional Information (RAI) dated August 24, 2000. As you are aware, our position on this project was reflected in the Health Department's August 24, 2000 comments. These included the following comments for consideration when deciding to issue or deny the permit:

1. The applicant has not submitted an air quality analyses that provides reasonable assurances that the proposed project will not cause or contribute to a violation of either a PSD Increment or NAAQS during year-round operation. Since the applicant has failed to provide the requested analyses, the Department may need to *specifically* deny the request for 8,760 hours of operation and restrict operations to the specific period which has been modeled.
2. The applicant's requested cap on heat input is not enforceable since it is based on a significant assumption related to the unit's overall efficiency (55%) which can not be monitored on a continuous basis. In its place, the Department needs (may need) to specify a monitoring program. The program should include continuous monitoring of the feed water and steam production rates, temperatures and pressures, along with continuous monitoring of the combustion efficiency by measuring O_2, CO and CO_2, and annual boiler efficiency testing, as allowed by the BACT Determination process.
3. Throughout the application, the applicant has estimated future PM_{10} emissions based on an emission rate of 0.14 lb/mmBtu. This is not consistent with the proposed BACT limit of 0.15 lb/mmBtu. Since the applicant has used the 0.14 lb/mmBtu to evaluate PSD applicability, ambient impacts, and BACT, the Department should specify a PM_{10} BACT emission limitation of 0.14 lb/mmBtu.
4. As stated in our August 24th comments, the applicant's request for a relaxation of current BACT limitations for NOx and VOC is not justified. Historical data and the most recent test results indicate that as long as the applicant maintains and properly operates the unit, it can comply with the existing BACT limitations of 0.15 lb/mmBtu and 0.25 lb/mmBtu, respectively. Based on the nature of the request, the Department needs (may need) to *specifically* deny the request.
5. The requested restrictions of 1 percent sulfur fuel oil, the 200,000 gallons annual cap on fuel oil, and the limit of 0.05 lb/mmBtu for bagasse need to be made federally enforceable within the final permit. For fuel oil, testing should include a sampling and monitoring program and a fuel oil meter. For bagasse, testing should include initial and renewal stack testing.

6. The Health Department believes that the BACT analysis should specify CEMS for the pollutants with potential emissions above 100 tons per year. This is consistent with the recent BACT analyses for the Thermo Electron Biomass Project, the Osceola Cogeneration Facility, and the Okeelanta Cogeneration Facility. In addition, the applicant should be required to monitor combustion efficiency.

I hope that you find our comments both helpful and supportive in the drafting of the air construction permit and BACT Determination. Should you have any further questions, please feel free to contact me at (561) 355-3136.

Sincerely,

For the Division Director
Environmental Health and Engineering

Darrel Graziani, PE
Air Pollution Control Section

cc: C. Holladay
D. Knowles, SD
EPA
NPS

Filename: 099-0016-004-AC, November Comments

Golder Associates Inc.

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

November 2, 2000

9937584

Florida Department of Environmental Protection
New Source Review Section
2600 Blair Stone Road MS5500
Tallahassee, Florida 32399-2400

Attention: Jeffery Koerner, P.E.

RE: REQUEST FOR ADDITIONAL INFORMATION NO. 3
DEP FILE NO. 0990016-004-AC (PSD-FL-078A, *FORMERLY* PSD-FL-279)
INCREASED OPERATION OF BOILER NO. 5

Dear Mr. Koerner:

On August 4, 2000 the Florida Department of Environmental Protection sent a letter to Mr. John A, Fanjul, Vice President and General Manager of Atlantic Sugar Association (ASA), requesting additional information to continue processing the Boiler 5 Prevention of Significant Deterioration (PSD) application. Golder Associates Inc. (Golder) is submitting this letter on behalf of Mr. John A. Fanjul. The items in this response are numbered as in the August 4, 2000 request, and are supported by the tables in Attachment A.

Comment No. 1
The additional information indicates a revised modeling analysis would be submitted in the near future. The Department has not yet received the modeling files or the summary tables of the analysis. Please submit the revised modeling analysis as soon as possible, including the following changes.

Response:
Revised tables from the original modeling analyses are provided in Attachment A. A modeling analysis for sulfur dioxide (SO_2) is no longer required, and therefore is not included in this submittal.

Comment No. 1a.
Short-term (<= 24-hour) modeling impacts should be based on a maximum heat input of 253 MMBtu per hour.

Response:
ASA has requested a 255.3 MMBtu per hour maximum 1-hr heat input rate, and a 225.9 MMBtu/hr heat input rate as a daily 24-hr average (see revised Table 2-1) for Boiler No. 5. The revised modeling analysis reflects this short-term rate.

Comment No. 1b.
Long-term (>24-hour) modeling impacts should be based on a maximum heat input of 226 MMBtu per hour.

Response:
The maximum 24-hour average heat input rate of 225.9 MMBtu/hr was also used for the long-term modeling analysis. The revised modeling analysis reflects this 24-hr rate modeled for a 7-month future operating season.

Comment No. 1c.
Osceola Boiler No. 5 and Okeelanta Boiler Nos. 12, 14, and 15 have been identified as being built after the PSD baseline date of January 6, 1975. Therefore, these units are no longer included in the baseline inventory for PSD increment modeling

Response:
The PSD increment status for Osceola Boiler No. 5 and Okeelanta Boiler Nos. 12, 14, and 15 have been corrected in revised Table 6-10, summary of PM_{10} sources included in the air modeling analysis.

Comment No. 1d.
Model all Atlantic Sugar boilers for the longest expected future crop season of 7 months (October through April).

Response:
The modeling has been revised to reflect the longest future crop season of 7 months (October through April) for all boilers at ASA. Note that historically ASA has operated during this same 7-month period, beginning as early as October 11 and ending as late as April 10. Refer to Table A in Attachment A for a summary of the months of operation used in the modeling analysis.

Comment No. 1e.
Use appropriate meteorological data and receptor spacing.

Response:
Meteorological data used in the ISCST3 model to determine air quality impacts consisted of a concurrent 5-year period of hourly surface weather observations and twice-daily upper air sounding for the National Weather Service (NWS) office located at the Palm Beach International Airport (PBI). Concentrations were predicted using 5 years of hourly meteorological data from 1987 through 1991. The NWS office at PBI is located approximately 35 km (20 miles) east of the site and is the closest site and the closest primary weather station to the study area considered to have meteorological data representative of the project site. The PBI station meteorological data have been approved by the FDEP and used for numerous air modeling studies submitted as part of air construction permits approved for sources located in Palm Beach County.

A property boundary receptor spacing of 100 meters was used in the revised modeling analysis submitted with this letter. Where refinements of the model results were required, receptors were spaced at 100 meters or less. A graphic display of the receptor locations used in the modeling analysis is presented in Figure 1 of Attachment A.

Comment No. 1f.
The thermal efficiency of the boilers is assumed to be 55 percent regardless of fuel.

Response:
Table 2-1 has been revised to reflect 55 percent efficiency for both cartonaceous fuel and fuel oil.

Comment No. 1g.
Inventory should include future operation of the Okeelanta Power cogeneration boilers, exclude future operation of the Okeelanta Corporation mill boilers, include operation of the Osceola Farms mill boilers and include future operation of the Osceola Power cogeneration boilers.

Response:
Emission inventory Tables 6-10 and 6-12 have been revised where appropriate to include future operation of the Okeelanta Power cogeneration boilers, exclude future operation of the Okeelanta Corporation mill boilers, include operation of the Osceola Farms mill boilers and include future operation of the Osceola Power cogeneration boilers. The revised modeling analysis reflects this future operation.

Comment No. 2
Several changes have been requested throughout the application process. The Department has summarized what it believes are the current requests in Attachment A to this letter. The Department is not attempting to approve or reject these requests at this time, but merely to accurately reflect the final requests made to date. Please provide comments.

Response:
ASA agrees with the summary of the applicant's requests as presented in Attachment A to the Department's letter.

Revised pages of the application are attached reflecting the revised modeling analysis. Please call if you have any questions concerning this information.

Sincerely,

GOLDER ASSOCIATES INC.

David A. Buff

David A. Buff P.E., Q.E.P.
Principal Engineer
Florida P.E. #19011

SEAL

DB/NAL/jkw

Enclosures

cc: Hector Cardentey
John A, Fanjul
Peter Cunningham
Stan Krivo, EPA Region IV
National Park Service
Darrel Graziani
C. Holladay
P:\Projects\1999\9937\9937584a ASA\03\R03ltr.doc
D. Knowles, SD

ATTACHMENT A

SUPPORTING TABLES AND FIGURES

Table A. Crop Season Months of Operation as Used in Modeling for All Boilers, Atlantic Sugar Association.

Time Period	Pollutant	Boilers in Operation	Months of Operation
Future	All	1 - 5	October - April
Current	All	1 - 5	October - March
PSD Baseline			
1974	PM10	1 - 4	October - April
1988	NO2	1 - 5	October - March

Table 1-1. Net Emissions Increase for Belle Glade Atlantic Sugar Boiler No. 5

Pollutant	PSD Baseline Emissions (TPY)	Future Maximum Emissions (TPY)	Net Increase in Emissions (TPY)	PSD Significant Rate (TPY)	PSD Review Applies?
Particulate Matter (PM)	29.0	65.0	36.0	25	Yes
PM10	26.6	60.7	34.1	15	Yes
Sulfur Dioxide	0.5	37.0	36.5	40	No
Nitrogen Oxides	34.9	109.3	74.5	40	Yes
Carbon Monoxide	65.4	2,818.7	2,753.4	100	Yes
Volatile Organic Compounds	36.3	151.8	115.5	40	Yes
Sulfuric Acid Mist	0.03	2.3	2.2	7.0	No
Lead	0.11	0.19	0.09	0.60	No
Mercury	9.20E-03	1.65E-02	7.28E-03	0.10	No
Beryllium	0	2.78E-06	2.78E-06	4.00E-04	No

Table 2-1. Future Short Term Emissions of Regulated Pollutants for ASA Boiler No. 5 (revised 10-20-00)

Regulated Pollutant	Emission Factor (lb/MMBtu)	Ref	Activity Factor 1-Hour Max. (MMBtu/hr)(a)	Activity Factor 24-Hour Avg. (MMBtu/hr)(a)	Maximum Hourly Emissions (lb/hr)	Maximum 24-Hour Emissions (lb/hr)
			Carbonaceuos Fuel			
Particulate Matter (PM)	0.15	1	255.3	225.9	38.3	33.9
Particulate Matter (PM10)	0.14	2	255.3	225.9	35.7	31.6
Sulfur dioxide	0.05	4	255.3	225.9	12.8	11.3
Nitrogen oxides	0.25	4	255.3	225.9	63.8	56.5
Carbon monoxide	6.50	1	255.3	225.9	1,659.6	1,468.1
VOC	0.35	4	255.3	225.9	89.4	79.1
Sulfuric Acid Mist	3.06E-03	5	255.3	225.9	0.8	0.7
Lead	4.45E-04	6	255.3	225.9	0.11	0.10
Mercury	3.80E-05	7	255.3	225.9	0.010	0.0086
Beryllium	--	6	255.3	225.9	--	--
			No. 6 Fuel Oil			
Particulate Matter (PM)	0.10	1	70.5	70.5	7.05	7.05
Particulate Matter (PM10)	0.10	8	70.5	70.5	7.05	7.05
Sulfur dioxide	1.07	9	70.5	70.5	75.4	75.4
Nitrogen oxides	0.31	10	70.5	70.5	21.86	21.86
Carbon monoxide	0.033	10	70.5	70.5	2.33	2.33
VOC	0.0019	10	70.5	70.5	0.13	0.13
Sulfuric Acid Mist	6.55E-02	5	70.5	70.5	4.62	4.62
Lead	1.01E-05	10	70.5	70.5	7.12E-04	7.12E-04
Mercury	7.53E-07	10	70.5	70.5	5.31E-05	5.31E-05
Beryllium	1.85E-07	10	70.5	70.5	1.30E-05	1.30E-05
			Maximum No. 6 Fuel Oil/ Remainder Bagasse			
Particulate Matter (PM)			255.3	225.9	34.8	30.4
Particulate Matter (PM10)			255.3	225.9	32.9	28.8
Sulfur dioxide			255.3	225.9	84.7	83.2
Nitrogen oxides			255.3	225.9	68.1	60.7
Carbon monoxide			255.3	225.9	1,203.5	1,012.4
VOC			255.3	225.9	64.8	54.5
Sulfuric Acid Mist			255.3	225.9	5.2	5.1
Lead			255.3	225.9	8.29E-02	6.99E-02
Mercury			255.3	225.9	7.08E-03	5.96E-03
Beryllium			255.3	225.9	1.30E-05	1.30E-05
			Maximum Any Combination			
Particulate Matter (PM)					38.3	33.9
Particulate Matter (PM10)					35.7	31.6
Sulfur dioxide					84.7	83.2
Nitrogen oxides					68.1	60.7
Carbon monoxide					1,659.6	1,468.1
VOC					89.4	79.1
Sulfuric Acid Mist					5.2	5.1
Lead					0.11	0.10
Mercury					9.70E-03	8.58E-03
Beryllium					1.30E-05	1.30E-05

(a) Maximum 1-hour activity factor is based on a steam production of 130,000 lb/hr at 250 psig, 550 F.
Maximum 24-hour average activity factor based on steam production rate of 115,000 lb/hr at 250 psig, 550 F.
Enthalpy of steam = 1,290 Btu/lb. Enthalpy of feedwater = 210 Btu/lb. Net enthalpy = 1,080 Btu/lb.
Boiler efficiency = 55% on fuel oil and 55% on bagasse.

References

1. Current BACT permit limit for Boiler No. 5.
2. Based on limited source testing of bagasse boiler which indicated 93% of PM was PM10.
3. Based on source test data for Boiler No. 5.
4. Proposed BACT permit limit for Boiler No. 5.
5. Based on assuming 5% of SO2 emissions are equal to SO3, based on AP-42 Section 1.3, Fuel Oil Combustion. Conversion of SO3 to H2SO4 (SO3 x 98/80).
6. Based on AP-42, Section 1.6, Wood Waste Combustion. Represents controlled emissions.
7. Based on stack testing of 5 bagasse boilers in Florida (refer to appendices).
8. Assumed as 100% of PM emissions.
9. Based on 1.0 % S fuel oil; 150,000 Btu/gal; 8.0 lb/gal; assumes 100% conversion of sulfur to SO2.
10. Based on AP-42, Section 1.3, Fuel Oil Combustion, residual oil.
    NOx - 40 lb/1000 gal; CO - 5 lb/1000 gal; VOC - 0.28 lb/1000 gal;
    Lead - 1.51E-03 lb/1000 gal; Mercury - 1.13E-04 lb/1000 gal;
    Beryllium - 2.78E-05 lb/1000 gal

Example Calculations

Single Fuel Combustion:

Hourly Emission Rate = Emission Factor X Activity Factor (1-hour maximum)

Table 2-2. Maximum Annual Emissions Proposed for Atlantic Sugar Boiler No. 5 (revised 7-7-00)

Pollutant	Bagasse Firing			Fuel Oil Firing			TOTAL
	Emission Factor	Heat Input (a) (MMBtu/yr)	Emissions (TPY)	Emission Factor	Heat Input (a) (MMBtu/yr)	Emissions (TPY)	Emissions (TPY)
Particulate Matter (PM)	0.15 lb/MMBtu	867,302	65.0	0.1 lb/MMBtu	0	0	65.0
PM10	0.14 lb/MMBtu	867,302	60.7	0.1 lb/MMBtu	0	0	60.7
Sulfur Dioxide	0.05 lb/MMBtu	837,302	20.9	1.07 lb/MMBtu	30,000	16.1	37.0
Nitrogen Oxides	0.25 lb/MMBtu	837,302	104.7	0.31 lb/MMBtu	30,000	4.7	109.3
Carbon Monoxide	6.50 lb/MMBtu	867,302	2,818.7	0.033 lb/MMBtu	0	0	2,818.7
Volatile Organic Compounds	0.35 lb/MMBtu	867,302	151.8	0.0019 lb/MMBtu	0	0	151.8
Sulfuric Acid Mist	3.06E-03 lb/MMBtu	837,302	1.3	0.066 lb/MMBtu	30,000	1.0	2.3
Lead	4.45E-04 lb/MMBtu	867,302	0.19	1.01E-05 lb/MMBtu	0	0	0.19
Mercury	3.80E-05 lb/MMBtu	867,302	0.016	7.53E-07 lb/MMBtu	0	0	0.016
Beryllium	--	837,302	--	1.85E-07 lb/MMBtu	30,000	2.78E-06	2.78E-06

(a) Total heat input based on steam production of 441.6 x 10^6 lb/yr and 1,964 Btu/lb steam.
Fuel oil considered where worst case emission factor is due to oil burning at 200,000 gal/yr.

Table 3-3. Current Actual Emissions for Atlantic Sugar Boiler No. 5 (revised 07/07/00)

Pollutant	Bagasse Firing				
	Emission Factor		Ref.	Heat Input [a] (MMBtu/yr)	Emissions (TPY)
Particulate Matter (PM)	0.12	lb/MMBtu	1	484,126	29.0
PM10	0.11	lb/MMBtu	2	484,126	26.6
Sulfur Dioxide	0.002	lb/MMBtu	1	484,126	0.48
Nitrogen Oxides	0.144	lb/MMBtu	1	484,126	34.9
Carbon Monoxide	0.27	lb/MMBtu	6	484,126	65.4
Volatile Organic Compounds	0.15	lb/MMBtu	1	484,126	36.3
Sulfuric Acid Mist	1.23E-04	lb/MMBtu	3	484,126	0.03
Lead	4.45E-04	lb/MMBtu	4	484,126	0.11
Mercury	3.80E-05	lb/MMBtu	5	484,126	9.20E-03
Beryllium	--		4	484,126	0.0

[a] Based on actual steam production during 97-98 and 98-99 crop seasons, and design steam enthalpies for Boiler No. 5. (246.5x10^6 lbs steam/yr @ 1,964 Btu/lb).

Footnotes:

(1) Based on average of stack tests from last 5 years.
(2) Based on 93% of PM emissions for bagasse burning.
(3) Based on assuming 5% of SO2 emissions are equal to SO3, based on AP-42 Section 1.3, Fuel Oil Combustion. Conversion of SO3 to H2SO4 (SO3 x 98/80).
(4) Based on AP-42, Section 1.6, Wood Waste Combustion. Represents controlled emissions.
(5) Based on stack testing of 5 bagasse boilers in Florida (refer to appendices).
(6) Based on original PSD permit limit.

Table 3-3a . Current Actual Short Term Emissions of Regulated Pollutants for ASA Boiler No. 5

Regulated Pollutant	Emission Factor (lb/MMBtu)	Ref	Activity Factor 1-Hour Max. (MMBtu/hr) [a]	Activity Factor 24-Hour Avg. (MMBtu/hr) [b]	Maximum Hourly Emissions (lb/hr)	Maximum 24-Hour Emissions (lb/hr)
			Carbonaceuos Fuel			
Particulate Matter (PM)	0.12	1	252.7	225.9	30.3	27.1
Particulate Matter (PM10)	0.112	2	252.7	225.9	28.3	25.3
Sulfur dioxide	0.002	1	252.7	225.9	0.5	0.5
Nitrogen oxides	0.144	1	252.7	225.9	36.4	32.5
Carbon monoxide	0.27	6	252.7	225.9	68.2	61.0
VOC	0.15	1	252.7	225.9	37.9	33.9
Sulfuric Acid Mist	0.000123	3	252.7	225.9	0.0	0.0
Lead	4.45E-04	4	252.7	225.9	0.11	0.10
Mercury	3.80E-05	5	252.7	225.9	0.010	0.0086
Beryllium	--	4	252.7	225.9	--	--

Notes:

[a] Based on current maximum hourly heat input.

[b] Based on current 24-hour steam production limit and historical operation.

References (1-5 based on current actual emission)

(1) Based on average of stack tests from last 5 years.

(2) Based on 93% of PM emissions for bagasse burning.

(3) Based on assuming 5% of SO2 emissions are equal to SO3, based on AP-42 Section 1.3, Fuel Oil Combustion. Conversion of SO3 to H2SO4 (SO3 x 98/80).

(4) Based on AP-42, Section 1.6, Wood Waste Combustion. Represents controlled emissions.

(5) Based on stack testing of 5 bagasse boilers in Florida (refer to appendices).

(6) Based on original PSD permit limit.

Table 6-2. Stack, Operating, and Emission Data for Current Actual and Future Operations for Boiler No. 5 (revised 11-2-00)

Parameters	Current Actual Operations [b]						Future Maximum Operations [c]					
	1-hour		24-hour		Annual		1-hour		24-hour		Annual	
STACK DATA												
Height (ft)			90						90			
Diameter (ft)			5.5						5.5			
OPERATING DATA												
Heat Input Rate (MMBtu/hr)	252.7		225.9		225.9		255.3		225.9		225.9	
Flow Rate (acfm) [a]	90,000		80,441		80,441		90,000		79,615		79,615	
Velocity (ft/s)	63.1		56.4		56.4		63.1		56.4		56.4	
Temperature (°F)	150		150		150		150		150		150	
EMISSION DATA	lb/hr	*g/s*	lb/hr	*g/s*	lb/hr	*g/s*	lb/hr	*g/s*	lb/hr	*g/s*	lb/hr	*g/s*
Particulate Matter (PM10)	28.3	*3.57*	25.3	*3.19*	18.0	*2.27*	35.7	*4.50*	31.6	*3.98*	31.6	*3.98*
Nitrogen oxides	36.4	*4.58*	32.5	*4.10*	23.2	*2.93*	68.1	*8.57*	60.7	*7.65*	56.9	*7.17*
Carbon monoxide	68.2	*8.6*	61.0	*7.7*	43.6	*5.5*	1659.6	*209.1*	1468.1	*185.0*	1468.1	*185.0*

[a] Flow rate based on the flow rate of 90,000 acfm at 255.3 MMBtu/hr. Other flow rates are determined by multiplying the ratio of flow of 90,000 acfm to heat input rate of 255.3 MMBtu/hr times the heat input rate for the other averaging period.

[b] Refer to Table 3-3 and 3-3a for the current actual short-term and annual emissions, assuming current permit limit of 3,000 hour/year.

[c] Refer to Tables 2-1 and 2-2 for the future short-term and annual emissions.

Table 6-5. Future Operation for ASA Mill -Maximum PM_{10} and CO Emissions (revised 10-23-00)

Source	Maximum Heat Input (MMBtu/hr)	Emission Factor		Emissions (lb/hr)	Emissions (g/s)
		MAXIMUM 24-HOUR CASE - PM10 EMISSIONS			
Boilers		PM Emission Factor	PM_{10} Emission Factor		
Boiler 1	280	0.30 lb/MMBtu [a]	93% of PM	78.1	9.84
Boiler 2	280	0.30 lb/MMBtu [a]	93% of PM	78.1	9.84
Boiler 3	260	0.30 lb/MMBtu [a]	93% of PM	72.5	9.14
Boiler 4	275	0.29 lb/MMBtu [a]	93% of PM	74.2	9.35
Boiler 5	225.9	0.15 lb/MMBtu	93% of PM	31.6	3.98
		MAXIMUM 1-HOUR CASE - CO EMISSIONS			
Boilers					
Boiler 1	280	8.5 lb/MMBtu		2,380	299.9
Boiler 2	280	16.6 lb/MMBtu		4,648	585.6
Boiler 3	260	5.5 lb/MMBtu		1,430	180.2
Boiler 4	275	5.2 lb/MMBtu		1,430	180.2
Boiler 5	255.3	6.5 lb/MMBtu		1,659	209.1

[a] Based on permitted emissions limit.

Table 6-9. Summary of PM_{10} Facilities Considered for Inclusion in the AAQS and PSD Class II Air Modeling Analyses (revised 10-26-00)

AIRS Number	Facility	County	UTM Coordinates East (km)	UTM Coordinates North (km)	Relative to ASA [a] X (km)	Relative to ASA [a] Y (km)	Relative to ASA [a] Distance (km)	Relative to ASA [a] Direction (deg)	Maximum PM Emissions (TPY)	Q, (TPY) Emission Threshold [b] (Dist -4.5 x 20)	Include in Modeling Analysis ?
990026	Sugar Cane Growers	Palm Beach	534.9	2953.3	-18.0	8.1	19.7	294	1,032	304.8	YES
990016	Osceola Farms	Palm Beach	544.2	2968.0	-8.7	22.8	24.4	339	700	398.1	YES
990061	U.S. Sugar -Bryant	Palm Beach	538.8	2968.1	-14.1	22.9	26.9	328	979	447.9	YES
990332	Okeelanta	Palm Beach	525.0	2937.4	-27.9	-7.8	29.0	254	283	489.4	NO
990086	Glades Correctional Institute	Palm Beach	523.4	2955.2	-29.5	10.0	31.1	289	30	533.0	NO
990021	Pratt & Whitney	Palm Beach	559.2	2978.3	6.3	33.1	33.7	11	30	583.9	NO
500234	Palm Beach Resource Recovery	Palm Beach	585.8	2960.2	32.9	15.0	36.2	65	26	633.2	NO
500045	Lake Worth Utilities	Palm Beach	592.8	2943.7	39.9	-1.5	39.9	92	468	708.6	NO
500042	FPL -Riviera Beach	Palm Beach	594.2	2960.6	41.3	15.4	44.1	70	3,340	791.6	YES
510001	Everglades Sugar	Hendry	509.6	2954.2	-43.3	9.0	44.2	282	41	794.5	NO
850102	Bechtel Indiantown	Martin	545.6	2991.5	-7.3	46.3	46.9	351	270	847.4	NO
510003	US Sugar Clewiston	Hendry	506.1	2956.9	-46.8	11.7	48.2	284	2,190	874.8	YES
112120	North Broward Resource Recovery	Broward	583.6	2907.6	30.7	-37.6	48.5	141	103	880.8	NO
850001	FPL -Martin	Martin	543.1	2992.9	-9.8	47.7	48.7	348	9,103	883.9	YES

[a] Atlantic Sugar Association East and North UTM Coordinates (km) 552.9 2945.2

[b] Proposed project's maximum 24-hour emissions are significant to 4.5 km.
Emission inventory is limited to facilities within 54.5 km of the ASA facility.

Table 6-10. Summary of PM_{10} Sources Included in the Air Modeling Analysis (revised 10/23/00)

AIRS Number	Facility	Units	ISCST3 ID Name	Stack Parameters: Height (m)	Diameter (m)	Temper. (K)	Velocity (m/s)	Emission Rate (g/s)	PSD Source? (EXP/CON)	Modeled in: AAQS	Modeled in: Class II
0990016	Atlantic Sugar Association [a]										
		Unit 1	ATLSUG1	27.4	1.83	346.0	17.97	9.84	CON	Yes	Yes
		Unit 2	ATLSUG2	27.4	1.83	350.0	23.36	9.84	CON	Yes	Yes
		Unit 3	ATLSUG3	27.4	1.83	350.0	21.56	9.14	CON	Yes	Yes
		Unit 4	ATLSUG4	27.4	1.83	344.0	25.16	9.35	CON	Yes	Yes
		Unit 5	ATLSUG5	27.4	1.68	339.0	19.24	3.98	CON	Yes	Yes
		Unit 1 PSD Baseline	ATLSUG1B	18.9	1.92	506.0	12.70	-14.74	EXP	No	Yes
		Unit 2 PSD Baseline	ATLSUG2B	18.9	1.92	511.0	10.90	-17.89	EXP	No	Yes
		Unit 3 PSD Baseline	ATLSUG3B	21.9	1.83	522.0	17.50	-9.32	EXP	No	Yes
		Unit 4 PSD Baseline	ATLSUG4B	18.3	1.83	344.0	15.00	-9.25	EXP	No	Yes
0990026	Sugar Cane Growers [a]										
		Unit 1&2	SUGCN12	45.7	1.87	339.0	21.75	6.49	CON	Yes	Yes
		Unit 3	SUGCN3	27.4	1.52	339.0	22.25	12.95	CON	Yes	Yes
		Unit 4	SUGCN4	54.9	2.44	339.0	21.73	12.45	CON	Yes	Yes
		Unit 5	SUGCN5	45.7	2.30	339.0	15.94	12.45	CON	Yes	Yes
		Unit 8	SUGCN8	47.2	2.90	339.0	13.62	8.57	CON	Yes	Yes
		Unit 1&2 PSD Baseline	SUGCN12B	24.4	1.40	344.0	11.40	18.94	EXP	No	Yes
		Unit 3 PSD Baseline	SUGCN3B	24.4	1.60	344.0	15.60	-5.70	EXP	No	Yes
		Unit 4 PSD Baseline	SUGCN4B	25.9	1.63	344.0	11.20	-10.90	EXP	No	Yes
		Unit 5 PSD Baseline	SUGCN5B	24.4	1.40	344.0	15.20	-9.10	EXP	No	Yes
		Unit 6&7 PSD Baseline	SUGCN67B	12.2	1.52	606.0	11.20	-2.50	EXP	No	Yes
0990019	Osceola Farms [a]										
		Unit 2	OSBLR2	27.4	1.52	339.0	17.85	6.56	CON	Yes	Yes
		Unit 3	OSBLR3	27.4	1.92	344.0	14.34	6.84	CON	Yes	Yes
		Unit 4	OSBLR4	27.4	1.83	344.0	16.53	9.84	CON	Yes	Yes
		Unit 5	OSBLR5	27.4	1.52	344.0	16.56	7.73	CON	Yes	Yes
		Unit 6	OSBLR6	27.4	1.92	339.0	18.25	6.66	CON	Yes	Yes
		Cogen 1 [c]	OSCOG1	61.0	2.44	419.0	24.86	2.87	CON	Yes	Yes
		Cogen 2 [c]	OSCOG2	61.0	2.44	419.0	24.86	2.87	CON	Yes	Yes
		Unit 1 PSD Baseline	OSBLR1B	22.0	1.52	342.0	8.18	-3.38	EXP	No	Yes
		Unit 2 PSD Baseline	OSBLR2B	22.0	1.52	341.0	18.10	-7.52	EXP	No	Yes
		Unit 3 PSD Baseline	OSBLR3B	22.0	1.93	341.0	14.50	-4.03	EXP	No	Yes
		Unit 4 PSD Baseline	OSBLR4B	22.0	1.83	341.0	18.80	-6.01	EXP	No	Yes
0990061	US Sugar - Bryant [a]										
		Unit 5	USSBRY5	42.7	2.90	345.0	11.49	12.59	CON	Yes	Yes
		Unit 1,2&3	USBRY123	19.8	1.64	342.0	36.40	43.66	CON	Yes	Yes
		Unit 1 PSD Baseline	USSBRY1B	19.8	1.68	494.0	44.30	-82.40	EXP	No	Yes
		Unit 2&3 PSD Baseline	USBRY23B	19.8	1.68	344.0	37.90	-12.04	EXP	No	Yes
0500042	FPL - Riviera Beach										
		Units 3 and 4	RIVU34	90.8	4.88	401.5	18.90	96.08	NO	Yes	No

Table 6-10. Summary of PM_{10} Sources Included in the Air Modeling Analysis (cont.) (revised 10/23/00)

AIRS Number	Facility	Units	ISCST3 ID Name	Stack Parameters: Height (m)	Diameter (m)	Temper. (K)	Velocity (m/s)	Emission Rate (g/s)	PSD Source? (EXP/CON)	Modeled in: AAQS	Modeled in: Class II
	US Sugar - Clewiston [b]										
		Unit 1 Crop Season	USSCL1C	64.9	2.44	347.0	19.20	14.52	CON	Yes	Yes
		Unit 2 Crop Season	USSCL2C	64.9	2.44	338.7	17.32	13.09	CON	Yes	Yes
		Unit 3 Crop Season	USSCL3C	64.9	2.44	333.2	8.47	9.33	CON	Yes	Yes
		Unit 4 Crop Season	USSCL4C	45.7	2.51	344.3	24.03	10.55	CON	Yes	Yes
		Unit 7 Crop Season	USSCL7C	68.6	2.59	405.4	23.60	2.79	CON	Yes	Yes
		Unit 1 Off Season	USSCL1F	64.9	2.44	347.0	12.05	9.11	CON	Yes	Yes
		Unit 2 Off Season	USSCL2F	64.9	2.44	338.7	12.05	9.11	CON	Yes	Yes
		Unit 3 Off Season	USSCL3F	64.9	2.44	333.2	8.47	9.11	CON	Yes	Yes
		Unit 4 Off Season	USSCL4F	45.7	2.51	344.3	0.00	--	CON	Yes	Yes
		Unit 7 Off Season	USSCL7F	68.6	2.59	405.4	23.60	2.79	CON	Yes	Yes
		Unit 1 PSD Baseline	USSCL1B	23.1	1.86	344.0	30.20	-7.48	EXP	No	Yes
		Unit 2 PSD Baseline	USSCL2B	23.1	1.86	343.0	35.70	-7.04	EXP	No	Yes
		Unit 3 PSD Baseline	USSCL3B	27.4	2.29	342.0	14.70	-4.57	EXP	No	Yes
		East Pellet Plant PSD Baseline	USSCLEPT	12.2	1.52	347.0	8.54	-1.69	EXP	No	Yes
		West Pellet Plant PSD Baseline	USSCLWPT	15.7	1.52	347.0	8.54	-0.82	EXP	No	Yes
		Units 5&6 PSD Baseline	USSCL56B	23.1	1.86	494.0	44.30	-52.92	EXP	No	Yes
0850001	FPL - Martin										
		Units 1&2	MART12	152.1	11.0	420.9	21.03	218.00	CON	Yes	Yes
		Aux Blr	MARTAUX	18.3	1.10	535.4	15.24	0.01	CON	Yes	Yes
		Diesel Gens	MARTGEN	7.6	0.30	785.9	39.62	0.22	CON	Yes	Yes
		Units 3&4	MART34	64.9	6.10	410.9	18.90	15.30	CON	Yes	Yes
		2 Simple Cycle CT	MARTCTs	18.3	6.17	853.2	37.63	4.28	CON	Yes	Yes

[a] Facilities or sources with facilities that operate only during the October 1 through April 30 crop season.

[b] US Sugar Clewiston mill sources operate all year. Emissions are for the worst case crop season (Oct.-Apr.) and off crop season ((May-Sept.). Baseline emissions for crop season (Oct.-Apr.).

[c] Facility or unit that operates year-round.

Note: EXP = PSD expanding source
CON = PSD consuming source
NO = Source does not effect PSD increment.

Table 6-11 . Summary of Competing CO Facilities Considered for Inclusion in the AAQS Air Modeling Analyses (revised 10-26-00)

AIRS Number	Facility	County	UTM Coordinates East (km)	UTM Coordinates North (km)	Relative to ASA [a] X (km)	Relative to ASA [a] Y (km)	Relative to ASA [a] Distance (km)	Relative to ASA [a] Direction [a] (deg)	Maximum CO Emissions (TPY)	Q, Emission Threshold [b] (Dist -6) x 20	Include in Modeling Analysis ?
990026	Sugar Cane Growers	Palm Beach	534.9	2953.3	-18.0	8.1	19.7	294	33,771	274.8	YES
990016	Osceola Farms	Palm Beach	544.2	2968.0	-8.7	22.8	24.4	339	25,175	368.1	YES
990061	U.S. Sugar -Bryant	Palm Beach	538.8	2968.1	-14.1	22.9	26.9	328	19,958	417.9	YES
990332	Okeelanta Power	Palm Beach	525.0	2937.4	-27.9	-7.8	29.0	254	3,297	459.4	YES
990086	Glades Correctional Institute	Palm Beach	523.4	2955.2	-29.5	10.0	31.1	289	10	503.0	NO
990021	Pratt & Whitney	Palm Beach	559.2	2978.3	6.3	33.1	33.7	11	30	553.9	NO
510001	Everglades Sugar	Hendry	509.6	2954.2	-43.3	9.0	44.2	282	15	764.5	NO
850102	Bechtel Indiantown	Martin	545.6	2991.5	-7.3	46.3	46.9	351	1,651	817.4	YES
510003	US Sugar Clewiston	Hendry	506.1	2956.9	-46.8	11.7	48.2	284	85,803	844.8	YES
850001	FPL -Martin	Martin	543.1	2992.9	-9.8	47.7	48.7	348	2,285	853.9	YES

[a] Atlantic Sugar Association East and North UTM coordinates (km): 552.9 2945.2

[b] Proposed project is significant to 6 km; Emission imventory is limited to facilities within 56 km of the proposed project.

Table 6-12. Summary of CO Sources Included in the Air Modeling Analysis (revised 10/23/00)

Number	Facility	Units	ISCST3 ID Name	Stack Parameters				Emission Rate (g/s)
				Height (m)	Diameter (m)	Temper. (K)	Velocity (m/s)	
0990016	Atlantic Sugar Association [a]							
		Unit 1	ATLSUG1	27.4	1.83	346.0	17.97	299.9
		Unit 2	ATLSUG2	27.4	1.83	350.0	23.36	585.6
		Unit 3	ATLSUG3	27.4	1.83	350.0	21.56	180.2
		Unit 4	ATLSUG4	27.4	1.83	344.0	25.16	180.2
		Unit 5	ATLSUG5	27.4	1.68	339.0	19.24	209.1
08500102	Bechtel Indiantown		BECHTIND	150.9	4.88	333.2	30.50	47.38
0850001	FPL Martin							
		Units 1&2	MART12	152.1	7.99	420.9	21 03	38.92
		Units 3&4	MART34	64.9	6.10	410.9	18.90	26.66
0990332	Okeelanta Power							
		Okeelanta Power Blrs 1,2,3 [b]	OKCOGEN	68.6	3.05	438.7	17.46	94.61
0990019	Osceola Farms [a]							
		Unit 2	OSBLR2	27.4	1.52	339.0	17.85	458.64
		Unit 3	OSBLR3	27.4	1.92	344.0	14.34	128.77
		Unit 4	OSBLR4	27.4	1.83	344.0	16.53	211.68
		Unit 5	OSBLR5	27.4	1.52	344.0	16.56	249.48
		Unit 6	OSBLR6	27.4	1.92	339.0	18.25	229.22
		Cogen 1 [b]	OSCOG1	61.0	2.44	419.0	24.86	33.52
		Cogen 2 [b]	OSCOG2	61.0	2.44	419.0	24.86	33.52
0990026	Sugar Cane Growers [a]							
		Unit 1&2	SUGCN12	45.7	1.87	339.0	21.75	547.09
		Unit 3	SUGCN3	27.4	1.52	339.0	22.25	187.61
		Unit 4	SUGCN4	54.9	2.44	339.0	21.73	467.71
		Unit 5	SUGCN5	45.7	2.30	339.0	15.94	359.60
		Unit 8	SUGCN8	47.2	2.90	339.0	13 62	361.02
0990061	US Sugar-Bryant [a]							
		Unit 5	USSBRY5	42.7	2.90	345.0	11.49	760.91
		Unit 1,2&3	USBRY123	19.8	1.64	342.0	36.40	1309.77
510003	US Sugar Clewiston [b]							
		Unit 1	BRL1	50.3	2.44	347.0	19.20	811.79
		Unit 2	BLR2	50.3	2 44	338.0	19.20	732.19
		Unit 3	BLR3	50 3	2.44	333.2	10.91	334.28
		Unit 4	BLR4	45.7	2.51	344.3	25.36	518.43
		Unit 7	BLR7	68.6	2.59	405.4	25.97	71.62

a. Facilities or sources with facilities that operate only during the October 1 through April 30 crop season.
b. Sugar mill sources that operate all year.

Table 6-14. ASA Mill Property Boundary Receptors Used in the Air Modeling Analysis (revised 10-26-00)

Direction (degrees)	Distance (m)	Direction (degrees)	Distance (m)	Direction (degrees)	Distance (m)	Direction (degrees)	Distance (m)	Direction (degrees)	Distance (m)
1	2254	82	2357	152	3633	218	4084	289	2722
4	2258	84	2345	154	3588	219	4122	291	2756
6	2267	87	2337	155	3545	220	4044	293	2793
9	2281	89	2334	157	3504	220	3968	295	2833
11	2298	92	2334	158	3466	221	3892	296	2876
14	2320	94	2339	160	3430	222	3818	298	2922
16	2346	97	2349	161	3397	223	3745	300	2971
18	2376	99	2362	163	3366	225	3673	302	3022
21	2409	101	2380	165	3338	226	3602	303	3075
23	2446	104	2401	166	3313	227	3533	305	3131
25	2487	106	2427	168	3291	228	3465	306	3189
27	2531	108	2456	170	3272	229	3399	308	3249
29	2578	110	2489	171	3255	231	3335	309	3311
31	2628	113	2526	173	3242	232	3272	310	3375
33	2681	115	2566	175	3231	233	3211	311	3400
35	2737	117	2609	177	3224	235	3153	313	3326
36	2795	118	2655	178	3220	236	3096	314	3253
38	2855	120	2704	180	3219	238	3042	315	3182
39	2917	122	2756	182	3221	239	2989	316	3112
41	2982	124	2811	184	3226	241	2940	318	3044
42	3048	126	2868	186	3234	243	2893	319	2978
44	3117	127	2927	187	3245	245	2849	321	2913
45	3187	129	2988	189	3260	247	2808	322	2851
46	3230	130	3052	191	3277	248	2769	324	2791
48	3162	132	3117	193	3297	250	2734	326	2733
49	3095	133	3184	194	3320	252	2702	327	2678
50	3030	134	3253	196	3346	254	2673	329	2625
52	2968	135	3324	197	3375	256	2648	331	2575
53	2907	137	3395	199	3406	259	2627	333	2528
55	2848	138	3469	201	3440	261	2609	335	2484
57	2792	139	3543	202	3477	263	2595	337	2444
58	2739	140	3619	204	3516	265	2584	339	2407
60	2688	141	3696	205	3557	267	2578	342	2374
62	2639	142	3774	207	3601	270	2575	344	2344
64	2594	143	3853	208	3647	272	2576	346	2318
66	2552	144	3934	209	3695	274	2581	349	2297
68	2513	145	3948	211	3745	276	2590	351	2280
70	2478	146	3891	212	3797	278	2603	354	2267
73	2446	147	3835	213	3851	281	2620	356	2258
75	2418	148	3782	215	3907	283	2640	359	2254
77	2394	150	3730	216	3964	285	2664		
79	2373	151	3681	217	4024	287	2691		

Note: Distances are relative to the Boiler No. 5 stack location.

Table 6-16. Maximum Pollutant Impacts Predicted for the Proposed Project, Screening Analysis (revised 11-2-00)

Pollutant/ Averaging Time	Value	Concentration[a] ($\mu g/m^3$)	Receptor Location[b] Direction (degree)	Receptor Location[b] Distance (m)	Time Period (YYMMDDHH)
PM10					
Annual	Highest	0.21	135	3,324	87123124
		0.19	155	3,545	88123124
		0.20	318	3,044	89123124
		0.28	270	2,575	90123124
		0.22	324	2,791	91123124
24-Hour	Highest	5.91	115	2,566	87041024
		4.93	359	2,254	88041824
		6.16	281	2,620	89042424
		5.26	340	2,400	90042924
		6.20	319	2,978	91042724
NOx					
Annual	Highest	0.55	135	3,324	87123124
		0.51	155	3,545	88123124
		0.50	140	3,619	89123124
		0.73	270	2,575	90123124
		0.51	324	2,791	91123124
CO					
8-Hour	Highest	1,028	349	2,297	87011624
		829	127	2,927	88110708
		882	21	2,409	89112308
		817	11	2,298	90010624
		974	9	2,281	91030808
1-Hour	Highest	2,622	349	2,297	87041122
		2,705	21	2,409	88042606
		2,654	344	2,344	89101322
		2,702	349	2,297	90043002
		2,746	4	2,258	91112107

[a] Based on 5-year meteorological record, West Palm Beach, 1987 to 1991

[b] Relative to Boiler Number 5 Stack Location

Legend:

YYMMDDHH = Year, Month, Day, Hour Ending

Table 6-16a. Maximum Pollutant Impacts Predicted for the Proposed Project, Refinement Analysis (revised 11-2-00)

Pollutant/ Averaging Time	Value	Concentration[a] ($\mu g/m^3$)	Receptor Location[b] Direction (degree)	Receptor Location[b] Distance (m)	Time Period (YYMMDDHH)	Significant Impact Level ($\mu g/m^3$)
PM10						
Annual	Highest	0.28	270	2,575	90123124	1
24-Hour	Highest	5.91	115	2,566	87041024	5
		6.16	281	2,620	89042424	
NOx						
Annual	Highest	0.55	135	3,324	87123124	1
		0.73	270	2,575	90123124	
CO						
8-Hour	Highest	1,028	349	2,297	87011624	500
1-Hour		2,746	4	2,258	91112107	2,000

[a] Based on 5-year meteorological record, West Palm Beach, 1987 to 1991.

[b] Relative to Boiler Number 5 Stack Location.

Legend:

YYMMDDHH = Year, Month, Day, Hour Ending

Table 6-17. Maximum Pollutant Impacts Predicted for the Proposed Project at the PSD Class I Area of the Everglades National Park (revised 11-2-00)

Pollutant/ Averaging Time	Value	Concentration[a] ($\mu g/m^3$)	UTM Coordinates (m) East	UTM Coordinates (m) North	Time Period (YYMMDDHH)	EPA Proposed Class I Significant Impact Levels ($\mu g/m^3$)
PM10						
Annual	Highest	0.001	545,000	2,848,600	87123124	0.2
		0.001	550,300	2,848,600	88123124	
		0.001	550,300	2,848,600	89123124	
		0.001	550,300	2,848,600	90123124	
		0.001	550,300	2,848,600	91123124	
24-Hour	Highest	0.07	514,500	2,843,000	87041224	0.3
		0.06	535,000	2,848,600	88042824	
		0.06	525,000	2,848,600	89042224	
		0.09	545,000	2,848,600	90040224	
		0.06	530,000	2,848,600	91042024	
NOx						
Annual	Highest	0.002	545,000	2,848,600	87123124	0.1
		0.003	550,300	2,848,600	88123124	
		0.002	550,300	2,848,600	89123124	
		0.002	550,300	2,848,600	90123124	
		0.002	550,300	2,848,600	91123124	

[a] Based on 5-year meteorological record, West Palm Beach, 1987 to 1991

Legend:
YYMMDDHH = Year, Month, Day, Hour Ending
PSD = Prevention of Significant Deterioration
NPS = National Park Service
EPA = Environmental Protection Agency

Table 6-18. Maximum Pollutant Impacts Predicted for All Future Sources, AAQS Screening Analyses (revised 10-26-00)

Pollutant/ Averaging Time	Value	Concentration[a] ($\mu g/m^3$)	Receptor Location[b] Direction (degree)	Receptor Location[b] Distance (m)	Time Period (YYMMDDHH)
PM_{10}					
Annual	Highest	3.7	137	3,396	87123124
		4.4	157	3,504	88123124
		3.7	160	3,430	89123124
		4.9	270	2,575	90123124
		3.9	333	2,528	91123124
24-Hour	HSH	55.8	349	2,297	87032724
		61.2	339	2,407	88021924
		50.1	342	2,374	89020524
		49.4	356	2,258	90012924
		51.8	335	2,484	91012924
CO					
8-Hour	HSH	3,721	350	2,400	87032708
		3,620	339	2,407	88112724
		3,319	33	2,681	89112224
		3,769	148	3,782	90030608
		3,412	150	3,730	91101708
1-Hour	HSH	13,294	346	2,319	87111006
		13,788	351	2,280	88123122
		13,740	344	2,344	89020523
		13,608	350	2,400	90010703
		13,038	20	2,400	91042303

[a] Based on 5-year meteorological record, West Palm Beach, 1987-91.

[b] Relative to Boiler Number 5 Stack Location.

Notes

YYMMDDHH = Year, Month, Day, Hour Ending

HSH = Highest, 2nd-Highest Concentration in 5 years.

Table 6-19. Maximum Pollutant Impacts Predicted for All Future Sources For Comparison to AAQS, Refined Analysis
(revised 10-26-00)

Pollutant/ Averaging Time	Value	Concentration ($\mu g/m^3$)			Receptor Location[b]		Time Period (YYMMDDHH)	Florida AAQS ($\mu g/m^3$)
		Total	Modeled	Background	Direction (degree)	Distance (m)		
PM_{10}								
Anuual	Highest	25	4.9	20	270	2,575	90123124	50
24-Hour	HSH	97	61.2	36	339	2,407	88021924	150
CO								
8-Hour	HSH	7,102	3,769	3,333	148	3,782	90030608	10,000
1-Hour	HSH	19,343	13,788	5,555	351	2,280	88123122	40,000

[a] Based on 5-year meteorological record, West Palm Beach, 1987-91

[b] Relative to Boiler Number 5 Stack Location

Notes

YYMMDDHH = Year, Month, Day, Hour Ending

H2H = Highest, 2nd-Highest Concentration in 5 years.

Table 6-20. Maximum Predicted Pollutant PSD Class II Increment Consumption, Screening Analysis (revised 11-2-00)

Pollutant/ Averaging Time	Value	Concentration[a] ($\mu g/m^3$)	Receptor Location[b] Direction (degree)	Receptor Location[b] Distance (m)	Time Period (YYMMDDHH)	Allowable PSD Class II Increment ($\mu g/m^3$)
PM_{10}						
Annual	High	0.03	190	4,500	87123124	17
		< 0	210	4,500	88123124	
		0.02	200	4,500	89123124	
		< 0	200	4,500	90123124	
		< 0	100	4,500	91123124	
24-Hour	HSH	3.5	298	2,922	87021824	30
		2.8	330	4,500	88021124	
		2.9	260	4,500	89022424	
		2.9	355	3,600	90121224	
		3.4	220	4,500	91111224	

[a] Based on 5-year meteorological record, West Palm Beach, 1987-91.

[b] Relative to Boiler Number 5 Stack Location.

Notes:

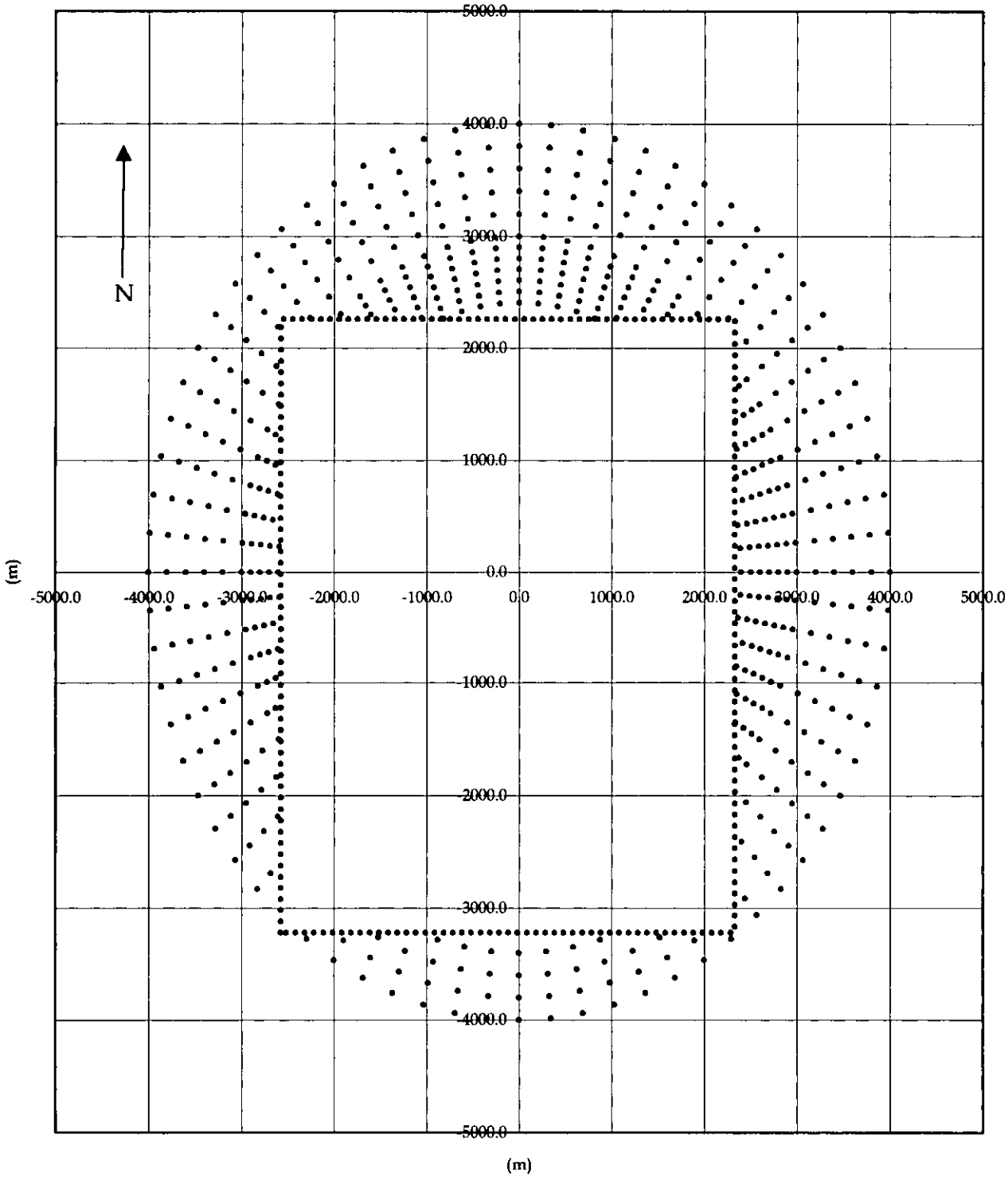
YYMMDDHH = Year, Month, Day, Hour Ending

HSH = Highest, 2nd-Highest Concentration in 5 years.

PSD = Prevention of Significant Deterioration

asaplot.xls
11:59 AM 11/2/00

Figure 1. ASA Modeling Receptor Plot
100 meter fenceline receptor spacing



Department of
Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

August 4, 2000

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. John A. Fanjul, Vice President and General Manager
Atlantic Sugar Association, Inc.
P.O. Box 1570
Belle Glade, FL 33440

Re: Request for Additional Information No. 3
DEP File No. 0990016-004-AC (PSD-FL-078A, *Formerly PSD-FL-279*)
Increased Operation of Boiler No. 5

Dear Mr. Fanjul:

On July 11, 2000, the Department received additional information for the above referenced project. The application remains incomplete. The following additional information is needed in order to continue processing your application. Should your response to any of the below items require new calculations, please submit the new calculations, assumptions, reference material and appropriate revised pages of the application form. The items are numbered as in the original request.

1. The additional information indicates a revised modeling analysis would be submitted in the near future. The Department has not yet received the modeling files or the summary tables of the analysis. Please submit the revised modeling analysis as soon as possible, including the following changes.
   a. Short-term (≤ 24-hour) modeling impacts should based on a maximum heat input of 253 mmBTU per hour.
   b. Long-term (> 24-hour) modeling impacts should be based on a maximum heat input of 226 mmBTU per hour.
   c. Osceola Boiler No. 5 and Okeelanta Boiler Nos. 12,14, and 15 have been identified as being built after the PSD baseline date of January 6, 1975. Therefore, these units are no longer included in the baseline inventory for PSD increment modeling.
   d. Model all Atlantic Sugar boilers for the longest expected future crop season of 7 months (October through April).
   e. Use appropriate meteorological data and receptor spacing.
   f. The thermal efficiency of the boiler is assumed to be 55% regardless of fuel.
   g. Inventory should include future operation of the Okeelanta Power cogeneration boilers, exclude future operation of the Okeelanta Corp. mill boilers, include operation of the Osceola Farms mill boilers and include future operation of the Osceola Power cogeneration boilers.

2. Several changes have been requested throughout the application process. The Department has summarized what it believes are the current requests in Attachment A to this letter. The Department is not attempting to approve or reject these requests at this time, but merely to accurately reflect the final requests made to date. Please provide comments.

The Department will resume processing your application after receipt of the requested information. Rule 62-4.050(3), F.A.C. requires that all applications for a Department permit must be certified by a professional engineer registered in the State of Florida. This requirement also applies to responses to Department requests for additional information of an engineering nature. A new certification statement by the authorized representative or responsible official must accompany any material changes to the application. Rule 62-4.055(1), F.A.C. now requires applicants to respond to requests for information within 90 days. If there are any questions, please call me at 850/414-7268. Matters regarding modeling issues should be directed to Cleve Holladay (meteorologist) at 850/921-8986.

Sincerely,

Jeffery F. Koerner, P.E.
New Source Review Section

JFK/jfk

cc: Mr. Hector Cardentey, ASA
Mr. David Buff, P.E., Golder Associates
Mr. Gregg Worley, EPA
Mr. John Bunyak, NPS
Mr. David Knowles, South Florida District DEP
Mr. Jim Stormer, PBCHD

Purpose

The purpose of this document is to summarize the applicant's requests made in the original application and subsequent additional information provided. The Department is not attempting to approve or reject these requests at this time, but merely to accurately reflect the final requests made by the applicant.

Project Description

The applicant requests an increase in the allowable heat input for Boiler No. 5 from 678,000 mmBTU per year to 867,302 mmBTU per year. This is approximately a 28% increase in maximum operation and nearly an 80% increase over actual operation. In addition, the applicant requests removal of the restriction on hours of operation (3000 hour per year) but will restrict operation to the seven months of October through April. The requested changes result in a modification of the permits and significant emissions of CO, NOx, PM/PM10, and VOC, which require determinations for Best Available Control Technology. The applicant has requested a lower emission limiting standard for SO_2 when firing oil and a reduced annual oil-firing rate to avoid PSD applicability for SO_2.

Emissions Unit Description

Boiler No. 5 is a traveling grate boiler with economizer fired with bagasse, wood chips, rice hulls, and No. 6 fuel oil. Particulate matter emissions are controlled by a Type D Joy Turbulaire wet impingement scrubber. CO, NOx, and VOC emissions are minimized using good combustion practices. SO_2 emissions when firing bagasse are reduced in the wet impingement scrubber due the large alkaline fly ash produced. SO_2 emissions when firing fuel oil are minimized by limiting the sulfur content of the fuel oil and the amount fired. Pollutant emissions exit the 5.5 feet diameter scrubber stack 90 feet above ground level at 150°F with a volumetric flow rate of 90,000 acfm.

Allowable Fuels

The applicant requests authorization to fire the following types and amounts of fuels in Boiler No. 5:

Fuel Type	Maximum Hourly Firing Rate	Heat Content	Heat Input mmBTU/hour	Annual Consumption Limit
Bagasse	35.5 TPH	3600 BTU/lb, wet	255.3	120,459
Fuel Oil, 1.0% S	470.0 GPH [b]	150 mmBTU/10^3 gallons	70.5	200,000 gallons
Rice Hulls	5.0 TPH	6200 BTU/lb	62.0	(Included with Wood Chips)
Wood Chips [a]	25.5 TPH	5000 BTU/lb	255.3	86,730

[a] Steam production when firing wood chips will be limited to no more than 100,000 pounds per hour.

[b] The maximum design oil-firing rate is 235 GPH per burner for two burners.

Permitted Capacities

The applicant requests the following restrictions on the operating capacity of Boiler No. 5:

Averaging Period	Steam Pressure [a]	Steam Temperature [a]	Steam [b] Production (lb / hour)	Heat Input [c]
1-hour	250 psig	550° F	130,000	253 mmBTU/hour
24-hour	250 psig	550° F	115,000	226 mmBTU/hour
12-months [d]	250 psig	550° F	NA	867,302 mmBTU per consecutive 12 months

[a] Steam temperature and pressure are design parameters. Changes to these parameters resulting from boiler aging or modification shall be reported to the Department and may require a permit modification.

[b] Steam production when firing wood chips is restricted to no more than 100,000 lb/hour based on a 1-hour average.

[c] Based on: 55% thermal efficiency of the boiler when firing bagasse; wet bagasse containing 55% moisture and a heat content of 3600 BTU/lb; 1290 BTU per pound of steam at 250 psig and 550° F; and 210 BTU/lb of feedwater at ___ psig and ___° F.

[d] The heat input to Boiler No. 5 shall not exceed 867,302 mmBTU during any consecutive 12 months.

Hours of Operation

The applicant requests no restriction on the hours of operation. The permitted capacity is restricted based on the heat-input limitation. However, based on the Air Quality Analysis, Boiler No. 5 shall only operate during the months of October through April.

Carbon Monoxide Emissions

The applicant requests to retain the CO limit of 6.5 lb/mmBTU as specified in the current operation permit. CO will be controlled by "good combustion practices", which will be established to minimized emissions of CO, NOx, and VOC.

Nitrogen Oxide Emissions

The applicant requests an increase in the NOx emission limit from 0.16 to 0.25 lb/mmBTU. Actual test data indicates that NOx emissions have been less 0.16 lb/mmBTU as required by the original PSD permit. The applicant does not identify any physical or operational changes that would suggest an increase in NOx emissions. The primary justification is to provide a "margin of safety for compliance". The applicant mentions that the use of "good combustion practices" to minimize emissions of CO and VOC may tend to drive NOx emissions higher. However, as indicated above, the CO standard was adjusted upward several years ago and has not resulted in any continuing problems with compliance. The applicant was unable to identify any add-on control technologies or combustion modifications that were considered technically feasible and cost effective for the proposed modification.

Particulate Matter Emissions

Applicant requests retaining the current PM limit of 0.15 lb/mmBTU based on the existing wet impingement scrubber and establishing a visible emissions standard of 30% opacity except for up to 40% opacity for two minutes per hour. The applicant will monitor the following parameters to ensure proper operation of the wet scrubber:

- Pressure drop (optimum range is 6 to 11 inches of water column)
- Spray nozzle water pressure (minimum of 35 psig on upper 14 and 60 psig on lower 24 nozzles)
- Scrubber flow rate (minimum is 550 gpm with an alarm system)

The applicant rejected a wet ESP stating that $5430/ton of PM removed was not cost effective. The applicant does not believe that a baghouse is feasible for the existing bagasse-fired boiler due heavy fly ash loading, presence of sulfur compounds, and high moisture content of the exhaust gas as well as the potential for fire damage due to the carryover of hot fly ash.

Sulfur Dioxide Emissions

Applicant requests decreasing the current SO_2 limit from 0.3 lb/mmBTU to 0.05 lb/mmBTU when firing bagasse based on tests showing inherent control by adsorption of SO_2 onto large alkaline fly ash particles and removal in the wet scrubber. Applicant requests maintaining the fuel oil sulfur content at 1.0% sulfur by weight and reducing the maximum annual oil firing from 500,000 to 200,000 gallons per year. This combination would

limit the increase in SO_2 emissions to below the Significant Emissions Rate of 40 tons per year. Therefore, a BACT determination is no longer required for SO_2.

Volatile Organic Compounds Emissions

Similar to NOx emissions, the applicant requests increasing the current VOC limit from 0.25 to 0.50 lb/mmBTU based on "good combustion practices" to provide additional "margin of safety for compliance". Test data indicates that actual VOC emissions have been very close to the current limit of 0.25 lb/mmBTU. The applicant proposes to establish an acceptable range of operation for the oxygen content of the flue gas. A flue gas oxygen monitor with alarm would represent the "good combustion practices" necessary to minimize CO and VOC emissions.

PSD Applicability

Based on current requests, the applicant believes PSD only applies to CO, NOx, PM, PM10, and VOC for the project.

Monitoring

In accordance with the current practice, the applicant proposes to continuously monitor and record the steam parameters (production, temperature, and pressure). The applicant will also continue to monitor and record by hand the following parameters at least once per shift:

- Scrubber parameters (pressure drop, scrubber flow rate, and scrubber spray nozzle pressure);
- Oil flow rate (integrator to accumulate oil consumption); and
- Flue gas oxygen content (in percent).

{Note: Because of the requested limit on heat input, the applicant must also calculate the heat input for each month of operation and each consecutive 12 months of operation based on: the total recorded steam production rate, the recorded steam temperature and pressure, the calculated steam enthalpy, and an assumed boiler thermal efficiency of 55%.}

SENDER: *COMPLETE THIS SECTION*

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- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Mr. John A. Fanjul
Vice President & Gen. Mgr
Atlantic Sugar Association, Inc
PO Box 1570
Belle Glade, FL 33440

COMPLETE THIS SECTION ON DELIVERY

A. Received by *(Please Print Clearly)* B. Date of Delivery 8/8/00

C. Signature
X [signature] ☐ Agent ☐ Addressee

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

Service Type
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☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

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Article Sent To: John A. Fanjul

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Mr. John A. Fanjul
Vice President & Gen. Mgr.
Atlantic Sugar Association, Inc.
PO Box 1570
Belle Glade, FL 33440

7099 3400 0000 1453 2900

PS Form 3800, July 1999

Golder Associates Inc.

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

July 10, 2000

9937584A/2

Florida Department of Environmental Protection
New Source Review Section
2600 Blair Stone Road MS 5500
Tallahassee, Florida 32399-2400

Attention : Jeffery Koerner, P.E.

RE: ATLANTIC SUGAR ASSOCIATION
PSD PERMIT APPLICATION FOR BOILER NO. 5
DEP FILE NO. 0990016-004-AC/PSD-FL-279
INFORMATION SUBMITTAL NO. 2

Dear Mr. Koerner:

Atlantic Sugar Association (ASA) has received the Florida Department of Environmental Protection (FDEP) letter dated January 11, 2000, concerning the above referenced PSD permit application for Boiler No.5. This letter also includes Palm Beach County Health Department's (PBCHD) comments. Responses to each of the FDEP's comments and PBCHD's comments are presented below, in the same order as they appear in the letter.

1. CO Standard: There have not been any other air construction permits or PSD permit modifications issued after 1986 for Boiler No. 5. However, we do not agree with the request to base the increase in emissions for CO on a change from 0.27 to 6.5 lb/MMBtu. The original 0.27 lb/MMBtu limit was found to be in error, and the CO emissions from Boiler No. 5 have never been 0.27 lb/MMBtu. The correction of the limit to 6.5 lb/MMBtu through the operating permit was approved by the FDEP. This approval was subsequent to a specific request by ASA submitted to both FDEP and EPA Region IV (see attached letter dated November 5, 1990).

   Nevertheless, in order to resolve this issue and avoid any potential concerns from EPA, the emission tables and air quality analysis have been revised to reflect the increase from 0.27 to 6.5 lb/MMBtu limit for Boiler No. 5.

   NO_x Standard: ASA reiterates the comments provided in the December 15, 1999 submittal regarding NO_x and CO emissions. The following summarizes the justification for increasing the current NO_x limit:
   - The current NO_x limit for Boiler No. 5 is the lowest in the sugar industry; actual test data approach this limit;

- NO_x emissions from Boiler No. 5 are very low compared to other combustion sources (i.e., fossil fuel and wood). Even at the proposed NO_x limit of 0.25 lb/MMBtu, the total NO_x emissions of 109.4 TPY from this boiler are very low;
- NO_x emissions from the boiler do not occur during the peak ozone forming months;
- FDEP is placing emphasis on control of CO/VOC emissions from bagasse boilers, which will drive the NO_x emissions higher.
- A recent BACT determination for NO_x from a bagasse-fired boiler resulted in an emission limit of 0.20 lb/MMBtu.

Past NO_x test data, presented previously, show emissions approaching but not exceeding the 0.16 lb/MMBtu limit, except for testing in January 1995. In 1995, the boiler exceeded the NO_x limit, and ASA subsequently came under an enforcement action and paid penalties for this exceedance. NO_x emissions during this testing averaged 0.22 lb/MMBtu, and were as high as 0.31 lb/MMBtu for an individual test run. During this testing, the CO emissions were generally lower compared to other compliance test data where the 0.16 lb/MMBtu limit was met. ASA is requesting a NO_x limit slightly higher than the actual average 1995 test data.

ASA cannot accept a limit based on the average actual data; there must be some reasonable margin of safety for compliance. In addition, the ability to achieve higher NO_x emissions should be welcomed since this would lead to lower CO and VOC emissions, which are of greater importance. It is also noted that Boiler No. 5 does not operate during the typical ozone season, during the summer months. Therefore, Boiler No. 5 would not contribute to peak ozone levels within Palm Beach County. In addition, the proposed NO_x limit for Boiler No. 5 of 0.25 lb/MMBtu is far below the RACT limitations of 0.9 lb/MMBtu contained in Rule 62-296.570 for carbonaceous fuel fired units.

BACT for NO_x, CO, and VOC emissions from Boiler No. 5 will be "good combustion practices". Emphasis will be on control of CO. As proposed on page 5-8 of the application, ASA will conduct testing to determine a proper range of O_2 that represents good combustion practices. An O_2 process monitor will then be used to implement good combustion practices, i.e., operating the boiler to minimize CO emissions to the extent practical. This will tend to drive up NO_x emissions.

Based on this discussion, the FDEP should accept the applicant's proposed NO_x limit of 0.25 lb/MMBtu.

PM/PM_{10} Standard

The cited BACT determination (#CA-0424) was investigated. This source is a biomass-fired fluidized bed boiler with a baghouse for PM control. The PSD permit has been modified several times since its original issuance. The source is permitted to burn natural gas and biomass fuels. Biomass fuels, according to the permit, include agricultural crop residue, lawn clippings, leaves, bark, vegetative waste material, plywood, and wood waste. Bagasse could be burned but is not mentioned specifically

in the permit. The source is operational and is burning primarily wood wastes. The PM limit for the source in the current permit is 0.045 lb/MMBtu. This source represents a different technology (fluidized bed boiler) compared to the ASA Boiler No. 5 (spreader stoker boiler). Although the fluidized bed design may make it technically feasible to use a baghouse when firing bagasse, it does not demonstrate in practice that a baghouse can be used on the existing Boiler No. 5. Since this technology has not been proven or used on a strictly bagasse-fired boiler, it cannot be considered as feasible for the existing ASA Boiler No. 5. However, it is noted that the ESP technology, achieving PM/PM_{10} emissions of 0.03 lb/MMBtu, would result in a PM emission rate lower than the fluidized bed/baghouse, which is permitted for 0.045 lb/MMBtu.

The combination cyclone/ESP represents the best proven technology for a bagasse-fired boiler, as well as the most stringent emission limit of 0.03 lb/MMBtu. A cyclone/baghouse is potentially feasible (although not proven at this time), but would result in little or no improvement in PM emissions. Also, the baghouse would be more costly compared to the ESP.

SO_2 Standards

ASA will agree to an SO_2 limit for bagasse firing of 0.05 lb/MMBtu, while increasing the maximum sulfur content of fuel oil fired in the boiler to 1.0 percent (previously proposed as 0.7 percent sulfur). As shown in the attached revised emission tables, this changes result in the net SO_2 emissions increase being less than the PSD significant emission rate. Therefore, the proposed project is no longer subject to PSD review for SO_2. Revised application pages, emission tables, and source applicability tables are attached which reflect the above described changes.

VOC Standard

In the case of VOC, past compliance test data are marginally below the current 0.25 lb/MMBtu limit. The 1997 and 1998 compliance tests showed averages of 0.23 and 0.21 lb/MMBtu, respectively (based on EPA Methods 18/25A, with VOC reported as methane). Therefore, there is currently no margin of safety for compliance purposes. VOC emissions can be variable depending on fuel characteristics and other factors. Therefore, a greater margin of safety is desired. In addition, the proposed VOC limit for Boiler No. 5 of 0.5 lb/MMBtu is far below the RACT limitations of 5.0 lb/MMBtu contained in Rule 62-296.570 for carbonaceous fuel fired units. In an effort to resolve this issue, ASA is willing to commit to a lower proposed limit of 0.35 lb/MMBtu. This limit is lower than the BACT limit of 0.50 lb/MMBtu set recently for U.S. Sugar Clewiston Boiler No. 4. Revised application pages, emission tables, and source applicability tables are attached which reflect the above described changes.

2. **(Item 6 in FDEP letter)**

The FDEP is correct in that the original EPA PSD permit required installation of a flue gas oxygen monitor, and testing to establish acceptable oxygen limits in order to meet the NO_x and CO BACT limits. ASA installed the oxygen monitor as required. However, the CO test method available at the time (Method 3 Orsat analysis) did not provide adequate information in which to establish any limits. When ASA received approval of a steam rate increase on Boiler No. 5 in 1986, the EPA PSD permit was

modified by EPA, but did not modify this requirement. However, FDEP also issued its own construction permit, which did not require an oxygen monitor, but did require Method 10 to be used for compliance. Subsequently, the use of Method 10 indicated that the original CO emission factor and emission limit were in error. This error was corrected by FDEP in the 1992 operating permit for Boiler No. 5. The operating permit did not require any oxygen monitoring.

Because of the test method issue, the emission factor/limit issue, and the various permits issued for Boiler No. 5, no range of operation for oxygen has been established. ASA is proposing to implement an oxygen content range with alarm system to move forward with this PSD permit revision.

3. **(Item 8 in FDEP letter)**
The comments from the PBCHD are addressed below.

4. **(Item 9 in FDEP letter)**
Golder has reviewed all modeling runs input files, and has also detected several discrepancies. Revised modeling has been performed, and results tables are attached. In regards to the specific points addressed in the FDEP letter:
   - The increase in CO emissions from 0.27 to 6.5 lb/MMBtu has been modeled. Boiler No. 5 is being modeled for the expected longest duration of the crop season (7 months or about 210 days/crop), since this boiler will not be operated outside of the crop season.
   - ASA is still proposing a higher NO_x limit of 0.25 lb/MMBtu, and modeling was performed on this basis. If the BACT limit issued by FDEP is lower, then the modeling would be conservative (i.e., the predicted impacts would be higher than would actually occur).
   - SO_2 emissions are no longer subject to PSD review; therefore, revised SO_2 modeling was not performed.
   - Short-term impacts (24-hours and less) have been based on a maximum heat input rate of 253 MMBtu/hr.
   - Long-term impacts have been based on a maximum heat input rate of 226 MMBtu/hr.

   Additional changes to the modeling are summarized below:
   - Osceola Boiler No. 5 and Okeelanta Boiler Nos. 12, 14, and 15 have been identified as being constructed after the major source baseline date of January 6, 1975. AS a result, these sources are no longer included in the baseline emissions inventory for PSD increment modeling.
   - ASA Boiler No. 5, as well as the other ASA boilers, were modeled for the longest expected future crop season duration of 7 months (October – April).
   - Appropriate meteorological data and receptor spacing have been used in the revised modeling.

Responses to PBCHD Comments

1. No response necessary.

2. No response necessary.
3. The CO emissions are now being subject to PSD review, and the PSD analysis, including air modeling analysis, is based on a limit of 6.5 lb/MMBtu.
4. As described above, SO_2 emissions are no longer subject to PSD review.
5. Requiring a stack test during soot blowing has never been required on a bagasse boiler, to our knowledge.
6. The oxygen analyzer was installed on Boiler No. 5 when the boiler was initially constructed, as required by the permit. Acceptable ranges of operations were not established, as explained previously. To resolve this issue, ASA will agree to performing parametric testing to establish acceptable operating ranges for oxygen on Boiler No. 5, consistent with good combustion practices.
7. As stated in the previous submittals, the environmental benefit of operating Boiler No. 5 is lower emissions compared to the other bagasse boilers at the mill. These benefits have not been quantified in the application. However, Boiler Nos. 1-4 at ASA are permitted for greater hours of operation. If Boiler No. 5 cannot operate due to limited operating hours, the other boilers at the mill will operate longer to process the sugar cane received at the mill. Therefore, it is beneficial to allow Boiler No. 5 increased operating hours.
8. No response necessary.
9. No response necessary.
10. No response necessary.

Additional PBCHD Comments

1. The issues identified by PBCHD are being addressed through this submittal.
2. In order to quickly resolve this issue, ASA will agree to limiting wood chip firing in Boiler No. 5 to the original steam permitted capacity of the boiler—100,000 lb/hr steam (196 MMBtu/hr). In the wood chip firing approval, FDEP concluded that wood chip firing in itself would not increase emissions. Thus, the modification of the boiler from 100,000 to 130,000 lb/hr steam is no longer an issue in regards to NSPS applicability. It is also noted that Boiler No. 5 was not physically modified in 1986 in order to achieve the higher steam production rate of 130,000 lb/hr. The boiler as originally constructed was found to be able to achieve a higher level of steam production compared to the design steam rate.
3. ASA does not agree with all the suggested changes to the economic evaluation of the ESP control device. Specifically, ASA does not agree with:
   - Using permitted allowables for PM as the baseline emissions for Boiler No. 5; current actual emissions should be used;
   - The comment regarding the cost of the wet cyclone. The cost for ASA was scaled down from the cost for U.S. Sugar, which was $200,000.
   - Scaling ductwork costs based strictly on the size of the ESP. Ductwork costs will be largely independent of the ESP size, and more dependent on the length of

ductwork, elbows, bends, obstacles, etc. The U.S. Sugar cost of $100,000 was scaled down to $75,000 for ASA.

- Further scaling direct installation costs. The only costs included in this category are site preparation and foundation costs, which will be largely independent of the size of the ESP. All other installation costs are included in the vendor quote, which was scaled down for the ASA application.
- A 20 year life for the ESP. A more reasonable life is 15 years, particularly on an unproven application located in a high humidity area, operating on a source with high stack gas moisture contents and some sulfur emissions (corrosion would be an issue). Seven percent interest at 15 years equates to a capital recovery factor of 0.11, and this factor was used in the analysis.

Based on this discussion, the estimated total capital investment of the ESP remains at $1,925,000. The capital recovery costs based on 15 years at 7 percent interest is $211,750/yr. A detailed analysis of operating costs of the existing wet scrubber versus an ESP was not performed. However, the existing wet scrubbers have no moving parts, and require very little maintenance. Typical maintenance activities include periodically cleaning the spray nozzles and replacing pumps. The scrubbers are by design low pressure drop and therefore energy consumption is moderate. By comparison, the ESP would have a pressure drop similar to the wet scrubbers, and overall energy could be higher with the ESP.

Experience with ESPs indicates a fair amount of maintenance is required on an ESP serving a bagasse boiler. Therefore, it is not expected that an ESP would result in a decrease in operating labor and maintenance, and may even result in an increase. To simplify the analysis, while remaining conservative, no operating costs were included in this revised cost analysis (i.e., assumes that operating and maintenance costs are the same as the present wet scrubbing system). The resulting cost effectiveness is $5,430/ton of PM removed ($211,750/yr divided by 39 TPY reduction). This cost is still very high, and the ESP is ruled out based on economics.

As discussed previously, a baghouse for PM control is unproven, would be more costly than an ESP, and may not achieve any lower PM emission rate.

It is reiterated here that ASA is merely requesting an increase in operating hours on an existing source, from 3,000 hr/yr to an equivalent operation of 3,840 hr/yr. This is not a new source.

4. ASA was not requested to address selective catalytic reduction (SCR) in previous comments received from the FDEP. Nevertheless, SCR is considered technically infeasible on a bagasse boiler due to the particulate, sulfur, and moisture in the flue gases, which would render the catalyst ineffective.

   For selective non-catalytic reduction (SNCR), the technical feasibility for application to this boiler has not been demonstrated. Temperature and residence time may not be adequate to accommodate an SNCR system. Nevertheless, an economic evaluation of SNCR was conducted. The analysis is shown in Table A attached. A 30 percent

reduction in NO_x emissions is considered achievable on this application. The cost effectiveness is shown to be $11,600/ton NO_x removed. This cost is deemed too high, which results in part from the relatively low NO_x emissions from Boiler No. 5.

5. ASA does not intend to operate Boiler No. 5 during the off-season, which is the peak ozone forming period in south Florida. Therefore, Boiler No. 5 should not affect the ozone attainment status of Palm Beach County.
6. As described above, ASA will accept an SO2 limit for bagasse firing of 0.05 lb/MMBtu. This limit, in conjunction with the fuel oil usage and sulfur content limit, does not trigger PSD review for SO2.
7. At Okeelanta, the old sugar mill boilers have been shutdown and are no longer operating. The FDEP is currently evaluating the permitting requirements if these boilers are to be restarted in the future. Therefore, it is appropriate to model only the cogeneration boilers at this time. Prior to any restart of the sugar mill boilers, appropriate FDEP approval must be obtained. In regards to Boiler Nos. 12, 14 and 15, it is believed that these boilers were indeed constructed after January 6, 1975, and therefore they should not be in the baseline emissions. The modeling analysis has be revised accordingly.

A revised modeling analysis, addressing FDEP's and PBCHD's concerns, will be submitted in the near future. Thank you for consideration of this information. Please call or e-mail me if you have any additional questions.

Sincerely,

GOLDER ASSOCIATES INC.

David A. Buff

David A. Buff, P.E.
Principal Engineer
Florida P.E. #19011
SEAL

DB/jkw

Enclosures

cc: Hector Cardentey
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National Park Service
Darrel Graziani
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P:\Projects\99\9937\9937584a ASA\I2\#02ltr.doc
SED
C. Holladay

Table A. Cost effectiveness for Using SNCR to Control NOx Emissions from ASA Boiler No. 5.

Cost Items	Cost Factors	SNCR Costs @ 30% removal (d) (1999 dollars)
DIRECT CAPITAL COSTS (DCC):		
(1) Purchased Equipment Cost		
(a) Supply & delivery of equipment	Based on Vendor Quote	456,973
(b) Erection of tanks	Based on Vendor Quote	25,033
(c) Installation of piping	Based on Vendor Quote	91,000
(d) Installation of electric & controls	Based on Vendor Quote	34,267
(e) Installation of nozzels into boiler	Based on Vendor Quote	10,380
(f) Sales Tax (Florida)	0.6*(1a...1e)	exempt
Total DCC:	(1a...1f)	**617,653**
INDIRECT CAPITAL COSTS (ICC):		
(2) Indirect Installation Costs		
(a) Technology License Fee	Based on Vendor Quote	included
(b) Engineering & Supervision	Based on Vendor Quote	385,950
(c) Construction & Field Expenses	Based on Vendor Quote	99,375
(d) Contingencies	(0.25) x (DCC)	154,413
(3) Other Indirect Costs		
(a) Startup & Testing	Based on Vendor Quote	52,800
(b) Model Study	Based on Vendor Quote	N/A
Total ICC:	(2) + (3)	**692,538**
TOTAL CAPITAL INVESTMENT (TCI):	DCC + ICC	**1,310,192**
DIRECT OPERATING COSTS (DOC):		
(1) Operating Labor		
Operator	$22/hr; 4 hr/day; 1,460 hr/yr	32,120
Supervisor (a)	15% of operator cost	4,818
(2) Maintenance (a)		
Labor	Equivalent to Operating Labor	36,938
Maintenance	Equivalent to Maintenance Labor	36,938
(3) Utilities (b)		
(a) Urea Injection System Electricity	$34/MW-hr and 70 MW-hr /yr/boiler	2,380
(b) Dilution water	4.1 gpm @ $0.60/1000 gal/boiler	567
(4) Chemicals and Materials		
Reductant	47,232 gal/yr @ $1.00/gal	47,232
Total DOC:	(1) + (2) + (3) + (4)	**160,993**
INDIRECT OPERATING COSTS (IOC): (a)		
(5) Overhead (a)	60% of oper. labor & maintenance	22,163
(6) Property Taxes (a)	1% of total capital investment	13,102
(7) Insurance (a)	1% of total capital investment	13,102
(8) Administration (a)	2% of total capital investment	26,204
Total IOC:	(5) + (6) + (7) +(8)	**74,570**
CAPITAL RECOVERY COSTS (CRC):	CRF of 0.11 times TCI (15 yrs @ 7%)	**144,121**
ANNUALIZED COSTS (AC):	DOC + IOC + CRF	**379,684**
UNCONTROLLED NOx EMISSIONS (TPY) :	Proposed Limit	109
TOTAL NOx REMOVED:	30%	33
COST EFFECTIVENESS:	$ per ton of NOx Removed	**11,579**

Notes:
(a) Factors and cost estimates reflect OAQPS Cost Manual.
(b) Utility rates reflect estimated regional rates.
(c) Uncontrolled emissions reflect proposed limit.
(d) Cost estimates based on 1999 dollars (vendor quote November 1999).

REVISED APPLICATION FORM PAGE

Attachment ASA-EU1-L2
Fuel Analysis Specification for Atlantic Sugar Association Boiler No. 5

Parameter	Carbonaceous Fuel			No. 6 Fuel Oil (d) (1.0% max S)
	Bagasse (a)	Wood Waste (b)	Rice Hulls(c)	
Density (lb/gal)	--	--	--	8.00
Approximate Heating Value (Btu/lb) (e)	3,600	5,000	6,200	18,892
Approximate Heating Value (Btu/gal)	--	--	--	150,000
Ultimate Analysis (dry basis):				
Carbon	48.48%	47.32%	39.2%	87.3%
Hydrogen	6.01%	5.62%	4.7%	10.5%
Nitrogen	0.33%	0.33%	1.45%	0.28%
Oxygen	43.65%	39.67%	33.25%	0.64%
Sulfur	0.05%	0.12%	0.2%	1.0%
Ash/Inorganic	1.44%	7.01%	21.2%	0.04%
Moisture	52%	37%	17.7%	--

Note: All values represent average fuel characteristics.

Footnotes:
(a) Source: sugar industry fuel analysis averages.
(b) Source: average of wood chip analysis (57 separate lots) from Okeelanta Corporation.
(c) Laboratory analysis performed for Atlantic Sugar Association by D.B. Riley, Inc.
(d) Source: Perry's Chemical Engineers' Handbook. Sixth Edition.
(e) Average values on a wet basis for bagasse, wood chips, and rice hulls.

E. SEGMENT (PROCESS/FUEL) INFORMATION
(All Emissions Units)

Segment Description and Rate: Segment 3 of 3

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **External combustion boilers, industrial, residual oil, grade 6 oil.**		
2. Source Classification Code (SCC): **1-02-004-01**	3. SCC Units: **Thousand Gallons Burned**	
4. Maximum Hourly Rate: **0.470**	5. Maximum Annual Rate: **200**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **1.0**	8. Maximum % Ash:	9. Million Btu per SCC Unit: **150**
10. Segment Comment (limit to 200 characters): **Max rates based on 70.5 MMBtu/hr and 0.7% sulfur (max permitted % S content) No. 6 fuel oil.**		

Segment Description and Rate: Segment ____ of ____

1. Segment Description (Process/Fuel Type) (limit to 500 characters):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters):		

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **SO_2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **83.1** lb/hour **37.0** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: **0.73 lb/MMBtu** Reference: **Permit limit for oil**	7. Emissions Method Code: **0**

8. Calculation of Emissions (limit to 600 characters):

(152.7 MMBtu/hr x 0.05 lb/MMBtu) + (70.5 MMBtu/hr x 1.07 lb/MMBtu) = 83.1 lb/hr.

((0.867 x 10^{12} Btu/yr - 30000 x 10^{6} Btu/yr) x 0.05 lb/MMBtu + (30,000 x 10^{6} x 1.07 lb/MMBtu) x tons/2000 lb = 37.0 TPY.

9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):

Max emissions based on carbonaceous fuel and fuel oil firing. Emission factor given is for fuel oil firing.

Allowable Emissions Allowable Emissions 1 of 3

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.05 lb/MMBtu**	4. Equivalent Allowable Emissions: **83.1** lb/hour **37.0** tons/year

5. Method of Compliance (limit to 60 characters):

EPA Method 6, 6A, 6B

6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):

SO_2 from carbonaceous heat input up to 255.3 MMBtu/hr and 0.867 x 10^{12} Btu/yr.

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted:	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

Allowable Emissions Allowable Emissions 2 of 3

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **1.07 lb/MMBtu**	4. Equivalent Allowable Emissions: **75.4** lb/hour **16.1** tons/year
5. Method of Compliance (limit to 60 characters): **Fuel oil analysis**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **SO_2 from No. 6 fuel oil heat input up to 255.3 MMBtu/hr and 30,000 MMBtu/yr(200,000 gal/yr).**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted:	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour tons/year	4. Synthetically Limited? [ ]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions (limit to 600 characters):	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):	

Allowable Emissions Allowable Emissions 3 of 3

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **83.1 lb/hr**	4. Equivalent Allowable Emissions: **83.1** lb/hour **37.0** tons/year
5. Method of Compliance (limit to 60 characters): **Fuel oil analysis and stack testing**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Combination of bagasse and fuel oil burning.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **89.4** lb/hour **151.8** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: **0.35 lb/MMBtu** Reference: **Permit limit**	7. Emissions Method Code: **0**
8. Calculation of Emissions (limit to 600 characters): **255.3 MMBtu/hr x 0.35 lb/MMBtu = 89.4 lb/yr** **0.867 x 10^{12} Btu/yr x 0.35 lb/MMBtu = 151.8 tons/year**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Max emissions are based on carbonaceous fuel firing. Emission factor given is for carbonaceous fuel firing.**	

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.35 lb/MMBtu**	4. Equivalent Allowable Emissions: **89.4** lb/hour **151.8** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 18, 25, 25A (modified)**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **VOC from carbonaceous heat input up to 255.3 MMBtu/hr and 0.867 x 10^{12} Btu/yr.**	

REVISED PSD REPORT TABLES

Table 1-1. Net Emissions Increase for Belle Glade Atlantic Sugar Boiler No. 5

Pollutant	PSD Baseline Emissions (TPY)	Future Maximum Emissions (TPY)	Net Increase in Emissions (TPY)	PSD Significant Rate (TPY)	PSD Review Applies?
Particulate Matter (PM)	29.0	65.0	36.0	25	Yes
PM10	26.6	60.7	34.1	15	Yes
Sulfur Dioxide	0.5	37.0	36.5	40	No
Nitrogen Oxides	34.9	109.3	74.5	40	Yes
Carbon Monoxide	65.4	2,818.7	2,753.4	100	Yes
Volatile Organic Compounds	36.3	151.8	115.5	40	Yes
Sulfuric Acid Mist	0.03	2.3	2.2	7.0	No
Lead	0.11	0.19	0.09	0.60	No
Mercury	9.20E-03	1.65E-02	7.28E-03	0.10	No
Beryllium	0	2.78E-06	2.78E-06	4.00E-04	No

Table 2-1. Future Short Term Emissions of Regulated Pollutants for ASA Boiler No. 5 (revised 7-7-00)

Regulated Pollutant	Emission Factor (lb/MMBtu)	Ref	Activity Factor 1-Hour Max. (MMBtu/hr)(a)	Activity Factor 24-Hour Avg. (MMBtu/hr)(a)	Maximum Hourly Emissions (lb/hr)	Maximum 24-Hour Emissions (lb/hr)
			Carbonaceous Fuel			
Particulate Matter (PM)	0.15	1	255.3	225.9	38.3	33.9
Particulate Matter (PM10)	0.14	2	255.3	225.9	35.7	31.6
Sulfur dioxide	0.05	4	255.3	225.9	12.8	11.3
Nitrogen oxides	0.25	4	255.3	225.9	63.8	56.5
Carbon monoxide	6.50	1	255.3	225.9	1,659.6	1,468.1
VOC	0.35	4	255.3	225.9	89.4	79.1
Sulfuric Acid Mist	3.06E-03	5	255.3	225.9	0.8	0.7
Lead	4.45E-04	6	255.3	225.9	0.11	0.10
Mercury	3.80E-05	7	255.3	225.9	0.010	0.0086
Beryllium	--	6	255.3	225.9	--	--
			No. 6 Fuel Oil			
Particulate Matter (PM)	0.10	1	70.5	--	7.05	7.05
Particulate Matter (PM10)	0.10	8	70.5	--	7.05	7.05
Sulfur dioxide	1.07	9	70.5	--	75.4	75.4
Nitrogen oxides	0.31	10	70.5	--	21.86	21.86
Carbon monoxide	0.033	10	70.5	--	2.33	2.33
VOC	0.0019	10	70.5	--	0.13	0.13
Sulfuric Acid Mist	6.55E-02	5	70.5	--	4.62	4.62
Lead	1.01E-05	10	70.5	--	7.12E-04	7.12E-04
Mercury	7.53E-07	10	70.5	--	5.31E-05	5.31E-05
Beryllium	1.85E-07	10	70.5	--	1.30E-05	1.30E-05
			Maximum No. 6 Fuel Oil/ Remainder Bagasse			
Particulate Matter (PM)			223.2	193.8	30.0	25.5
Particulate Matter (PM10)			223.2	193.8	28.4	24.3
Sulfur dioxide			223.2	193.8	83.1	81.6
Nitrogen oxides			223.2	193.8	60.0	52.7
Carbon monoxide			223.2	193.8	994.9	803.8
VOC			223.2	193.8	53.6	43.3
Sulfuric Acid Mist			223.2	193.8	5.1	5.0
Lead			223.2	193.8	6.87E-02	5.56E-02
Mercury			223.2	193.8	5.86E-03	4.74E-03
Beryllium			223.2	193.8	1.30E-05	1.30E-05
			Maximum Any Combination			
Particulate Matter (PM)					38.3	33.9
Particulate Matter (PM10)					35.7	31.6
Sulfur dioxide					83.1	81.6
Nitrogen oxides					63.8	56.5
Carbon monoxide					1,659.6	1,468.1
VOC					89.4	79.1
Sulfuric Acid Mist					5.1	5.0
Lead					0.11	0.10
Mercury					9.70E-03	8.58E-03
Beryllium					1.30E-05	1.30E-05

Footnotes

(a) Maximum 1-hour activity factor is based on a steam production of 130,000 lb/hr at 250 psig, 550 F.
Maximum 24-hour average activity factor based on steam production rate of 115,000 lb/hr at 250 psig, 550 F.
Enthalpy of steam = 1,290 Btu/lb. Enthalpy of feedwater = 210 Btu/lb. Net enthalpy = 1,080 Btu/lb.
Boiler efficiency = 80% on fuel oil and 55% on bagasse.
Derivation of heat input for No. 6 Fuel oil/Bagasse combination firing:
Max 1-hr case:
Max oil = 70.5 MMBtu/hr x 80% eff. =56.4 MMBtu/hr into steam
Remainder needed into steam = (130,000 lb/hr steam x 1,080 Btu/lb) - 56.4 MMBtu/hr = 84.0 MMBtu/hr
Required heat input to boiler from bagasse = 84.0 MMBtu/hr / 55% eff. = 152.7 MMBtu/hr
Total heat input required = 70.5 + 152.7 = 223.2 MMBtu/hr
Max 24-hr case:
Max oil = 70.5 MMBtu/hr x 80% eff. = 56.4 MMBtu/hr into steam.
Remainder needed into steam = (115,000 lb/hr steam x 1,080 Btu/lb) - 56.4 MMBtu/hr = 67.8 MMBtu/hr
Required heat input to boiler from bagasse = 67.8 MMBtu/hr / 55% eff. = 123.3 MMBtu/hr
Total heat input required = 123.3 + 70.5 = 193.8 MMBtu/hr

References

1. Current BACT permit limit for Boiler No. 5.
2. Based on limited source testing of bagasse boiler which indicated 93% of PM was PM10.
3. Based on source test data for Boiler No. 5.
4. Proposed BACT permit limit for Boiler No. 5.
5. Based on assuming 5% of SO2 emissions are equal to SO3, based on AP-42 Section 1.3, Fuel Oil Combustion. Conversion of SO3 to H2SO4 (SO3 x 98/80).
6. Based on AP-42, Section 1.6, Wood Waste Combustion. Represents controlled emissions.
7. Based on stack testing of 5 bagasse boilers in Florida (refer to appendices).
8. Assumed as 100% of PM emissions.
9. Based on 1.0 % S fuel oil; 150,000 Btu/gal; 8.0 lb/gal; assumes 100% conversion of sulfur to SO2.
10. Based on AP-42, Section 1.3, Fuel Oil Combustion, residual oil.
NO_x - 40 lb/1000 gal; CO - 5 lb/1000 gal; VOC - 0.28 lb/1000 gal;
Lead - 1.51E-03 lb/1000 gal; Mercury - 1.13E-04 lb/1000 gal;
Beryllium - 2.78E-05 lb/1000 gal

Example Calculations

Single Fuel Combustion:
Hourly Emission Rate = Emission Factor X Activity Factor (1-hour maximum)

Table 2-2. Maximum Annual Emissions Proposed for Atlantic Sugar Boiler No. 5 (revised 7-7-00)

Pollutant	Bagasse Firing			Fuel Oil Firing			TOTAL
	Emission Factor	Heat Input (a) (MMBtu/yr)	Emissions (TPY)	Emission Factor	Heat Input (a) (MMBtu/yr)	Emissions (TPY)	Emissions (TPY)
Particulate Matter (PM)	0.15 lb/MMBtu	867,302	65.0	0.1 lb/MMBtu	0	0	65.0
PM10	0.14 lb/MMBtu	867,302	60.7	0.1 lb/MMBtu	0	0	60.7
Sulfur Dioxide	0.05 lb/MMBtu	837,302	20.9	1.07 lb/MMBtu	30,000	16.1	37.0
Nitrogen Oxides	0.25 lb/MMBtu	837,302	104.7	0.31 lb/MMBtu	30,000	4.7	109.3
Carbon Monoxide	6.50 lb/MMBtu	867,302	2,818.7	0.033 lb/MMBtu	0	0	2,818.7
Volatile Organic Compounds	0.35 lb/MMBtu	867,302	151.8	0.0019 lb/MMBtu	0	0	151.8
Sulfuric Acid Mist	3.06E-03 lb/MMBtu	837,302	1.3	0.066 lb/MMBtu	30,000	1.0	2.3
Lead	4.45E-04 lb/MMBtu	867,302	0.19	1.01E-05 lb/MMBtu	0	0	0.19
Mercury	3.80E-05 lb/MMBtu	867,302	0.016	7.53E-07 lb/MMBtu	0	0	0.016
Beryllium	–	837,302	--	1.85E-07 lb/MMBtu	30,000	2.78E-06	2.78E-06

(a) Total heat input based on steam production of 441.6 x 10^6 lb/yr and 1,964 Btu/lb steam.
Fuel oil considered where worst case emission factor is due to oil burning at 200,000 gal/yr.

Table 3-3. Current Actual Emissions for Atlantic Sugar Boiler No. 5 (revised 07/07/00)

Pollutant	Bagasse Firing				
	Emission Factor		Ref.	Heat Input (a) (MMBtu/yr)	Emissions (TPY)
Particulate Matter (PM)	0.12	lb/MMBtu	1	484,126	29.0
PM10	0.11	lb/MMBtu	2	484,126	26.6
Sulfur Dioxide	0.002	lb/MMBtu	1	484,126	0.48
Nitrogen Oxides	0.144	lb/MMBtu	1	484,126	34.9
Carbon Monoxide	0.27	lb/MMBtu	6	484,126	65.4
Volatile Organic Compounds	0.15	lb/MMBtu	1	484,126	36.3
Sulfuric Acid Mist	1.23E-04	lb/MMBtu	3	484,126	0.03
Lead	4.45E-04	lb/MMBtu	4	484,126	0.11
Mercury	3.80E-05	lb/MMBtu	5	484,126	9.20E-03
Beryllium	--		4	484,126	0.0

(a) Based on actual steam production during 97-98 and 98-99 crop seasons, and design steam enthalpies for Boiler No. 5. (246.5×10^6 lbs steam/yr @ 1,964 Btu/lb).

Footnotes:

(1) Based on average of stack tests from last 5 years.
(2) Based on 93% of PM emissions for bagasse burning.
(3) Based on assuming 5% of SO2 emissions are equal to SO3, based on AP-42 Section 1.3, Fuel Oil Combustion. Conversion of SO3 to H2SO4 (SO3 x 98/80).
(4) Based on AP-42, Section 1.6, Wood Waste Combustion. Represents controlled emissions.
(5) Based on stack testing of 5 bagasse boilers in Florida (refer to appendices).
(6) Based on original PSD permit limit.

Table 3-4. Net Emissions Increase for Belle Glade Atlantic Sugar Boiler No. 5

Pollutant	PSD Baseline Emissions (TPY)	Future Maximum Emissions (TPY)	Net Increase in Emissions (TPY)	PSD Significant Rate (TPY)	PSD Review Applies?
Particulate Matter (PM)	29.0	65.0	36.0	25	Yes
PM10	26.6	60.7	34.1	15	Yes
Sulfur Dioxide	0.5	37.0	36.5	40	No
Nitrogen Oxides	34.9	109.3	74.5	40	Yes
Carbon Monoxide	65.4	2,818.7	2,753.4	100	Yes
Volatile Organic Compounds	36.3	151.8	115.5	40	Yes
Sulfuric Acid Mist	0.03	2.3	2.2	7.0	No
Lead	0.11	0.19	0.09	0.60	No
Mercury	9.20E-03	1.65E-02	7.28E-03	0.10	No
Beryllium	0	2.78E-06	2.78E-06	4.00E-04	No

Table 6-2. Stack, Operating, and Emission Data for Current Actual and Future Operations for Boiler No. 5 (revised 7-7-00)

Parameters	Current Actual Operations [b]						Future Maximum Operations					
	1-hour		24-hour		Annual		1-hour		24-hour		Annual	
STACK DATA												
Height (ft)			90						90			
Diameter (ft)			5.5						5.5			
OPERATING DATA												
Heat Input Rate (MMBtu/hr)	255.3		225.9		225.9		255.3		225.9		225.9	
Flow Rate (acfm) [a]	90,000		79,615		79,615		90,000		79,615		79,615	
Velocity (ft/s)	63.1		55.9		55.9		63.1		55.9		55.9	
Temperature (°F)	150		150		150		150		150		150	
EMISSION DATA	lb/hr	g/s	lb/hr	g/s	lb/hr [c]	g/s	lb/hr	g/s	lb/hr	g/s	lb/hr [d]	g/s
Particulate Matter (PM)	30.6	*3.86*	27.1	*3.42*	19.4	*2.44*	38.3	*4.83*	33.9	*4.27*	33.9	*4.27*
Particulate Matter (PM10)	28.6	*3.60*	25.3	*3.19*	18.0	*2.27*	35.7	*4.50*	31.6	*3.98*	31.6	*3.98*
Sulfur dioxide	0.5	*0.06*	0.5	*0.06*	0.3	*0.04*	83.1	*10.47*	81.6	*10.28*	19.3	*2.43*
Nitrogen oxides	36.8	*4.63*	32.5	*4.10*	23.2	*2.93*	63.8	*8.04*	56.5	*7.11*	56.9	*7.17*
Carbon monoxide	68.9	*8.7*	61.0	*7.7*	43.6	*5.5*	1,659.6	*209.1*	1,468.1	*185.0*	1,468.1	*185.0*

[a] Flow rate based on the flow rate of 90,000 acfm at 255.3 MMBtu/hr. Other flow rates are determined by multiplying the ratio of flow of 90,000 acfm to heat input rate of 255.3 MMBtu/hr times the heat input rate for the other averaging period.

[b] Emission data based on test data.

[c] Refer to Table 3-3 for the current actual annual emissions, assuming current permit limit of 3,000 hour/year.

[d] Future equivalent hours/year of operation = 3,840

Golder Associates Inc.

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

April 6, 2000

9937584A/01

Florida Department of Environmental Protection
New Source Review Section
2600 Blair Stone Road MS 5500
Tallahassee, Florida 32399-2400

Attention : Jeffery Koerner, P.E.

RE: ATLANTIC SUGAR ASSOCIATION
PSD PERMIT APPLICATION FOR BOILER NO. 5
DEP FILE NO. 0990016-004-AC/PSD-FL-279
REQUEST FOR EXTENSION OF TIME TO RESPOND

Dear Mr. Koerner:

Atlantic Sugar Association (ASA) has received the Department's letter dated January 11, 2000, concerning the above referenced PSD permit application for Boiler No. 5. ASA and its consultant, Golder Associates Inc., have been developing the needed information to respond to the Department's comments. We have also met with Darell Graziani of Palm Beach County and discussed the County's comments. However, ASA does not need the increase in operating hours for the crop season just recently ended; therefore, the permit modification will not be needed until the upcoming crop season. We have had other pending issues, such as the Title V permit, which we have been focusing on.

ASA still intends to pursue the permit modification and plans on submitting the requested information in the near future. As such, ASA respectfully requests a 60-day extension of the time in which to respond to the Department's letter. Thus, ASA will provide a response no later than June 11, 2000.

Thank you for consideration of this request. Please call or e-mail me if you have any additional questions.

Sincerely,

GOLDER ASSOCIATES INC.

David A. Buff

David A. Buff, P.E.
Principal Engineer
Florida P.E. #19011

DAB/jkw

cc: Hector Cardentey
John Fanjul
Peter Cunningham
Darrel Graziani

cc: SD
Palm Bch. Co.
EPA
NPS

Golder Associates Fax

To: Jeffery Koerner, P. E. **Fax Number:** 850-922-6979

Company: FDEP **Date:** April 7, 2000

From: David Buff **e-mail:** @golder.com

Our ref: **Voice Mail:**

RE: 993-7584-0100

Total pages (including cover): 2 **Hard copy to follow** ☐

MESSAGE

Golder Associates

6241 NW 23rd St., Suite 500
Gainesville, FL 32653
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Thank you for consideration of this request. Please call or e-mail me if you have any additional questions.

Sincerely,

GOLDER ASSOCIATES INC.

David A. Buff

David A. Buff, P.E.
Principal Engineer
Florida P.E. #19011

DAB/jkw

cc: Hector Cardentey
John Fanjul
Peter Cunningham
Darrel Graziani

Department of Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

January 11, 2000

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. John A. Fanjul, Vice President and General Manager
Atlantic Sugar Association, Inc.
P.O. Box 1570
Belle Glade, FL 33440

Re: Request for Additional Information No. 2
DEP File No. 0990016-004-AC (PSD-FL-279)
Increased Operation of Boiler No. 5

Dear Mr. Fanjul:

On December 16, 1999, the Department received the requested additional information for the above referenced project. This information has been reviewed and the application remains incomplete. The following additional information is needed in order to continue processing your application. Should your response to any of the below items require new calculations, please submit the new calculations, assumptions, reference material and appropriate revised pages of the application form. The items are numbered as in the original request.

1. The Department researched the following previous permits for Boiler No. 5: AC50-42389 (1981), PSD-FL-078 (1981), AC50-107181 (1986), and AO50-205996 (1992). Based on this review, the Department summarizes the current BACT standards and requests additional information or a response for the following items.

   CO Standard: As established in the previous PSD permits, the CO BACT standard is 0.27 lb/mmBTU. A review of the permitting history shows that several original CO emissions limits for bagasse boilers were based on EPA Method 3. More recent test data based on EPA Method 10 indicates that CO emissions are much higher than initially believed. In the mid-1990s, several facilities obtained PSD permit modifications to revise the CO limit. However, Atlantic Sugar obtained a similar revised CO standard of 6.5 lb/mmBTU through the District Office in a non-federally enforceable state operation permit. The applicant requests this revised CO emission standard as BACT for the current project. Test data for the last five years indicates compliance with the 6.5 lb/mmBTU standard based on EPA Method 10.

   Were there any other air construction or PSD permit modifications for Boiler No. 5 after 1986?

   Please revise the air quality analysis to reflect an increase in CO emissions for the current project due to a change from 0.27 to 6.5 lb/mmBTU, as well as increased operation of Boiler No. 5.

   NOx Standard: As established in the previous PSD permits, the NOx BACT standard is 0.16 lb/mmBTU. The applicant requests increasing the current limit from 0.16 to 0.25 lb/mmBTU in order to provide additional "margin of safety" for compliance. Test data for the last four years

indicates compliance with the current BACT standard. Please provide additional technical information to justify why the boiler can no longer meet the original BACT emissions standard.

PM/PM10 Standard: As pointed out by the Palm Beach County Health Department, the RACT/BACT/LAER Clearinghouse (RBLC) database indicates a fluidized bed boiler in California that is fired by biomass - primarily bagasse. NOx emissions from the unit are controlled by thermal de-NOx system with ammonia injection. Particulate emissions are controlled by a baghouse. The RBLC identification number is #CA-0424. Please update the initial BACT analysis to include this project. The baghouse control results in a standard of 0.01 grain/dscf, which would probably qualify this option as the best available control. Please submit a cost analysis with vendor quote for this equipment. Similar to the ESP, a cyclone device would likely be necessary to remove large particles prior to the baghouse.

SO2 Standards: The Department notes the applicant's request to restrict annual fuel oil consumption to 200,000 gallons. In addition, test data for the last five years indicates a *maximum* SO2 emission rate of 0.006 lb/mmBTU. This is an order of magnitude higher than the BACT standard proposed by the applicant. The Department is considering a BACT standard of 0.06 lb/mmBTU, similar to the recent determination for Boiler Bo. 4 at U.S. Sugar's Clewiston mill (PSD-FL-272).

VOC Standard: As established in the original PSD permit, the VOC BACT standard was 0.27 lb/mmBTU. The 1986 modification revised this limit to 0.25 lb/mmBTU. The applicant requests increasing the current limit from 0.25 to 0.50 lb/mmBTU in order to provide additional "margin of safety" for compliance. Test data for the last three years indicates compliance with the current BACT standard. Please provide additional technical information to justify why the boiler can no longer meet the original BACT emissions standard.

6. A review of the original PSD permit indicates that a permanent, flue gas oxygen meter was required to be installed and operated in accordance with the document "Use of Flue Gas Oxygen Meter as BACT for Combustion Controls", which was attached to the permit. This document requires sufficient testing to establish the oxygen content at which the boiler can achieve both the CO and NOx BACT standards. In addition, an alarm is required to sound if the oxygen content is not maintained within the appropriate range. This seems to be the same monitoring that the applicant is proposing as "new" for this project. Please explain.

8. Additional comments and questions from the Palm Beach County Health Department are attached for your response.

9. The Department has received the input/output files for the air quality analysis. The Department does not believe that the modeling analysis presented reflects the maximum allowable emissions for this facility. Please re-run the modeling analysis to include:

   - The increase in CO emissions for the current project due to a change from 0.27 to 6.5 lb/mmBTU, as well as increased operation of Boiler No. 5.
   - Maximum NOx emissions from Boiler No. 5 of 0.16 lb/mmBTU, the current BACT standard;
   - Maximum SO2 emissions based on new standard for bagasse-firing and permit allowable sulfur contents of fuel oil-firing for each of the five boilers;
   - Short-term emissions impacts (3-hour and less) based on a maximum heat input of 253 mmBTU per hour;
   - Long-term emissions impacts (annual) based on a maximum heat input of 226 mmBTU per hour;

   Revised modeling should reflect approved meteorological data and receptor spacings.

10. The Department has not yet received any written comments from the National Park Service (NPS) or EPA Region 4.

The Department will resume processing your application after receipt of the requested information. Rule 62-4.050(3), F.A.C. requires that all applications for a Department permit must be certified by a professional engineer registered in the State of Florida. This requirement also applies to responses to Department requests for additional information of an engineering nature. A new certification statement by the authorized representative or responsible official must accompany any material changes to the application. Rule 62-4.055(1), F.A.C. now requires applicants to respond to requests for information within 90 days. If there are any questions, please call me at 850/414-7268. Matters regarding modeling issues should be directed to Cleve Holladay (meteorologist) at 850/921-8986.

Sincerely,

Jeffery F. Koerner, P.E.
New Source Review Section

JFK/jfk

cc: Mr. Hector Cardentey, ASA
Mr. David Buff, P.E., Golder Associates
Mr. Gregg Worley, EPA
Mr. John Bunyak, NPS
Mr. David Knowles, South Florida District DEP
Mr. Jim Stormer, PBCHD

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Atlantic Sugar Assoc
PO Box 1570
Belle Glade, Fl
33440

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