Technical Evaluation
and
Final Determination

Atlantic Sugar Association

Power Boiler No. 5

Palm Beach County, Florida

Permit Numbers

State: AC 50-42389

Federal: PSD-FL-078

Florida Department of Environmental Regulation

Bureau of Air Quality Management

Central Air Permitting

October 6, 1981

Technical Evaluation

and

Final Determination

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I. Applicant and Location

Atlantic Sugar Assocation

State Road 80 South

P.O. Drawer B

Belle Glade, Florida 33430

The proposed modification will occur at Atlantic Sugar Association's (ASA's) existing plant that is located approximately 16 miles east southeast of Belle Glade, Palm Beach County, Florida, and about 3.5 miles south of State Road 80. The UTM coordinates are 552.9 km east and 2,945.2 km north.

II. Project Description

The project involves transferring one existing boiler from Gulf and Western Food Products Company to ASA. The proposed unit will be designated number 5 boiler at the site. This boiler will be modified to supply 100,000 pounds per hour of steam at 250 psig and 500°F. The boiler will be assembled using two existing drums with new tubes and water walls. One new Detroit Stoker Rotograte continuous traveling conveyor feeder will be installed under the boiler to feed bagasse fuel. The existing fuel-oil burning system will be connected to this boiler..

The boiler will normally burn 100 percent bagasse during the operating season from October to April. Number 6 fuel oil will be burned in emergencies and as a supplementary fuel. Maximum bagasse consumption (100%) is 53,000 pounds per hour (194.35 MMBTU/hr). Maximum fuel oil consumption is 131.5 gallons per hour (19.7 MMBTU/hr).

Particulate matter (PM), SO_2, and NO_x actual emissions from five boilers at ASA are listed in the application as follows:

Boiler Number	Maximum Heat Input (MMBTU/hr)	PM (lb/hr)	SO_2 (lb/hr)	NO_x (lb/hr)
1	195.8	55.56	136.83	35.4
2	195.8	52.14	178.73	40.5
3	244.8	73.41	133.97	40.2
4	244.8	73.41	133.97	40.2
5	194.4	35.65	76.37	41.5

III. Process and Controls

Particulate matter (PM) emissions from boiler No. 5 will be controlled by an impingement scrubber similar to Joy Manufacturing Company's Type D Turbulaire scrubber. The scrubber will be sized to handle 103,000 ACFM flue gas at 9 inches water pressure drop and use 147 gallons makeup water per minute. PM emissions will be 0.15 lb/MMBTU heat input on bagasse and 0.10 lb/MMBTU heat input on oil. The maximum emission rate will be 51.4 tons per year based on 3,528 hr/yr operation.

Sulfur dioxide emissions will be controlled by limiting the quantity of fuel oil used and the sulfur content (1.0%) in the fuel oil. In normal operation, SO_2 emissions while burning 100% bagasse will be 0.49 lb/MMBTU. When fuel oil (131.5 Gal/hr) is burned with bagasse (47,720 lb/hr), the maximum SO_2 emissions will be 0.55 lb/MMBTU heat input.

CO, NO_x, and VOC emissions will be controlled by good operation practice. The boiler will be operated at 50 percent excess air which will minimize CO and VOC emissions. The actual emissions of these pollutants will be 53.1 lb/hr (93.7 TPY) for CO, 53.1 lb/hr (93.7 TPY) for VOC and 31.9 lb/hr (56.3 TPY) for NO_x. These emissions are based on the factors listed in AP-42 for bagasse boilers. The VOC emission factor of 2 lb/ton bagasse burned reported in AP-42 is questionable, and the review engineer believes that the actual emissions of VOC could be less than this value.

IV. Rule Applicability

A. State Rule

The proposed project is subject to preconstruction review under the provisions of Chapter 403, Florida Statutes, and Chapter 17-2, Florida Adminstrative Code (FAC).

Based on the latest revised application and responses from the applicant, FDER has recalculated the emissions while burning 100 percent bagasse having 3,660 BTU/lb heating value and 0.2 percent sulfur content. Calculated emissions are listed as follows:

	Emission without control		Actual Emission	
Pollutant	lb/hr	ton/yr	lb/hr	ton/yr
Particulate (PM)	425.0	749.7	29.2	51.4
Sulfur Dioxide (SO_2)	95.1	167.8	95.1	167.8
Nitrogen Oxides (NO_x)	31.9	56.3	31.9	56.3
Carbon Monoxide (CO)	53.1	93.7	53.1	93.7
VOC	53.1	93.7*	53.1	93.7

*93.7 TPY VOC emission is calculated from the LAER determination (2 lb VOC per ton of bagasse burned) and revised maximum bagasse fuel consumption. The bagasse fuel consumption originally listed in the application would have resulted in VOC emission of 98 TPY.

The proposed project location is in the Palm Beach County ozone (VOC) nonattainment area. The actual emissions of the proposed boiler, which are listed above, show that VOC emissions will be 93.7 ton/yr. This is greater than the 50 ton/yr as listed in Table II of 17-2.17(3), FAC. Therefore, LAER, emission offsets and statewide compliance are required pursuant to 17-2.17(5) FAC. In accordance with the LAER determination for this boiler and 17-2.17(5)(b), it is necessary to allocate 93.7 tons per year of VOC new source allowance from the current amount available in Palm Beach County. Recognizing the present uncertainty in VOC emission factors as discussed in the LAER determination, certain conditions will be imposed.

Since Palm Beach County's initial new source allowance through 1981 is 970 tons per year (17-2.17(7)(d)) and none has been assigned to date, the allocation of 93.7 tons will leave a balance of 876.3 tons which should have no foreseeable limitations on county growth in the near term before emission factors can be established and reflected in the LAER determination.

At such time as emission factors are established, the anticipated balance over and above any required by 17-2.17 will revert to new source allowance and be available for future growth.

The proposed project is a major emitting facility for PM as defined in Chapter 17-2, because PM emissions (before control) exceed 250 tons per year. The project is subject to the provisions of Subsection 17-2.05(6) Table II, Emission Limiting Standards, and Subsection 17-2.04(6), Prevention of Significant Deterioration (PSD) which requires the use of Best Available Control Technology (BACT).

B. Federal Rule

The proposed source is subject to federal PSD review because it is a major modification. The net increases for pollutant emissions and significant emission rates are listed as follows:

Pollutant	Actual Emission increase (T/yr)	Significant Emission Rate
PM	51.4	25
SO_2	167.8	40
NO_x	56.3	40
CO	93.7	100
VOC	93.7	40

The net increases for PM, SO_2, NO_x emissions are above significant levels. Therefore, these pollutants are subject to federal BACT analysis under 40 CFR 52.21(j). VOC emissions, which are also above the significant emission rate, are not subject to a BACT analysis because the proposed site is in the ozone nonattainment area and subject to review under the nonattainment rule 17-2.17. They are therefore exempt from review under Federal PSD.

V. Control Technology Review

The BACT determination proposed by the Department is attached. A discussion of this determination follows.

A. Particulate Matter (PM)

The applicant has proposed use of an impingement scrubber with 92 percent efficiency and an emission rate of 0.20 lb PM/MMBTU heat input as BACT. This type scrubber has been standard in the sugar cane industry in Florida. FDER believes better control systems, such as multicyclone plus scrubber or bag filters, are available for control of particulate matter emissions from bagasse boilers. Cost and maintenance of these alternatives would be higher than the impingement scrubber proposed and, at the present time, it is not clear whether sufficient improvement in performance would be gained to offset the additional cost. FDER believes that a well designed impingement scrubber and related control system, with adequate pressure drop across the scrubber and optimum amount of make up water to the scrubber, can reduce the PM emission rate to less than 0.15 lb/MMBTU heat input when the boiler is burning bagasse.

B. Sulfur Dioxide (SO_2)

Sulfur Dioxide is created in the boiler when sulfur containing fuels are burned. The sulfur content of bagasse is reported to vary from 0.1 to 0.2 percent on a dry basis. No feasible method exists to reduce the sulfur content in bagasse. Sulfur content in the fuel oil varies. The applicant has proposed and FDER has accepted the use of oil with a maximum of 1.0% sulfur content as BACT for sulfur dioxide emissions for this boiler.

SO_2 emissions could be reduced by installation of a flue gas desulfurization (FGD) system. However, FDER does not believe a FGD system is justified for this seasonal industry. Use of low sulfur fuel oil as BACT is more cost effective.

C. Nitrogen Oxide (NO_x) and Ozone (VOC)

The operating practice of the proposed boiler requires the use of 50 percent excess air to burn bagasse. High excess air for combustion encourages the formation of NO_x but reduces the emissions of VOC and CO. As the plant site is classified nonattainment for ozone, FDER believes good boiler operation practice should minimize VOC emissions. To limit the NO_x and VOC emissions as required by BACT and LAER, the applicant shall install an oxygen or carbon dioxide monitor in the boiler's duct, calibrate it and set alarms in it as described in the attached article entitled "Use of Flue Gas Oxygen Meter as BACT for Combustion Controls".

D. Maximum Allowable Emissions

The maximum allowable emissions are based on two different conditions: (1) 100% bagasse burning, (2) bagasse and fuel oil burning. Table I summarizes the maximum allowable emissions for each condition.

Table I

Pollutant	Burning 100% Bagasse		Burning* Bagasse with Fuel Oil	
	lb/MMBTU	lb/hr	lb/MMBTU	lb/hr
PM	0.15	29.2	0.14	27.9
SO_2	0.49	95.1	0.55	106.1
CO	0.27	53.1	0.28	53.8
VOC	0.27	53.1	0.27	53.2
NO_x	0.16	31.9	0.19	36.5

Opacity: 30% except for 40% no more than 2 minutes per hour

*Based on 174.65 MMBTU/hr heat input from burning bagasse and 19.7 MMBTU/hr heat input from burning fuel oil

VI. Air Quality Impact Analysis

A. Summary

The proposed Atlantic Sugar Association (ASA) project is subject to State PSD review under 17-2.04(6), FAC, for the pollutants PM and SO_2. For each pollutant subject to State PSD review, an air quality impact analysis is required which includes a PSD increment analysis and a Florida ambient air quality standards (FAAQS) analysis. The State PSD and FAAQS analyses depend on air quality modeling carried out in accordance with FDER-approved methods.

The proposed project is subject to federal PSD review under 40 CFR 52.21(i) for the pollutants PM, SO_2 and NO_x. For each pollutant subject to federal PSD review, an air quality impact analysis is required which includes:

- o An analysis of existing air quality;
- o A PSD increment analysis (for PM and SO_2 only);
- o A National Ambient Air Quality Standards (NAAQS) analysis; and
- o An analysis of impact on soils, vegetation and visibility and growth-related air quality impacts.

The analysis of existing air quality may require preconstruction monitoring; the PSD and NAAQS analyses depend on air quality modeling carried out in accordance with EPA-approved methods. Federal PSD review also requires a good-engineering-practice (GEP) stack height evaluation.

Based on these required State and federal air quality impact analyses, FDER has reasonable assurance that the ASA project, as described in this permit and subject to the conditions of approval proposed herein, will not cause or contribute to a violation of any State or federal PSD increment or ambient air quality standard. A discussion of the required analyses follows.

B. Discussion

1. Modeling Methodology

Two FDER and EPA-approved dispersion models were used in the State and federal air quality impact analyses. These were the Single-Source (CRSTER) and Industrial Source Complex (ISC) models.

Short-term air quality impacts were evaluated outside the ASA mill property boundaries. ASA-owned and operated sugar cane fields present a natural physical barrier which prevents access of the general public to ASA property. These property boundaries are at a distance from the mill of 0.6 miles (1.0 kilometer) to the south and southwest, 1.5 miles (2.4 kilometers) to the north and northwest and at least 2.5 miles (4.0 kilometers) in all other directions. Long-term air quality impacts were evaluated both within and outside the plant boundaries.

The ISC model, which takes into account the separation of individual emissions units, was used to determine maximum predicted annual concentrations and to identify the absolute worst-case 24-hour and 3-hour meteorological conditions which

would affect emissions from ASA after the proposed modification is completed. Also identified were days on which meteorological conditions produced worst-case short-term ASA impacts in the vicinity of the mill with interacting sources located directly upwind. The maximum short-term impacts were refined using a 0.1 kilometer spacing between receptors and only the days on which worst-case meteorological conditions occurred. Emissions from interacting sources were included in these runs.

Additional modeling using CRSTER was performed both by the applicant's consultant and FDER after the applicant submitted revised property boundaries and also because revised stack parameters and emission rates for some of ASA's boilers were calculated by FDER.

The surface meteorological data used in the models were National Weather Service data collected at West Palm Beach, Florida during the period 1970-1974. Upper air meteorological data used in the models were collected during the same time period at Miami, Florida.

Final stack parameters and emission rates used in modeling the proposed ASA modification are contained in Tables II and III.

2. Analysis of Existing Air Quality

In order to evaluate existing air quality in the area of a proposed project, FDER may require a period of continuous preconstruction monitoring for any pollutant subject to federal PSD review.

For this project, FDER required the submittal of preconstruction monitoring data for total suspended particulate matter (TSP). Three years of data collected from Palm Beach County Health Department TSP monitors PB-16 and PB-19 were used. TSP monitor PB-16 is located 6 miles to the northeast of the ASA mill, and monitor PB-19 is located approximately 14 miles to the west of the mill. Data from these monitors meet all FDER and EPA quality assurance requirements. Data from both of these monitors were used in order to more accurately reflect the impact of cane field burning on air quality in the vicinity of ASA. FDER has assumed that the average of the annual geometric means from the two monitors best represents the existing air quality or background value for all averaging times. This value is 43 ug/m^3.

There are no FDER or EPA approved SO_2 and NO_2 monitors within 15 miles of the ASA mill. Since this mill is located in a remote area with respect to emissions of these pollutants from other sources, background values of 0 ug/m^3 for SO_2 and 20 ug/m^3 for NO_2 were assumed by FDER in lieu of requiring preconstruction monitoring. FDER assumed a background value of 0 ug/m^3 for SO_2 since all sources of SO_2 which would interact with emissions from the ASA mill are accounted for in the modeling. These background values are also used for all averaging times are consistent with EPA monitoring guidelines applicable to projects submitting complete applications prior to June 8, 1981.

3. PSD Increment Analysis

Both the State and federal PSD increment analyses pertain to TSP and SO_2 for which maximum allowable increases (increments) are defined in 17-2.04(1), FAC, and 40 CFR 52.21(c). These increments provide for future industrial growth while insuring that relatively unpolluted areas remain so. The proposed ASA modification will be located in an area where the Class II increments apply. The nearest Class I area is more than 100 kilometers away from the proposed site.

The predicted maximum TSP and SO_2 increment consumption is the same in both the State and federal PSD increment analyses. In addition to boiler No. 5, increment consumption is affected by the addition of particulate scrubbers to ASA boilers No. 1 through No. 3 in 1975. With the addition of the scrubbers, PM emissions were reduced and the stack exit temperatures were lowered; SO_2 emissions were unchanged. The effect of the PM emissions reductions outweighs the effect of the reductions in temperature with the result that TSP increment was expanded by the addition of the scrubbers. SO_2 increment was consumed, however, due to the reductions in stack exit temperatures.

As shown in the following table, modeling results predict that the maximum TSP and SO_2 increment consumption due to boiler No. 5 and the modifications to boilers No. 1 through No. 3 will not exceed allowable increments outside the property boundary. The highest, second-highest short term predicted concentrations are given in the table since five years of meteorological data were used in the modeling.

Maximum Increment Consumption
(ug/m^3)
State and Federal

Pollutant	Averaging Time 3-hour	24-hour	Annual
SO_2: Maximum ASA Impact	331	82	6
SO_2: Allowable Class II Increment	512	91	20
PM: Maximum ASA Impact	NA	8	2
PM: Allowable Class II Increment	NA	37	19

There are other increment consuming sources within a 50 kilometer radius of ASA. Even though these sources consume increment in the area around the ASA mill, this consumption is very small due to the remoteness of the ASA mill. The combined impacts of these sources and ASA in the interacting directions are less than the maximum increment consumed by ASA only.

The nearest Class I area is Everglades National Park which is 103 km away from ASA. At this distance, it can be assumed that no Class I increment will be consumed as a result of emissions from ASA.

4. Ambient Air Quality Standards Analysis

Both the National and Florida ambient air quality standards (NAAQS and FAAQS) are established to protect pubic health and welfare. The Florida standards are more stringent than the national standards for SO_2 and TSP. Both federal and State PSD regulations require the permit applicant to demonstrate that, given existing air quality in an area, a proposed emissions increase subject to PSD review will not cause or contribute to any violation of ambient air quality standards. For the proposed project at ASA, an ambient air quality standards analysis is required for PM, SO_2, and NO_x.

As shown in the following table, modeling results predict that maximum ground-level concentrations for each of these pollutants will be below both the NAAQS and FAAQS outside the ASA property boundary. The highest, second-highest short term predicted values are given in this table since five years of meteorological data were used in the modeling.

Pollutant	Averaging Time	Projected Air Quality (Includes Background) (ug/m^3)	NAAQS (ug/m^3)	FAAQS (ug/m^3)
SO_2	annual	33	80	60
	24-hour	164	365	260
	3-hour	533	1300	1300
TSP	annual	58	75	60
	24-hour	115	150	150
NO_2	annual	29	100	100

NO_x emissions from this project are predicted to increase ground-level NO_2 concentrations by only 2 ug/m^3 on the annual average.

Modeling was also performed to evaluate the impacts of interactions of emissions from other sources with those from the ASA plant. Maximum contributions from surrounding sources are very small compared to maximum ground-level concentrations from the ASA plant. If these concentrations are added to the values in the table, no violations are predicted to occur

5. Analysis of Impact on Soils, Vegetation and Visibility and Growth-Related Air Quality Impacts

The maximum impact of the proposed increase in SO_2 and PM emissions from the ASA plant, as demonstrated through the air quality analysis, will be below the national secondary air quality standards established to protect public welfare related values. Also, the maximum impact of the proposed emissions increase in NO_x, as demonstrated through the air quality analysis, will be insignificant. Therefore, no adverse effect on soils, vegetation and visibility is expected.

There will be no increase in the number of employees at this site due to the project. No secondary residential, commercial or industrial growth which will adversely effect air quality in the area is expected.

6. Good Engineering Practice Stack Height Evaluation

The stack height (90 feet) proposed for boiler No. 5 is significantly less than the Good Engineering Practice (GEP) stack height of 234.5 feet. A downwash analysis was performed according to the techniques of Huber (1979). This analysis

showed that the proposed stack height would be sufficient to ensure that PM and SO_2 emissions from this stack would not result in excessive ground-level concentrations as a result of aerodynamic effects of nearby structures.

Table II

Stack Parameters for Atlantic Sugar Association Mill - Baseline Case

Emissions Unit	Stack Height (m)	Stack Diameter (m)	Exit Velocity (m/s)	Exit Temperature (K)	Emission Rate (g/sec) SO_2	PM	NO_x
Boiler #1	18.9	1.92	12.71	506.0	17.24	14.74	4.5
Boiler #2	18.9	1.92	10.89	511.0	22.52	17.89	5.1
Boiler #3	21.9	1.83	17.52	522.0	16.88	9.32	5.1
Boiler #4	18.3	1.83	15.03	344.0	16.88	9.25	5.1

Table III

Stack Parameters for Atlantic Sugar Association Mill - Projected Case

Emissions Unit	Stack Height (m)	Stack Diameter (m)	Exit Velocity (m/s)	Exit Temperature (K)	Emission Rate (g/sec) SO_2	PM	NO_x
Boiler #1	18.9	1.92	12.71	346.0	17.24	7.00	4.5
Boiler #2	18.9	1.92	10.89	342.0	22.52	6.57	5.1
Boiler #3	21.9	1.83	17.52	341.0	16.88	9.25	5.1
Boiler #4	18.3	1.83	15.03	344.0	16.88	9.25	5.1
Boiler #5	27.4	1.98	9.72	344.0	13.39	4.64	5.2

VII. Conclusions

FDER proposes a final determination of approval with conditions for the construction of the proposed boiler by Atlantic Sugar Association. The determination is made on the basis of information contained in the application and in the additional information dated March 24, April 29, May 15, May 28, June 16, June 25, and July 6, 1981, supplied by the applicant.

The general and specific conditions are listed in the attached draft state permit (AC 50-42389) and federal permit (PSD-FL-078).

VIII. Attachments

1. State Permit.
2. Federal Permit.
3. BACT and LAER Determination.
4. Application to Construct Air Pollution Sources, DER Form 17-1.122(16), received on March 30, 1981.
5. DER's incompleteness letter to ASA, dated April 29, 1981.
6. ASA's response to DER, dated May 15, 1981.
7. ASA's response with revised application to DER, date May 28, 1981.
8. DER's second incompleteness letter to ASA, dated June 16, 1981.
9. ASA's response to DER, dated June 25, 1981.
10. ESE's response to DER, dated July 6, 1981.
11. ASA's response to July 13 letter from DER about cane field and proposed scrubber, date July 17, 1981.
12. ESE's response about soils, vegetation, and visibility impacts, dated July 23, 1981.
13. ASA's response about growth impact, site boundary, and BACT analysis, dated July 31, 1981.
14. ESE's response about downwash analysis, dated August 7, 1981.
15. ESE's revised ambient air quality analysis, dated August 7, 1981.
16. ESE's revised PSD analysis, dated August, 17, 1981.

Final Determination

Atlantic Sugar Association

Application PSD-FL-078

The preceeding Technical Evaluation and Final Determination are adopted by reference for the federal permit, PSD-FL-078.

Special Conditions listed in the State permit, AC 50-42389, are adopted as special conditions for the federal permit, PSD-FL-078, for this source.

The attached General Conditions are also made a part of the federal permit PSD-FL-078 for this source.

Attachment: General Conditions (Federal)

GENERAL CONDITIONS

1. The permittee shall notify the permitting authority in writing of the beginning of construction of the permitted source within 30 days of such action and the estimated date of start-up of operation.

2. The permittee shall notify the permitting authority in writing of the actual start-up of the permitted source within 30 days of such action and the estimated date of demonstration of compliance as required in the specific conditions.

3. Each emission point for which an emission test method is established in this permit shall be tested in order to determine compliance with the emission limitations contained herein within sixty (60) days of achieving the maximum production rate, but in no event later than 180 days after initial start-up of the permitted source. The permittee shall notify the permitting authority of the scheduled date of compliance testing at least thirty (30) days in advance of such test. Compliance test results shall be submitted to the permitting authority within forty-five (45) days after the complete testing. The permittee shall provide (1) sampling ports adequate for test methods applicable to such facility, (2) safe sampling platforms, (3) safe access to sampling platforms, and (4) utilities for sampling and testing equipment.

4. The permittee shall retain records of all information resulting from monitoring activities and information indicating operating parameters as specifed in the specific conditions of this permit for a minimum of two (2) years from the date of recording.

5. If, for any reason, the permittee does not comply with or will not be able to comply with the emission limitations specified in this permit, the permittee shall provide the permitting authority with the following information in writing within five (5) days of such conditions:

   (a) description of noncomplying emission(s),

   (b) cause of noncompliance,

   (c) anticipated time the noncompliance is expected to continue or, if corrected, the duration of the period of noncompliance,

   (d) steps taken by the permittee to reduce and eliminate the noncomplying emission,

   and

   (e) steps taken by the permittee to prevent recurrence of the noncomplying emission.

Failure to provide the above information when appropriate shall constitute a violation of the terms and conditions of this permit. Submittal of this report does not constitute a waiver of the emission limitations contained within this permit.

6. Any change in the information submitted in the application regarding facility emissions or changes in the quantity or quality of materials processed that will result in new or increased emissions must be reported to the permitting authority. If appropriate, modifications to the permit may then be made by the permitting authority to reflect any necessary changes in the permit conditions. In no case are any new or increased emissions allowed that will cause violation of the emission limitations specified herein.

7. In the event of any change in control or ownership of the source described in the permit, the permittee shall notify the succeeding owner of the existence of this permit by letter and forward a copy of such letter to the permitting authority.

8. The permittee shall allow representatives of the State environmental control agency or representatives of the Environmental Protection Agency, upon the presentation of credentials:

   (a) to enter upon the permittee's premises, or other premises under the control of the permittee, where an air pollutant source is located or in which any records are required to be kept under the terms and conditions of the permit;

   (b) to have access to any copy at reasonable times any records required to be kept under the terms and conditions of this permit, or the Act;

   (c) to inspect at reasonable times any monitoring equipment or monitoring method required in this permit;

   (d) to sample at reasonable times any emission of pollutants;

   and

   (e) to perform at reasonable times an operation and maintenance inspection of the permitted source.

9. All correspondence required to be submitted by this permit to the permitting agency shall be mailed to:

   Chief, Air Facilities Branch
   Air and Hazardous Materials Division
   U. S. Environmental Protection Agency
   Region IV
   345 Courtland Street
   Atlanta, Georgia 30308

10. The conditions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalud, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

The emission of any pollutant more frequently or at a level in excess of that authorized by this permit constitute a violation of the terms and conditions of this permit.

USE OF FLUE GAS OXYGEN METER AS BACT FOR COMBUSTION CONTROLS

Within the time limits specified in General Condition 3 of this permit, the permittee shall determine the emissions of nitrogen oxides and carbon monoxide from the permitted combustion device in accordance with test methods and procedures set out in 40 CFR Part 60, Appendix A, Methods 7 and 10, respectively. These emission determinations shall be made at:

1) Maximum design capacity; and

2) Normal operational load.

The permittee shall install a continuous oxygen monitor in the flue of the permitted combustion device which meets the requirements of 40 CFR Part 60, Appendix B, Performance Specification 3. Results of emission determinations shall be correlated to the flue gas oxygen content to define:

1) The point at which Nitrogen Oxides (NO_x) emissions (lb/MMBtu) equals the allowable NO_x emission rate contained in the permit.

2) The point at which carbon monoxide (CO) emissions exceed the allowable CO emission rate contained in the permit.

The flue gas oxygen content shall be maintained between these points and alarms shall be set to sound when flue gas oxygen levels exceed either side of this range. Any operation outside of this range will constitute noncompliance with this specific condition, shall be recorded in accordance with General Condition 4 of this permit, and will be reported quarterly along with excess emissions in accordance with 40 CFR 60.7(c).

Should any combustion equipment modifications be made such as different type burners, combustion air relocation, fuel conversion, tube removal or addition, etc., emissions correlations as described above shall be conducted within 90 days of attaining full operation after such modification. Results of all emission determinations shall be sent to the permitting authority within 90 days after completion of the tests.

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301

BOB GRAHAM
GOVERNOR
Victoria J. Tschinkel
SECRETARY

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICANT: Atlantic Sugar Association
P.O. Drawer B
Belle Glade, Florida 33430

PERMIT/CERTIFICATION NO. AC 50-42389

COUNTY: Palm Beach

PROJECT: Boiler No. 5

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Chapter 17-2 and 17-4, Florida Administrative Code. The above named applicant, hereinafter called Permittee, is hereby authorized to perform the work or operate the facility shown on the approved drawing(s), plans, documents, and specifications attached hereto and made a part hereof and specifically described as follows:

For the construction of a 100,000 pounds of steam per hour bagasse fuel (No. 6 oil supplementary fuel) fired boiler equipped with an impingement scrubber to be located at Atlantic Sugar Association's existing plant that is approximately 16 miles east southeast of Belle Glade, Palm Beach County, Florida. The UTM coordinates of the proposed plant are 2,945.9 km north and 552.9 km east.

Construction shall be in accordance with the attached permit application plans, documents and drawings except as otherwise noted on pages 3 and 4, Specific Conditions.

Attachments:

1. Application to Construct Air Pollution Sources, DER Form 17-1.122(16), received on March 30, 1981.
2. DER's incompleteness letter to ASA, dated April 29, 1981.
3. ASA's response to DER, dated May 15, 1981.
4. DER's second incompleteness letter to ASA, dated June 16, 1981.
5. ASA's response to DER, dated June 25, 1981.
6. ESE's response to DER, dated July 6, 1981.
7. BACT and LAER determinations, dated August 6 and 10, 1981.

8. ASA's and ESE's additional information, dated on July 17, 23, 31, and August 7, 17, 1981.

PERMIT NO.: AC 50-42389
APPLICANT: Atlantic Sugar Association

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions:, and as such are binding upon the permittee and enforceable pursuant to the authority of Section 403.161(1), Florida Statutes. Permittee is hereby placed on notice that the department will review this permit periodically and may initiate court action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

2. This permit is valid only for the specific processes and operations indicated in the attached drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit shall constitute grounds for revocation and enforcement action by the department.

3. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately notify and provide the department with the following information: (a) a description of and cause of non-compliance; and (b) the period of non-compliance, including exact dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance. The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the department for penalties or revocation of this permit.

4. As provided in subsection 403.087(6), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

5. This permit is required to be posted in a conspicuous location at the work site or source during the entire period of construction or operation.

6. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the department, may be used by the department as evidence in any enforcement case arising under the Florida Statutes or department rules, except where such use is proscribed by Section 403.111, F.S.

7. In the case of an operation permit, permittee agrees to comply with changes in department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or department rules.

8. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant, or aquatic life or property and penalities therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and department rules, except where specifically authorized by an order from the department granting a variance or exception from department rules or state statutes.

9. This permit is not transferable. Upon sale or legal transfer of the property or facility covered by this permit, the permittee shall notify the department within thirty (30) days. The new owner must apply for a permit transfer within thirty (30) days. The permittee shall be liable for any non-compliance of the permitted source until the transferee applies for and receives a transfer of permit.

10. The permittee, by acceptance of this permit, specifically agrees to allow access to permitted source at reasonable times by department personnel presenting credentials for the purposes of inspection and testing to determine compliance with this permit and department rules.

11. This permit does not indicate a waiver of or approval of any other department permit that may be required for other aspects of the total project.

12. This permit conveys no title to land or water, nor constitutes state recognition or acknowledgement of title, and does not constitute authority for the reclamation of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

13. This permit also constitutes:

[X] Determination of Best Available Control Technology (BACT)
[X] Determination of Prevention of Significant Deterioration (PSD)
[ ] Certification of Compliance with State Water Quality Standards (Section 401, PL 92-500)

PERMIT NO.: AC 50-42389
APPLICANT: Atlantic Sugar Association

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions:, and as such are binding upon the permittee and enforceable pursuant to the authority of Section 403.161(1), Florida Statutes. Permittee is hereby placed on notice that the department will review this permit periodically and may initiate court action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

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4. As provided in subsection 403.087(6), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

5. This permit is required to be posted in a conspicuous location at the work site or source during the entire period of construction or operation.

6. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the department, may be used by the department as evidence in any enforcement case arising under the Florida Statutes or department rules, except where such use is proscribed by Section 403.111, F.S.

7. In the case of an operation permit, permittee agrees to comply with changes in department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or department rules.

8. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant, or aquatic life or property and penalities therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and department rules, except where specifically authorized by an order from the department granting a variance or exception from department rules or state statutes.

9. This permit is not transferable. Upon sale or legal transfer of the property or facility covered by this permit, the permittee shall notify the department within thirty (30) days. The new owner must apply for a permit transfer within thirty (30) days. The permittee shall be liable for any non-compliance of the permitted source until the transferee applies for and receives a transfer of permit.

10. The permittee, by acceptance of this permit, specifically agrees to allow access to permitted source at reasonable times by department personnel presenting credentials for the purposes of inspection and testing to determine compliance with this permit and department rules.

11. This permit does not indicate a waiver of or approval of any other department permit that may be required for other aspects of the total project.

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[X] Determination of Best Available Control Technology (BACT)
[X] Determination of Prevention of Significant Deterioration (PSD)
[ ] Certification of Compliance with State Water Quality Standards (Section 401, PL 92-500)

PERMIT NO.: AC 50-42389
APPLICANT: Atlantic Sugar Association

SPECIFIC CONDITIONS:

1. The proposed boiler shall be constructed in accordance with the capacities and specifications stated in the application and additional information supplied by the applicant.

2. The proposed boiler's maximum emission rates shall not exceed the emission limits listed below.

Pollutant	Burning Bagasse 100%		Burning Bagasse with Fuel Oil	
	lb/MMBTU	lb/hr	lb/MMBTU	lb/hr
PM	0.15	29.2	0.14	27.9
SO_2	0.49	95.1	0.55	106.1
CO	0.27	53.1	0.28	53.8
VOC	0.27	53.1	0.27	53.2
NO_x	0.16	31.9	0.19	36.5

3. Sulfur content of the fuel oil fired in the proposed boiler shall not exceed 1.0 percent.

4. Emissions of VOC and CO shall be maintained at the lowest possible level through the installation, calibration, and operation of a flue gas oxygen monitor as described in the attached article: "Use of Flue Gas Oxygen Meter as BACT for Combustion Controls".

5. The boiler shall not be operated more than 3,528 hours per year during the season from October to April.

6. Compliance with the emission limits required in condition No. 2 shall be determined by performance tests while the boiler is at or close to full operating capacity. The performance tests shall be conducted in accordance with EPA reference methods (40 CFR 60, Appendix A) and the provisions of 40 CFR 60.8 and 40 CFR 60.46. EPA reference method 25 shall be used to determine VOC emissions.

7. Visible emissions from the bagasse handling system shall not exceed 10 percent opacity over any 6 minute period as measured by EPA reference method 9.

8. Instruments shall be installed, calibrated, and maintained to continuously measure the fuel oil used by the proposed boiler. The records of fuel oil usage will be kept by the company, available for regulatory agencies inspection for a two-year period.

9. Bagasse fired in the proposed boiler shall not be dried in the existing on site bagasse drying system.

10. The scrubber shall be equipped with a manometer or equivalent instrument to measure the total pressure drop of the flue gas stream across the scrubber, with pressure gauges to measure the water pressure at the spray nozzles, with a flow meter or equivalent device (weir) to measure the quantity of water circulating through the scrubber and a pH meter to measure pH of scrubber water at the scrubber inlet. Data from these instruments shall be recorded each shift (every 8 hours) and available for regulatory agencies inspection for one year.

11. The stack sampling configuration of the proposed boiler shall comply with the minimum of 2D downstream and 0.5D upstream distances to the sampling ports required to use reference method 2.

12. Atlantic Sugar Association will take precautions to exclude the general public from the company's property surrounding the plant during the operating season.

13. The quantity of 93.7 tons per year of VOC emissions is hereby assigned to the boiler from the new source allowance balance for Palm Beach County pursuant to 17-2.17 (7)(a) and (d). At such time as the LAER determination for this boiler is revised, based on data acquired under Specific Condition #6, any VOC emission allowance not required shall revert to Palm Beach County available new source allowance.

Expiration Date: May 31, 1982

Issued this _____ day of _____, 19_____.

_____ Pages Attached.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

_____
Signature

9. The scrubber shall be equipped with a manometer or equivalent instrument to measure the total pressure drop of the flue gas stream across the scrubber, with pressure gauges to measure the water pressure at the spray nozzles, with a flow meter or equivalent device (weir) to measure the quantity of water circulating through the scrubber. The pH of scrubber water at the scrubber inlet and outlet shall be measured. Data from these instruments shall be recorded each shift (every 8 hours) and available for regulatory agencies inspection for one year.

10. The stack sampling configuration of the proposed boiler shall comply with the minimum of 2D downstream and 0.5D upstream distances to the sampling ports required to use reference method 2.

11. Atlantic Sugar Association will take precautions to exclude the general public from the company's property surrounding the plant during the operating season.

12. The quantity of 93.7 tons per year of VOC emissions is hereby assigned to the boiler from the new source allowance balance for Palm Beach County pursuant to 17-2.17(7)(a) and (d). At such time as the LAER determination for this boiler is revised, based on data acquired under Specific Condition #6, any VOC emission allowance not required shall revert to Palm Beach County available new source allowance.

Expiration Date: May 31, 1982

Issued this _____ day of _____, 19_____.

_____ Pages Attached.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

_____
Signature

PERMIT NO.:
APPLICANT:

SPECIFIC CONDITIONS:

ORIGINAL

DUPLICATING JOB SHEET

COST CENTER 0442

DATE ASAP PHONE 8-1344

REQUESTED BY T. Powell

NO. PAGES 62 NO. COPIES 10

JOB DESCRIPTION permit

SPECIAL INSTRUCTIONS first page is 2-sided

[✓] ONE SIDE COPY	[ ] COVER STOCK	[ ] STAPLE
[ ] TWO SIDE COPY	[ ] COLOR STOCK	[✓] DO NOT STAPLE
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[ ] LEGAL SIZE	[✓] COLLATE	[ ] BIND
[ ] REDUCE TO 8½ x 11	[ ] REDUCE TO 2 PER PAGE	[ ] GLUE

P16 7682395

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL
(See Reverse)

SENT TO H.J. Vellela - Atlantic Sugar Assoc

STREET AND NO. P.O. Drawer B

P.O., STATE AND ZIP CODE Belle Glade, Fl 33430

POSTAGE		$
CONSULT POSTMASTER FOR FEES — OPTIONAL SERVICES	CERTIFIED FEE	¢
	SPECIAL DELIVERY	¢
	RESTRICTED DELIVERY	¢
	RETURN RECEIPT SERVICE — SHOW TO WHOM AND DATE DELIVERED	¢
	RETURN RECEIPT SERVICE — SHOW TO WHOM, DATE, AND ADDRESS OF DELIVERY	¢
	RETURN RECEIPT SERVICE — SHOW TO WHOM AND DATE DELIVERED WITH RESTRICTED DELIVERY	¢
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PS Form 3800, Apr. 1976

THE POST

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

PROOF OF PUBLICATION

STATE OF FLORIDA

COUNTY OF PALM BEACH

Before the undersigned authority personally appeared Don K. Creamer who on oath says that he is Class Adv. Mgr. of The Post, a daily and Sunday newspaper published at West Palm Beach in Palm Beach County, Florida; that the attached copy of advertising, being a Notice in the matter of Proposed Modification in the ---------- Court, was published in said newspaper in the issues of September 2, 1981

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

Sworn to and subscribed before me this 2 day of September A.D. 19 81

Barbara M. McCord

NOTARY PUBLIC STATE OF FLORIDA AT LARGE
MY COMMISSION EXPIRES SEPT 9 1983
BONDED THRU GENERAL INS. UNDERWRITERS

NO. 662610
Public Notice

A modification to an existing air pollution source is being proposed by Atlantic Sugar Association near the city of Belle Glade, Palm Beach County, Florida. The proposed modification is the construction of a bagasse/fuel oil fired boiler with 100,000 pounds of steam per hour capacity. The modification will increase emissions of air pollutants, in tons per year, by the following amounts:
PM 51.4; SO2 167.8; NOx 56.3; CO 93.7 VOC 93.7

The proposed modification has been reviewed by the Florida Department of Environmental Regulation under Chapter 403; Florida Statutes, and Federal regulation 40 CFR 52.21, Prevention of Significant Deterioration (PSD). The Department has made a preliminary determination that the construction can be approved provided certain conditions are met. A summary of the basis for the determination and the application for State and Federal permits submitted by Atlantic Sugar Association are available for public review at the following offices:
Municipal Library
530 South Main Street
Belle Glade, Florida 33430
South Florida District
Dept. of Environmental Regulation
2269 Bay Street
Fort Myers, Florida 33901
Health and Rehabilitative Services
Palm Beach County Health Department
West Palm Beach, Florida 33402
Bureau of Air Quality Management
Dept. of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

The maximum percentages of allowable PSD increments consumed by the proposed modification will be as follows:
Annual PM 11, SO2 30; 24-Hour 22, 90; 3-Hour NA, 65

Any person may submit written comments regarding the proposed modification. All comments, postmarked not later than 30 days from the date of notice, will be considered in making a final determination regarding approval for construction of this source. Those comments will be made available for public review on request. Furthermore, a public hearing can be requested by any person. Such request should be submitted within 15 days of the date of this notice. Letters should be addressed to:
Mr. C.H. Fancy
Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301
PUBLISH: September 2, 1981

Response to Public Comment

Atlantic Sugar Association

(AC 50-42389) (PSD-FL-078)

Atlantic Sugar Association's (ASA's) application for permits to construct its boiler No. 5 located near Belle Glade in Palm Beach County, Florida has been reviewed by the Bureau of Air Quality Management (BAQM). Public notice of EPA's and the Department's Intent to Issue the Federal and the State permits was published in the Palm Beach Post on September 2, 1981.

Copies of the Preliminary Determination have been made available for public inspection at the Municipal Library in Belle Glade, the Palm Beach County Health Department in West Palm Beach, the Department's BAQM in Tallahassee and the Department's South Florida District Office in Fort Myers.

The comments received on the Preliminary Determination were from ASA and a BAQM staff member. ASA's comments are attached and the comment from the staff member is quoted as follows:

> "Modeling results predicted violations of the 24-hour sulfur dioxide ambient air quality standard and the 24-hour sulfur dioxide PSD increment at points out to 1.4 kilometers and 2.4 kilometers away from the mill, respectively. Therefore, approval of this permit is possible only because these violations are predicted to occur on property which is owned by Atlantic Sugar Association and to which access by the general public is prevented."

The substance of the above comment was considered by the BAQM in the Preliminary Determination. While no permit condition relating to the ownership and use of this property has been included, ASA shall be aware of its responsibility to not cause or contribute to any violation of standards or increments in areas to which the general public has access.

Responses to the ASA's comments are as follows:

Comment (a): ASA claims that the designed pressure drop across the scrubber was 8 inches for a flue gas volume of 103,000 ACFM (inlet). BAQM has not made pressure drop a permit condition. The permit limits particulate matter (PM) emissions and the actual pressure drop is of concern only to the extent that it affects compliance with that limit.

Comment (b) Specific Condition Number 2:

ASA requests that the permit contain provisions for amendment of BACT if future test data shows that the PM emission limit is beyond the capabilities of the control equipment. BAQM believes that review of BACT is inherent in the BACT process upon presentation of sufficient pertinent data and that such constraints entered as permit conditions are neither proper nor acceptable. ASA has also questioned PM and CO emission rate calculations for burning oil/bagasse mix. BAQM has rechecked the calculations and believes them to be correct for the chosen scenario.

Comment (c) Specific Condition Number 4:

ASA questions the use of a flue gas oxygen meter to control VOC and CO emissions. ASA also requests that the permit be modified requiring "best efforts" in the application of the analyzer and a possible future deletion of its application proves costly and unreliable. BAQM believes that its value has been proven in other applications and that sufficient evidence has not been presented to show its lack of applicability to bagasse boilers.

Comment (d) Specific Condition Number 6:

ASA objects to the specific condition requiring determination of boiler efficiency. BAQM has made the changes as requested.

Comment (e) Specific Condition Number 9:

ASA objects to prohibition of use of the existing bagasse drying system on boiler #5, and requests that this condition be deleted. BAQM has made the changes as requested.

Comment (f) Specific Condition Number 10:

ASA questions the purpose of measuring scrubber water pH. BAQM feels that these measurements will be useful in establishment of a data base for explanation of SO_2 loss which has been seen on empirical measurements and may form a basis for further SO_2 reductions in the future.

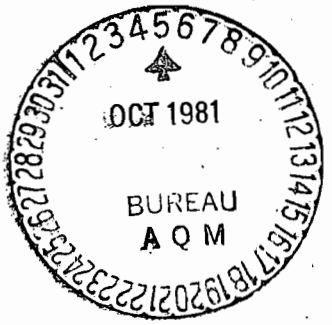
The comments received were considered as indicated above in the development of the FDER's and EPA's Final Determination for the proposed construction of one bagasse boiler by Atlantic Sugar Association.

Comment (g) Specific Condition No. 7:

ASA has requested that the 5% opacity limit be changed to 20% in conjunction with "best efforts" to prevent fugitive emissions. BAQM feels that there is some merit to the contention that 5% may be low, particularly in view of the coarse nature of the bagasse on the conveyors which would preclude its transport to any location where the public could be affected. The requested 20% and "best efforts", on the other hand would not reflect a real "best effort". The permit limit has therefore been changed to 10% opacity on a 6 minute average.

Atlantic Sugar Association

P. O. Drawer B
BELLE GLADE, FLORIDA 33430
(305) 996-6541



September 29, 1981

Bill

Mr. C. H. Fancy
Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

Dear Mr. Fancy:

Re: Boiler No. 5, Permits AC50-42389
and PSD-FL-078
Certified Mail - No. 1684407

We have reviewed the preliminary determination on the reference boiler and we submit for your consideration the following comments:

(a) (Page 3, Section III "Process and Controls", first paragraph, second sentence).

We refer to our letter of May 15, 1981, (Exhibit "C") where two performance specifications by the boiler manufacturer specifies that the pressure drop across the "Air Pollution Equipment" is given as 7.84 inches of water for 60.9% bagasse moisture and 6.12 inches of water for 56% bagasse moisture content. The variability of the moisture content of bagasse will force us to operate the scrubber on a pressure drop ranging from 5 inches to 9 inches of water. Although it may be possible to obtain 9 inches of water across the scrubber our design was 8 inches for a flue gas volume of 103,000 ACFM (scrubber inlet). Since we are projecting a flue gas volume variation (at the scrubber inlet with the same steam production) of:

126,000 ACFM for 60% bagasse moisture
103,000 ACFM for 56% bagasse moisture
and 93,000 ACFM for 52% bagasse moisture

we feel that a range of pressure drop from 5 inches to 9 inches of water would be an acceptable performance range for the proposed scrubber. It should be understood that the scrubber will not register a fixed pressure drop since the pressure drop across

the scrubber varies with the moisture content of bagasse for the same steam level.

(b) Specific Condition Number 2

The DER determination explicitly recognizes the possibility that the emission limit of 0.15 lbs/MMBTU might not be achievable on a continuous basis and provides that the limit may be modified if future compliance tests justify a higher limit. We feel that this right to a future revision should be repeated in the specific conditions of the permit.

Our calculations indicate that the emission rates for particulate matter burning bagasse with fuel oil should be 28.2 lbs/hr. instead of 27.8 lbs/hr. and the emission rate, for the same operating conditions, for CO should be 48.4 lbs/hr. instead of 53.8 lbs/hr. We understand that the emission levels under the condition of burning bagasse with fuel oil is for the case of maximum fuel oil usage. A different mix of oil and bagasse will result in different emission levels. The emission level approaches 0.15 lbs/MMBTU as the amount of fuel oil decreases.

(c) Specific Condition Number 4

Industry experience has shown that oxygen meters in bagasse boilers may be unreliable and impractical because of the nature of the flue gas generated in bagasse boilers and because of unduly frequent maintenance. Perhaps more important, the maximum allowable NOx and CO emission rates are based on AP-42 emission factors rather than actual field tests. In addition, in practice there might not be a true correlation between the oxygen readings and the emissions levels of NOx and VOC. This problem would be further compounded by the fact that AP-42 emission factors do not account for the routine fluctuations in the quality of bagasse and air infiltration which are factors beyond our control.

We request that the permit be modified requiring "best efforts" in the application of the analyzer and a possible future deletion if its application proves costly and unreliable.

(d) Specific Condition Number 6

We strenuously object to the condition of having to determine the boiler efficiency for the following reasons:

1. The nature of the sugar industry along with the constant variability in the quality of bagasse led DER and the industry to establish the efficiency of all boilers at 55% for the purpose of computing heat input calculation when testing for compliance.

2. The 55% efficiency has been the basis of all existing emission limitations on bagasse boilers for the past six (6) years and is the basis for the proposed BACT limitation of 0.15 lbs/MMBTU input.

3. Variations in the moisture content of bagasse would make extremely difficult the determination of the weighted average moisture of bagasse that would be needed in the efficiency calculations. To determine the weight of bagasse fed to each boiler would be economically unfeasible. The ultimate analysis of the bagasse would delay test results to such an extent that test results would lose their effectiveness.

4. Other heat balance methods would require assumptions which would render the calculation of efficiency no more significant that the present 55%.

We feel that the 55% efficiency presently used in calculating heat input is a true representation of the actual efficiency of most bagasse boilers. Individual efficiency determination for each boiler would be costly, unreliable, and the results will not deviate significantly from the 55% efficiency.

(e) Specific Condition Number 9

The bagasse drying system has not been in operation for at least three crop seasons. We do not intend to operate it during the coming crop. However, we do not overrule the possibility of using the system in the future. The bagasse driers are an energy saving system with the potential of saving us considerable amount of fuel oil. Your restriction on the use of the driers with the proposed boiler has no basis. If we decide in the future to put the system into operation we will submit the proper documentation such that the system will be permitted to operate. Therefore, we request that this condition be deleted from the permit.

(f) Specific Condition Number 10

We feel that the installation of a PH meter to measure the PH of the scrubber water will serve no useful purpose. Therefore, we request that this requirement be deleted from the permit.

(g) Specific Condition Number 7

We believe that a 5% opacity is not a realistic value. Rather, we feel that a 20% opacity would be more realistic in conjunction with "best efforts" to prevent fugitive emissions.

Sincerely yours,

ATLANTIC SUGAR ASSOCIATION

Jose A. Alvarez
Asst. to Executive Vice-President

JAA:mc

cc: Mr. H. J. Valella
DER, South Florida District
Palm Beach County Health Dept.
Mr. Angel M. Tellechea, Gulf + Western

CCM
RRR P30 411721
M/O 11/18/86

NOV 17 1986

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Jose F. Alvarez
General Manager
Atlantic Sugar Association
Post Office Drawer B
Belle Glade, Florida 33430

RE: PSD-FL-078 Permit Modification

Dear Mr. Alvarez:

This letter is in response to your July 15, 1985, request to increase steam production at the No. 5 bagasse boiler at your facility in Belle Glade, Florida. This boiler was permitted by EPA on December 4, 1981, and your request to increase steam production due to decreased fuel moisture content and boiler improvements will result in increases in all regulated pollutants (except sulfur dioxide emissions) at levels which are less than the significant levels for those pollutants contained in 40 CFR 52.21. The Florida Department of Environmental Regulation (FDER) issued a preliminary and final determination on February 4, 1986, and October 14, 1986, respectively, recommending that the EPA PSD permit PSD-FL-078 be modified to reflect the increase in steam production.

Based upon the FDER's recommendation in the final determination, your PSD permit (PSD-FL-078) is hereby modified as follows:

1. Specific Condition No. 2 is revised to reflect minor (non-significant) increases in regulated pollutants due to the increased steam production as follows:

POLLUTANT	MAX. EMISSION RATE ($lb/10^6$ Btu)	MAX. EMISSION RATE* (lb/hr)	(TPY)
Particulate Matter	0.150 (bagasse) 0.10 (fuel oil)	38.0	57.0
Sulfur Dioxide	0.30 (bagasse) 1.10 (fuel oil)	96.0	144.0
Nitrogen Oxides	0.160 (bagasse) 0.40 (fuel oil)	46.5	69.8
Volatile Organic Compounds	0.250 (bagasse) 0.00 (fuel oil)	63.3	95.0
Carbon Monoxide	0.270 (bagasse) 0.030 (fuel oil)	68.3	102.5
Visible Emissions	30% Opacity		

* When bagasse and oil are burned together, the allowable emissions are determined by prorating the standards for each fuel by the heat input.

2. Specific Condition No. 5 is hereby revised to limit boiler operating time from 3528 hours to 3000 hours per year during the season from October to April.

3. Specific Condition No. 6 is hereby revised as follows:

"Performance tests shall be made while Boiler No. 6 is within 10% of full operating capacity and conducted in accordance with each applicable, promulgated EPA reference method as contained in 40 CFR 60, Appendix A. Each pollutant referenced by emissions limitations within this permit modification shall be tested in accordance with 40 CFR 60.8".

Please be advised that the modification to your PSD permit herein described shall become a binding part of permit PSD-FL-078. This permit modification shall become effective upon receipt of this letter, unless you notify us of your unacceptance of the conditions contained herein within ten (10) days after receipt of this letter.

If you have any questions regarding this permit modification, please contact me or Mr. Bruce P. Miller, Chief, Air Programs Branch at (404) 347-2864.

Sincerely yours,

/s/ Lee A. DeHihns, III
Deputy Regional Administrator

Jack E. Ravan
Regional Administrator

cc: Mr. C.H. Fancy, Deputy Director
Florida Department of Environmental Regulation

Mr. Peter C. Cunningham, Esq.
Hopping, Boyd, Green & Sams
Suite 420, First Florida Bank Building
Post Office Box 6526
Tallahassee, Florida 32314

bc: James T. Wilburn, Chief
Air Compliance Branch
Air, Pesticides, and Toxics
Management Division

BRANDON/lms 11/3/86 DOC #27 DISC # 1PSS

BRANDON	ARONSON	HARPER	MILLER	SMITH	RAVAN
11/4/86	11/4	11/7/86	11/10/86	11/10	

file Federal PSD

Best Available Copy

Walt S—
Steve S—

AUG 30 1979

REF: 4AH-AP

RECEIVED
SEP 6 1979
ENVIRONMENTAL REGULATION

Mr. A.F. Mayo
Vide President
U.S. Sugar Corporation
Post Office Drawer 1207
Clewiston, Florida 33440

Dear Mr. Mayo:

Review of your May 11, 1978, application to construct Boiler No. 5 at your Bryant Mill has been completed. The construction is subject to rules for the Prevention of Significant Air Quality Deterioration (PSD), contained in 40 CFR 52.21.

We have determined that the construction, as described in the application, meets all applicable requirements of the PSD regulations, subject to the conditions in the Final Determination (enclosed). EPA performed a Preliminary Determination concerning the proposed construction, and published a request for public comment on June 20, 1979. No comments were received except for those from William H. Green, U.S. Sugar's Counsel. The permit conditions have been modified in response to some of the comments in Mr. Green's letter for the facility described above, subject to the conditions in the Final Determination. This Authority to Construct is based solely on the requirements of 40 CFR 52.21, the federal regulations governing significant deterioration of air quality. It does not apply to NPDES or other permits issued by this agency or permits issued by other agencies. Information regarding EPA permitting requirements can be provided if you contact Mr. Joe Franzmathes, Director, Office of Program Integration and Operations, at (404)881-4727. Additionally, construction covered by this Authority to Construct must be initiated within 18 months from the receipt of this letter.

The United States Court of Appeals for the District of Columbia Circuit issued a ruling in the case of Alabama Power Co. vs. Douglas M. Costle (78-1006 and consolidated cases) which has significant impact on the EPA prevention of significant deterioration (PSD) program and permits issued thereunder. Although the court has stayed its decision pending resolution of petitions for reconsideration, it is probable that the final decision will require modification of the PSD regulations and could affect permits issued under the existing program. Examples of potential impact areas include the scope of the best available control technology requirement (BACT), source applicability, the amount of increment available (baseline definition), and the extent of preconstruction monitoring that a source may be required to perform. The applicant is hereby advised that this permit may be subject to reevaluation as a result of the terms of the final court decision and its ultimate effect.

1 Please be advised that a violation of any condition issued as part of this approval, as well as any construction which proceeds in material variance with information submitted in your application will be subject to enforcement action.

Authority to Construct will take effect on the date of this letter. The complete analysis which justifies this approval has been fully documented for future reference, if necessary. Any questions concerning this approval may be directed to Mr. Ray Cunningham, Chief, Air Strategy Development Section (404/881-3286).

Sincerely yours,

Thomas W. Devine
Director
Air & Hazardous Materials Division

Enclosure

cc: Dr. J.P. Subramani, Chief
Division of Environmental Programs

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30365

DEC 4 1981

REF: 4AW-AF

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

H. J. Valella
Executive Vice President
Atlantic Sugar Association
P.O. Drawer B
Belle Glade, Florida 33430

Re: PSD-FL-078

Dear Mr. Valella:

Review of your March 30, 1981, application to construct a new bagasse/fuel oil boiler at your facility near Belle Glade, Palm Beach County, Florida, has been completed. The construction is subject to rules for the Prevention of Significant Air Quality Deterioration (PSD) contained in 40 CFR 52.21. The Florida Bureau of Air Quality Management performed the preliminary determination concerning the proposed construction and published a request for public comment on September 2, 1981. Comments were submitted by your company and the US EPA.

Authority to construct a stationary source is hereby granted for the facility described above, subject to the conditions in the permit to construct (enclosed). This authority to construct is based solely on the requirements of 40 CFR 52.21, the federal regulations governing significant deterioration of air quality. It does not apply to other permits issued by this agency or by other agencies. The complete analysis which justifies this approval has been fully documented for future reference, if necessary. Please be advised that a violation of any condition issued as part of this approval, as well as any construction which proceeds in material variance with information submitted in your application, will be subject to enforcement action.

This final permitting decision is subject to appeal under 40 CFR 124.19 by petitioning the Administrator of the US EPA within 30 days after receipt of this letter of approval to construct. The petitioner must submit a statement of reasons for the appeal and the Administrator must decide on the petition within a reasonable time period. If the petition is denied, the permit becomes immediately effective. The petitioner may then seek judicial review.

Any questions concerning this approval may be directed to Dr. Kent Williams, Chief, New Source Review Section at (404) 881-4552.

Sincerely yours,

Charles R. Jeter
Regional Administrator

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30365

PERMIT TO CONSTRUCT UNDER THE RULES FOR THE PREVENTION OF SIGNIFICANT DETERIORATION OF AIR QUALITY

Pursuant to and in accordance with the provisions of Part C, Subpart 1 of the Clear Air Act, as amended, 42 U.S.C. § 7470 et seq., and the regulations promulgated thereunder at 40 C.F.R. § 52.21, as amended at 45 Fed. Reg. 52676, 52735-41 (August 7, 1980),

Atlantic Sugar Association
P.O. Drawer B
Belle Glade, Florida 33430

is hereby authorized to construct/modify a stationary source at the following location:

Belle Glade, Florida

UTM Coordinates: 2,945.9 km. N, 552.9 km E.

Upon completion of this authorized construction and commencement of operation/production, this stationary source shall be operated in accordance with the emission limitations, sampling requirements, monitoring requirements, and other conditions set forth in the attached Specific Conditions (Part I) and General Conditions (Part II).

This permit shall become effective on DEC 4 1981

If construction does not commence within 18 months after the effective date of this permit, or if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable time this permit shall expire and authorization to construct shall become invalid.

This authorization to construct/modify shall not relieve the owner or operator of the responsibility to comply fully with all applicable provisions of Federal, State, and Local law.

Dec. 4, 1981
Date Signed

Charles R. Jeter
Regional Administrator

PSD - FL - 078

APPLICANT: Atlantic Sugar Association

SPECIFIC CONDITIONS:

1. The proposed boiler shall be constructed in accordance with the capacities and specifications stated in the application and additional information supplied by the applicant.

2. The proposed boiler's maximum emission rates shall not exceed the emission limits listed below.

Pollutant	Burning Bagasse 100%		Burning Bagasse with Fuel Oil	
	lb/MMBTU	lb/hr	lb/MMBTU	lb/hr
PM	0.15	29.2	0.14	27.9
SO_2	0.49	95.1	0.55	106.1
CO	0.27	53.1	0.28	53.8
VOC	0.27	53.1	0.27	53.2
NO_x	0.16	31.9	0.19	36.5

3. Sulfur content of the fuel oil fired in the proposed boiler shall not exceed 1.0 percent.

4. Emissions of VOC and CO shall be maintained at the lowest possible level through the installation, calibration, and operation of a flue gas oxygen monitor as described in the attached article: "Use of Flue Gas Oxygen Meter as BACT for Combustion Controls".

5. The boiler shall not be operated more than 3,528 hours per year during the season from October to April.

6. Compliance with the emission limits required in condition No. 2 shall be determined by performance tests while the boiler is at or close to full operating capacity. The performance tests shall be conducted in accordance with EPA reference methods (40 CFR 60, Appendix A) and the provisions of 40 CFR 60.8 and 40 CFR 60.46. EPA reference method 25 shall be used to determine VOC emissions.

7. Visible emissions from the bagasse handling system shall not exceed 10 percent opacity over any 6 minute period as measured by EPA reference method 9.

8. Instruments shall be installed, calibrated, and maintained to continuously measure the fuel oil used by the proposed boiler. The records of fuel oil usage will be kept by the company, available for regulatory agencies inspection for a two-year period.

9. The scrubber shall be equipped with a manometer or equivalent instrument to measure the total pressure drop of the flue gas stream across the scrubber, with pressure gauges to measure the water pressure at the spray nozzles, with a flow meter or equivalent device (weir) to measure the quantity of water circulating through the scrubber. The pH of scrubber water at the scrubber inlet and outlet shall be measured. Data from these instruments shall be recorded each shift (every 8 hours) and available for regulatory agencies inspection for one year.

10. The stack sampling configuration of the proposed boiler shall comply with the minimum of 2D downstream and 0.5D upstream distances to the sampling ports required to use reference method 2.

11. Atlantic Sugar Association will take precautions to exclude the general public from the company's property surrounding the plant during the operating season.

Part II

GENERAL CONDITIONS

1. The permittee shall notify the permitting authority in writing of the beginning of construction of the permitted source within 30 days of such action and the estimated date of start-up of operation.

2. The permittee shall notify the permitting authority in writing of the actual start-up of the permitted source within 30 days of such action and the estimated date of demonstration of compliance as required in the specific conditions.

3. Each emission point for which an emission test method is established in this permit shall be tested in order to determine compliance with the emission limitations contained herein within sixty (60) days of achieving the maximum production rate, but in no event later than 180 days after initial start-up of the permitted source. The permittee shall notify the permitting authority of the scheduled date of compliance testing at least thirty (30) days in advance of such test. Compliance test results shall be submitted to the permitting authority within forty-five (45) days after the complete testing. The permittee shall provide (1) sampling ports adequate for test methods applicable to such facility, (2) safe sampling platforms, (3) safe access to sampling platforms, and (4) utilities for sampling and testing equipment.

4. The permittee shall retain records of all information resulting from monitoring activities and information indicating operating parameters as specifed in the specific conditions of this permit for a minimum of two (2) years from the date of recording.

5. If, for any reason, the permittee does not comply with or will not be able to comply with the emission limitations specified in this permit, the permittee shall provide the permitting authority with the following information in writing within five (5) days of such conditions:

   (a) description of noncomplying emission(s),

   (b) cause of noncompliance,

   (c) anticipated time the noncompliance is expected to continue or, if corrected, the duration of the period of noncompliance,

   (d) steps taken by the permittee to reduce and eliminate the noncomplying emission,

   and

   (e) steps taken by the permittee to prevent recurrence of

Failure to provide the above information when appropriate shall constitute a violation of the terms and conditions of this permit. Submittal of this report does not constitute a waiver of the emission limitations contained within this permit.

6. Any change in the information submitted in the application regarding facility emissions or changes in the quantity or quality of materials processed that will result in new or increased emissions must be reported to the permitting authority. If appropriate, modifications to the permit may then be made by the permitting authority to reflect any necessary changes in the permit conditions. In no case are any new or increased emissions allowed that will cause violation of the emission limitations specified herein.

7. In the event of any change in control or ownership of the source described in the permit, the permittee shall notify the succeeding owner of the existence of this permit by letter and forward a copy of such letter to the permitting authority.

8. The permittee shall allow representatives of the State environmental control agency or representatives of the Environmental Protection Agency, upon the presentation of credentials:

   (a) to enter upon the permittee's premises, or other premises under the control of the permittee, where an air pollutant source is located or in which any records are required to be kept under the terms and conditions of the permit;

   (b) to have access to any copy at reasonable times any records required to be kept under the terms and conditions of this permit, or the Act;

   (c) to inspect at reasonable times any monitoring equipment or monitoring method required in this permit;

   (d) to sample at reasonable times any emission of pollutants;

   and

   (e) to perform at reasonable times an operation and maintenance inspection of the permitted source.

9. All correspondence required to be submitted by this permit to the permitting agency shall be mailed to:

   Chief, Air Facilities Branch
   Air and Waste Management Division
   U. S. Environmental Protection Agency
   Region IV
   345 Courtland Street

10. The conditions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

The emission of any pollutant more frequently or at a level in excess of that authorized by this permit constitutes a violation of the terms and conditions of this permit.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

November 13, 1981

Mr. Tommie Gibbs
Air Facilities Branch
US EPA, Region IV
345 Courtland Street
Atlanta, Georgia 30365

Dear Mr. Gibbs:

RE: Atlantic Sugar Association, Belle Glade, Florida: PSD-FL-078

Since the EPA comments were not timely to the public notice period, they are covered in this letter. Please attach this letter to the package transmitted to you on October 6, 1981. It had been agreed with Mr. Jim Manning to handle it this way by letter to Mr. T. Michael Taimi. Information since then indicates that you should be the addressee. The responses to the comments are as follows:

1. We agree that an opacity limit is necessary in the permit. We failed to address the opacity limit in the State Construction Permit, but it will be addressed in the State Operating Permit.

2. DER is not recommending that post-construction monitoring be performed to document the impact from the new boiler for the following two reasons:

(1) No baseline monitoring data at the point of predicted maximum increment consumption exists. In the absence of these data, we cannot verify compliance with the increment. In addition, particulate scrubbers which were added to boilers 1 through 3 in 1975 affect available increment by lowering stack exit temperatures. Thus, DER believes that there is no way to verify the maximum incremental impact of the new boiler by post construction monitoring. DER's position with respect to post-construction monitoring is in accordance with guidelines located on page 2 of the May, 1978 publication entitled "Ambient Monitoring Guidelines for Prevention of Significant Deterioration". These guidelines are applicable to the new boiler since ASA's permit application was complete before the June, 1981 monitoring guidelines went into effect.

(2) Even if we could measure the maximum incremental impact of the new boiler, the point of predicted maximum increment consumption is located in a small area which is not representative of air quality outside of ASA property boundaries. This area, which is located from 1.0 km to 2.6 km south of the mill, is surrounded on three sides by ASA sugar cane fields. However, ASA's property boundaries extend out to at least 3.9 km from the mill in most directions. Therefore, incremental impacts predicted at points which are at least 3.9 km away from the mill are more representative of the actual impacts to be expected outside ASA property boundaries than are those predicted to occur in the area just to the south of the mill. The maximum incremental impact at 3.9 km is much less than that within the small area of property south of ASA.

If there are any questions on modeling, please contact Mr. Cleve Holladay at (904) 488-1344.

Sincerely,

C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality Management

CFH:caa

cc: T. Michael Taimi

Bob Kmg/file

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30365

4E-CP

10/26 Bill, Larry

OCT 23 1981

Mr. C. H. Fancy, Deputy Chief
Bureau of Air Quality Management
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301

Re: Atlantic Sugar Association, Belle Glade, Florida; PSD-FL-078

Dear Mr. Fancy:

We have completed our review of the Preliminary Determination for the Atlantic Sugar Association's proposed construction. In response, we offer the following comments:

1. We are concerned with the lack of an opacity limit in the permit conditions for the bagasse boiler. Table 1 on page 9 of the Preliminary Determination contains an opacity limit but it was not included in Specific Condition 2 with the other emission limits. We believe an opacity limit is necessary in the permit to insure that the company is aware that they are subject to an opacity limit, as stipulated in the Florida regulations, and to insure that EPA has a method of enforcing that opacity limit until the SIP containing that limit has been approved by EPA. An opacity limit equivalent to that proposed for carbonaceous fuel-fired boilers by Florida in the SIP revision submitted to EPA for approval will be included in the federally-issued PSD permit, i.e., 30% opacity as measured by Method 9.

2. Because the modeling predicts this source will consume a major portion (90%) of the Class II, 24-hour SO_2 increment, we recommend that post-construction monitoring be performed to document the impact from the new boiler.

Thank you for your cooperation. If there are any questions, please contact Mr. Richard Schutt at 404/881-2017.

Sincerely yours,

T. Michael Taimi, Chief
Consolidated Permits Branch
Enforcement Division

OCT 1981
BUREAU
A Q M

Table 2. SO_2 Source Index for ISCLT Computer Output
(Continued, Page 2 of 2)

Source No.	Source Name
100	Glades Correctional Institute 86-01
101	Glades Correctional Institute 86-02
125	Pratt & Whitney 21-10
131	Florida Refinery Nos. 1 and 2
143	Glades Refinery 01-02
152	FPL Riviera No. 1
153	FPL Riviera No. 2

Source: ESE, 1981.

PSD-FL-078

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

October 6, 1981

Mr. H. J. Vallela
Executive Vice-President
Atlantic Sugar Association
P. O. Drawer B
Belle Glade, Florida 33430

RE: Final Determination - Atlantic Sugar Association, Application for State and Federal PSD Permits to Construct New Bagasse Boiler (AC 50-42389, PSD-FL-078)

Dear Mr. Vallela:

Enclosed please find one copy of the referenced Final Determination. State Permit Number AC 50-42389 is hereby issued as of October 6, 1981, pursuant to Section 403, Florida Statutes. Final approval of the Federal PSD permit, which is incorporated with the state permit, is contingent upon review and acceptance of the permit conditions by the Environmental Protection Agency Region IV office in Atlanta. Questions concerning final issuance of the Federal permit should be directed to Mr. T. Michael Taimi of the EPA office, at (404) 881-2017.

Acceptance of the state permit constitutes notice and agreement that the Department will periodically review this permit for compliance, including site inspections where applicable, and may initiate enforcement actions for violation of the conditions and requirements thereof.

Sincerely,

C. H. Fancy, Deputy Chief
Bureau of Air Quality Management

cc: T. Michael Taimi, EPA Region Iv
Angel M. Tellechea, Gulf and Western Food Products Co.
Michael Martin, Palm Beach Co. Health Department
Phil Edwards, FDER, South Florida District

CHF:caa

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

October 6, 1981

Phyllis Lilley
Municipal Library
530 South Main Street
Belle Glade, Florida 33430

Dear Ms. Lilley:

Please find enclosed one copy of the Final Determination for the Atlantic Sugar Association application for a Federal Prevention of Significant Deterioration (PSD) Construction Permit. As with the Preliminary Determination, this information must be available to the public upon request for a period of at least 30 days from the date of this letter.

Again, we appreciate your help in providing this valuable public service. Should you have any questions, please call Tim Powell at (904) 488-1344.

Sincerely,

C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality Management

CHF:caa

THE POST

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

PROOF OF PUBLICATION

STATE OF FLORIDA

COUNTY OF PALM BEACH

Before the undersigned authority personally appeared Don K. Creamer who on oath says that he is Class. Adv. Mgr. of The Post, a daily and Sunday newspaper published at West Palm Beach in Palm Beach County, Florida: that the attached copy of advertising, being a Notice in the matter of Proposed Modification in the ---------- Court, was published in said newspaper in the issues of September 2, 1981

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

Sworn to and subscribed before me this 2 day of September A.D. 19 81

Barbara M. McCord

NOTARY PUBLIC STATE OF FLORIDA AT LARGE
MY COMMISSION EXPIRES SEPT 9 1983
BONDED THRU GENERAL INS. UNDERWRITERS

NO. 662610
Public Notice

A modification to an existing air pollution source is being proposed by Atlantic Sugar Association near the city of Belle Glade, Palm Beach County, Florida. The proposed modification is the construction of a bagasse/fuel oil fired boiler with 100,000 pounds of steam per hour capacity. The modification will increase emissions of air pollutants, in tons per year, by the following amounts:
PM 51.4; SO2 167.8; NOx 56.3; CO 93.7 VOC 93.7

The proposed modification has been reviewed by the Florida Department of Environmental Regulation under Chapter 403; Florida Statutes, and Federal regulation 40 CFR 52.21, Prevention of Significant Deterioration (PSD). The Department has made a preliminary determination that the construction can be approved provided certain conditions are met. A summary of the basis for the determination and the application for State and Federal permits submitted by Atlantic Sugar Association are available for public review at the following offices:
Municipal Library
530 South Main Street
Belle Glade, Florida 33430
South Florida District
Dept. of Environmental Regulation
2269 Bay Street
Fort Myers, Florida 33901
Health and Rehabilitative Services
Palm Beach County Health Department
West Palm Beach, Florida 33402
Bureau of Air Quality Management
Dept. of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

The maximum percentages of allowable PSD increments consumed by the proposed modification will be as follows:
Annual PM 11, SO2 30; 24-Hour 22, 90; 3-Hour NA, 65

Any person may submit written comments regarding the proposed modification. All comments, postmarked not later than 30 days from the date of notice, will be considered in making a final determination regarding approval for construction of this source. Those comments will be made available for public review on request. Furthermore, a public hearing can be requested by any person. Such request should be submitted within 15 days of the date of this notice. Letters should be addressed to:
Mr. C.H. Fancy
Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301
PUBLISH: September 2, 1981

Public Notice

A modification to an existing air pollution source is being proposed by Atlantic Sugar Association near the city of Belle Glade, Palm Beach County, Florida. The proposed modification is the construction of a bagasse/fuel oil fired boiler with 100,000 pounds of steam per hour capacity. The modification will increase emissions of air pollutants, in tons per year, by the following amounts:

PM	SO_2	NO_x	CO	VOC
51.4	167.8	56.3	93.7	93.7

The proposed modification has been reviewed by the Florida Department of Environmental Regulation under Chapter 403, Florida Statutes, and, Federal regulation 40 CFR 52.21, Prevention of Significant Deterioration (PSD). The Department has made a preliminary determination that the construction can be approved provided certain conditions are met. A summary of the basis for the determination and the application for State and Federal permits submitted by Atlantic Sugar Association are available for public review at the following offices:

Municipal Library
530 South Main Street
Belle Glade, Florida 33430

Health and Rehabilitative Services
Palm Beach County Health Department
West Palm Beach, Florida 33402

South Florida District
Dept. of Environmental Regulation
2269 Bay Street
Fort Myers, Florida 33901

Bureau of Air Quality Management
Dept. of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

The maximum percentages of allowable PSD increments consumed by the proposed modification will be as follows:

	Annual	24-Hour	3-Hour
PM	11	22	NA
SO_2	30	90	65

Any person may submit written comments regarding the proposed modification. All comments, postmarked not later than 30 days from the date of notice, will be considered in making a final determination regarding approval for construction of this source. Those comments will be made available for public review on request. Furthermore, a public hearing can be requested by any person. Such request should be submitted within 15 days of the date of this notice. Letters should be addressed to:

Mr. C.H. Fancy
Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

September 1, 1981

RE: Preliminary Determination - Atlantic Sugar Association's Proposed New Bagasse Boiler (AC 50-42389, PSD-FL-078)

Dear

I wish to bring to your attention that Atlantic Sugar Association proposes to construct a new bagasse/fuel oil fired boiler at their facility near Belle Glade, Palm Beach County, Florida, and that emissions of air pollutants will thereby be increased. The Florida Department of Environmental Regulation, under the authority delegated by the U.S. Environmental Protection Agency, has reviewed the proposed construction under Federal Prevention of Significant Deterioration Regulations (40 CFR 52.21) and reached a preliminary determination of approval, with conditions, for this construction. This approval applies only to Federal regulatory requirements and has no bearing on other State or local functions.

Please also be aware that the attached Public Notice announcing the preliminary determination, the availability of pertinent information for public scrutiny and the opportunity for public comment will be published in a local newspaper, the Palm Beach Post, in the near future. This notice has been mailed to you for your information and in accordance with regulatory requirements. You need take no action unless you wish to comment on the proposed construction.

If you have any questions, please feel free to call Mr. Bill Thomas or myself at (904) 488-1344.

Sincerely,

Clair Fancy, P.E.
Deputy Chief
Bureau of Air Quality Management

CF:caa

file: PSD-FL-078

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

September 2, 1981

Mr. Jose Alverez
Atlantic Sugar Association
P.O. Drawer B
Belle Glade, Florida 33430

RE: Preliminary Determination - Proposed Construction of New Bagasse/Fuel Oil Boiler (AC50 42389, PSD-FL-078)

Dear Mr. Alverez:

Please find enclosed two copies of the Preliminary Determination for both State and Federal air construction permit applications as referenced.

A public notice will appear in a local newspaper, the Palm Beach Post, in the near future. A copy of the Preliminary Determination and your application will be open to public review and comment for a period of 30 days. The public can also request a public hearing to review and discuss specific issues. At the end of this period, the Department will evaluate the comments received and make a final determination regarding the proposed construction.

Should you have any questions regarding this information, please contact Mr. Bill Thomas at (904) 488-1344.

Sincerely,

C.H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality Management

cc: David Buff

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

September 1, 1981

Mr. T. Michael Taimi, Chief
Consolidated Permits Branch
EPA Region IV
345 Courtland Street N.E.
Atlanta, Georgia 30365

RE: Preliminary Determination - Atlantic Sugar Association's Proposed New Bagasse Boiler (PSD-FL-078)

Dear Mr. Taimi:

Enclosed for your review and comment are the Public Notice and Preliminary Determination for the Atlantic Sugar Association's proposed construction of a new bagasse/fuel oil boiler at their facility near Belle Glade, Palm Beach County, Florida. The public notice will appear in a local newspaper, the Palm Beach Post, in the near future.

Please inform my office if you have comments or questions regarding this determination, at (904) 488-1344.

Sincerely,

C.H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality Management

CF:mjr

State of Florida

DEPARTMENT OF ENVIRONMENTAL REGULATION

INTEROFFICE MEMORANDUM

For Routing To District Offices And/Or To Other Than The Addressee	
To: _____	Loctn.: _____
To: _____	Loctn.: _____
To: _____	Loctn.: _____
From: _____	Date: _____

TO: Micheal Martin
Mirza Baig

FROM: C.H. Fancy

DATE: September 1, 1981

SUBJECT: Preliminary Determination - Atlantic Sugar Association's Proposed New Bagasse/Fuel Oil Boiler (AC 50-42389, PSD-FL-078)

Please find enclosed one copy of the Preliminary Determination, application and related materials for Atlantic Sugar's proposed bagasse boiler in Belle Glade, Palm Beach County, Florida.

The information must be available for public inspection for 30 days from the date of public notice, which will appear in the Palm Beach Post in the near future (probably September 3, give or take a few days).

Should you have any questions, please call Bill Thomas or myself.

CF:mjr

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

August 31, 1981

Phyllis Lilley
Municipal Library
530 South Main Street
Belle Glade, Florida 33430

Dear Ms. Lilley:

As I explained in our telephone conversation, we need to make the enclosed information available for public inspection, pursuant to Federal Prevention of Significant Deterioration Regulations 40-CFR 52.21, Paragraph (q)). A notice directing people to the library will be published in the West Palm Beach Post in the near future.

The information must be available upon request for a period of at least 30 days from the notice date. At the end of the period, we will forward to you, a Final Determination on the permit application which must be available for an additional 30 days.

We appreciate your help in providing this valuable public service. Should you have any questions, please call me at (904) 488-1344.

Sincerely,

Tim Powell

Tim Powell, Engineer
Bureau of Air Quality Management

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAO
TALLAHASSEE, FLORIDA 32301

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

September 1, 1981

John Sansburg
County Administrator
Palm Beach County Board of County Commissioners
P.O. Box 1989
West Palm Beach, Florida 33402

RE: Preliminary Determination - Atlantic Sugar Association's Proposed New Bagasse Boiler (AC 50-42389, PSD-FL-078)

Dear Mr. Sansburg:

I wish to bring to your attention that Atlantic Sugar Association proposes to construct a new bagasse/fuel oil fired boiler at their facility near Belle Glade, Palm Beach County, Florida, and that emissions of air pollutants will thereby be increased. The Florida Department of Environmental Regulation, under the authority delegated by the U.S. Environmental Protection Agency, has reviewed the proposed construction under Federal Prevention of Significant Deterioration Regulations (40 CFR 52.21) and reached a preliminary determination of approval, with conditions, for this construction. This approval applies only to Federal regulatory requirements and has no bearing on other State or local functions.

Please also be aware that the attached Public Notice announcing the preliminary determination, the availability of pertinent information for public scrutiny and the opportunity for public comment will be published in a local newspaper, the Palm Beach Post, in the near future. This notice has been mailed to you for your information and in accordance with regulatory requirements. You need take no action unless you wish to comment on the proposed construction.

If you have any questions, please feel free to call Mr. Bill Thomas or myself at (904) 488-1344.

Sincerely,

Clair Fancy, P.E.
Deputy Chief
Bureau of Air Quality Management

CF:caa

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

September 1, 1981

Sam Shannon, Executive Director
Treasure Coast Regional Planning Council
P.O. Box 2395
Stuart, Florida 33494

RE: Preliminary Determination - Atlantic Sugar Association's Proposed New Bagasse Boiler (AC 50-42389, PSD-FL-078)

Dear Mr. Shannon:

I wish to bring to your attention that Atlantic Sugar Association proposes to construct a new bagasse/fuel oil fired boiler at their facility near Belle Glade, Palm Beach County, Florida, and that emissions of air pollutants will thereby be increased. The Florida Department of Environmental Regulation, under the authority delegated by the U.S. Environmental Protection Agency, has reviewed the proposed construction under Federal Prevention of Significant Deterioration Regulations (40 CFR 52.21) and reached a preliminary determination of approval, with conditions, for this construction. This approval applies only to Federal regulatory requirements and has no bearing on other State or local functions.

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If you have any questions, please feel free to call Mr. Bill Thomas or myself at (904) 488-1344.

Sincerely,

Clair Fancy, P.E.
Deputy Chief
Bureau of Air Quality Management

CF:caa

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

September 1, 1981

Mr. Max Osceola
Superintendent of Seminole Agency
Bureau of Indian Affairs
Department of the Interior
6075 Sterling Road
Hollywood, Florida 33024

RE: Preliminary Determination - Atlantic Sugar Association's Proposed New Bagasse Boiler (AC 50-42389, PSD-FL-078)

Dear Mr. Osceola:

I wish to bring to your attention that Atlantic Sugar Association proposes to construct a new bagasse/fuel oil fired boiler at their facility near Belle Glade, Palm Beach County, Florida, and that emissions of air pollutants will thereby be increased. The Florida Department of Environmental Regulation, under the authority delegated by the U.S. Environmental Protection Agency, has reviewed the proposed construction under Federal Prevention of Significant Deterioration Regulations (40 CFR 52.21) and reached a preliminary determination of approval, with conditions, for this construction. This approval applies only to Federal regulatory requirements and has no bearing on other State or local functions.

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If you have any questions, please feel free to call Mr. Bill Thomas or myself at (904) 488-1344.

Sincerely,

Clair Fancy, P.E.
Deputy Chief
Bureau of Air Quality Management

CF:caa

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

September 1, 1981

Mr. Thomas Altman
Mayor, City of Belle Glade
110 S.W. Avenue E
Belle Glade, Florida 33430

RE: Preliminary Determination - Atlantic Sugar Association's Proposed New Bagasse Boiler (AC 50-42389, PSD-FL-078)

Dear Mr. Altman:

I wish to bring to your attention that Atlantic Sugar Association proposes to construct a new bagasse/fuel oil fired boiler at their facility near Belle Glade, Palm Beach County, Florida, and that emissions of air pollutants will thereby be increased. The Florida Department of Environmental Regulation, under the authority delegated by the U.S. Environmental Protection Agency, has reviewed the proposed construction under Federal Prevention of Significant Deterioration Regulations (40 CFR 52.21) and reached a preliminary determination of approval, with conditions, for this construction. This approval applies only to Federal regulatory requirements and has no bearing on other State or local functions.

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If you have any questions, please feel free to call Mr. Bill Thomas or myself at (904) 488-1344.

Sincerely,

Clair Fancy, P.E.
Deputy Chief
Bureau of Air Quality Management

CF:caa

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

September 1, 1981

Ms. Carolyn Dekle
State A-95 Coordinator
Office of Planning and Budget
The Capital
Tallahassee, Florida 32301

RE: Preliminary Determination - Atlantic Sugar Association's Proposed New Bagasse Boiler (AC 50-42389, PSD-FL-078)

Dear Ms. Dekle:

I wish to bring to your attention that Atlantic Sugar Association proposes to construct a new bagasse/fuel oil fired boiler at their facility near Belle Glade, Palm Beach County, Florida, and that emissions of air pollutants will thereby be increased. The Florida Department of Environmental Regulation, under the authority delegated by the U.S. Environmental Protection Agency, has reviewed the proposed construction under Federal Prevention of Significant Deterioration Regulations (40 CFR 52.21) and reached a preliminary determination of approval, with conditions, for this construction. This approval applies only to Federal regulatory requirements and has no bearing on other State or local functions.

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If you have any questions, please feel free to call Mr. Bill Thomas or myself at (904) 488-1344.

Sincerely,

Clair Fancy, P.E.
Deputy Chief
Bureau of Air Quality Management

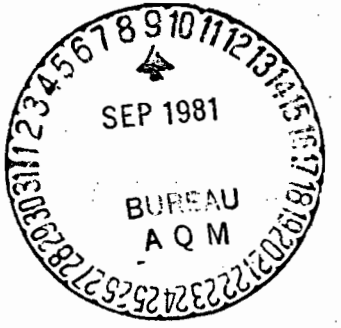
CF:caa

(Detach this stub and forward with your remittance to
Palm Beach Newspapers, Inc., 2751 So. Dixie, West Palm Beach)

Date Sept. 2, 1981 Account No. 448998

Ad. No. 662610 Size 5 1/2 II Amount $42.63

Mr. Jose Alverez
Atlantic Sugar Assn.
P.O. Drawer B
Belle Glade, FL 33430



PALM BEACH NEWSPAPERS, INC.

The Post Daily & Sunday — The Evening Times

2751 SO. DIXIE WEST PALM BEACH, FLA
Phone 833-7411, Ext. 335

THANK YOU FOR THE
LEGAL ADVERTISEMENT
DESCRIBED BELOW

PAYMENT BY RETURN MAIL
WILL BE APPRECIATED

RETAIN THIS PART FOR YOUR FILES

Acct. No. 448998

Ad. No. 662610

Size 5 1/2 II

Amount $42.63

Ad Description: Notice: Proposed Modification

Publ. Date September 2, 1981

THE POST

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

PROOF OF PUBLICATION

STATE OF FLORIDA

COUNTY OF PALM BEACH

Before the undersigned authority personally appeared Don K. Creamer who on oath says that he is Class. Adv. Mgr. of The Post, a daily and Sunday newspaper published at West Palm Beach in Palm Beach County, Florida; that the attached copy of advertising, being a Notice in the matter of Proposed Modification in the ---------- Court, was published in said newspaper in the issues of September 2, 1981

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

Sworn to and subscribed before me this 2 day of September A.D. 19 81

BARBARA M. MCCORD NOTARY PUBLIC STATE OF FLORIDA AT LARGE

NOTARY PUBLIC STATE OF FLORIDA AT LARGE
MY COMMISSION EXPIRES SEPT 9 1983
BONDED THRU GENERAL INS. UNDERWRITERS

NO. 662610
Public Notice

A modification to an existing air pollution source is being proposed by Atlantic Sugar Association near the city of Belle Glade, Palm Beach County, Florida. The proposed modification is the construction of a bagasse/fuel oil fired boiler, with 100,000 pounds of steam per hour capacity. The modification will increase emissions of air pollutants, in tons per year, by the following amounts:
PM 51.4; SO2 167.8; NOx 56.3; CO 93.7 VOC 93.7

The proposed modification has been reviewed by the Florida Department of Environmental Regulation under Chapter 403; Florida Statutes, and Federal regulation 40 CFR 52.21, Prevention of Significant Deterioration (PSD). The Department has made a preliminary determination that the construction can be approved provided certain conditions are met. A summary of the basis for the determination and the application for State and Federal permits submitted by Atlantic Sugar Association are available for public review at the following offices:
Municipal Library
530 South Main Street
Belle Glade, Florida 33430
South Florida District
Dept. of Environmental Regulation
2269 Bay Street
Fort Myers, Florida 33901
Health and Rehabilitative Services
Palm Beach County Health Department
West Palm Beach, Florida 33402
Bureau of Air Quality Management
Dept. of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

The maximum percentages of allowable PSD increments consumed by the proposed modification will be as follows:
Annual PM 11, SO2 30; 24-Hour 22, 90; 3-Hour NA, 65

Any person may submit written comments regarding the proposed modification. All comments, postmarked not later than 30 days from the date of notice, will be considered in making a final determination regarding approval for construction of this source. Those comments will be made available for public review on request. Furthermore, a public hearing can be requested by any person. Such request should be submitted within 15 days of the date of this notice. Letters should be addressed to:

Mr. C.H. Fancy
Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

PUBLISH: September 2, 1981

Proof of Publication

.....

.....

vs.

.....

.....

Filed in the Office of Clerk of Circuit Court

..... 19 .....

....., Clerk

By ....., D. C.

.....

Complainant's Solicitor.

RULES OF THE ADMINISTRATIVE COMMISSION
MODEL RULES OF PROCEDURE
CHAPTER 28-5
DECISIONS DETERMINING SUBSTANTIAL INTERESTS

28-5.15 Requests for Formal and Informal Proceedings

(1) Requests for proceedings shall be made by petition to the agency involved. Each petition shall be printed typewritten or otherwise duplicated in legible form on white paper of standard legal size. Unless printed, the impression shall be on one side of the paper only and lines shall be double spaced and indented.

(2) All petitions filed under these rules should contain:

(a) The name and address of each agency affected and each agency's file or identification number, if known;

(b) The name and address of the petitioner or petitioners;

(c) All disputed issues of material fact. If there are none, the petition must so indicate;

(d) A concise statement of the ultimate facts alleged, and the rules, regulations and constitutional provisions which entitle the petitioner to relief;

(e) A statement summarizing any informal action taken to resolve the issues, and the results of that action;

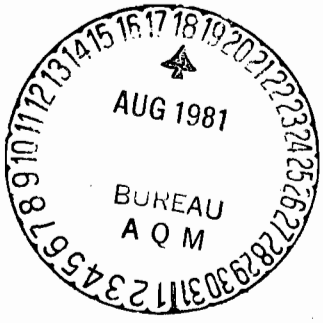
(f) A demand for the relief to which the petitioner deems himself entitled; and

(g) Such other information which the petitioner contends is material.

ESE ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.

Larry cleve

August 17, 1981
ESE No. 81-120-100



Mr. Clair Fancy
Bureau of Air Quality Management
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

Subject: Atlantic Sugar Association - PSD-FL-078

Dear Mr. Fancy:

The enclosed printouts and following discussion are offered in response to Cleve Holladay's request for a PSD increment analysis at the revised property boundary.

Both EPA and FDER baseline conditions at the ASA mill include emissions from boilers 1 through 4. Boiler #4 was originally permitted with a scrubber; the addition of scrubbers to boilers 1 through 3 affects available increment both by reducing particulate emissions and lowering the stack exit temperature.

The effect of the emissions reduction on TSP impact outweighs the effect of the reduction in temperature. Printout #1 shows that the impacts of boiler #5 alone will not exceed the allowable PSD increments outside the property boundary. The actual impact on increment will be less than this because of the addition of scrubbers to boilers 1 through 3.

Printout #2 shows the baseline SO_2 impact and includes the composite tables, submitted previously, of projected impact. No violation of allowable SO_2 increments outside the property boundary are predicted. The critical averaging period is 24-hours. Printout #3 is a refinement of the point of maximum 24-hour increment consumption using the revised SO_2 emission rate for boiler #5. No violations are predicted. Since the revised boiler #5 emission rate did not cause a violation of the 24-hour allowable increment, the 3-hour and annual periods were not further refined.

If there are any questions, please do not hesitate to call.

Sincerely,

Printouts are in modeling files - CH

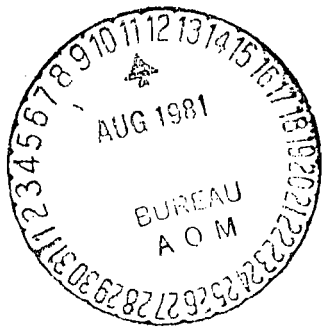
David A. Buff

David A. Buff, P.E.
Senior Engineer
Project Operations

DAB/sn
cc: Jose Alvarez

Atlantic Sugar Association

P. O. Drawer B
BELLE GLADE, FLORIDA 33430
(305) 996-6541



August 10, 1981

Mr. Bill Thomas,
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301

Re: Application to construct air pollution source AC 50-42389
PSD-FL-078

Dear Mr. Thomas:

Attached are the printouts demonstrating that the State and Federal ambient air quality standards will not be violated at any point outside Atlantic Sugar Association property boundaries. A letter from ESE is also attached, which details the concentrations for TSP and SO_2.

This completes all questions on the subject matter. If any additional information is requested, we will be glad to help.

Sincerely yours,

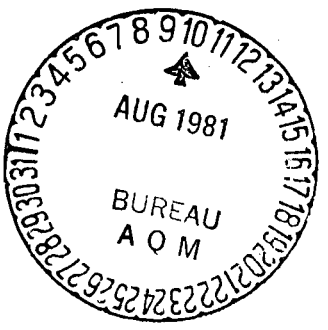
Jose F. Alvarez
Asst. to General Manager

cc. Mr. David Knowles, South Florida District
Mr. Michael Martin, Palm Beach County Health Dept.
Mr. Angel Tellechea, Gulf & Western
Mr. H. J. Valella, ASA

Note: copy of modeling data in CAPS AC-file

ESE ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.

August 7, 1981
ESE No. 81-120-100



Larry Clare

Mr. Clair Fancy, P.E.
Bureau of Air Quality Management
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

Subject: Atlantic Sugar Federal Construction Permit Application, PSD-FL, 078

Dear Mr. Fancy:

Enclosed please find a copy of the revised Atlantic Sugar Modeling results per Mr. Alvarez request. If you have any questions concerning this information, please call.

Sincerely,

David A. Buff

David A. Buff, P.E.
Senior Engineer
Project Operations

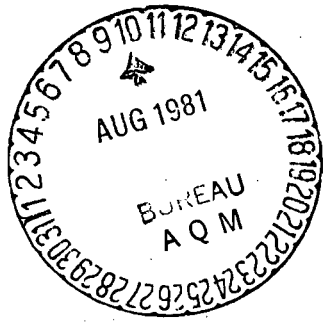
DAB/sn

Printouts in modeling files - CH

ESE ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.

Larry Cleve

August 7, 1981
ESE No. 81-120-100



Mr. Clair Fancy, P.E.
Bureau of Air Quality Management
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

RE: Atlantic Sugar Air Construction Permit Application, PSD-FL-078

Dear Mr. Fancy:

In response to Cleve Holladay's request to reassess the downwash analysis presented in the Atlantic Sugar PSD report, the following information is provided. This request was necessitated due to the distance to the nearest property boundary changing from 3900 meters to 960 meters (refer to ESE letter to Atlantic Sugar dated August 5, 1981). The 960 meters represents the nearest boundary to the south of the mill, as distances in all other directions are much greater.

Following the same methodology used in the Atlantic Sugar PSD report of May 1981, the following worst-case downwash concentrations due to the entire Atlantic Sugar mill were obtained (Note: a factor of 0.4 was used to convert 1-hour concentrations to 24-hour concentrations as recommended in Volume 10 (revised) of the Guidelines for Air Quality Maintenance Planning and Analysis.):

Pollutant	Averaging Time	Stability D U = 8.24 m/s	Stability D U = 2.57 m/s
TSP	1-hour	284 ug/m^3	246 ug/m^3
TSP	24-hour	114 ug/m^3	98 ug/m^3
SO2	1-hour	650 ug/m^3	587 ug/m^3
SO2	24-hour	260 ug/m^3	235 ug/m^3
SO2	3-hour	650 ug/m^3	587 ug/m^3

All predicted downwash concentrations are below the AAQS. The 24-hour SO2 results are approaching the standard, but it should be emphasized, as stated in the Volume 10 Guidelines, that "a degree of conservatism is incorporated into the (averaging time) factors to provide reasonable assurance that maximum concentrations for 3, 8, and 24 hours will not be underestimated." In addition, property boundaries in all directions except to the south are at least 2400 meters from the mill. Therefore, the above predicted concentrations would occur at the property line for only northerly winds, thereby decreasing the frequency of such impacts.

Please call me if you have any questions concerning this matter.

Sincerely,

David A. Buff

David A. Buff, P.E.
Senior Engineer
Project Operations

DAB/sn

cc: Jose Alvarez

Table 1. Particulate Source Index for ISCLT Computer Output

Source No.	Source Name
10	U.S. Sugar, Bryant Nos. 1 and 2
11	U.S. Sugar, Bryant No. 3
12	U.S. Sugar, Bryant No. 5
20	U.S. Sugar, Clewiston 03-01
21	U.S. Sugar, Clewiston 03-02
22	U.S. Sugar, Clewiston 03-03
23	U.S. Sugar, Clewiston 03-04
24	U.S. Sugar, Clewiston 03-05
26	U.S. Sugar, Clewiston 03-07
27	U.S. Sugar, Clewiston 03-08
30	Atlantic No. 1
31	Atlantic No. 2
32	Atlantic No. 3
33	Atlantic No. 4
34	Atlantic No. 5
40	SCGC No. 1
41	SCGC No. 2
42	SCGC No. 3
43	SCGC No. 4
46	SCGC No. 5
50	Osceola No. 1
51	Osceola No. 2
52	Osceola No. 3
53	Osceola Nos. 4 and 5
61	Gulf & Western 05-03
62	Gulf & Western 05-04
63	Gulf & Western 05-05
67	Gulf & Western 05-09
68	Gulf & Western 05-10
69	Gulf & Western 05-11
70	Gulf & Western 05-12
71	Gulf & Western 05-13
73	Talisman No. 1
74	Talisman No. 2
75	Talisman No. 3
130	Florida Refinery Kiln
131	Florida Refinery Nos. 1 and 2

Table 1. Particulate Source Index for ISCLT Computer Output
(Continued, Page 2 of 2)

Source No.	Source Name
140	Glades Refinery 01-04
141	Glades Refinery 01-05
142	Glades Refinery 01-06
152	FPL Riviera Unit No. 1
153	FPL Riviera Unit No. 2
160	FPL Riviera Unit No. 3
161	FPL Riviera Unit No. 4

Source: ESE, 1981.

Table 2. SO_2 Source Index for ISCLT Computer Output

Source No.	Source Name
10	U.S. Sugar, Bryant No. 1
11	U.S. Sugar, Bryant No. 2
12	U.S. Sugar, Bryant No. 3
20	U.S. Sugar, Clewiston 03-01
21	U.S. Sugar, Clewiston 03-02
22	U.S. Sugar, Clewiston 03-03
23	U.S. Sugar, Clewiston 03-04
24	U.S. Sugar, Clewiston 03-05
25	U.S. Sugar, Clewiston 03-06
26	U.S. Sugar, Clewiston 03-07
27	U.S. Sugar, Clewiston 03-08
30	Atlantic No. 1
31	Atlantic No. 2
32	Atlantic No. 3
33	Atlantic No. 4
34	Atlantic No. 5
40	SCGC No. 1
41	SCGC No. 2
42	SCGC No. 3
43	SCGC No. 4
46	SCGC No. 5
47	SCGC No. 6
48	SCGC No. 7
50	Osceola No. 1
51	Osceola No. 2
52	Osceola No. 3
53	Osceola Nos. 4 and 5
61	Gulf & Western 05-03
62	Gulf & Western 05-04
63	Gulf & Western 05-05
67	Gulf & Western 05-07
68	Gulf & Western 05-08
69	Gulf & Western 05-09
70	Gulf & Western 05-10
71	Gulf & Western 05-11
72	Gulf & Western 05-13
73	Talisman No. 1
74	Talisman No. 2
75	Talisman No. 3

Atlantic Sugar Association

P. O. Drawer B
BELLE GLADE, FLORIDA 33430
(305) 996-6541

July 31, 1981

Mr. Clair Fancy, Deputy Chief
Bureau of Air Quality Management
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301

Dear Mr. Fancy:

Re: Application to construct air pollution source
Ac 50-42389
PSD-FL-078

The purpose of this letter is to answer the pending questions on our application.

The remaining questions concern the (a) growth impact, (b) the properties controlled by Atlantic and (c) the BACT analysis.

(a) The construction of the boiler will not increase the personnel needed for operation and maintenance. Therefore, we have to dismiss any growth impact.

(b) Attached is a map of our mill and the surrounding properties controlled by the cooperative. Environmental Science and Engineering is modeling in accordance with these boundaries for TSP and SO_2. As soon as the report is ready it will be forwarded to you.

(c) We have researched the question of pressure drop in the scrubber, we have found that the conditions under which this scrubber operates, requires that the scrubber be designed for a range of pressure drops. For our unit, this range falls between 5 and 10 inches of water. However, this does not mean that we can choose a desired pressure drop in this range and operate at that point. Instead we select a mid-point in this range for the normal operation of the boiler. As the boiler steam pro-

duction increases and decreases around the normal operating point the pressure drop in the scrubber reacts, respectively, to maintain its efficiency. (Refer to attached graph). Our boilers steam production fluctuates 20% below and above the design point. Attached is a 24 hr. chart showing the variations in steam production during a normal operating day. This is typical for a bagasse fired boiler. If the scrubber operates with a pressure drop above 10 inches of water the velocities at the peripheral nozzle become excessive, causing a drop in the efficiency of the scrubber.

Again, we wish to point out that since we have chosen the technology that provides the highest efficiency a BACT analysis is not required. We refer you to the EPA Workshop Manual on Prevention of Significant Deterioration section "B" page I-B-7, middle of the last paragraph which states:

"The only exception ... is a case in which an applicant has demonstrated that this chosen control strategy, the base case, provides the highest degree of emission reduction available. In these cases, the analysis of the alternative strategies is not required."

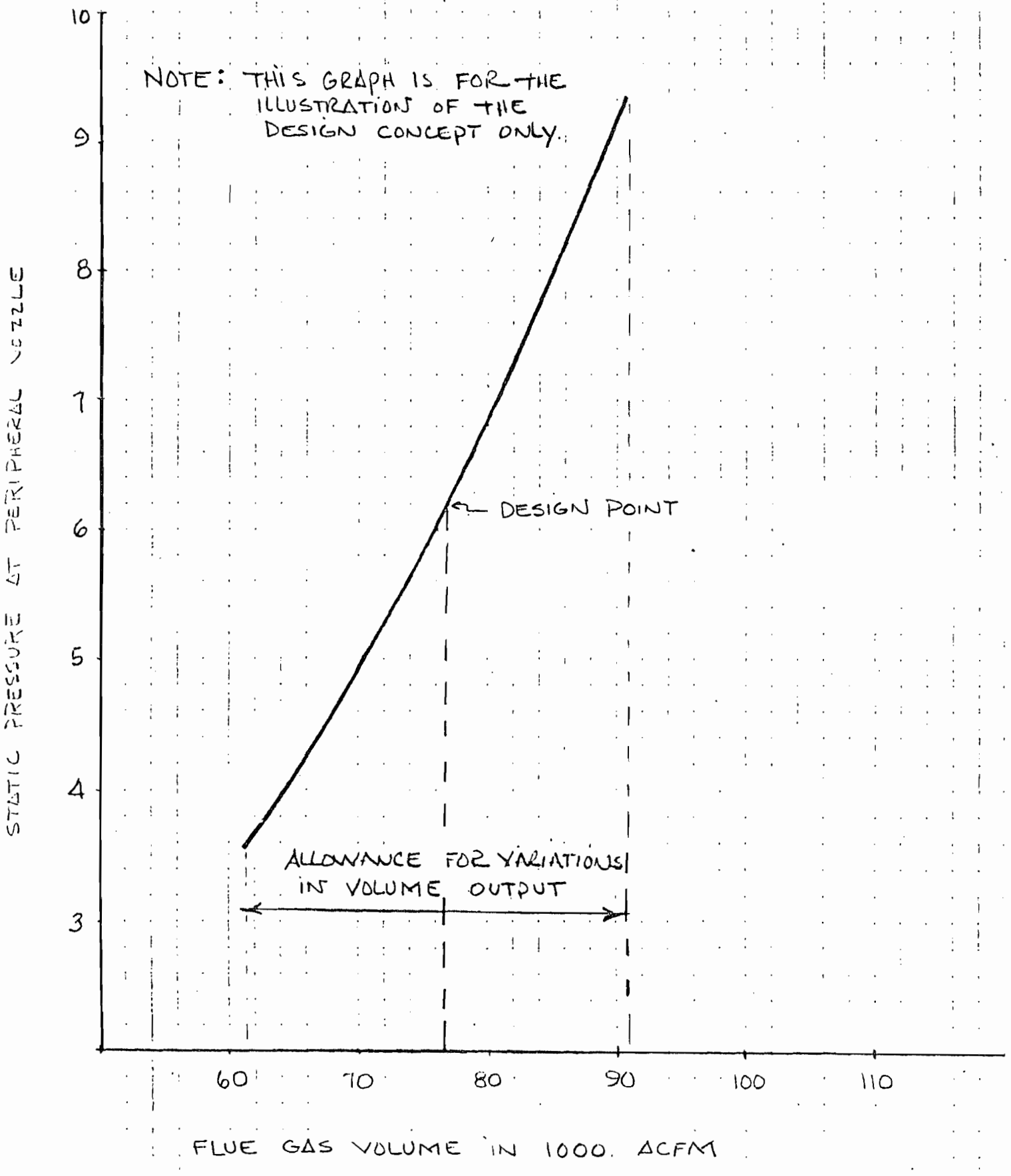
We would be happy to clarify our answers in this letter and answer any more questions you may have.

Sincerely yours

Jose F. Alvarez

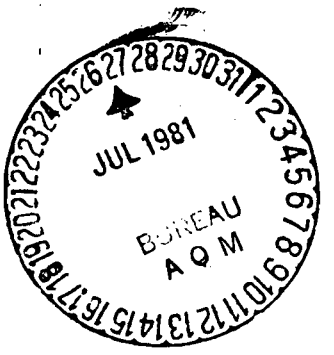
Cc: Mr. David Knowles, South Florida Dist.
Mr. Michael Martin, Palm Beach Co. Health Dept.
Mr. Angel Tellechea, Gulf & Western
Mr. H. J. Valella

VOLUME VS PRESURE DROP FOR IMPINGEMENT TYPE SCRUBBER TYPICAL PRESSURE RANGE. FOR, TURBULAIRE SCRUBBERS



ESE ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.

July 23, 1981
ESE No. 81-120-100



Larry

Mr. Clair Fancy, P.E.
Bureau of Air Quality Management
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

RE: Atlantic Sugar Federal Construction Permit Application, PSD-FL-078

Dear Mr. Fancy:

In response to your comments to Mr. H.J. Valella of Atlantic Sugar concerning the above referenced application as documented in your July 14, 1981 letter, ESE is providing the following information. This information is intended to supplement the information already submitted on soils, vegetation and visibility impacts (Section 7.0 of the PSD Modeling Report).

Impacts Upon Soils and Vegetation

The primary vegetation type in the area of the Atlantic Sugar mill is sugar cane. No data are available on the sensitivity of sugar cane to SO2 concentrations or other pollutants. However, no evidence of damage to the cane surrounding the Atlantic Sugar mill has been observed. No significant impacts are anticipated from the proposed source. The primary soil type in the area is the Everglades Brighton Pamlico Association (primarily peat/muck), and no adverse effects upon this type soil is anticipated from the proposed project.

Visibility Impacts

The proposed bagasse boiler is not expected to have a significant impact on visibility in the immediate area of the proposed source due to the low predicted emission rate for the boiler (Table 2-2 of the PSD report). These low stack gas and particulate emission rates should not contribute to significant plume blight from the proposed source. A significant amount of steam is produced by the scrubber controlling emissions from the source; however, the steam will evaporate eventually and will not be visible after a short travel distance. In addition, visibility impairment should be minimized by the low pollutant emission rates and application of BACT to the facility.

Should you have any questions concerning this information or require additional information, please do not hesitate to contact me.

Sincerely,

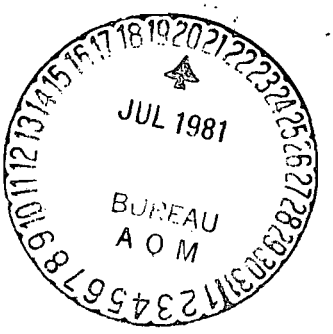
David A. Buff

David A. Buff, P.E.
Senior Engineer
Project Operations

DAB/sn

Atlantic Sugar Association

P. O. Drawer B
BELLE GLADE, FLORIDA 33430
(305) 996-6541



July 17, 1981

Mr. Cleve Holliday, Meteorologist
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301

Dear Mr. Holliday

Re: Air Construction Permit
Application AC-50-42389

The purpose of this letter is to respond to your letter dated July 13, 1981. The numbering of our answers coincides with the numbering of your questions.

1. Our Cane fields on the East are adjacent to the Loxahatchee National Wildlife Refuge. The fields are separated from the Refuge by a canal that is 40' wide. The refuge extends for 10-12 miles to the East. This is a natural barrier which prevents the general public from reaching the outskirts of our property. On the West, we have cane fields that extend for 5 to 6 miles. The cane fields are typically, 40 acres surrounded by canals. The width of the canals varies from 20 to 40 feet. For someone to travel a mile through cane fields, they would have to cross 8 cane fields and approximately 16 canals.
   The nearest public highway to our mill is 4 miles to the North. A person would have to travel through 4 miles of cane fields in order to reach our mill. Our cane fields do not provide an open area between the mill and the public highway since the cane is not harvested all at once.
   During the harvesting of the cane fields, our private roads are heavily travelled by our farm equipment and trailers. Each section being harvested is supervised by personnel in pickup trucks equipped with mobile two-way radios. They are instructed to report any

occurrances which are out of the ordinary,including intruders. A person walking in an open field would be easily detected.

2. As we indicated in our letter of May 15, 1981, to Mr. Steve Smallwood, the proposed scrubber is a scaled-up unit from an impingement type scrubber, modified to improve it's performance. The major modifications are stated in the May 15 letter. We have contracted a local shop to fabricate the scrubber in accordance with the drawings and specifications supplied by IPS engineers. We feel it would be very difficult to obtain a guarantee from a scrubber manufacturer or a supplier on equipment which we have fabricated and which we have modified. However, since this equipment is used widely by most mills with good results, we feel that its performance can be predicted within the range of past performance tests.
Another obstacle that would make a performance guarantee difficult is the variability in the efficiency of the scrubber. Variations in the quality of bagasse and in the operation of the boiler makes impossible the determination of a grain loading and the particle size distribution. Without these two factors a performance would be difficult to ascertain. The only factor that we can measure is the emission from the stack. The past performance of this equipment, which is well documented, is the basis for our requested emission limit 0.20 lbs. per MMBTU. A lower BACT standard has no basis and would be impossible to attain.

If any further information is needed, please do not hesitate to call us.

Sincerely yours,

Jose Alvarez for HJ Valella

H. J. Valella
Executive Vice President &
General Manager

HJV:mc

cc: Mr. David Knowles, South Florida Dist.
Mr. Michael Martin, Palm Beach Co. Health Dept.
Mr. Angel Tellechea, Gulf + Western

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

July 14, 1981

Mr. H.J. Valella
Executive Vice President
Atlantic Sugar Association
P. O. Drawer B
Belle Glade, Florida 33430

Dear Mr. Valella:

RE: Federal Construction Permit Application, PSD-FL-078

Both State and Federal permits are required to construct or modify a major air pollution source. State and Federal permits are processed separately. The Department has partial delegation for Federal PSD review. We review applications and prepare Federal PSD permit documents for EPA's Approval.

Although your application for a State permit is nearing completion, additional information will be required before we can draft the Federal permit documents. The information needed to process the Federal application is listed below.

1. The BACT analysis must contain economic, environmental and energy impact analyses. One of the control strategies must be a multicyclone plus a wet scrubber.

2. An additional impact analysis of the affect of the proposed source on the growth, visibility, soils and vegetation in the area.

Enclosed is a copy of the PSD Workshop Manual. It includes formats for BACT and additional impact analysis which should assist your staff in providing the required information.

If you have any questions on the data requested, please contact Bob King at (904) 488-1344.

Sincerely,

Clair Fancy, P.E.
Deputy Bureau Chief
Bureau of Air Quality Management

CF:dav

Attachment: Manual

cc: David Buff, ESE, w/o attachment
David Knowles, South Florida District, w/o
Michael Martin, Palm Beach County, w/o
Angel M. Tellchea, Gulf and Western Food Products Co. w/o

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

July 13, 1981

Mr. H.J. Valella
Executive Vice President
Atlantic Sugar Association
P. O. Drawer B
Belle Glades, Florida 33430

Dear Mr. Valella:

RE: Air Construction Permit Application, AC 50-42389

The Department has received your response to our second incompleteness letter of June 16, 1981 for your permit application to construct a bagasse boiler in Palm Beach County, Florida.

Based on the review of your June 25, 1981 letter, the following additional information is requested.

1. Question number 13 of our June 16, 1981 letter states that we needed assurance that no member of the general public would have access to the area within 3900 m of the mill. Federal policy requires physical barriers to prevent access of the general public to this area. You state that Atlantic Sugar maintains a guard service and posts signs prohibiting members of the general public to enter your property or to travel on your private roads. Would your guard service be able to detect uninvited members of the general public on the outskirts of your property? Do your sugar cane fields extend out to 3900 m from your boiler complex in all directions? Also, are these fields maintained as inaccessible to the general public during the growing season; i.e., by continuous planting and growing of sugar cane? What measures do you take to prevent access of the general public to fields within 3900 m which are lying fallow? Please provide the answers to these questions and also provide a map of your property, showing the location of your sugar cane fields.

2. IPS Engineers, Inc., stated the turbulaire impingement type scrubber has proven capable of obtaining emissions of 0.25 lb particulate matter/MMBTU. Your application requested a BACT emission limit for particulate matter of 0.20 lb/MMBTU. Presently, it appears the Department's BACT Determination may be

0.15 lb/MMBTU. The standard will be below the proven limit IPS Engineers stated. Once the BACT standard is finalized, it will be necessary for Atlantic Sugar Association to contact the scrubber manufacturer, and, perhaps, other control equipment suppliers to obtain a guarantee from the equipment supplier that the control device will meet the BACT standard.

If you have any questions concerning these additional requests, please contact this office.

Sincerely,

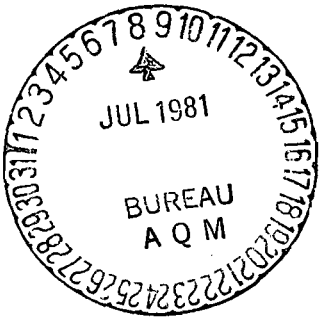
Cleve Holladay

Cleve Holladay,
Meteorologist
Bureau of Air Quality Management

CH:dav

ESE ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.

July 6, 1981
ESE No. 81-120-100



Mr. Clair Fancy
Deputy Bureau Chief
Central Air Permitting Section
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

Re: Atlantic Sugar Association
Air Construction Permit Application, AC-50-42389

Dear Mr. Fancy:

This letter is in response to your letter of June 16, 1981, to H.S. Valella concerning information required to complete the referenced application.

Atlantic Sugar Association has responded in a separate letter to Questions 1 through 5, 8, and 13. The remaining questions are addressed individually:

6. The question of an appropriate TSP background value for modeling and design purposes has been discussed in a response to a similar request concerning the Sugar Cane Growers Cooperative air construction permit (ESE letter to Steve Smallwood, July 6, 1981). In this letter, it was demonstrated that the assumption of a constant 40 ug/m^3 background concentration for modeling purposes gave results equivalent to those expected when the actual concentration distribution recorded at PB-16 was considered. It is not expected that the form of the distribution of modeled concentrations at the point of ASA maximum impact would differ significantly from that observed for SCGC nor would the overall conclusion be altered by a site-specific analysis. Therefore, the use of the 40 ug/m^3 background concentration for modeling purposes for ASA is considered justified and appropriate.

7. The values used to model the ASA facility were provided by ASA. The modeled stack height and exit velocity would both tend to predict greater impacts than the respective APIS listed values, thereby rendering the existing analysis conservative.

9. Each of these three generating stations is greater than 35 km from the ASA mill and each has relatively tall stacks. Projected concentrations in the appropriate interacting directions were less than half the AAQS, and it has been

ESE's experience that these sources do not contribute significantly to short-term impacts at this distance. Therefore, modeling of these sources is not considered justified or necessary.

10. The default value for height of measured windspeed is 10.0 m in the ISC model. The input should correctly have been 7.0 m. Using the default value of 10.0 m results in lower calculated wind speeds as height increases. The effect of this change would be minimal and would not affect the conclusions of the air quality analysis.

11. A list identifying particulate and SO_2 sources in the ISCLT inventory is attached to this letter as Tables 1 and 2.

12. The emissions inventory was compiled from the 1980 APIS listing. No SO_2 emissions were reported for Gulf & Western Boiler No. 14. The omission of SCGC Boilers 1 and 2 was an oversight. Since the projected interaction concentrations with SCGC were less than 25 percent of the corresponding AAQS, inclusions of actual emissions from either source would not change the conclusions of the air quality analysis.

14. In Table 6-1 of the PSD report, the SO_2 background value was inadvertantly added twice. The correct concentrations would be (in ug/m^3):

	Without Background	With Background
184-day average	33.0	53.0
24-hour average	90.6	110.6

On behalf of our client, we hope that this information will aid the processing of the permit application.

Sincerely,

David A. Buff

David A. Buff, P.E.
Senior Engineer
Project Operations

DAB/vs

cc: H.J. Valella, Atlantic Sugar Association
David Knowles, South Florida District
Michael Martin, Palm Beach County Health Department
Angel M. Tellechea, Gulf & Western

Atlantic Sugar Association

P. O. Drawer B
BELLE GLADE, FLORIDA 33430
(305) 996-6541

June 25, 1981

Mr. Clair Fancy
Deputy Bureau Chief
Central Air Permitting Section
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301

Dear Mr. Fancy:

This letter is for the purpose of answering the questions stated in your letter dated June 16, 1981. Please note that we are answering questions 1 through 5, 8 and 13. The rest of the questions will be answered by Environmental Science and Engineering.

1. The new boiler will be more efficient than boiler number 4. The stoker is designed to burn bagasse with less excess air, resulting in less flue gases. The loading to the scrubber will be less as a result of a more efficient combustion.

2. Attached is a letter from our design engineer.

3. The existing bagasse drying system will not be used in conjunction with boiler number 5.

4. The I.D. fan is designed for 111,000 CFM. The 63,508 ACFM is correct.

5. In the past two crops Atlantic's average moisture content of bagasse has been higher than the industry average. The following table compares our average with the industry average:

	Crops	
	79-80	80-81
Atlantic Sugar Association	56.28	55.19
Industry Average, excluding ASA	53.92	53.87
Industry Average, including ASA	54.26	54.06

We estimate that based on the higher moisture content and laboratory tests done on our bagasse, that our heating value (as fired basis) is 15 to 20 percent lower than the industry average. DER has already admitted that Bryant's bagasse is good quality bagasse. Since our scrubbers and Bryant are essentially identical, we feel that our poorer performance in emissions and consumption of fuel oil is attributed to the lower quality bagasse which we use in our boiler.

8. We agree with your calculations, based on your assumptions, that 91.7 lbs/hr. would be the emission of sulfur oxides.

13. We have always maintained the policy that no visitors are allowed in our property unless they are persons applying for a job or persons with specific purpose such as businessmen, salesmen, etc. We enforce this policy by maintaining a guard service and posting signs prohibiting members of the general public to enter our property or travel on our private road. In addition, none of our roads are thoroughfares and therefore the general public has no reason to use them. We are not near any population centers. Since we are relatively isolated, people who come here do so for a specific purpose.

Security service
Cerve - flood it

Sincerely yours,

ATLANTIC SUGAR ASSOCIATION

Jose F. Alvarez
Asst. to Exec. Vice-President

cc: H. J. Valella, Atlantic Sugar Association
David Buff, Environmental Science & Engineering
David Knowles, South Florida Dist.
Michael Martin, Palm Beach Co. Health Dept.
Angel M. Tellechea, Gulf + Western

I P S ENGINEERS, INC.
INTERNATIONAL PLANNING SERVICES, INC.
CONSULTING ENGINEERS

2326 SOUTH CONGRESS AVENUE
WEST PALM BEACH, FLORIDA 33406
TEL (305) 968-1211
TELEX: 519619

JOSE E. LIMA, P.E.
PRESIDENT
J. H. FARINAS, P.E.
VICE-PRESIDENT
RICARDO A. LIMA, CH.E.
SECRETARY-TREASURER

June 25, 1981
0246-81

ATLANTIC SUGAR ASSOCIATION
P.O. Drawer "B"
Belle Glade, Fl. 33430

Attn: Mr. H.J. Valella, Executive
Vice-President

Re: Use of turbulaire impigement type scrubber
for new 100,000 lbs/hr steam boiler.

Gentlemen:

In accordance with your request we are pleased to indicate the criteria used in the design of wet scrubber built for your boiler No.4, per our drawing 264/06-03-01 and operated the last three years with permit No. A050-5867.

1. The scrubber is of the turbulaire impigement type with general dimensions similar to others previously used at other sugar factory, but with added provisions to improve its performance efficiency as follows:

   a. The pressure drop can be changed from its minimum of 5" of water to maximum of 9" by changing the "movable skirts" provided in this design to handle different volumes of gases through "the nozzle".

   b. Increase of the No. of spray nozzles to increase the normal water rate flow of 130 gpm. at the spray nozzles and 17 gpm. at the inlet nozzle.

      Above principle to improve efficiency is based on original manufactures "operation instructions" for turbulaire scrubbers page 34 enclosed in permit application.

IPS

The scrubber has proven capable to obtain emissions of .25 lb/MMBTU in the last 3 seasons with a boiler, burning bagasse in stationary cells.

A similar scrubber installed with a smaller unit (100,000 instead of 125,000 lbs/hr.) and using "traveling grate stoker" to burn bagasse should improve tremendously in its performance.

We trust the above information to be of service. If you need further assistance please do not hesitate to contact us.

Very truly yours,

IPS ENGINEERS

J.H.Fariñas
Vice-President

JHF/gs

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

June 16, 1981

Mr. H. J. Valella, Executive Vice-President
Atlantic Sugar Association
P. O. Drawer B
Belle Glade, Florida 33430

RE: Air Construction Permit Application, AC 50-42389

Dear Mr. Valella:

The Department has received your response to our first incomplete letter of April 29, 1981 for permit application to construct a bagasse boiler in Palm Beach County, Florida. Based on the review of your May 15, 1981 letter, it has been determined that more information is needed before we can process the application. The information required to complete the application is listed below.

1. Your letter indicated the proposed scrubber would be identical to the existing scrubber boiler #4. The particulate emissions compliance test data (application page 21) showed the lowest emissions between 1975 and 1980 from boiler #4 was 0.25 lb/MMBTU. Please explain how the proposed scaled-up scrubber will meet your proposed BACT emission standard of 0.2 lb/MMBTU for bagasse.

2. Item #5 in our letter of April 29, 1981 has not been properly answered. We still need a current commitment from the scrubber manufacturing company or design engineer for the units performance. Include information on the minimum pressure drop and water flow rate for the scrubber.

3. Will the existing on-site bagasse drying system be utilized with boiler #5?

4. Please explain the inconsistency in the volumetric flow rate for the scrubber ID Fan (Application Page 17); 111,000 ACFM on page 16 and 43,369 ACFM (revised to 63,508 ACFM) on page 8, item H. Which is correct?

5. Please provide data to support the claim that Atlantic Sugar's bagasse is different than that used by the rest of the industry (Application page 48).

6. Based on the latest EPA ambient monitoring guidelines (Ambient Monitoring Guidelines for Prevention of Significant Deterioration, EPA-450/4-80-012, Section 2), we believe that ESE's procedure to determine a TSP background is not justified. We suggest two alternatives for developing this background. Data collected from the Palm Beach County Health Department TSP monitor PB-16 could be used. This monitor would be considered a "regional" monitor. Because of its remote location, with the Everglades to the north and Loxahatchee Wildlife Refuge to the south, the impact of cane field burning would probably not be reflected in data from this monitor. Therefore a modeling analysis of the impact of cane field burning would need to be included in order to supplement the data from PB-16. The other alternative would be to use data from an existing monitor within 10 km of Atlantic Sugar Association (ASA). Florida Sugar Cane League monitors SL-15 or SL-14 could be used. The impact of cane field burning would probably be reflected in data from these monitors. If a Sugar Cane League monitor were used, though, the data would have to meet all FDER and EPA quality assurance requirements, and the data would have to be submitted to FDER for verification. Since data from either of these monitors may be impacted by point source emissions from ASA, the modeled impact of these sources at the location of the monitor could be subtracted out. For either alternative, we suggest that three years of monitor data be used if available.

7. In Table 2-1, a value of 18.90m is given for the stack height for Boiler #3. This value is used in the computer modeling. Both the FDER construction permit and APIS output give 72 ft. (21.9m) as the stack height for Boiler #3. Also in Table 2-1 and again in the computer modeling, a value of 6.64 m/sec is given for the exit velocity for stack #5. Our calculations show that the exit velocity should be 9.72 m/sec. Please explain these discrepancies.

8. Our sulfur oxides emissions calculations for Boiler #5 using bagasse with a 0.2% sulfur content shows that these emissions should be 91.7 lbs/hr instead of 76.37 lbs/hr as given in Table 2-2 and as used in the modeling.

9. According to Table 4-1 and the computer printouts in Appendix Volumes I and II, maximum interaction impacts between FPL-Riveria/ASA, FPL-Martin/ASA and Lake Worth Utilities/ASA have not been evaluated. These sources are within 50 km of ASA. Please model for these impacts or explain why modeling for these impacts has not been included.

10. In the computer printouts on pages 1, 16, 38, etc. the height above ground at which the wind speed was measured is given as 10.00m. According to the Local Climatological Data for West Palm Beach, Florida, the anemometer is located 7.0m above ground. Please explain.

11. Atlantic Sugar Long Term TSP and SO_2 printouts are included in Appendix Volume II. Source numbers and stack parameters which were used as inputs to each computer run are given. What sources do these source numbers correspond to? Please provide an index relating the sources considered with their respective source numbers.

12. In Appendix, Volume II, Interaction with Gulf and Western, page 11, Boiler #14 was not modeled. Also on page 10 of interaction with SCGC, Boilers #1 and 2 were not modeled. Please comment.

13. Since the modeling was performed at the ASA property boundaries (closest modeling receptor is 3900m), we must have assurance that no member of the general public would have access to the area within 3900m. What physical barriers exist to prevent this access?

14. In Table 6-1 the value for the highest, second-highest 24 hour SO_2 concentration is given as 110.6 ug/m^3. According to the computer printout this value should be 90.6 ug/m^3. Also the 184 day SO_2 concentration is given as 53.0 ug/m^3. According to the printout this value should be 33.0 ug/m^3.

As soon as the requested information is received, we will resume processing your application. If you have any questions on the data requested, please contact this office. Cleve Holladay should be contacted on any question (questions No. 6-14) related to modeling and Willard Hanks on the other data requested.

Sincerely,

Clair Fancy
Deputy Bureau Chief
Central Air Permitting Section

cc: David Buff, Environmental Science and Engineering
David Knowles, South Florida District
Michael Martin, Palm Beach County
Angel M. Tellechea, Gulf and Western Food Products Company

CF:BK:CH:caa

Atlantic Sugar Fed. PSD

- recieved @ BAQM - May 29, 1981
- from applicant via Purolator Courier

contents: - ~~3~~ construction applications (1 orig.)
- 2 Fed PSD request cover letters (1 orig.)
- 2 letters to B.T. answering questions raised at May 22 meeting (1 orig.)
- ~~2~~ 1 copies of PSD report (originally recd. at BAQM May 18)

distribution:

- 1 copy to Bob King - application + 2 letters
- " " " Cleve Holladay - " " " "

Copies made - 5 May 29

Atlantic Sugar Association

P. O. Drawer B
BELLE GLADE, FLORIDA 33430
(305) 996-6541

May 26, 1981

Mr. Steve Smallwood, PE
Chief, Bureau of Air Quality Management
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301

Dear Mr. Smallwood:

We are hereby requesting a Federal PSD review for the proposed boiler at Atlantic Sugar Association. Enclosed along with this letter, we are sending you the a) Application to operate/ construct Air Pollution Sources, b) our letter dated May 15, 1981 which includes as Exhibit "E" - the report on the prevention of significant deterioration (PSD) and c) our letter dated May 28, 1981 covering questions raised during a meeting in Tallahassee on May 22, 1981. The modeling printouts are presently being reviewed by DER at Tallahassee.

We hope this information complies with the requirements necessary for a Federal PSD review and we trust that the review will be done expeditiously.

We will be glad to supply any additional information.

Sincerely,

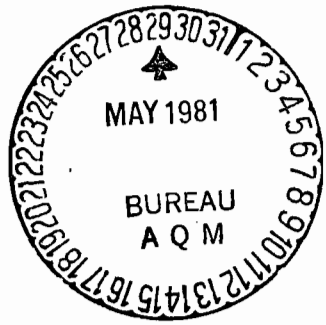
H. J. Valella
Exec. Vice-President &
General Manager

vs.

cc. Mr. A. Tellechea

Atlantic Sugar Association

P. O. Drawer B
BELLE GLADE, FLORIDA 33430
(305) 996-6541



May 28, 1981

Mr. Bill Thomas, BAQM
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301

Dear Mr. Thomas:

We are sending you this letter to answer the questions raised during the May 22nd. meeting held at your office in Tallahassee, and to supply the information requested.

(a) The maximum heat input to our existing boilers is as follows:

Boiler No. 1	195.8	MMBTU/Hr.
Boiler No. 2	195.8	MMBTU/Hr.
Boiler No. 3	244.8	MMBTU/Hr.
Boiler No. 4	244.8	MMBTU/Hr.

(b) Enclosed is a copy of the permit sealed and signed as per your request. Page #8 of the Permit has been revised to reflect the gas flow rate at actual conditions. Please note that the application is being submitted as Revision 2.

(c) We checked our compliance tests and did not find any test data on the scrubbers. The pressure drop and the waterflow is routinely monitored by the operators during normal operations but no records are kept of actual data.

(d) We have no objections on the testing of the proposed boiler for the purpose of gathering data so that hydrocarbons emissions can be ascertained.

Atlantic Sugar Association

P. O. Drawer B
BELLE GLADE, FLORIDA 33430
(305) 996-6541

(e) The maximum firing rate of each one of the proposed oil burners is 1,845 lbs. of oil per hour. The normal firing rate whould be zero since we intend to burn bagasse 100% of the time

(f) The sulphur content of bagasse, as we indicated at the meeting, varies between 0.1% and 0.2%. The worst conditions, of course, would be the higher value.

(g) To confirm my telephone conversation with Mr. King, the proposed boiler will be fired using bagasse 100% of the time. Oil will be used during start up and emergencies. Our calculations are based on firing bagasse only.

If we can be of any further assistance don't hesitate to call us.

Sincerely yours,

Jose Alvarez
Asst. to Executive Vice-President

JF:mc

cc: Mr. Steve Smallwood, P.E., Chief BAQM
DER, South Florida Dist., Palm Beach County
H. J. Valella, Atlantic Sugar Association
A. Tellechea, Gulf + Western

Atlantic Sugar Association

P. O. Drawer B
BELLE GLADE, FLORIDA 33430
(305) 996-6541

(originally received DAQM May 18.)

May 15, 1981

Mr. Steve Smallwood, P.E.
Chief Bureau of Air Quality Management
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301

Dear Mr. Smallwood:

We are referring to your letter of April 29, 1981, in regards to our application for permit to construct a bagasse fired boiler in Atlantic Sugar Mill, Palm Beach County. Enclosed you will find two copies of the application permit submitted as Revision 1.

The information you are requiring to complete the application is as follows:

1. The only measured emissions that we can supply you at this time are copies of the stack emissions survey conducted by Ecology Audits, Inc. January 1977 (Exhibit "A"). If you need official compliance tests, we will have to get them from the public records at D.E.R. in Fort Myers. The control system used on the existing boiler when it was in operation at Moore Haven were two mechanical dust collectors. The existing pollution control system is not being transferred with the boiler.

2. The records available show the design capacity of the boiler as 100,000 lb/hr. of steam. See copy attached from the manufacturers of the boiler (Exhibit "B").

    1. The boiler will be provided with 4 oil burners.
    2. The excess air designed for the boiler is 50%
    3. The basis for the 55% thermal efficiency used for Unit 5 is according with the agreement between D.E.R. and Florida Sugar Cane League.

Atlantic Sugar Association

P. O. Drawer B
BELLE GLADE, FLORIDA 33430
(305) 996-6541

4. We are including copies of the performance specifications for Unit 5 with 60.9% and 56% bagasse moisture (Exhibit "C").

3. We are submitting copies of Detroit Stoker Co. specifications and proposal for the metering bagasse conveyor feeders that will be installed under the boiler. (Exhibit "D").
These metering devices are not capable of measuring pounds or tons per hour of bagasse being fed to the boiler on any basis.

4 & 5. We want to clarify that the scrubber we are proposing is a scaled-up unit from a turbulaire impingement type scrubber. Also, the proposed unit will be identical to the existing scrubber in Atlantic serving boiler #4. (This boiler is presently operating under permit A050-5867). The performance of the proposed scrubber is based on actual performance obtained from the existing scrubber and it is based on the past three compliance tests. The results are as follows:

Boiler Number 4
Compliance Tests

Crop Year	Allowed (lbs/hr.)	Actual (lbs/hr.)
1980-81	61.2	41.4
	60.4	49.6
	58.6	52.7
Average	60.1	47.9
1979-80	61.9	54.5
	63.3	55.0
	62.2	57.0
Average	62.5	55.8
1978-79	50.1	43.0
	52.9	47.9
	49.5	41.1
Average	50.8	44.0

Atlantic Sugar Association

P. O. Drawer B
BELLE GLADE, FLORIDA 33430
(305) 996-6541

Since the proposed boiler will produce 100,000 lbs/hr. of steam, less than the existing boiler #4, we feel the unit will perform as well as the existing unit. In addition, we incorporated features into the existing unit which through experience have proven to be advantageous. The features are primarily the use of sprays to humidify the gas and clean the swirl vanes, and the use of movable skirts on the peripheral nozzle of the inner chamber to regulate the gas velocity. The performance of the proposed scrubber is very well known by D.E.R. in Fort Myers and West Palm Beach by the results of compliance tests in the Florida sugar mills.

6. We based the 92% efficiency on the experience obtained from the scrubber serving boiler #4.
The average of all compliance tests made at Atlantic mill averaged 0.266 lb/10^6 BTU (See Table D-9 Emissions).
.25
Please note that with this 92% efficiency we are using a 0.20 lb/10^6 BTU, which is lower ~~that~~ than the average experienced.

Also, we have taken into consideration the type of bagasse burned at this mill which has been proven to be the most difficult to burn in the Florida Sugar Cane industry.

For this past crop, Atlantic averaged 55.21% moisture content in bagasse, the highest of all 7 mills in the area. The quality of the cane was also proven to be the highest percent of trash and muck.

It has been established by the EPA that BACT will be determined in a case by case basis. Thus, for these reasons we believe that the 0.20 lbs. should apply.

7. In BACT analysis we have considered impingement scrubbers, venturi scrubbers and multiclones plus scrubbers. It has been proven by tests conducted by U.S. Bryant that the impingement type scrubbers have a better performance without multiclones. The justification for the BACT standard required is included in our application (See sheet attached section VI; Best Available Control Technology).

Atlantic Sugar Association

P. O. Drawer B
BELLE GLADE, FLORIDA 33430
(305) 996-6541

8. (a) The number 172.33 pounds SO_2 per hour allowable emissions in Section IIIC is being taken out.

   (b) 35.65 pounds revised to 35.13 because of heat content of steam at 250 psig. and 500 F corrected to 1262 BTU per pound. (See F.2 Method of determining efficiency attached.) Assumed efficiency 92%.

   (c) The process input rate is being corrected to 54,681 lb. per hour of bagasse because of new heat content of 1262 BTU/lb. (See sheet attached to Application Permit "Show the Derivation of process weight".)

9. (a) We have checked the maximum heat imput from 3.13 barrels/hr. fuel oil to be 19.7MMBTU/hr.

   (b) Correct value for heat content of steam at 250 psig. and 500 F to be 1,262 BTU/lb

10. We do not have any data or information to be able to calculate the non-methane hydrocarbon emission rate for the proposed bagasse boiler.

11. We are submitting the scrubber I.D. fan operating curve including the fan speed (RPM) driver hp. at designed conditions. The temperature of the flue gas at the scrubber is predicted to be 506°F. (Exhibit "F")

12. The 60.9% moisture content listed for bagasse in Section IIIE is not representative of the bagasse burned at Atlantic Sugar plant. It is one sample taken during the compliance test performed 3-14-79.

13. The results of the PSD study and predicted modeling output are included in the Application Permit (Exhibit "E").

Atlantic Sugar Association

P. O. Drawer B
BELLE GLADE, FLORIDA 33430
(305) 996-6541

14. A check for $20.00 is enclosed.

15. Sketch showing the stack and specifications are included in the application permit. (page 15.)

    In drawing #3 submitted with the application permit (page 15) you have data showing the specifications of the stack with sampling platform and sample parts. Material for the stack is mild steel.

If any further information is needed, please do not hesitate to call us.

Sincerely yours,

ATLANTIC SUGAR ASSOCIATION

Jose Alvarez
Asst. to Executive Vice-President

JA:mc

cc: Mr. H. J. Valella, Executive Vice-President
DER, South Florida Dist., Palm Beach Co.
Mr. Angel M. Tellechea

See pages: 7,8,10, 12,14,16,17 & 52.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Air Pollution [X] New[1] [ ] Existing[1]

APPLICATION TYPE: [X] Construction [ ] Operation [ ] Modification

COMPANY NAME: Atlantic Sugar Association COUNTY: Palm Beach County

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peeking Unit No. 2, Gas Fired) _____

SOURCE LOCATION: Street South of S.R. 80 City Belle Glade, Florida

UTM: East 552.93 North 2,945.22

Latitude _____ ° _____ ' _____ "N Longitude _____ ° _____ ' _____ "W

APPLICANT NAME AND TITLE: H.J. Valella, Executive Vice-President

APPLICANT ADDRESS: P.O. Drawer B, Belle Glade, Floria 33430

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Atlantic Sugar Association

I certify that the statements made in this application for a Construction Permit permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed: _____

Executive Vice President & General Manager
Name and Title (Please Type)

Date: May 27, 1981 Telephone No. 305- 996-6541

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed: _____

Angel M. Tellechea
Name (Please Type)

(Affix Seal)

Gulf + Western Food Products Company
Company Name (Please Type)

P.O. Box 86, South Bay, Florida 33493
Mailing Address (Please Type)

Florida Registration No. 12343 Date: _____ Telephone No. (305) 996-9072

[1]See Section 17-2.02(15) and (22), Florida Administrative Code, (F.A.C.)

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

See additional sheets attached.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction May 1981 Completion of Construction November 1981

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

The cost of the wet scrubber including all necessary controlls it is estimated at $100,000.00. Detail cost will be provided when completion of construction.

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

Unit #	Permit #	Date Issue	Expiring Date
Boiler #1	A050-2031A	4-5-1976	4-5-1981
Boiler #2	A050-2032A	4-5-1976	4-5-1981
Boiler #3	A050-2033A	4-5-1976	4-5-1981
Boiler #4	A050-5867	5-8-1979	5-8-1984

E. Is this application associated with or part of a Development of Regional Impact (DRI) pursuant to Chapter 380, Florida Statutes, and Chapter 22F-2, Florida Administrative Code? ____ Yes ____ No

F. Normal equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 21 ; if power plant, hrs/yr ____ ; if seasonal, describe: Operating from October to April - Estimating 3528 hours during the season.

G. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? Yes
   a. If yes, has "offset" been applied? No
   b. If yes, has "Lowest Achievable Emission Rate" been applied? No
   c. If yes, list non-attainment pollutants.
      Volatile Organic Compounds (VOC)
2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. Yes
3. Does the State "Prevention of Significant Deterioriation" (PSD) requirements apply to this source? If yes, see Sections VI and VII. Yes
4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? No
5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? No

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

SECTION II: GENERAL PROJECT INFORMATION

A.

The proposed project consists of transfering and installing one existing boiler from Gulf + Western Food Products Company (Florida Crystals Refinery, Moore Haven) to Atlantic Sugar Association. The existing boiler is Erie City Iron Works Boiler # 2/64, H.S.B. No. 96747, Size 9, Type 33W. 3-1/4", 46W. 2-1/2". ~~100~~ OK 100,000 lb/hr. 2 Drums. ~~250~~ 300 OK PSIG. design pressure, 250 PSIG operating pressure and 500° FTT.

This boiler will be modified and installed to supply 100,000 pounds per hour of steam at 250 pounds per square in. and 500° FTT. This boiler will be assembled using two existing drums with new tubes, existing and new headers, new water walls. The mud drum elevation will be 31'-3" in order to provide ample furnace volume to properly burn the 60.9% (x) 55.21% moisture bagasse. The existing steel structures will be extended to accommodate the boiler. One New Detroit Stoker Rotograte Continuous traveling with metering bagasse conveyor feeders will be installed under the boiler to burn bagasse. Total heating surface of the boiler 16,312 sq.ft. One new air heater with 16,375 sq.ft. of heating surface will be installed.

The existing fuel-oil burning system will be installed to be used in emergencies.

One Impinger Wet Scrubber will service the exhaust gases of the furnace to comply with the particulate matter emission limitation of 0.20 lbs. of particulate per 10^6 BTU'S of carbonaceous fuel input and 0.1 lb/10^6 BTU'S heat input of fossil fuels.

The pollution control equipment will be designed following the same parameters as those existing at Atlantic Sugar Association and to comply with all applicable ambient air quality standards and emission regulations. The Induced Draft Fan will be located downstream of the Scrubber. The boiler will operate normally burning only bagasse. Fuel oil Bunker C#6 will be burned only when absolutely necessary and on emergencies. How much?

(x) See Test Report Sample of bagasse attached.

This sample of bagasse was taking during the third run of the compliance test on Boiler #1 1-30-79. It is noticeable the high moisture content and low heating value of this bagasse from Atlantic Sugar Association.

II.A. This facility processes raw sugar cane by milling the sugar cane by extracting the juice. The mills are powered by steam which is produced from bagasse steam boilers. The new Boiler #5 will be a steam boiler fired with bagasse with No. 6 fuel oil used as a supplementary fuel to meet steam load demands.

The unit operation to be controlled will be the bagasse boiler. The unit must meet the State of Florida carbonaceous fuel burning regulation of 0.2 lbs. particulate per million BTU heat input from fossil fuel. The burning of bagasse and fuel oil will cause the emissions of particulate matter, sulfur dioxide, nitrogen oxides, hydrocarbons and carbon monoxide. Operation of the proposed new source will comply with all applicable ambient air quality standards and emission standards.

Section

II.A

The proposed project consists of transfering and installing one existing boiler from Gulf + Western Food Products Company(Florida Crystals Refinery) to Atlantic Sugar Association. This existing boiler is E.C.I.W. Boiler # 2/64, H.S.B. No. 96747, Size 9, Type 33W. 3-1/4", 46W. 2-1/2", 100,000 #/Hr, 300#; 2 Drum.

This boiler will be constructed to supply 100,000 pounds per hour of steam at 250 pounds per square inch and 500°F total temperature. This boiler will be fired mainly with bagasse from the existing mills and No. 6 fuel oil as an auxilliary fuel to meet the steam load needs.

One Impinger Wet Scrubber will service the exhaust gases of the furnace to comply with the particulate matter emission limitation of 0.20 lbs. particulate per 10^6 BTU's of carbonaceous fuel input and 0.1 lbs./10^6 BTU's heat input of fossil fuels. The pollution control equipment will be designed following the same parameters as those existing at Atlantic Sugar Association and to comply with all applicable ambient air quality standards and emission regulations. The boiler will operate normally burning only bagasse. Fuel oil will be burned only when absolutely necessary and on emergencies.

G.

Discuss the Social Impact of the Selected (Technology Versus Other Applicable Technologies. (i.e. Jobs, Payroll, Production, Taxes, Energy, Etc.)

The selected technology (spray impingement scrubber) will reduce potential particulate matter emissions to the atmosphere and thus will result in cleaner air for people to breathe. Energy consumption is not high compared to the benefits gained in removing the pollutants.

The selected technology is similar to other possible, but unproven, technology (i.e. baghouse, ESP's) in regards to costs, jobs, employment and production. Currently, all sugar cane industry bagasse boilers in Florida have some type of wet scrubber in operation for the control of particulate emissions. Requiring new boilers to meet similar requirements will not adversely affect the cost of producing and manufacturing sugar.

Energy requirements for the spray impingement scrubber are approximately a factor of three (3) below that for the venturi scrubber. The spray impingement scrubber also requires lower capital costs and maintenance than the venturi scrubber.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
		NOT APPLICABLE		

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): 54,681 lb/hr of wet bagasse OK

2. Product Weight (lbs/hr): 100,000 lb of steam @ 250 p.s.i.g. @ 500° F.T.T.

C. Airborne Contaminants Emitted: See Emission Calculations sheet attached.

Name of Contaminant	Emission[1]		Allowed Emission[2] Rate per Ch. 17-2, F.A.C.	Allowable[3] Emission lbs/hr	Potential Emission[4]		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/hr	T/yr	
Particulate	35.13 Y	61.97	0.20 #/MBU/hr	36.9	987.45 439.15	774.65	
Sulfur Oxides	75.57 Y	133.21	Major Source	-	75.57	133.21	
Carbon Monoxide	55.33 Y	97.60		N/A	55.33	97.60	
Hydrocarbons CH4	54.81 Y	96.68		N/A	54.81	96.68	
Nitrogen Oxide NO2	40.69 Y	71.74		N/A	40.69	71.74	

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles[5] Size Collected (in microns)	Basis for Efficiency (Sec. V, It[5])
Impinger Scrubber T	Particulate	92%	0.3 - 10.0 & greater	
9.5				

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g., Section 17-2.05(6) Table II, E. (1), F.A.C. – 0.1 pounds per million BTU heat input)

[3]Calculated from operating rate and applicable standard

[4]Emission, if source operated without control (See Section V, Item 3)

[5]If Applicable

Contaminants emitted base on burning 3.13 barrels of oil and 54,681 lbs of wet bagasse per hour

E. Fuels

3659 BTU/lb w/ 55.21% moist.

Type (Be Specific)	Consumption* avg/hr	Consumption* max./hr	Maximum Heat Input (MMBTU/hr)
55.2% 60.9% Moisture Bagasse	33.524	54,681 53116	174.65 x 10^6
1.0% Sulfur Fuel Oil (Bunker C)	2.19	3.13 bbl/hr	19.7 x 10^6
		600 000	lb steam/hr

*Units Natural Gas, MMCF/hr; Fuel Oils, barrels/hr; Coal, lbs/hr Bagasse, lbs/hr. See Bagasse Analysis Attached.

Fuel Analysis: Fuel Oil

Percent Sulfur: 1.0 OK Percent Ash: 0.0%

Density: 8.1 OK lbs/gal Typical Percent Nitrogen:

Heat Capacity: 18,500 OK BTU/lb 149,850 OK BTU/gal

Other Fuel Contaminants (which may cause air pollution): Sulfur Compounds, (SO_x - SO_2), Nitrogen Compounds (NO_x - NO_2), Hydrocarbons, Carbon Monoxide

F. If applicable, indicate the percent of fuel used for space heating. Annual Average Maximum

G. Indicate liquid or solid wastes generated and method of disposal.

NOT APPLICABLE

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 90'-0" ft. Stack Diameter: 6'-6" ft.

Gas Flow Rate: Or 63508 ACFM Gas Exit Temperature: 145 (335°R) °F.

Water Vapor Content: 25 % Velocity: 31.9 FPS

Stack Area = 33.18 sq.ft. OK

$31.9(6.5/2)^2\pi = 63512$

9.7 m/s

SECTION IV: INCINERATOR INFORMATION

modeled w/ 6.64 did not change from orig. appl

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq & Gas By-prod.)	Type VI (Solid By-prod.)
Lbs/hr Incinerated			NOT APPLICABLE				

Description of Waste

Total Weight Incinerated (lbs/hr) Design Capacity (lbs/hr)

Approximate Number of Hours of Operation per day days/week

Manufacturer

Date Constructed Model No.

DER FORM 17-1.122(16) Page 4 of 10

	Volume (ft^3)	Heat Release (BTU/hr)	Fuel		Temperature (^oF)
			Type	BTU/hr	
Primary Chamber		NOT APPLICABLE			
Secondary Chamber					

Stack Height: _____ ft. Stack Diameter _____ Stack Temp. _____

Gas Flow Rate: _____ ACFM _____ DSCFM* Velocity _____ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner [ ] Other (specify) _____

Brief description of operating characteristics of control devices: _____

NOT APPLICABLE

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight — show derivation.
2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.,) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, etc.).
5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3, and 5 should be consistent: actual emissions = potential (1-efficiency).
6. An 8½" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.
7. An 8½" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).
8. An 8½" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

Section V: SUPPLEMENTAL REQUIREMENTS

1. Total process input rate and product weight - show derivation

100,000 lbs./hr. steam @ 250 psig and 500° FTT.

BTU value of steam leaving boiler = 1262.0 BTU/lb.

BTU value of water entering boiler = 193.1 BTU/lb.

BTU requirements per lb. of steam = 1262 - 193.1 = 1068.9 BTU/lb.

Boiler Efficiency = 55%.

Bagasse Heating Value = 3194 BTU/lb. (See Copy of Test Attached).

$$\text{Total heat fuel Input} = \frac{(1262.0 - 193.1) \times 10^6}{.55} = 194.35 \times 10^6 \text{ BTU/hour}$$

1068.9

Heat due to fuel oil burned 19.7 X 10^6 BTU/hr.

Heat due to bagasse burned 174.65 X 10^6 BTU/hr.

174.65
+ 19.70
194.35

$$\text{Bagasse burned per hour} = \frac{174.65 \times 10^6}{3194} = 54{,}681 \text{ lb./hr. bagasse}$$

~ 3659 BTU instead for 55%

$$\text{Fuel Oil burned per hour} = \frac{19.7 \times 10^6}{149{,}850 \times 42} = 3.13 \text{ Barrel Fuel Oil}$$

BTU/gal gal/bbl

or 18500 BTU/lb x 8.1 lb/gal x 42 gal/bbl =
6,293,700 BTU/bbl

Comparable value for any boiler

RILEY | RILEY STOKER CORPORATION
POST OFFICE BOX 547, WORCESTER, MASS. 01613
A SUBSIDIARY OF THE RILEY COMPANY

FUELS LABORATORY

TEST REPORT

Laboratory No. 22,308 Sample of Bagasse Date Rec'd 2/8/79

Received From Atlantic Sugar Assoc. (Sugar Cane Growers) Belle Glade, Fla

Sample Data Bagasse Sample Blr. #1 1/30/79 Run 3 6:30 pm

Contract No. (641-91110) P.O.# F2479-78 Field Sample By Customer

Air Drying Loss	59.4 %	

Proximate Analysis	As Rec'd	Dry
Moisture	Should be 53.1 % 60.9	-----
Volatile	34.2 %	87.6 %
Ash	0.3 %	0.7 %
Fixed Carbon	4.6 %	11.7 %
	100.0 %	100.0 %
British Thermal Units	3,194	8,170

Ultimate Analysis	As Rec'd	Dry
Moisture	%	-------
Carbon	%	48.5 %
Hydrogen	%	6.0 %
Nitrogen *	%	0.36 %
Oxygen (diff.)	%	44.24 %
Sulfur	%	0.2 %
Ash	%	0.7 %
	100.0 %	100.0 %
Free Swelling Index		
Grindability Index		

Fusibility of Ash

Initial Deformation	F
Softening	F
Fluid	F

(*Skinner & Sherman)

Date March 14, 1979

Thomas J. Gallagher

Corrections using 55.21% moisture

EMISSION CALCULATIONS

BAGASSE

1. Particulate: From AP-42 Emission Factors Table 1.8-1

   Uncontrolled Emissions from bagasse:

   $$16 \text{ lbs/ton bagasse} \times \frac{(54{,}681)}{2000} \text{ tons/hr} = 437.45 \text{ lbs/hr.}$$

   $$16 \times \frac{53116}{2000} = 425$$

2. Sulfur Oxides:

   % content of dry bagasse = ~~0.1%~~ 0.2%

   2 lbs/ton of bagasse x $\frac{(54{,}681)}{2000}$ Tons/hr = 54.68 lbs./hr

   305-996-8072

   $$0.2 \times (1 - 55.21\%) \times 53116 \times 2 = 95.1 \text{ lbs/hr} \; *$$

3. Carbon Monoxide:

   2 lbs/ton of bagasse x $\frac{(54{,}681)}{2000}$ tons/hr = 54.68 lbs/hr

   $$2 \times \frac{53116}{2000} = 53.1 \text{ lbs/hr}$$

4. Hydrocarbons:

   2 lbs/ton of bagasse x $\frac{(54{,}681)}{2000}$ tons/hr = 54.68 lbs/hr.

   $$2 \times \frac{53116}{2000} = 53.1 \text{ lb/hr}$$

5. Nitrogen Oxides:

   1.2 lbs/ton of bagasse x $\frac{(54{,}681)}{2000}$ tons/hr - 32.81 lbs/hr.

   $$1.2 \times \frac{53116}{2000} = 31.9 \text{ lb/hr}$$

* - Use this number in the modeling

Results in about a 1.2X increase

Bagasse input lb/hr ⇒

$$\frac{174.65 \times 10^6}{3659} = 47{,}690 \text{ lb/hr}$$

3.13 bbl/hr

EMISSION CALCULATIONS

FUEL OIL

AP-42 Emission Factors: Table 1.3-1 (Industrial Boiler)

1.- Particulate $lb/10^3$ gal = 10(S) + 3 = 10 (1.0) + 3 = 13 lb/1000 gal.

$$\frac{13 \times 131.46 \text{ gal/hr}}{1000} = 1.7 \text{ lbs/hr}$$

2. Sulfur Dioxide:

$$\frac{157 \text{ (1.0)}}{1000 \text{ gal}} \times 131.46 \text{ gal/hr} = 20.63 \text{ lb/hr.}$$

3.- Sulfur Trioxide

$$\frac{2 \times (1.0) \times 131.46}{1000} = 0.26 \text{ lb/hr.}$$

4.- Carbon Monoxide

$$\frac{5 \times (1.0) \times 131.46}{1000} = 0.65 \text{ lb/hr}$$

5.- Hydrocarbons as CH_4 :

$$\frac{1 \times (1.0) \times 131.46}{1000} = 0.13 \text{ lb/hr}$$

6.- Nitrogen Oxides as NO_2

$$\frac{60 \times 131.46}{1000 \quad \text{hr}} = 7.88 \text{ lb/hr}$$

SHOW THE DERIVATION OF PROCESS WEIGHT

100,000 lbs/hr steam @ 250 p.s.i.g. and 500° FTT

Total heat in steam = 100,000 x 1262 = 126.2×10^6 BTU/hr

Total heat in feed water = 100,000 x 193.05 = 19.31×10^6 BTU/hr

Boiler Efficiency = 55%

Total heat fuel input = $\frac{(126.2 - 19.31) \times 10^6}{.55} = 106.89 \times 10^6 = 194.35 \times 10^6$ BTU/hr

Bagasse heating value ~~3194~~ 3659 BTU/lb (See copy of Test Attached)

$194.35 \times 10^6 - 19.7 \times 10^6 = 174.65 \times 10^6$

Allowable particulate burning bagasse and fuel oil

$174.65 \times 10^6 \times 0.20 = 34.93$ ⇒ .2 lb/mmBTU

$19.7 \times 10^6 \times 0.1 = 1.97$

Total Allowable 36.90 lbs/hr

$\frac{19.7 \times 10^6}{149,850 \times 42} = 3.13$ Barrels oil/hr

$\frac{174.65 \times 10^6}{3194(x)} = 54,681$ lbs. of bagasse/hr.

3659 ~53116

Estimated discharge of each contaminant in lbs/hr and tons/year on maximum fuel burned per hour.

	FROM BAGASSE		FROM FUEL OIL		TOTAL	
	lb/hr	T/yr.	lb/hr	T/yr.	lb/hr	T/hr
Particulate	~~437.45~~ 425	771.66	1.7	2.99	439.15	774.65
Sulfur Oxides	~~54.68~~ 91.7	96.46	20.89	36.75	75.57	133.21
Carbon Monoxide	~~54.68~~ 53.1	96.46	0.65	1.14	55.33	97.60
Hydrocarbons as CH4	~~54.68~~ 53.1	96.46	0.13	0.22	54.81	96.68
Nitrogen Oxides as NO_2	~~32.81~~ 31.9	57.88	7.88	13.86	40.69	71.74

(x) $F_a 2$ Method of determining efficiency.

OK

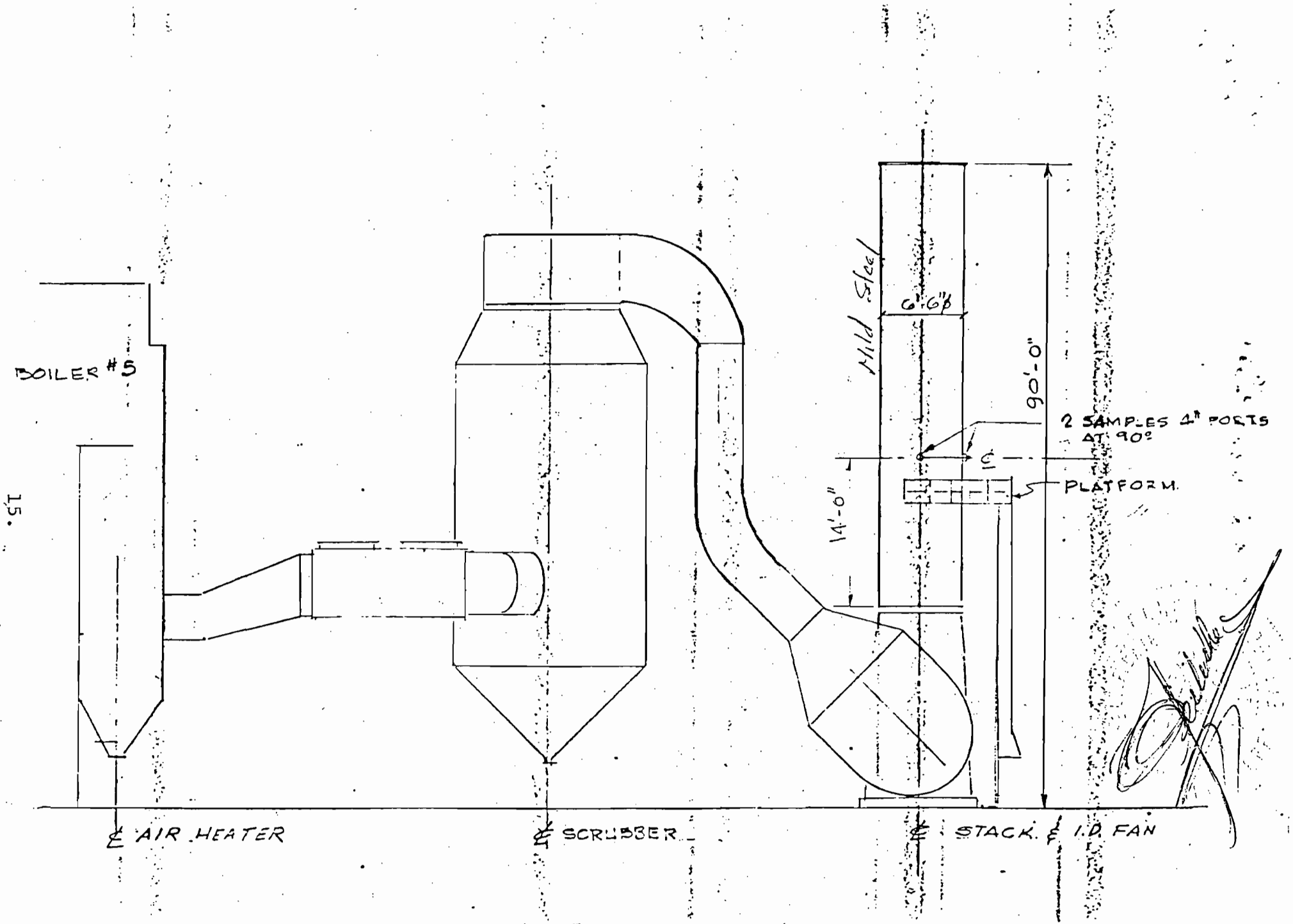
Potential Particulate Emissions = 439.15 lbs/hr

Actual Particulate Emissions = 35.13 lbs/hr

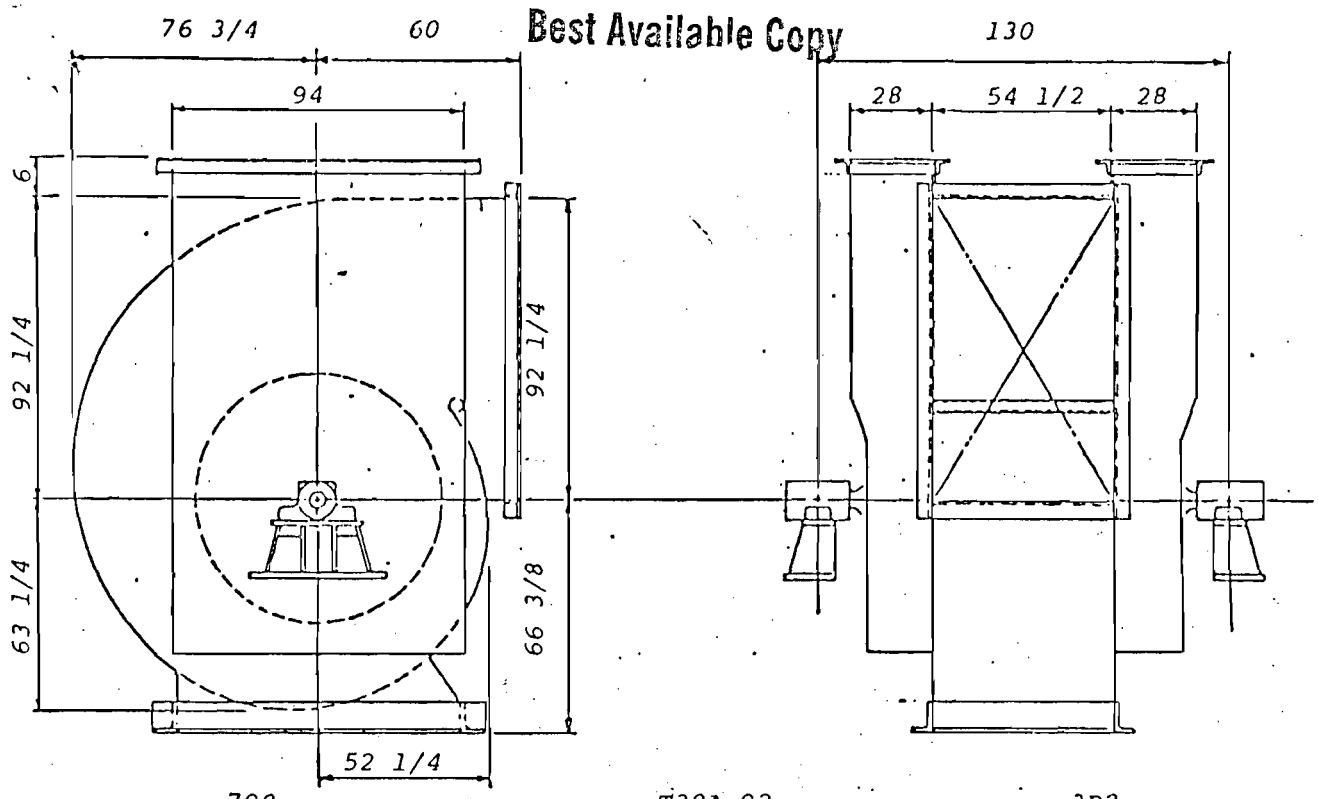
Particulate going to Ponds = 404.02 lbs/hr

Efficiency: $\frac{439.15 - 35.13}{439.15} = \frac{404.02}{439.15} = .92$

What do you mean?



FLOW DIAGRAM BOILER #5	ATLANTIC SUGAR ASSOC. PALM BEACH, FLA. DWG #3 DATE.



FAN SIZE 790 TYPE T30A-92 ARRANGEMENT 3D2

DESIGN RPM 1000 DESIGN TEMPERATURE 200° F. EXCURSIONS TO 400° F. (30MIN)

WEIGHTS:

TOTAL FAN WEIGHT 16,750 TOTAL ROTATING ASSEMBLY WT. 11028

IMPELLER WT. LESS SHAFT 2550 SHAFT WT. 2300

PERFORMANCE:

CONDITION	VOLUME	STATIC PRESS	DENSITY	RPM	BHP
DESIGN	111,000	16	.056	900	354

IMPELLER:	THICKNESS	MATERIAL	TYPE
BLADES	1/4	316 L SS	RADIAL TIP
SHROUDS	1/4	316 L SS	CONICAL
BACKPLATE			
SPIDER ( )	5/8	316 L SS	SCALLOPED

SHAFT:
DIA. AT HUB: 9 1/2
APPROX. CENTER TO CENTER 130

HUB:
TYPE: CAST
MATERIAL: STEEL

BEARINGS:
SIZE: 3 15/16
TYPE: SPHERICAL ROLLER
MFG. LINKBELT

HOUSING:	THICKNESS	MATERIAL
SCROLL	1/4	CORTEN
CHEEK	1/4	CORTEN
INLET BOX	1/4	CORTEN

9. STABILIZER VANES

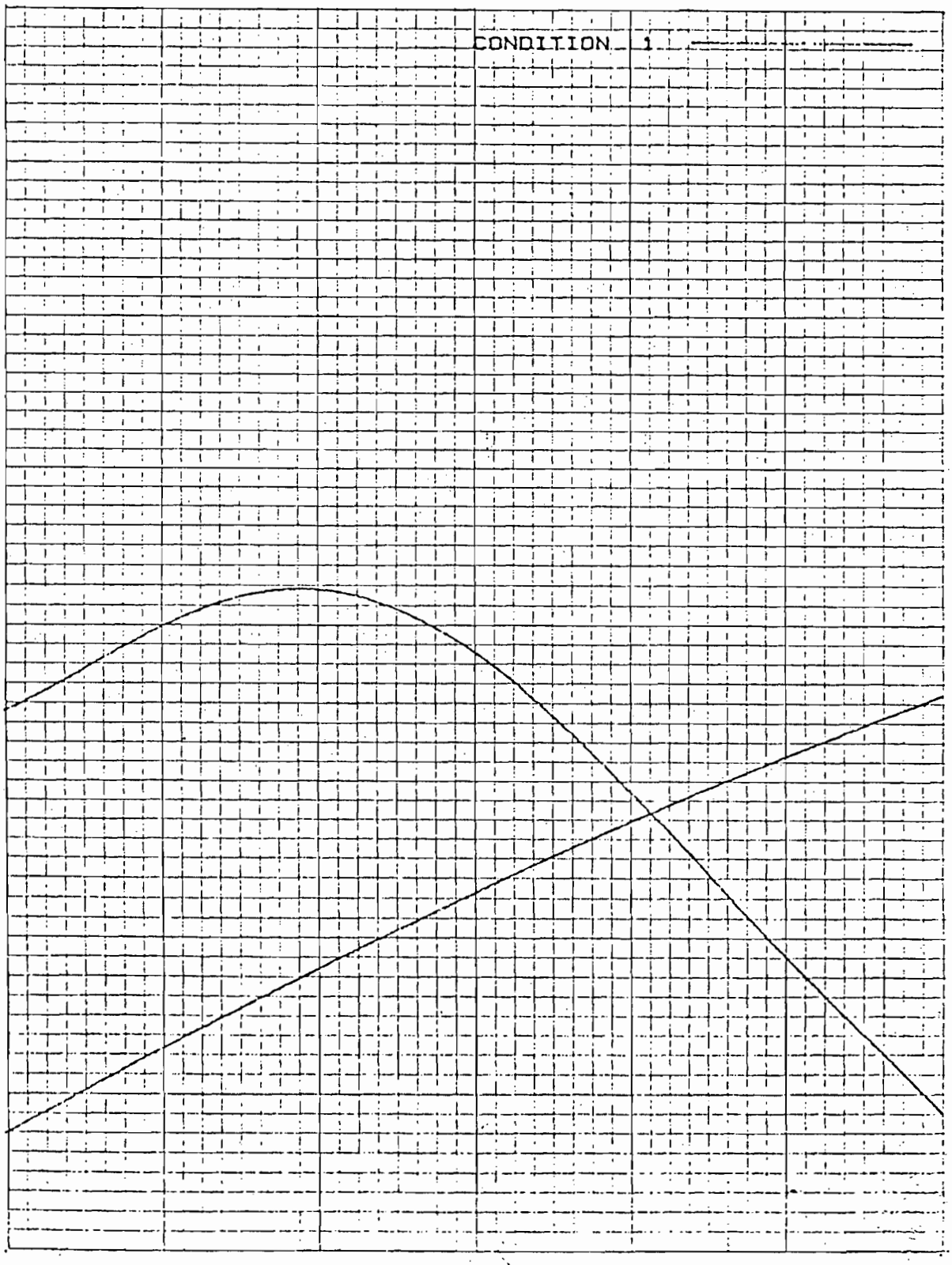
OPTIONAL EQUIPMENT INCLUDED IN PRICING:

1. FLANGED INLET & OUTLET
2. HOUSING DRAINS
3. ACCESS DOORS
4. FALK GEAR COUPLING
5. HOUSING SPLIT FOR IMPELLER REMOVAL
6. 316 L SS SHAFT & HUB COVERS
7. HOUSING CLAD WITH 16 GA. 316 L SS
8. 1/4" 316 L SS FULL BLADE WEAR PADS

BY SNN	CUSTOMER: I.P.S. ENGINEERS, INC. INQUIRY: VERBAL	PAGE OF
DATE 3-24-81	FOR: ATLANTIC SUGAR COMPANY -BELLE GLADE, FLORIDA	
APPROVED	BARRON PROPOSAL # #NF-64/10-1187 REVISION:	
DATE	NOTE: THESE SPECIFICATIONS ARE PRELIMINARY. BARRON INDUSTRIES RESERVES THE RIGHT TO MAKE MODIFICATIONS UPON FINAL DETERMINATION OF APPLICATION, OPERATION AND ARRANGEMENT.	RT

FAN SIZE	790	COND.	1	2	3
FAN SERIES	T90A	DEN. (LB/CU. FT.)	.0560		
FAN TYPE	DI (92.00%) DW	RPM	900.		

REF: ATLANTIC SUGAR-I. P. S. ENGINEERS DATE: 3/24/81



United States
Environmental Protection
Agency

Region 4
345 Courtland Street NE
Atlanta GA 30308

Alabama, Florida,
Mississippi, North Carolina,
South Carolina, Tennessee,
Kentucky

EPA

MAR 22 1979

REF: 4RC

William H. Green, Esquire
Mahoney, Hadlow & Adams
P.O. Box 5617
Tallahassee, Florida 32301

Re: Best Available Control Technology
Determination for Bagasse Boiler

Dear Mr. Green:

This is in response to your February 12, 1979, letter on the above. Specifically, your letter addressed our pending Best Available Control Technology (BACT) determination for a bagasse boiler the United States Sugar Company intends to install at its Bryant, Florida, sugar cane processing operation.

You first asked whether an overly stringent BACT emission limitation could be modified upward after the facility is in operation, if operating results justify a higher limitation. We know of no written EPA policy that provides for such a procedure. As you are aware, EPA regulations also do not provide for such a procedure. However, since this is a policy or program question and not a legal question, we offer no opinion on it.

The remainder of your letter addressed what the appropriate emission limitation reflecting BACT should be in this case. As quoted in your letter, the BACT definition in EPA regulations is:

> "... an emission limitation ... based on the maximum degree of reduction for each pollutant ... which the Administrator, on a case-by-case basis ... determines is achievable for such [major stationary] source ... through application of production processes or available methods, systems, and techniques ...." (emphasis added)

43 Fed.Reg. 26388, 26404 (1978), to be printed as 40 C.F.R. §52.21(b)(10). From this, it is evident that the BACT emission limitation must reflect the maximum emission reduction achievable through use of control systems and techniques. The designation EPA uses to describe techniques that can be used in achieving the BACT emission limitation is "good operating practices". Also, as noted in your letter, the emission limitation must be met on a continuous basis. Clean Air Act §302(k).

In the February 12 letter, you argue that the data from the Clewiston, Florida, bagasse boilers of U.S. Sugar should be weighted more heavily than that from the Bryant boilers. The reasons given are that the Clewiston boilers are 40% larger than the existing Bryant boilers and show consistently higher emission levels. Since the contemplated Bryant boiler will be even larger than the Clewiston boilers, the argument is in effect that the larger the boiler, the higher the emission rate, so that the BACT emission limitation for the contemplated Bryant boiler should at least be as high as the Clewiston test results.

We see at least two weaknesses in this argument. First, the test results at Clewiston when both Boiler No. 1 and Boiler No. 2 were being fired at their highest rate tested (218,000 #/hr. and 215,000 #/hr., respectively) both would meet the BACT emission limit of .15 #/million B.t.u. contemplated for the new Bryant boiler. This and other aspects of the data convince us that there is no clear correlation between size and emissions control efficiency of the bagasse boilers. Second, insufficient information was submitted to eliminate other variables affecting emissions. For example, a significant factor could be differences from site to site or from time to time in adherence to good operating practices. These practices include, for example, maintenance of a sufficient scrubber pressure and sufficient flue gas and water flow rates into the scrubber. This factor of use of good operating practices is, of course, within the control of the permit holder.

There has not been a showing that good operating practices were followed when the Bryant test results showed emissions higher than .15 #/million B.t.u. Also, the .15 #/million B.t.u. level was only rarely exceeded in the Bryant data and thus was not consistently exceeded at a significantly higher level.

These considerations lead us to conclude that .15 #/million B.t.u. can be met continuously if U.S. Sugar uses BACT, including good engineering practices, in designing and operating the contemplated Bryant bagasse boiler.

If we may be of further assistance, please call (telephone 404/881-2335).

Sincerely yours,

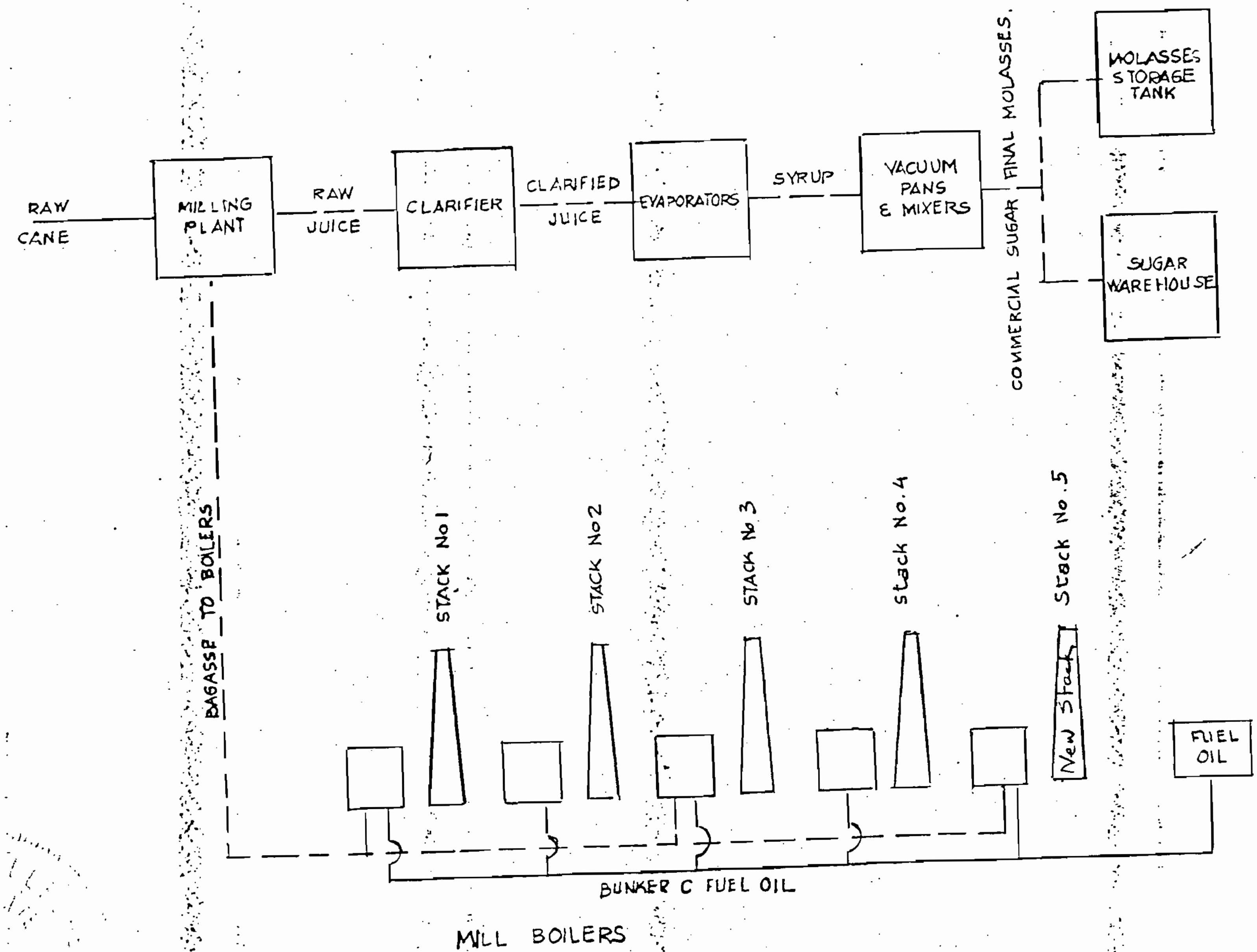
Sanford W. Harvey, Jr.
Regional Counsel

cc: Ms Mary F. Clark
Florida Department of Environmental Regulation

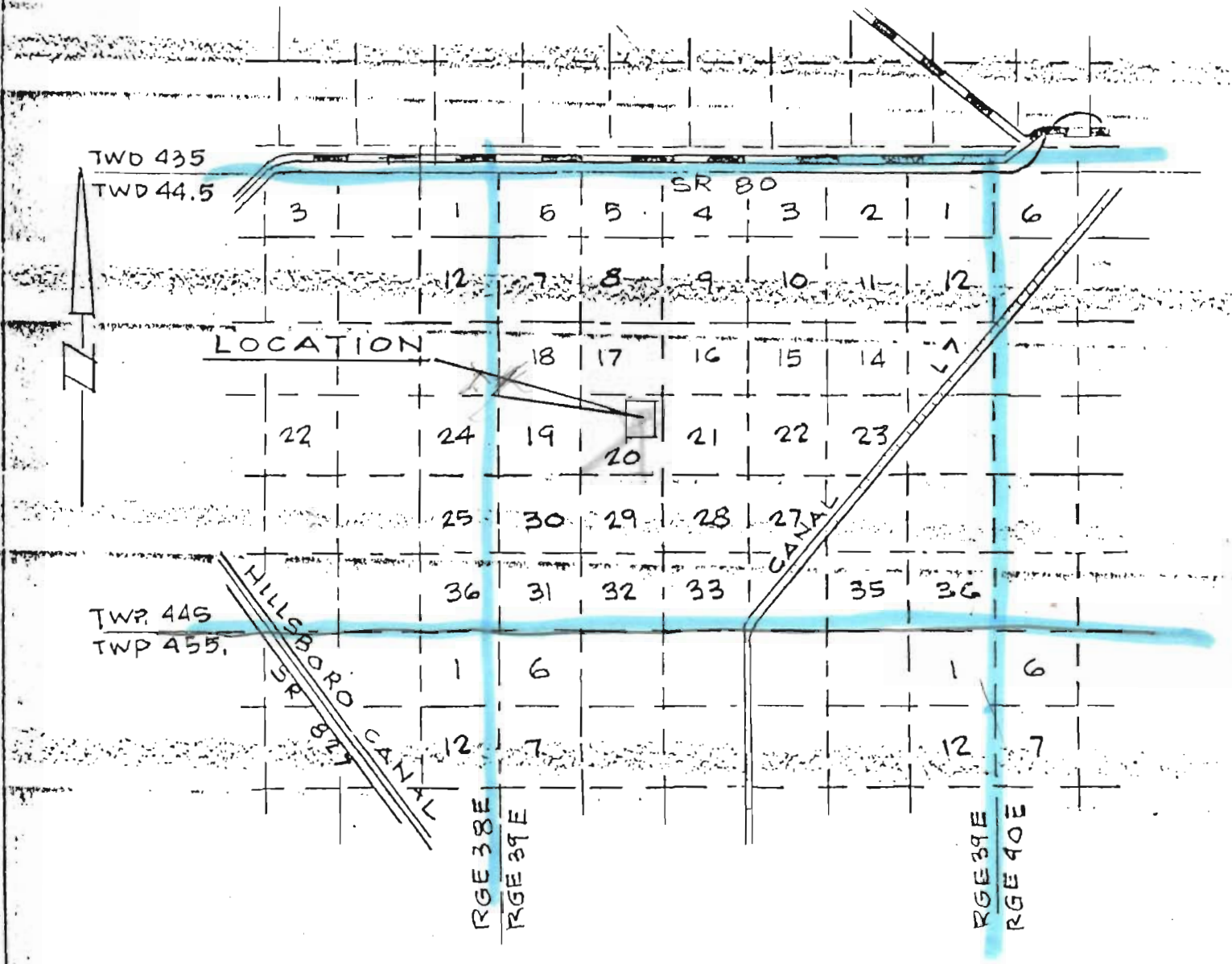
TABLE - D-9 EMISSIONS

Summary of Particulate Emissions Compliance Test Data from all Atlantic Sugar Association Boilers burning bagasse and fuel oil from 1975-76, 1976-77, 1977-78 1978-79 and 1979-80.

BOLER # AND YEAR	$lb/10^6$ BTU'S CONTROL EMISSIONS
1 - 1975-1976	0.25
1 - 1976-1977	0.24
1 - 1977-1978	0.26
1 - 1978-1979	0.20
1 - 1979-1980	0.30
2 - 1975-1976	0.26
2 - 1976-1977 (Average	0.43
2 - 1977-1978	0.21
2 - 1978-1979	0.20
2 - 1979-1980	0.26
3 - 1975-1976	0.27
3 - 1976-1977	0.28
3 - 1977-1978	0.26
3 - 1978-1979	0.26
3 - 1978-1980	0.24
4 - 1975-1976	0.30
4 - 1976-1977	0.25
4 - 1977-1978	0.26
4 - 1978-1979	0.25
4 - 1979-1980	0.25
Average all years	0.266



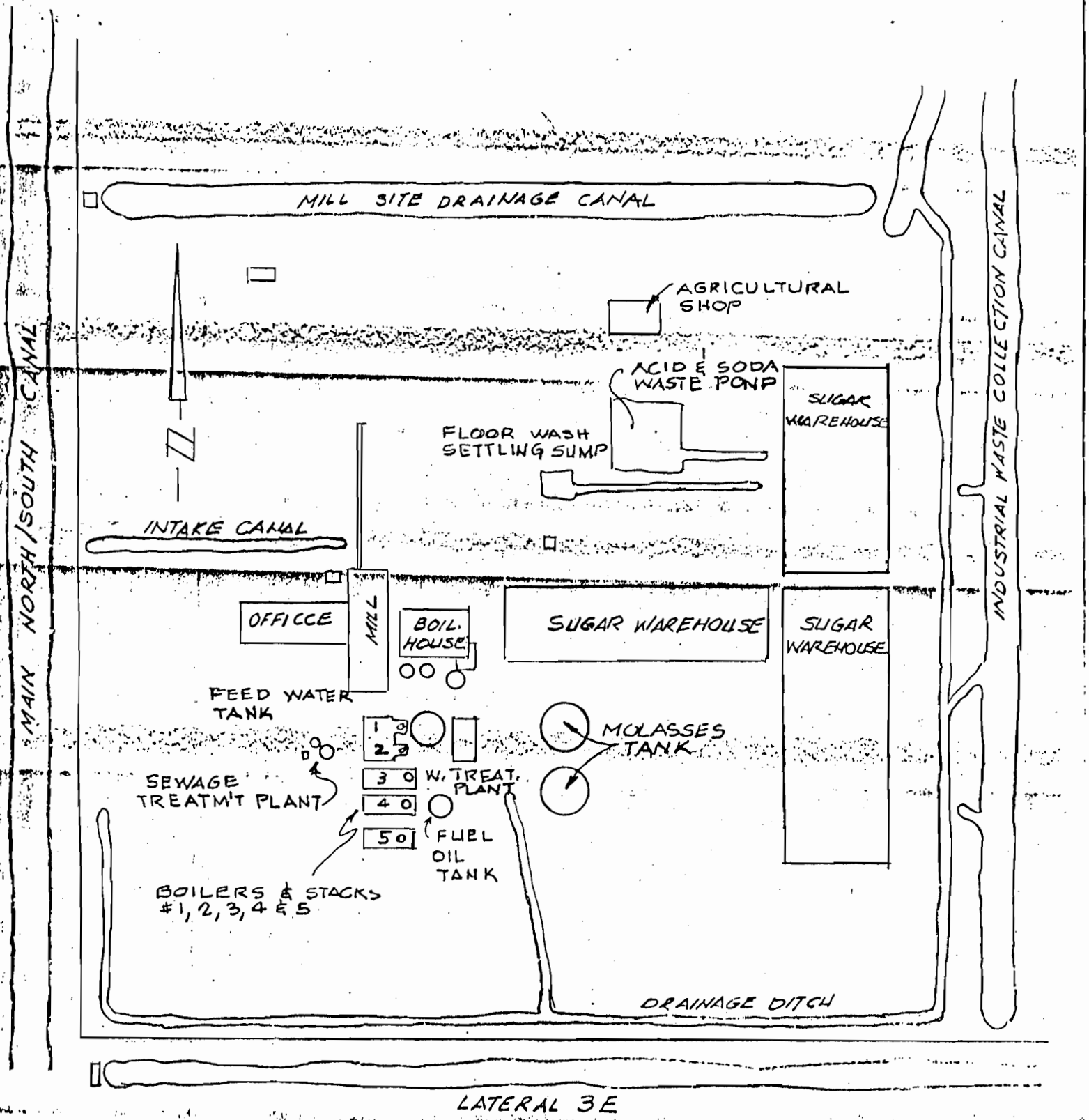
SCHEMATIC FLOW DIAGRAM
ATLANTIC SUGAR ASSOC.
BELLEGLADE FLA



ATLANTIC SUGAR ASSOCIATION
LOCATION MAP

SEC 20 TWP 44S RGE 39E
PALM BEACH COUNTY, FLORIDA

DWG # 1
DATE



MILL SITE
ATLANTIC SUGAR ASSOC.

DWG. # 2
DATE:

WESTERN PRECIPITATION DIVISION
JOY MANUFACTURING COMPANY
4565 COLORADO BOULEVARD
LOS ANGELES, CALIFORNIA 90039
Phone: (213) 240-2300

February 8, 1974

Florida Sugar Cane League, Inc.
P.O. Box 1148
Clewiston, Florida 33440

Attention: Mr. J. Nelson Fairbanks
Vice President & General Manager

Gentlemen:

Confirming our conversations of January 30, 1974, we wish to present, herewith, the guarantees we are prepared to make to any member of the Sugar Cane League on the performance of our Type D "TURBULAIRE" Scrubber when used in conjunction with bagasse fired boilers.

With an inlet loading to the scrubber of 1 gr/dry standard CFM (DSCFM), we will guarantee a particulate outlet not to exceed .03 gr/DSCFM. If the condensables are to be included with particulate emission, we will then guarantee an outlet not to exceed .06 gr/DSCFM. These guarantees are based on operating the equipment at a pressure drop across the unit of not less than 5" water column (w.c.) and not more than 9" w.c. In addition, these guarantees are based on sampling with the EPA Train, Method 5, described in the Federal Register, Volume 36, No. 247, Thursday, December 23, 1971, copy enclosed.

The aforementioned guarantees are made on our equipment as originally designed or as modified with our approval. Any unauthorized modifications will abrogate these guarantees.

Very truly yours,

Allen H. Jones
Vice President, Standard Products

AHJ:js

Encl. EPA Train, Method 5.

cc: F. Arroyo - Arroyo Process Equipment
cc: L. Newton - Western Precipitation
cc: R. Fernandez - Western Precipitation

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JOY MANUFACTURING COMPANY
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With an inlet loading to the scrubber of 2 gr/dry standard CFM (DSCFM), we will guarantee a particulate outlet not to exceed .07 gr/DSCFM. If the condensables are to be included with particulate emission, we will then guarantee an outlet not to exceed .08 gr/DSCFM. These guarantees are based on operating the equipment at a pressure drop across the unit of not less than 5" water column (w.c.) and not more than 9" w.c. In addition, these guarantees are based on sampling with the EPA Train, Method 5, described in the Federal Register, Volume 36, No. 247, Thursday, December 23, 1971, copy enclosed.

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Vice President, Standard Products

AHJ:js

Encl. EPA Train, Method 5.

cc: F. Arroyo - Arroyo Process Equipment
cc: L. Newton - Western Precipitation
cc: R. Fernandez - Western Precipitation

October 24, 1977 - other Article

INSTALLATION, OPERATING, AND MAINTENANCE INSTRUCTIONS

FOR

TURBULAIRE® SCRUBBER

TYPE D

JOY MANUFACTURING COMPANY
Western Precipitation Division
1000 W. Ninth St.
Los Angeles, California 90015

CONTENTS

	PAGE NO.
OPERATING DATA SHEET	ii
DESCRIPTION	2
FIELD INSTALLATION	4
PREPARATION OF THE SCRUBBER FOR OPERATION	5
OPERATION	6
MAINTENANCE	8
AUTOMATIC CONTROL RECOMMENDATION	9

FIGURES

Figure 1. Turbulaire® Scrubber, Type D-B, Sizes 20 thru 64 1

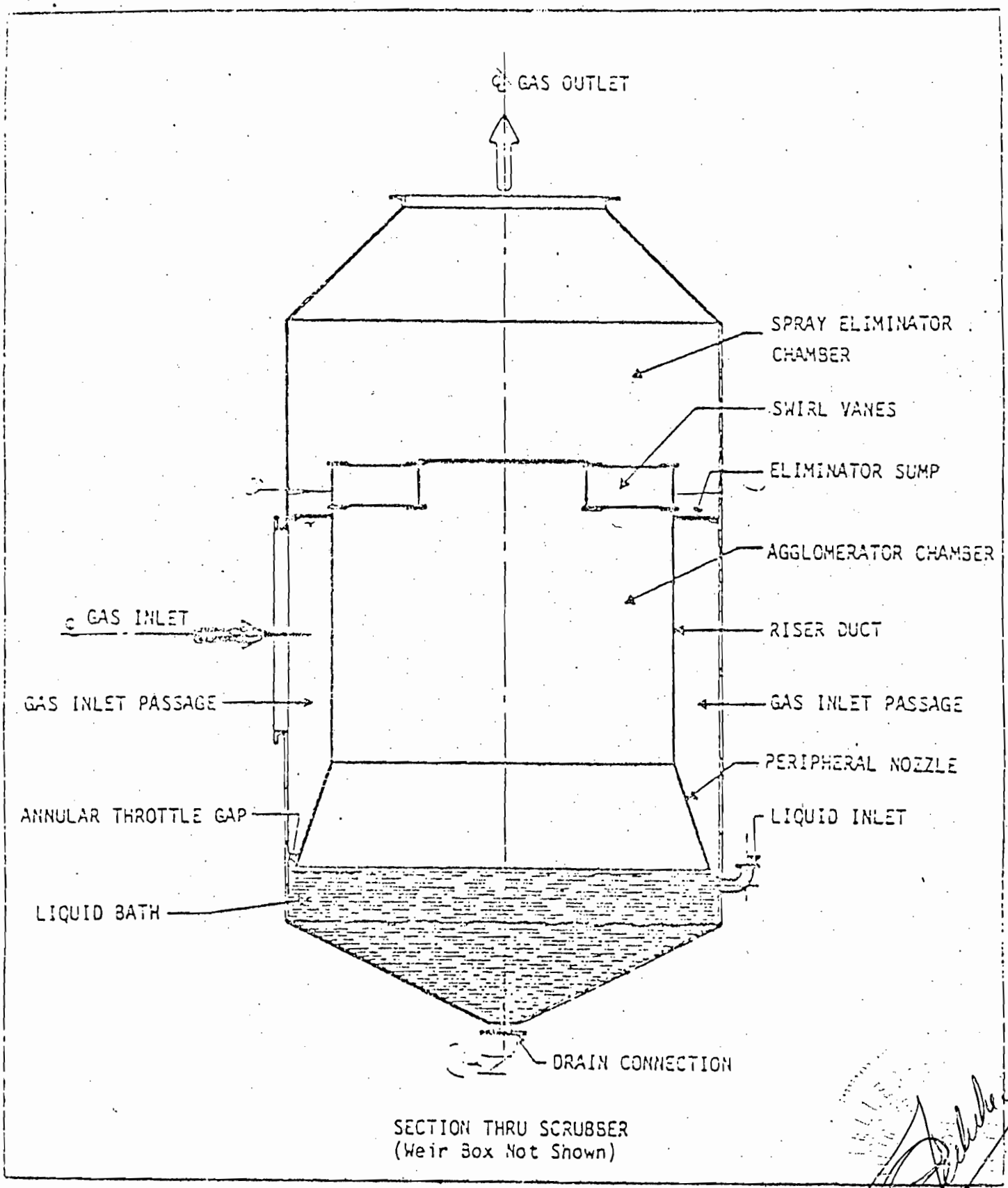


Figure 1. Turbulaire® Scrubber, Type D-3, Sizes 20 thru 54

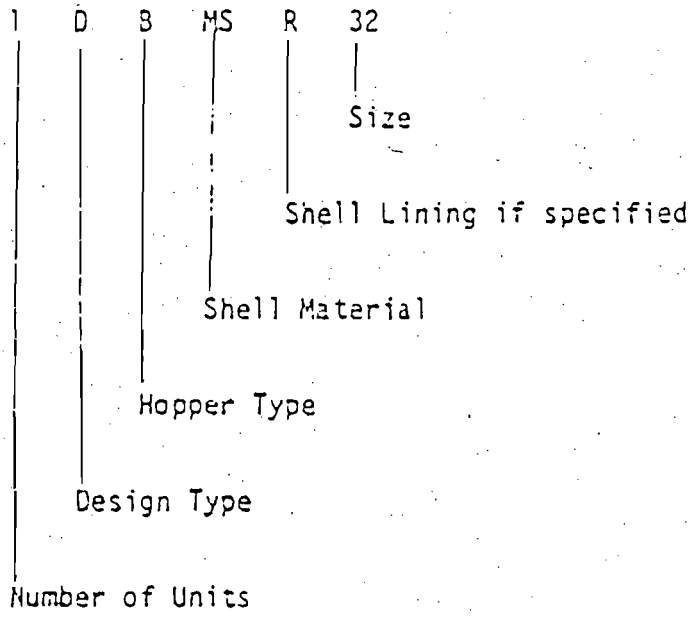
DESCRIPTION

The Type D Turbulaire® Scrubber (Figure 1) consists of a vertical cylindrical shell with conical top and conical hopper on the lower end. The scrubber is divided into two chambers; the agglomerator chamber and the eliminator chamber.

The agglomerator chamber is in the lower portion of the scrubber and consists of the hopper with liquid bath, the gas inlet passage with conical throttle and the liquid level regulating assembly.

The eliminator chamber is above the agglomerator chamber and consists of a set of swirl vanes and a sump preceding the gas outlet.

TYPE & SIZE DESIGNATION

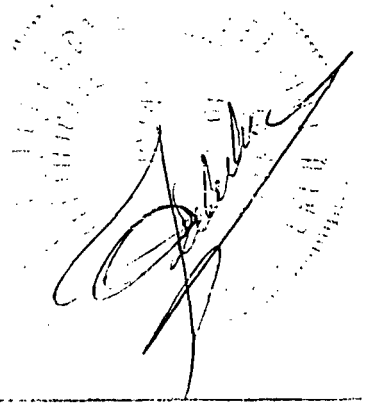


The scrubber has the gas inlet located radially on the side of the shell and the gas outlet at the top center. The agglomerator cylinder is surrounded by the gas inlet passage. The shell and the peripheral nozzle of the agglomerator chamber form an annular throttling gap at the bottom of the gas inlet passage. The normal operating level of the scrubbing liquid bath is just below the throttling gap.

Swirl vanes are mounted in the top of the agglomerator cylinder. A horizontal plate joining the agglomerator with the shell forms the eliminator sump. Weep holes drain the liquid from the eliminator sump into the scrubbing liquid bath in the hopper.

A liquid level regulating assembly is mounted on the lower exterior region of the shell. This assembly consists of a gas lock release pipe, weir box with liquid level control, and a seal pipe with overflow. The liquid inlet is located just above the hopper. Access doors are provided in the hopper and in the upper region of the shell.

Construction material for the standard scrubber is mild steel. Optional materials of construction may be: mild steel lined with rubber, lead or coated with epoxy resin; 304 or 306 stainless steel; and fiber reinforced polyester.



FIELD INSTALLATION

Field installation of the scrubber is as follows:

1. Set the unit on the foundation and attach the anchor bolts. Level unit by shimming between unit and foundation.

NOTE: Vertical and horizontal alignment of the scrubber is important to ensure an even circumferential dimension between the peripheral nozzle and quiescent liquid level.

2. Connect the inlet and outlet flues to the unit. It is recommended that inspection doors, adjacent to the scrubber, be included in the customer's flues.

NOTE: Dynamic and dead load forces from customer's fan, equipment and flues must not be transmitted to the scrubber equipment.

3. Attach the sight glass and weir box to the scrubber, then connect the seal pipe overflow to a drain line.

4. Connect the hopper outlet to a drain line. The drain line should contain a valve for flow balancing purposes.

PREPARATION OF THE SCRUBBER FOR OPERATION

The scruboer is designed to operate under the conditions in the operating data sneet in the front of the manual.

Prior to turning on the flue gas, liquid flow and liquid level should be established as follows:

1. Remove the weir box cover.

2. Turn on the liquid supply. By means of a flow meter or other measuring device, adjust the flow of the inlet liquid until the rate prescribed on the data sheet is attained.

3. Open the valve at the hopper outlet and establish a flow of liquid adequate to remove the slurry from the hopper.

4. Raise or lower the liquid level control as required until the liquid in the scrubber reaches and maintains a steady level, approximately 1/2-inch below the peripheral nozzle. This level is indicated by a red line painted on the weir box. Tighten the clamp which secures the level control in place.

NOTE: The liquid level control and liquid inlet rate may require adjustment to comply with rated pressure drop and outlet gas conditions.

5. Replace the weir box cover. The scrubber is now ready to receive flue gas.

If the tank is lined with lead, rubber, epoxy resins or other material which may deteriorate at high temperatures, the temperature of the inlet gas must be adjusted within limits compatible with these materials as noted after operating instruction.

NOTE: Unless otherwise recommended, 95% to 99% of the slurry should be removed through the valve at the hopper outlet. Only 1% to 5% should be removed through the weir box overflow pipe.

OPERATION

Operation of the scrubber requires only that the fan be turned on to move flue gas through the scrubber.

As flue gas enters the scrubber through the inlet, its speed is increased to the desired operating velocity as it passes through the throttling gap. The dust-laden gas is then discharged at high velocity and penetrates deeply into the liquid bath wherein the dust combines with the liquid to form a slurry which is discharged through the hopper outlet valve. The turbulence resulting from the entrance of the high velocity gas into the scrubbing bath is sufficient to produce a dense spray. This spray is removed from the gas by the swirl vanes.

The scrubber should continue to operate at constant efficiency if the gas volume, temperature and dust load do not change. If there is an increase in the dust load, it may be necessary to increase the flow rate of the scrubbing liquid, in which case, the hopper outlet valve must be adjusted to maintain the operating liquid level. A decrease in the dust load will permit decreasing the scrubbing liquid flow rate.

The efficiency of the unit may be increased by: increasing pressure drop through unit, cooling inlet gases if necessary, and increasing the inlet liquid rate, described as follows:

1. Increase pressure drop through the unit by restricting the nozzle opening or by increasing the gas flow through the unit.

The nozzle opening can be restricted by adding material to the nozzle opening and thus cut down the size of the opening. The opening is designed so that at the gas density and volume specified, the required pressure drop should be obtained. Sometimes the gas density or the volume are not that which is calculated and, if the pressure drop is low, it is necessary to close down on the opening. This is fairly easily accomplished and, by doing this, the velocity of the jet is increased into the liquid pool and, therefore, increases the efficiency of the unit.

The volume of air should never exceed the maximum allowable outlet gas volume as specified on the data sheet. This maximum volume cannot be exceeded without entraining some of the scrubbing liquid, and carrying it into the outlet flue.

Gas flow through the unit can be increased by opening the fan dampers or by introducing infiltration air into the flue through a damper.

If the scrubber is operating well below the maximum outlet gas volume, the simplest way to increase the pressure drop through the unit is to increase the fan delivery until the design pressure drop is reached.

2. Introduce liquid sprays ahead of the scrubber inlet to humidify the gases entering the scrubber. This system is employed whenever inlet gas temperatures are high enough to damage the lining of the shell. Changing the specified water flow to the spray nozzles is not recommended since this will change inlet gas density beyond scrubber design limits.

3. Increase the inlet liquid rate. This will also bring the temperatures of the gas down to saturation quickly. However, as the liquid rate is increased the liquid level control will have to be reset until equilibrium conditions are maintained without gas passing through the unit. Increase of the liquid rate will give lower outlet gas temperatures and also lower outlet liquid temperatures.

MAINTENANCE

Although the scrubber should operate continuously with minimum maintenance some may be required. This includes: removing any build-up of dust on the peripheral nozzle which would impair operation, and periodically cleaning out the scrubber and liquid seal pipe to prevent clogging of the outlet.

In addition, situations may be encountered which may impair the operation of the scrubber:

1. Plugging of the Overflow Pipe

   Occasionally on some dusts (generally those associated with fluorides), there may be some plugging of the overflow pipe which leads from the scrubber to the weir box. This plugging is due to settling out or deposition of particles in the pipe and can generally be relieved by one or two methods.

   One method is to periodically clean out the pipe with a reamer or a scraper of some sort. For those scrubbers with rubber, lead, or plastic lining, care should be taken that the lining is not pierced.

   Another method is to increase the velocity of liquid through the pipe by closing down on the cross sectional area. This is accomplished by laying pieces of tubing in the overflow pipe and building up enough tubing so that the cross sectional area of the pipe is gradually reduced. The velocity of liquid for materials which tend to settle out should be a minimum of 2 to 3 fps or higher.

2. Cold Weather Operation

   During periods of cold weather, care must be taken to prevent freezing of the liquid in the scrubber and in the supply lines. It may be necessary to insulate one or both. During periods of shutdown, the scrubber and liquid lines should be drained unless some method is employed to keep temperatures above the freezing point.

AUTOMATIC CONTROL RECOMMENDATION

An automatic liquid level control system is available as an optional extra from Western Precipitation Division.

The system consists of the following components:

a. Displacer type level control unit (Magnetrol)

b. Solenoid valve

c. Strainer

d. Piping and pipe fittings as required for field assembly.

The system is normally shipped loose for field assemoly by the customer. Hook-up connections are provided on the hopper and the scrubber body.

OPERATION

The liquid level control unit uses a solid block displacer - heavier than the liquid - which is suspended from a helical spring. A rising liquid level imparts buoyancy to the displacer, lessening the load on the spring, thus, the displacer moves upward. A magnetic sleeve connected to the displacer also moves upward inside a non-magnetic enclosing tube, attracting a permanent magnet attached to a mercury switch (or pneumatic pilot valve). This actuates and closes the solenoid valve, and make-up water to the scrubber is shut-down. As the liquid level recedes, the magnetic sleeve and displacer drops allowing the magnet and switch element to return to the normal operating level. This actuates and opens the solenoid valve allowing flow of makeup water to the scrubber.

Thus, there is no possibility of excessive high or low liquid levels in the scrubber.

A cross is provided in the line to allow periodic flushing and cleanout of the system.

This information is provided to give a general idea of the dust collection mechanisms employed by Western Precipitation scrubbers as well as some of our competitors.

[redacted] so that it is directed downward toward the liquid level located immediately under peripheral nozzle which provides the venturi. The unusual aerodynamics in the gap area causes liquid to be sucked from the surface of the water. Thus the water is propelled in a direction which sends droplets across the high velocity zone immediately below the venturi and in a horizontal direction perpendicular to the downward moving gas flow such that the same conditions experienced in the classical venturi scrubber are achieved. Once in the high velocity gas stream, these droplets are shredded into very fine droplets whose size decreases with increased gas velocity. [redacted]

[redacted] Of course higher gas velocities caused by reductions in the size of the scrubbing gap cause higher pressure doprs. For this purpose dust collection efficiency is presented a a function of the scrubber pressure drop. Both dust particles and water droplets are surrounded by a gas boundary layer which cushions the impact. Because of this buffer, the finer dust particles can dodge the droplets by following the gas streamlines around them. Increased momemtum, obtained by higher impact velocity, is required to penetrate this boundary layer and effect collision. Obviously the smaller the mass (or size) of the particle, the higher the necessary velocity requi for the penetration. For this reason, increases in pressure drop are required to maintain a constant efficiency as particle size drops.

The same classical venturi impaction principle can be achieved in the Type "D" "TURBULAIRE" Scrubber even with low liquid levels, if scrubbi liquid is added to the venturi region via sprays. The liquid flows down the walls to the venturi area. As the gas accelerates to pass through the convergence zone of the venturi, it rips liquid from the lip of the converging wall and atomizes this liquid as well as any droplets in the gas stream into a great number of fine droplets. It is in this zone that the dust is impacted into the droplets due to the high relative velocity of the dust particle to the droplets.

Up to a point, higher water flow rates increase the number of fine dro lets, thus increasing the dust collection efficiency. Inadequate wate

supply results in not only lower probability of collision, but also causes incomplete water coverage of the venturi zone so that high velocity dust particles may have few or even no droplets to collide with, thus reducing the overall efficiency of the scrubber. The effect of liquid to gas ratio in the scrubbing zone can be generally depicted in Fig. #1.

In order to present a more concrete example, Fig. #1 is shown with specific scrubber pressure drops, dust concentrations, and efficienc with values in the range which may be experienced ~~at Weyerhaeuser's plants.~~ However, the values are not exact and should not be interpreted as engineering data. The subject graph is a plot of dust collection efficiency as a function of liquid flow rate to the venturi with scrubber pressure drops of 5" and 10" water gauge as parameters As indicated the higher pressure drop produces a higher dust collection efficiency which corresponds to an outlet dust loading of .05 grains/DSCF. As shown, the efficiency rises rapidly from 0/0 at no liquid flow rate until it asymtotically approaches an efficiency of 95% at a liquid flow rate of approximately 200 GPM. From this point the efficiency remains essentially constant as liquid rate is increased until the liquid flow is so high that the venturi is floo ed and inefficient use is made of the dust particle velocity and liquid. At the lower scrubber pressure drop of 5" the trend of the efficiency vs liquid rate curve is similar, but dust collection efficiency is always less than that of the 10" pressure drop. Employing this set of curves will allow a better understanding and evaluation of our present situation in regard to quantity of spray liquor provided to the venturi. If only 90 GPM of liquor is used, the full 10" pressure drop will be required to produce the guaranteed outlet dust loading of .1 grain/DSCF, and if only a 5" pressure drop is us across the scrubber, the efficiency will drop way below that requir to meet the code. In the case where the liquid rate is increased t 200 GPM, the outlet dust loading will decrease significantly to .05 grain/DSCF at the higher 10" water gauge pressure drop. Howeve since the efficiency at the higher irrigation rate will be more tha adequate, this would allow a reduction in pressure drop to 5" water gauge, while still meeting ~~the code~~ 0.1 grains and also reap the benefit of lower fan power consumption due to the lower scrubber pr sure drop. Although the values of the parameters just discussed ma not be wholly accurate, the general relationship of pressure drop, dust collection efficiency, and liquid flow rate is accurate enough show the general relationships so that both the economies and ineff ciencies of the various operating points can be easily understood.

Because of the inefficiencies resulting from using a minimum quantit of spray liquid we recommend the use of the higher liquid rate m

only reasonable way to achieve these higher flows is to utilize recycle slurry from the scrubber sump. The maximum flow available from the drag chain tank is 90 GPM, with the drag tank hold time maintained above 40 minutes. This flow rate is inadequate for efficient use of the scrubber pressure drop. There may be a concern for the possibility of large chunks of char clogging the 9/16" diameter spray nozzle orifice should the "MULTICLONE" fail in some way. The installation of a simpler, low pressure drop, line strainer (with large 3/8" diameter perforations) in the appropriate slurry pipelines would prevent this. This device would have a manual backwash to purge any large debris and would require maintenance only during the infrequent times when a failure occurred. Should there be a catastrophic failure that plugged the strainer, the sprays would still operate 90 GPM of fluid from the drag chain tank during the corrective period.

The sprays serve another purpose also in that the water washes the internal gap area especially in the zone just above the gap where plugging has sometimes been experienced due to low liquid quantities when hot gases above 300°F are being scrubbed. The splashing of dirty water at the dry/wet interface with low liquid quantities has allowed the solids to be baked onto the hot surfaces, leaving a residual crust composed of the solids. This soon builds up a formidable deposit. The high flushing rate of the cleaning sprays provides adequate continuous flushing of the surface so that no thin films of liquid ever occur.

Several other modifications have been made to the Type "D" Scrubber to improve its reliability even under very difficult conditions. One change has been the replacements of the weep holes in the eliminator vane which provided drainage of liquor back from the demister sump by several large 3" diameter pipes which seal below the liquid level in the scrubber hopper. These pipes are of adequate size to quickly pass any large debris back into the sump region, thus keeping the demister sump from plugging and flooding.

In cases where plugging has developed in the scrubber sump, higher liquid velocities have been employed to eliminate the accumulation and eventual bridging of solids at the sump discharge nozzle. This has been achieved by increasing the flow through the discharge nozzle by the addition of a recycle pump. The recycle pump delivers liquid to the sump nozzle which has been located to provide a maximum of agitation in the trouble zone. These high recycle rates have also been effective in causing sufficient agitation so that any floaters at the liquid surface can be wetted and swept down to the discharge nozzle.

DEPARTMENT OF POLLUTION CONTROL
2562 EXECUTIVE CENTER CIRCLE, EAST
MONTGOMERY BUILDING, TALLAHASSEE, FLORIDA 32301

VINCENT D. PATTON
EXECUTIVE DIRECTOR

DIVISION OF OPERATIONS

3319 Maguire Boulevard
Suite 232
Orlando, Florida 32803

DAVID H. LEVI
CHAIRMAN

RECEIVED
MAY 25 1973
FLA. SUGAR CANE LEAGUE

May 21, 1973

Frank S. Kleeman, P. E.
Engineering Consultant
Florida Sugar Cane League, Inc.
Post Office Box 1148
Clewiston, Florida 33440

Dear Mr. Kleeman:

Pursuant to our meeting with the representive of Florida's sugar industry held on April 12, 1973, this office agreed to coordinate the Department's response to all the questions discussed.

Please be advised that the following is the Department's official response to those questions.

Process Weight Determination:

The process weight is defined as all materials entered into the process. This would include "natural" or "adsorbed" moisture found in the bagasse as it comes from the milling operation or from the by-product resulting from the production of furfural. The term "uncombined water" is directed toward water added to the baggasse just before entering the boilers would be considered uncombined water.

Latest Technology

The technical staff of this Department has determined that the scrubbers proposed by the Florida Sugar Cane League in the April 12, 1973 meeting would constitute latest technology. The modifications necessary to accommodate scrubbers to each plant may change, therefore, the performance of these units would be considered on an individual basis.

Source Testing Method:

Some questions have arisen concerning the necessity of changing from our present testing procedures. These were discussed by Mr. Oven with Mr. Henderson during recent conversations. Concern exists over the solubility of particulate matter in the thimble because of a "wet" stack. This may result in particulate emissions greater than that obtained from the stack analysis. Consequently, our present test method must apply. If test data can be submitted which would justify the "dry" stack sampling method as a more accurate indication of particulate matter emitted from baggasse boilers, a change in test methods will definately be considered.

If you have any questions concerning the above, please feel free to contact this office and if necessary another meeting can be held.

Very truly yours,

A. Senkevich, P. E.
Director
Division of Operations

AS/KK/rm

cc: Mr. H. Oven
Mr. P. Baljet
Mr. Nelson Fairbanks, Fla. Sugar Cane League, Inc.
Mr. W. Straham
Mr. J. Cooper, Palm Beach County Health Dept.

[illegible] application fee of $50, unless exempted by Section 17-4.05(3), F.A.C. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?
[ ] Yes [ ] No

Contaminant	Rate or Concentration
NOT APPLICABLE	NOT APPLICABLE

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy) [X] Yes [ ] No

Contaminant	Rate or Concentration
Particulate (from Bagasse	0.15 # 10^6 BTU's.
Particulate (from Fuel Oil)	0.10 # 10^6 BTU's
Sulfure Dioxide	0.8 # 10^6 BTU's

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration
Particulate (Bagasse)	0.20 # 10^6 BTU's
Particulate (Fuel Oil Bunker C)	0.10 # 10^6 BTU's
Sulfur Dioxide	1.0% Low Sulfur Fuel Oil

D. Describe the existing control and treatment technology (if any). (Four existing boilers)

1. Control Device/System: Joy Turbulaire Spray Impingement Scrubbers
2. Operating Principles: See attached literature
3. Efficiency:* 90%
4. Capital Costs: 100,000.00/boiler
5. Useful Life: 10 years
6. Operating Costs: $ 5,000.00
7. Energy: ΔP = 5"-6' W.C.
8. Maintenance Cost: 3,000.00
9. Emissions: See attached sheet D-9 Emissions

Contaminant	Rate or Concentration
Particulate Matter	0.266#/10^6 BTU's (xx)

(xx) Average of all boilers (4) from 1975-1980.

*Explain method of determining D 3 above. Potential Particulate Emissions = 16# Particulate per ton of bagasse burned minus Actual Emissions (lbs. particulate per hour) divided by Potential particulate is equal to the efficiency.

Area 28.27

a. Height: 60'-1" ft. b. Diameter: 6'-0" ft.

c. Flow Rate: 54,044 ACFM d. Temperature: 154° F Average 4 Boilers °F

e. Velocity: 31.86 FPS Average (4 Boilers)

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

a. Control Device: Turbulaire Scrubber (Spray Impingement)

b. Operating Principles: Impaction of large particules on water surface, removal of small particles by Venturi effect; inertial separation of droplets from gas by use of swirl vanes

c. Efficiency*: 90% d. Capital Cost: 100,000.00

e. Useful Life: 10 years f. Operating Cost: Proportional to pressure drop

g. Energy*: 350 h. Maintenance Cost: Low

i. Availability of construction materials and process chemicals: Readily available, require a vertical cylindrical steel shell with conical top and conical hoppers. Water required is available.

j. Applicability to manufacturing processes: Applicable to processes emitting a wide range of particle sizes. Widely used by Sugar Cane Industry for pollution control.

k. Ability to construct with control device, install in available space, and operate within proposed levels: Applications throughout industry have shown that they can be easily installed at the same time as new boilers. Sugar mills have ample space to allow retrolitting with duct modificatio

2. All plants meet particulate emission limits with those Scrubbers.

a. Control Device: Venturi Scrubbers

b. Operating Principles: Intimate contact between particulate laden gases and water spray i throat of venturi. Could be horizontal or vertical.

c. Efficiency*: 90% d. Capital Cost: 200,000

e. Useful Life: 10 f. Operating Cost: Probably two or three times more than Turbulaire Scrubbers

g. Energy**: 750 h. Maintenance Costs: Low

i. Availability of construction materials and process chemicals: Readily available. More water required than Turbulaire Scrubbers. Water can be recirculated and also used to flood cane fiel

j. Applicability to manufacturing processes: Can be used but has to be preceded by dust collector to remove large particles.

k. Ability to construct with control device, install in available space, and operate within proposed levels: There are no limitations related to construction and installations. Will meet particulate emission levels with higher pressure drops.

*Explain method of determining efficiency.

**Energy to be reported in units of electrical power – KWH design rate.

3.

a. Control Device: Fabric Filter

b. Operating Principles: Dust laden gases are passed through fabric filter-bags where a filt cake is developed. Dust particles are removed from the gas stream as the gases are passed through the filter cake area.

c. Efficiency*: 99% d. Capital Cost: 150,000.00

e. Life: Non-predictable due to fire hazards. f. Operating Cost: Proportional to pressure drop.

g. Energy: 300 KwH h. Maintenance Cost: Very high.

*Explain method of determining efficiency above.

...and process chemicals: Available

j. Applicability to manufacturing processes: Not likely

k. Ability to construct with control device, install in available space and operate within proposed levels: Needs more space than scrubbers. Will meet emission levels if installed.

4.

a. Control Device Electrostatic Precipitators

b. Operating Principles: Will not work with bagasse burning boilers.

c. Efficiency*:

d. Capital Cost:

e. Life:

f. Operating Cost:

g. Energy:

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device: Joy Turbulaire Spray Impingement Scrubber type D- Size 90
2. Efficiency*: 92%
3. Capital Cost: 100,000.00
4. Life: 10 years
5. Operating Cost: $ 5,000.00
6. Energy: 350 KWH
7. Maintenance Cost: 3,000.00
8. Manufacturer: Joy Manufacturing
9. Other locations where employed on similar processes:

a.

(1) Company: Osceola Farms Company

(2) Mailing Address: P.O. Box 679

(3) City: Pahokee (4) State: Florida 33476

(5) Environmental Manager: Mr. Alberto Recio

(6) Telephone No.: (305) 924-7156

*Explain method of determining efficiency above. See Emission Calculations attached.

(7) Emissions*:

Contaminant	Rate or Concentration
Particulate (Average All Boilers) 1975-76	0.193 lbs/10^6 BTU
Particulate (Average All Boilers) 1976-77	0.265 lbs/10^6 BTU
Particulate (Average All Boilers) 1977-78	0.177 lbs/10^6 BTU
Particulate (Average All Boilers) 1978-79	0.283 lbs/10^6 BTU

(Cont. Adendum A

(8) Process Rate*:

b. 155,250 lbs/ of bagasse average per hour per day of crop.

(1) Company: U.S. Sugar Corporation (Clewiston)

(2) Mailing Address: P.O. Box 1206

(3) City: Clewiston (4) State: Florida 33440

*Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

(5) Environmental Manager: Mr. A. R. Mayo

(6) Telephone No.: (813) 983-8121

(7) Emissions*: 1975-76-77-78-79-80 Compliance Tests

Contaminant	Rate or Concentration
Particulate (Average 3 Boilers) 1975-76	0.166 lbs/10^6BTU
~~Particulate (Average 4 Boilers) 1976-77~~	~~0.192 lbs/10^6BTU~~
Particulate (Average 5 Boilers) 1977-78	0.188 lbs/10^6BTU
Particulate (Average 4 Boilers) 1978-79	0.193 lbs/10^6BTU
~~Particulate (Average 5 Boilers) 1979-80~~	~~0.24 lbs /10^6BTU~~

(8) Process Rate*: 340,250 lbs of bagasse per hour per day of crop (Average)

10. Reason for selection and description of systems:

The selected Joy Turbulaire spray impingement scrubber is currently employed by a majority of the Sugar Mill bagasse burning boilers to meet existing state particulate emission rates for existing and new boilers.

The Technical Staff of the Department of Pollution Control determined that the Joy Scrubbers proposed by the Florida Sugar Cane League constitute latest technology. (See Letter Attached)

In the case of the new boiler #5 installed at Bryant Mill U.S.S. Corporation the Department of Environmental Regulations determined that this selected system is capable of meeting and lowering the existing emission rate for new boilers.

The selected system is the most economical to install and to operate.

The existing four bagasse burning boilers at Atlantic Sugar Association are served by Joy Turbulaire Spray Impingement Scrubbers with the Fan down stream of the Scrubber.

The system consists of one Joy Turbulaire Scrubber size 90 (14'-0" diameter) type D receiving the hot gases from the boiler and with the fan down stream. One set of water sprays will be installed ahead of the Scrubber inlet for quenching. The pressure drop will be changed by changing the nozzle opening. The liquid rate could be changed readily. All controls will be the same as the ones on the existing Scrubbers with the newest improvements availables.

*Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

Section VI- Best Available Control Technology

C. Propose emission levels:

Particulate (Bagasse)	0.20 lb./10^6 BTU'S
Particulate (Fuel Oil)	0.10 lb/10^6 BTU'S
Sulfur Dioxide	1.0 Low Sulfur Fuel Oil

The reason for proposing an emission limit of 0.20 lb/10^6 BTU. is that we are of the opinion that the proposed Atlantic Sugar Association boiler #5 will not be capable at meeting an emission limit of 0.15 lbs/10^6 BTU'S on a continuous basis due to the type of bagasse burned at Atlantic Sugar. It is the DER'S position that the quality of bagasse burned is one of the major variables affecting emission rates. Also DER'S information suggests that the bagasse burned at the Bryant mill is the best in the industry. By looking at the bagasse sample analysis from Atlantic Sugar Association is considerably of worst quality than Bryant. The bagasse at Bryant is better because of lower moisture content, higher heating value and cleaner cane.

Another reason is that as it is shown in Sheet D-9 Emissions: the average controlled emissions on all compliance test on all the Atlantic Boilers from 1975 to 1980 is 0.26 lb/10^6 BTU's.

(1) United States Sugar Corporation (Bryant)

(2) Mailing Address: P.O. Drawer 1207

(3) City: Clewiston

(4) State: Florida 33440

(5) Environmental Manager: Mr. A.R. Mayo

(6) Telephone No.: (813) 983-8121

(7) Emissions: 1975-76 to 1979-80 Compliance Test

CONTAMINANT	RATE OF CONCENTRATION
Particulate (Average All Boilers:1975-76)	0.106 lb./10^6 BTU
Particulate (Average All Boilers:1976-77)	0.113 lb./10^6 BTU
Particulate (Average All Boilers:1977-78)	0.126 lb./10^6 BTU
Particulate (Average All Boilers:1978-79)	0.133 lb./10^6 BTU
Particulate (Average All Boilers:1979-80)	0.223 lb./10^6 BTU

(8) Process Rate: 327,675 lbs. of Bagasse per hour per day of crop (Average)

(1) Company: Sugar Cane Growers Cooperative of Florida

(2) Mailing Address: P.O. Box 86

(3) City: Belle Glade,

(4) State: Florida

(5) Environmental Manager: Mr. Enrique Arias

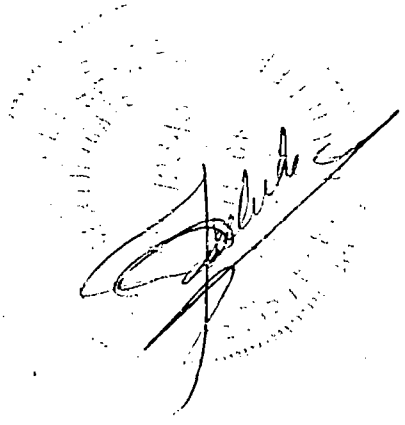
(6) Telephone No.: (305) 996-5556 .

(7) Emissions: 1975-76-1979-80 Compliance Tests

CONTAMINANT	RATE OF CONCENTRATION
Particulate (Average All Boilers:1975-76)	0.162 lbs/10^6 BTU (x)
Particulate (Average All Boilers:1976-77)	0.142 lbs/10^6 BTU (x)
Particulate (Average All Boilers:1977-78)	0.138 lbs/10^6 BTU (x)
Particulate (Average All Boilers:1978-79)	0.146 lbs/10^6 BTU (x)
Particulate (Average All Boilers:1979-80)	0.134 lbs/10^6 BTU (x)

(x) These boilers are burning mostly residue.

(8) Process Rate: 135,340 lbs/hour of Residue per day of crop.
118,433 lbs/hour of Bagasse per day of Crop
- Average -



ADDENDUM A---- CONTINUED

CONTAMINANT	RATE OR CONCENTRATION
Particulate (Average All Boilers) 1979-80	0.297 lbs/ 10^6 BTU

SECTION VII – PREVENTION OF SIGNIFICANT DETERIORATION

Company Monitored Data NA: See PSD Report, Section 5.0

1. _____ no sites _____ TSP _____( )SO^2* _____ Wind spd/dir

Period of monitoring ___/___/___ to ___/___/___
month day year month day year

Other data recorded _____

Attach all data or statistical summaries to this application.

2. Instrumentation, Field and Laboratory

a) Was instrumentation EPA referenced or its equivalent? ____ Yes ____ No

b) Was instrumentation calibrated in accordance with Department procedures? ____ Yes ____ No ____ Unknown

B. Meteorological Data Used for Air Quality Modeling

1. 5 Year(s) of data from 1 / 1 / 70 to 12 / 31 / 74
month day year month day year

2. Surface data obtained from (location) West Palm Beach

3. Upper air (mixing height) data obtained from (location) Miami

4. Stability wind rose (STAR) data obtained from (location) West Palm Beach

C. Computer Models Used

1. ISC Short term (ISCST) 5 - year Modified? If yes, attach description.

2. ISC Long term (ISCST) 5 - year Modified? If yes, attach description.

3. _____ Modified? If yes, attach description.

4. _____ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate
TSP	4.49 grams/sec
SO^2	9.62 grams/sec

E. Emission Data Used in Modeling See PSD Report

Attach list of emission sources. Emission data required is source name, description on point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review. See PSD Report

*Specify bubbler (B) or continuous (C).

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources. See Bact Section

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology. See Bact. Section

Revision 1

See pages: 7,8,10, 12,14,16,17 & 52.

AC 50-42389

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Air Pollution [X] New[1] [ ] Existing[1]

APPLICATION TYPE: [X] Construction [ ] Operation [ ] Modification

COMPANY NAME: Atlantic Sugar Association COUNTY: Palm Beach County

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peeking Unit No. 2, Gas Fired) _____

SOURCE LOCATION: Street South of S.R. 80 City Belle Glade, Florida

UTM: East 552.93 North 2,945.22

Latitude _____ ° _____ ' _____ "N Longitude _____ ° _____ ' _____ "W

APPLICANT NAME AND TITLE: H.J. Valella, Executive Vice-President

APPLICANT ADDRESS: P.O. Drawer B, Belle Glade, Floria 33430

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Atlantic Sugar Association

I certify that the statements made in this application for a Construction Permit permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed: _____

Name and Title (Please Type)

Date: _____ Telephone No. _____

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed: _____

Angel M. Tellechea
Name (Please Type)

(Affix Seal)

Gulf + Western Food Products Company
Company Name (Please Type)

P.O. Box 86, South Bay, Florida 33493
Mailing Address (Please Type)

Florida Registration No. 12343 Date: _____ Telephone No. (305) 996-9072

[1]See Section 17-2.02(15) and (22), Florida Administrative Code, (F.A.C.)

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

See additional sheets attached.

B. Schedule of project covered in this application (Construction Permit Application Only) need to be change

Start of Construction May 1981 Completion of Construction November 1981

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

The cost of the wet scrubber including all necessary controlls it is estimated at $100,000.00. Detail cost will be provided when completion of construction.

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

Unit #	Permit #	Date Issue	Expiring Date
Boiler #1	A050-2031A	4-5-1976	4-5-1981
Boiler #2	A050-2032A	4-5-1976	4-5-1981
Boiler #3	A050-2033A	4-5-1976	4-5-1981
Boiler #4 Sigr	A050-5867	5-8-1979	5-8-1984

E. Is this application associated with or part of a Development of Regional Impact (DRI) pursuant to Chapter 380, Florida Statutes, and Chapter 22F-2, Florida Administrative Code? ____ Yes ____ No

F. Normal equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 21 ; if power plant, hrs/yr ____ ; if seasonal, describe: Operating from October to April - Estimating 3528 hours during the season.

G. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? Yes
   a. If yes, has "offset" been applied? No
   b. If yes, has "Lowest Achievable Emission Rate" been applied? No
   c. If yes, list non-attainment pollutants.
      Volatile Organic Compounds (VOC)
2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. Yes
3. Does the State "Prevention of Significant Deterioriation" (PSD) requirements apply to this source? If yes, see Sections VI and VII. Yes
4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? No
5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? No

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

SECTION II: GENERAL PROJECT INFORMATION

A.

The proposed project consists of transfering and installing one existing boiler from Gulf + Western Food Products Company (Florida Crystals Refinery, Moore Haven) to Atlantic Sugar Association. The existing boiler is Erie City Iron Works Boiler # 2/64, H.S.B. No. 96747, Size 9, Type 33W. 3-1/4", 46W. 2-1/2". 1000,000 lb/hr. 2 Drums. 30 PSIG. design pressure, 250 PSIG operating pressure and 500° FTT.

This boiler will be modified and installed to supply 100,000 pounds per hour of steam at 250 pounds per square in. and 500° FTT. This boiler will be assembled using two existing drums with new tubes, existing and new headers, new water walls. The mud drum elevation will be 31'-3" in order to provide ample furnace volume to properly burn the 60.9% (x) moisture bagasse. The existing steel structures will be extended to accommodate the boiler. One New Detroit Stoker Rotograte Continuous traveling with metering bagasse conveyor feeders will be installed under the boiler to burn bagasse. Total heating surface of the boiler 16,312 sq.ft. One new air heater with 16,375 sq.ft. of heating surface will be installed.

The existing fuel-oil burning system will be installed to be used in emergencies.

One Impinger Wet Scrubber will service the exhaust gases of the furnace to comply with the particulate matter emission limitation of 0.20 lbs. of particulate per 10^6 BTU'S of carbonaceous fuel input and 0.1 lb/10^6 BTU'S heat input of fossil fuels.

The pollution control equipment will be designed following the same parameters as those existing at Atlantic Sugar Association and to comply with all applicable ambient air quality standards and emission regulations. The Induced Draft Fan will be located downstream of the Scrubber. The boiler will operate normally burning only bagasse. Fuel oil Bunker C#6 will be burned only when absolutely necessary and on emergencies.

(x) See Test Report Sample of bagasse attached.

This sample of bagasse was taking during the third run of the compliance test on Boiler #1 1-30-79. It is noticeable the high moisture content and low heating value of this bagasse from Atlantic Sugar Association.

II.A. This facility processes raw sugar cane by milling the sugar cane by extracting the juice. The mills are powered by steam which is produced from bagasse steam boilers. The new Boiler #5 will be a steam boiler fired with bagasse with No. 6 fuel oil used as a supplementary fuel to meet steam load demands.

The unit operation to be controlled will be the bagasse boiler. The unit must meet the State of Florida carbonaceous fuel burning regulation of 0.2 lbs. particulate per million BTU heat input from fossil fuel. The burning of bagasse and fuel oil will cause the emissions of particulate matter, sulfur dioxide, nitrogen oxides, hydrocarbons and carbon monoxide. Operation of the proposed new source will comply with all applicable ambient air quality standards and emission standards.

Section

II.A

The proposed project consists of transfering and installing one existing boiler from Gulf + Western Food Products Company(Florida Crystals Refinery) to Atlantic Sugar Association. This existing boiler is E.C.I.W. Boiler # 2/64, H.S.B. No. 96747, Size 9, Type 33W. 3-1/4", 46W. 2-1/2", 100,000 #/Hr, 300#; 2 Drum.

This boiler will be constructed to supply 100,000 pounds per hour of steam at 250 pounds per square inch and 500°F total temperature. This boiler will be fired mainly with bagasse from the existing mills and No. 6 fuel oil as an auxilliary fuel to meet the steam load needs.

One Impinger Wet Scrubber will service the exhaust gases of the furnace to comply with the particulate matter emission limitation of 0.20 lbs. particulate per 10^6 BTU's of carbonaceous fuel input and 0.1 lbs./10^6 BTU's heat input of fossil fuels. The pollution control equipment will be designed following the same parameters as those existing at Atlantic Sugar Association and to comply with all applicable ambient air quality standards and emission regulations. The boiler will operate normally burning only bagasse. Fuel oil will be burned only when absolutely necessary and on emergencies.

G.

Discuss the Social Impact of the Selected (Technology Versus Other Applicable Technologies. (i.e. Jobs, Payroll, Production, Taxes, Energy, Etc.)

The selected technology (spray impingement scrubber) will reduce potential particulate matter emissions to the atmosphere and thus will result in cleaner air for people to breath. Energy consumption is not high compared to the benefits gained in removing the pollutants.

The selected technology is similar to other possible, but unproven, technology (i.e. baghouse, ESP's) in regards to costs, jobs, employment and production. Currently, all sugar cane industry bagasse boilers in Florida have some type of wet scrubber in operation for the control of particulate emissions. Requiring new boilers to meet similar requirements will not adversely affect the cost of producing and manufacturing sugar.

Energy requirements for the spray impingement scrubber are approximately a factor of three (3) below that for the venturi scrubber. The spray impingement scrubber also requires lower capital costs and maintenance than the venturi scrubber.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
		NOT APPLICABLE		

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): 54,681 lb/hr of wet bagasse

2. Product Weight (lbs/hr): 100,000 lb of steam @ 250 p.s.i.g. @ 500° F.T.T.

C. Airborne Contaminants Emitted: See Emission Calculations sheet attached.

Name of Contaminant	Emission[1]		Allowed Emission[2] Rate per Ch. 17-2, F.A.C.	Allowable[3] Emission lbs/hr	Potential Emission[4]		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/hr	T/yr	
Particulate	35.13	61.97	0.20 #/MBU/hr	36.9	439.15	774.65	
Sulfur Oxides	75.57	133.21		-	75.57	133.21	
Carbon Monoxide	55.33	97.60		N/A	55.33	97.60	
Hydrocarbons CH4	54.81	96.68		N/A	54.81	96.68	
Nitrogen Oxide NO2	40.69	71.74		N/A	40.69	71.74	

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles[5] Size Collected (in microns)	Basis for Efficiency (Sec. V, It[5]
Impinger Scrubber	Particulate	92%	0.3 - 10.0 & greater	

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g., Section 17-2.05(6) Table II, E. (1), F.A.C. – 0.1 pounds per million BTU heat input)

[3]Calculated from operating rate and applicable standard

[4]Emission, if source operated without control (See Section V, Item 3)

[5]If Applicable

Contaminants emitted base on burning 3.13 barrels of oil and 54,681 lbs of wet bagasse per hour.

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
60.9% Moisture Bagasse	33.524	~~54,681~~ 97,719	174.65 x 10^6
1.0% Sulfur Fuel Oil (Bunker C)	2.19	3.13	19.7 x 10^6

*Units Natural Gas, MMCF/hr; Fuel Oils, barrels/hr; Coal, lbs/hr Bagasse, lbs/hr. See Bagasse Analysis Attached.

Fuel Analysis: Fuel Oil

Percent Sulfur: 1.0 Percent Ash: 0.0%

Density: 8.1 lbs/gal Typical Percent Nitrogen: ____

Heat Capacity: 18,500 BTU/lb 149,850 BTU/gal

Other Fuel Contaminants (which may cause air pollution): Sulfur Compounds, (SO_x - SO_2), Nitrogen Compounds (NO_x - NO_2), Hydrocarbons, Carbon Monoxide

F. If applicable, indicate the percent of fuel used for space heating. Annual Average ____ Maximum ____

G. Indicate liquid or solid wastes generated and method of disposal.

NOT APPLICABLE

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 90'-0" ft. Stack Diameter: 6'-6" ft.

Gas Flow Rate: 43,369 SCFM ~~ACFM~~ Gas Exit Temperature: 160 °F.

Water Vapor Content: 25 % Velocity: 21.78 FPS

Stack Area = 33.18 sq.ft. x 21.78 x $\frac{60}{1}$ = 43564 ACF

SECTION IV: INCINERATOR INFORMATION

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq & Gas By-prod.)	Type VI (Solid By-prod.)
Lbs/hr Incinerated			NOT APPLICABLE				

Description of Waste ____

Total Weight Incinerated (lbs/hr) ____ Design Capacity (lbs/hr) ____

Approximate Number of Hours of Operation per day ____ days/week ____

Manufacturer ____

Date Constructed ____ Model No. ____

	Volume $(ft)^3$	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber		NOT APPLICABLE			
Secondary Chamber					

Stack Height: _____ ft. Stack Diameter _____ Stack Temp. _____

Gas Flow Rate: _____ ACFM _____ DSCFM* Velocity _____ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner [ ] Other (specify) _____

Brief description of operating characteristics of control devices: _____

NOT APPLICABLE

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight — show derivation.
2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.,) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, etc.).
5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3, and 5 should be consistent: actual emissions = potential (1-efficiency).
6. An 8½" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.
7. An 8½" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).
8. An 8½" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

Section V: SUPPLEMENTAL REQUIREMENTS

1. Total process input rate and product weight - show deriuation

100,000 lbs./hr. steam @ 250 psig and 500° FTT.
BTU value of steam leaving boiler = 1262.0 BTU/lb.
BTU value of water entering boiler = 193.1 BTU/lb.
BTU requirements per lb. of steam = 1262 - 193.1 = 1068.9 BTU/lb.
Boiler Efficiency = 55%.
Bagasse Heating Value = 3194 BTU/lb. (See Copy of Test Attached).

$$\text{Total heat fuel Input} = \frac{(1262.0 - 193.1) \times 10^6}{.55} = 194.35 \times 10^6 \text{ BTU/hour}$$

Heat due to fuel oil burned 19.7 X 10^6 BTU/hr.
Heat due to bagasse burned 174.65 X 10^6 BTU/hr.

$$\text{Bagasse burned per hour} = \frac{174.65 \times 10^6}{3194} = 54{,}681 \text{ lb./hr.}$$

$$\text{Fuel Oil burned per hour} = \frac{19.7 \times 10^6}{149{,}850 \times 42} = 3.13 \text{ Barrel Fuel Oil}$$

RILEY | RILEY STOKER CORPORATION
POST OFFICE BOX 547, WORCESTER, MASS. 01613
A SUBSIDIARY OF THE RILEY COMPANY

FUELS LABORATORY

TEST REPORT

Laboratory No. 22,308 Sample of Bagasse Date Rec'd 2/8/79

Received From Atlantic Sugar Assoc. (Sugar Cane Growers) Belle Glade, Fla

Sample Data Bagasse Sample Blr. #1 1/30/79 Run 3 6:30 pm

Contract No. (641-91110) P.O.# F2479-78 Field Sample By Customer

Air Drying Loss	59.4 %

Proximate Analysis	As Rec'd	Dry
Moisture	60.9 %	-----
Volatile	34.2 %	87.6 %
Ash	0.3 %	0.7 %
Fixed Carbon	4.6 %	11.7 %
	100.0 %	100.0 %
British Thermal Units	3,194	8,170

Ultimate Analysis	As Rec'd	Dry
Moisture	%	-------
Carbon	%	48.5 %
Hydrogen	%	6.0 %
Nitrogen *	%	0.36 %
Oxygen (diff.)	%	44.24 %
Sulfur	%	0.2 %
Ash	%	0.7 %
	100.0 %	100.0 %
Free Swelling Index		
Grindability Index		

Fusibility of Ash

Initial Deformation	F
Softening	F
Fluid	F

(*Skinner & Sherman)

Date March 14, 1979 Thomas J. Gallagher

EMISSION CALCULATIONS

BAGASSE

1. Particulate: From AP-42 Emission Factors Table 1.8-1

   Uncontrolled Emissions from bagasse:

$$16 \text{ lbs/ton bagasse} \times \frac{27.34}{(54,681)} \text{ tons/hr} = 437.45 \text{ lbs/hr.}$$
$$2000$$

2. Sulfur Oxides:

   2 content of dry bagasse = 0.1%

$$2 \text{ lbs/ton of bagasse} \times \frac{(54,681)}{2000} \text{ Tons/hr} = 54.68 \text{ lbs./hr}$$

3. Carbon Monoxide:

$$2 \text{ lbs/ton of bagasse} \times \frac{(54,681)}{2000} \text{ tons/hr} = 54.68 \text{ lbs/hr}$$

4. Hydrocarbons:

$$2 \text{ lbs/ton of bagasse} \times \frac{(54,681)}{2000} \text{ tons/hr} = 54.68 \text{ lbs/hr.}$$

5. Nitrogen Oxides:

$$1.2 \text{ lbs/ton of bagasse} \times \frac{(54,681)}{2000} \text{ tons/hr} = 32.81 \text{ lbs/hr.}$$

EMISSION CALCULATIONS

FUEL OIL

AP-42 Emission Factors: Table 1.3-1 (Industrial Boiler)

1.- Particulate $lb/10^3$ gal = 10(S) + 3 = 10 (1.0) + 3 = 13 lb/1000 gal.

$$\frac{13 \times 131.46}{1000} = 1.7 \text{ lbs/hr}$$

2. Sulfur Dioxide:

$$\frac{157\ (1.0)}{1000} \times 131.46 = 20.63 \text{ lb/hr.}$$

3.- Sulfur Trioxide

$$\frac{2 \times (1.0) \times 131.46}{1000} = 0.26 \text{ lb/hr.}$$

4.- Carbon Monoxide

$$\frac{5 \times (1.0) \times 131.46}{1000} = 0.65 \text{ lb/hr}$$

5.- Hydrocarbons as CH_4 :

$$\frac{1 \times (1.0) \times 131.46}{1000} = 0.13 \text{ lb/hr}$$

6.- Nitrogen Oxides as NO_2

$$\frac{60 \times 131.46}{1000 \quad \text{hr}} = 7.88 \text{ lb/hr}$$

SHOW THE DERIVATION OF PROCESS WEIGHT

100,000 lbs/hr steam @ 250 p.s.i.g. and 500° FTT

Total heat in steam = 100,000 x 1262 = 126.2×10^6 BTU/hr

Total heat in feed water= 100,000 x 193.05 = 19.31×10^6 BTU/hr

Boiler Efficiency = 55%

Total heat fuel input = $\frac{(126.2 - 19.31) \times 10^6 = 106.89 \times 10^6}{.55}$ = 194.35×10^6 BTU/hr

Bagasse heating value 3194 BTU/lb (See copy of Test Attached)

$194.35 \times 10^6 - 19.7 \times 10^6 = 174.65 \times 10^6$

Allowable particulate burning bagasse and fuel oil

$174.65 \times 10^6 \times 0.20 = 34.93$

$19.7 \times 10^6 \times 0.1 = 1.97$

Total Allowable 36.90

$\frac{19.7 \times 10^6}{149,850 \times 42}$ = 3.13 Barrels oil/hr

$\frac{174.65 \times 10^6}{3194(x)}$ = 54,681 lbs. of bagasse/hr.

Estimated discharge of each contaminant in lbs/hr and tons/year on maximum fuel burned per hour.

	FROM BAGASSE		FROM FUEL OIL		TOTAL	
	lb/hr	T/yr.	lb/hr	T/yr.	lb/hr	T/hr
Particulate	437.45	771.66	1.7	2.99 3.00	439.15	774.65
Sulfur Oxides	54.68	96.46	20.89	36.75 36.84	75.57	133.21
Carbon Monoxide	54.68	96.46	0.65	1.14	55.33	97.60
Hydrocarbons as CH4	54.68	96.46	0.13	0.22	54.81	96.68
Nitrogen Oxides as NO_2	32.81	57.88	7.88	13.86	40.69	71.74

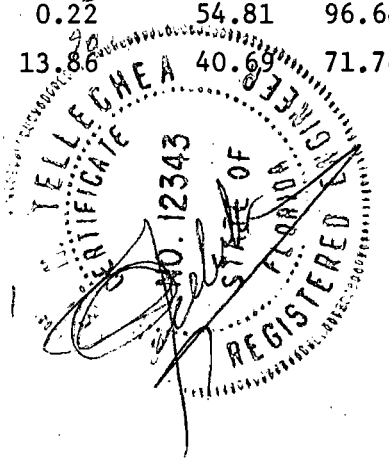
(x) $F_a 2$ Method of determining efficiency.

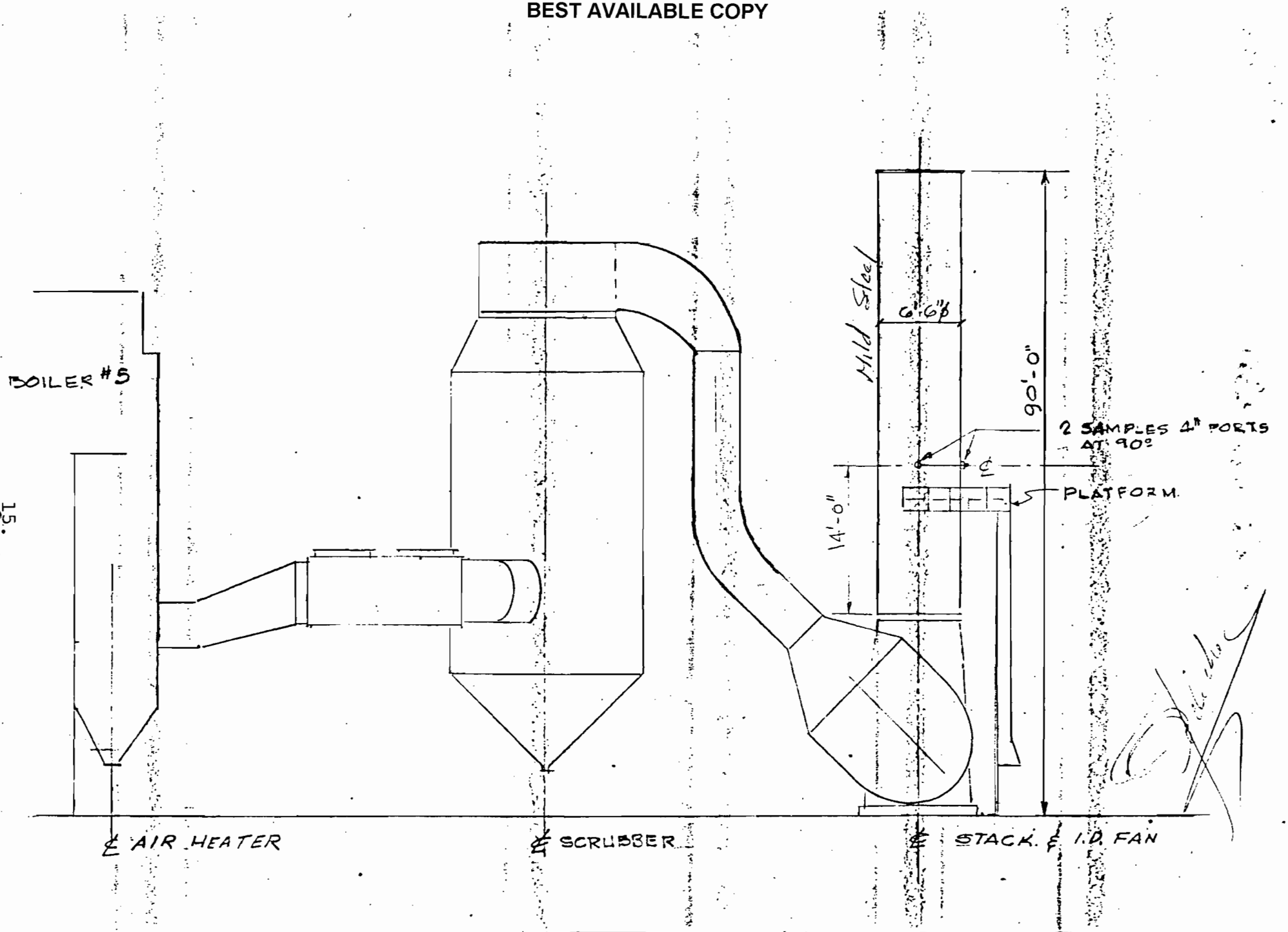
Potential Particulate Emissions = 439.15 lbs/hr

Actual Particulate Emissions = 35.13 lbs/hr

Particulate going to Ponds = 404.02 lbs/hr 354.71

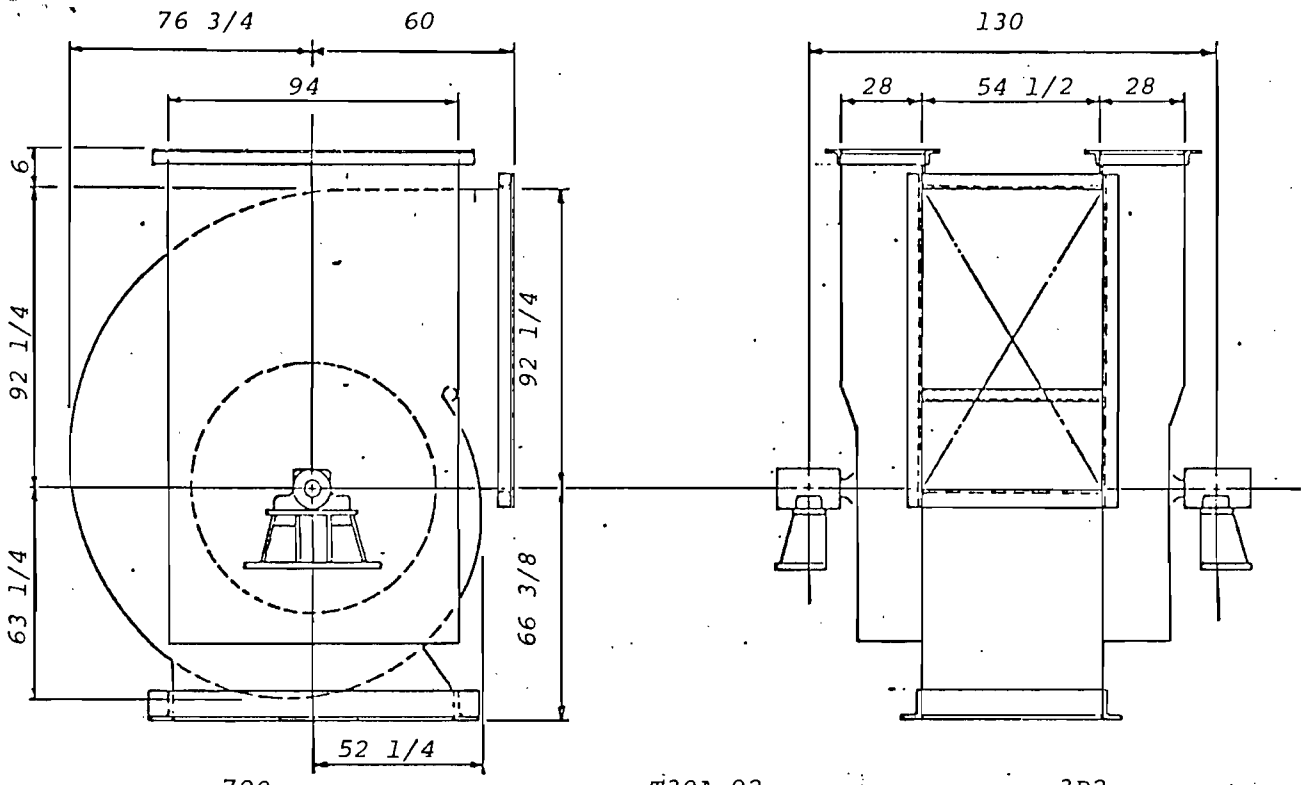
Efficiency: $\frac{439.15 - 35.13}{439.15} = \frac{404.02}{439.15}$ = .92





FLOW DIAGRAM BOILER #5	ATLANTIC SUGAR ASSOC. PALM BEACH, FLA. DWG #3 DATE.

FAN SPECIFICATIONS



FAN SIZE 790 TYPE T30A-92 ARRANGEMENT 3D2

DESIGN RPM 1000 DESIGN TEMPERATURE 200° F. EXCURSIONS TO 400° F. (30MIN)

WEIGHTS:

TOTAL FAN WEIGHT 16,750 TOTAL ROTATING ASSEMBLY WR² 11028

IMPELLER WT. LESS SHAFT 2550 SHAFT WT. 2300

PERFORMANCE:

CONDITION	VOLUME	STATIC PRESS	DENSITY	RPM	BHP
DESIGN	111,000	16	.056	900	354

IMPELLER:	THICKNESS	MATERIAL	TYPE
BLADES	1/4	316 L SS	RADIAL TIP
SHROUDS	1/4	316 L SS	CONICAL
BACKPLATE			
SPIDER ( )	5/8	316 L SS	SCALLOPED

SHAFT:

DIA. AT HUB: 9 1/2

APPROX. CENTER TO CENTER 130

HUB:

TYPE: CAST

MATERIAL: STEEL

BEARINGS:

SIZE: 3 15/16

TYPE: SPHERICAL ROLLER

MFG. LINKBELT

HOUSING:	THICKNESS	MATERIAL
SCROLL	1/4	CORTEN
CHEEK	1/4	CORTEN
INLET BOX	1/4	CORTEN

9. STABILIZER VANES

OPTIONAL EQUIPMENT INCLUDED IN PRICING:

1. FLANGED INLET & OUTLET
2. HOUSING DRAINS
3. ACCESS DOORS
4. FALK GEAR COUPLING
5. HOUSING SPLIT FOR IMPELLER REMOVAL
6. 316 L SS SHAFT & HUB COVERS
7. HOUSING CLAD WITH 16 GA. 316 L SS
8. 1/4" 316 L SS FULL BLADE WEAR PADS

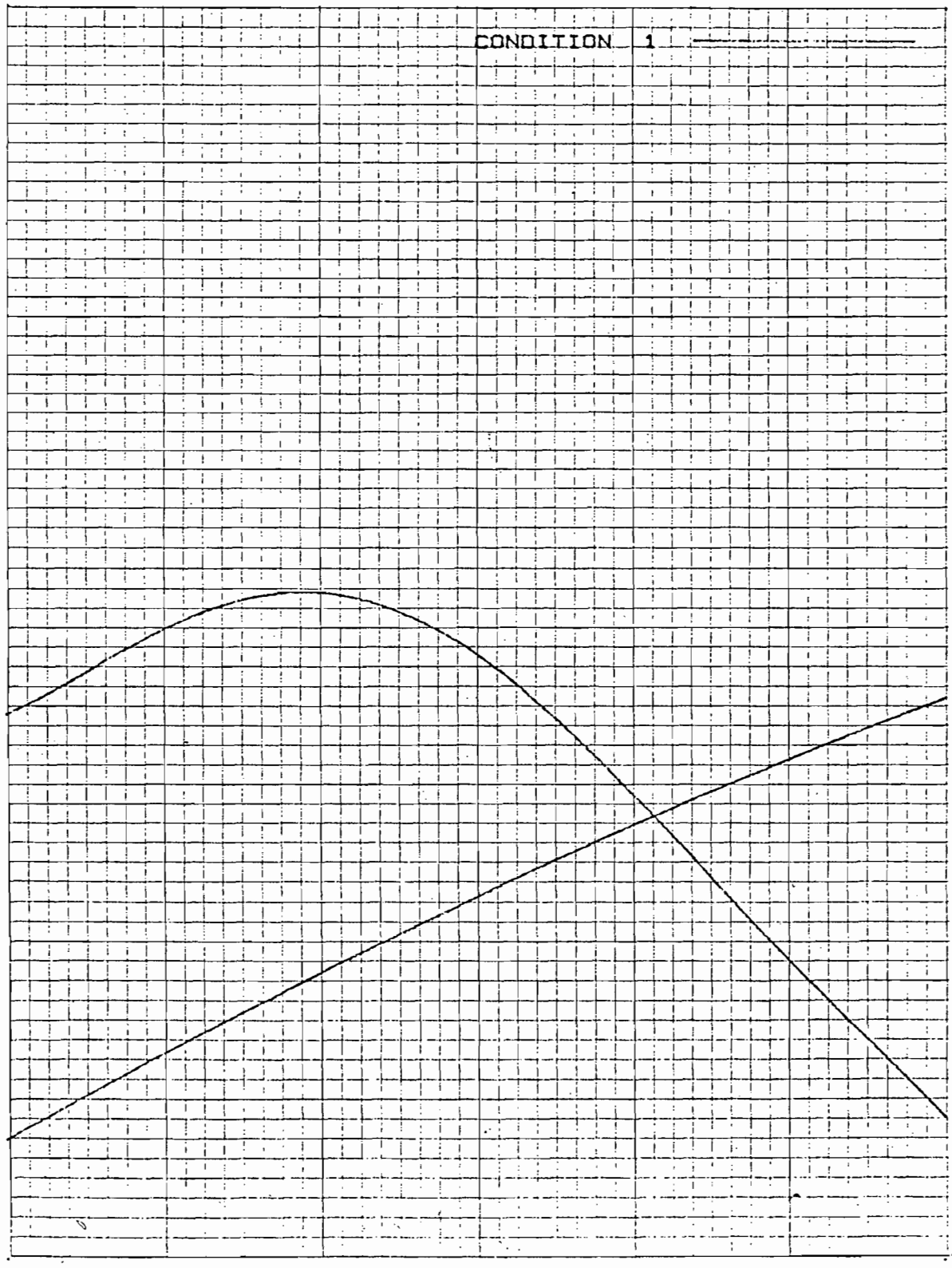
BY SNN	CUSTOMER: I.P.S. ENGINEERS, INC. INQUIRY: VERBAL	PAGE: OF
DATE 3-24-81	FOR: ATLANTIC SUGAR COMPANY -BELLE GLADE, FLORIDA	
APPROVED	BARRON PROPOSAL # #NF-64/10-1187 REVISION:	
DATE:	NOTE: THE ABOVE SPECIFICATIONS ARE PRELIMINARY. BARRON INDUSTRIES RESERVES THE RIGHT TO MAKE MODIFICATIONS UPON FINAL DETERMINATION OF APPLICATION, ORIENTATION AND ARRANGEMENT.	RT

BARRON INDUSTRIES
P.O. BOX DRAWER 1 - LEEDS, AL 35094

BARRON INDUSTRIES
ENGINEERS & MANUFACTURERS

FAN SIZE	790	COND.	1	2	3
FAN SERIES	T30A	DEN. (LB/CU. FT.)	.0560		
FAN TYPE	DI (92.00%) DW	RPM	900.		

REF: ATLANTIC SUGAR-I.P.S. ENGINEERS DATE: 3/24/81



United States
Environmental Protection
Agency

Region 4
345 Courtland Street NE
Atlanta GA 30308

Alabama, Georgia, Florida,
Mississippi, North Carolina,
South Carolina, Tennessee,
Kentucky

EPA

MAR 22 1979

REF: 4RC

William H. Green, Esquire
Mahoney, Hadlow & Adams
P.O. Box 5617
Tallahassee, Florida 32301

Re: Best Available Control Technology
Determination for Bagasse Boiler

Dear Mr. Green:

This is in response to your February 12, 1979, letter on the above. Specifically, your letter addressed our pending Best Available Control Technology (BACT) determination for a bagasse boiler the United States Sugar Company intends to install at its Bryant, Florida, sugar cane processing operation.

You first asked whether an overly stringent BACT emission limitation could be modified upward after the facility is in operation, if operating results justify a higher limitation. We know of no written EPA policy that provides for such a procedure. As you are aware, EPA regulations also do not provide for such a procedure. However, since this is a policy or program question and not a legal question, we offer no opinion on it.

The remainder of your letter addressed what the appropriate emission limitation reflecting BACT should be in this case. As quoted in your letter, the BACT definition in EPA regulations is:

> "... an emission limitation ... based on the maximum degree of reduction for each pollutant ... which the Administrator, on a case-by-case basis ... determines is achievable for such [major stationary] source ... through application of production processes or available methods, systems, and techniques ...." (emphasis added)

43 Fed.Reg. 26388, 26404 (1978), to be printed as 40 C.F.R. §52.21(b)(10). From this, it is evident that the BACT emission limitation must reflect the maximum emission reduction achievable through use of control systems and techniques. The designation EPA uses to describe techniques that can be used in achieving the BACT emission limitation is "good operating practices". Also, as noted in your letter, the emission limitation must be met on a continuous basis. Clean Air Act §302(k).

In the February 12 letter, you argue that the data from the Clewiston, Florida, bagasse boilers of U.S. Sugar should be weighted more heavily than that from the Bryant boilers. The reasons given are that the Clewiston boilers are 40% larger than the existing Bryant boilers and show consistently higher emission levels. Since the contemplated Bryant boiler will be even larger than the Clewiston boilers, the argument is in effect that the larger the boiler, the higher the emission rate, so that the BACT emission limitation for the contemplated Bryant boiler should at least be as high as the Clewiston test results.

We see at least two weaknesses in this argument. First, the test results at Clewiston when both Boiler No. 1 and Boiler No. 2 were being fired at their highest rate tested (218,000 #/hr. and 215,000 #/hr., respectively) both would meet the BACT emission limit of .15 #/million B.t.u. contemplated for the new Bryant boiler. This and other aspects of the data convince us that there is no clear correlation between size and emissions control efficiency of the bagasse boilers. Second, insufficient information was submitted to eliminate other variables affecting emissions. For example, a significant factor could be differences from site to site or from time to time in adherence to good operating practices. These practices include, for example, maintenance of a sufficient scrubber pressure and sufficient flue gas and water flow rates into the scrubber. This factor of use of good operating practices is, of course, within the control of the permit holder.

There has not been a showing that good operating practices were followed when the Bryant test results showed emissions higher than .15 #/million B.t.u. Also, the .15 #/million B.t.u. level was only rarely exceeded in the Bryant data and thus was not consistently exceeded at a significantly higher level.

These considerations lead us to conclude that .15 #/million B.t.u. can be met continuously if U.S. Sugar uses BACT, including good engineering practices, in designing and operating the contemplated Bryant bagasse boiler.

If we may be of further assistance, please call (telephone 404/881-2335).

Sincerely yours,

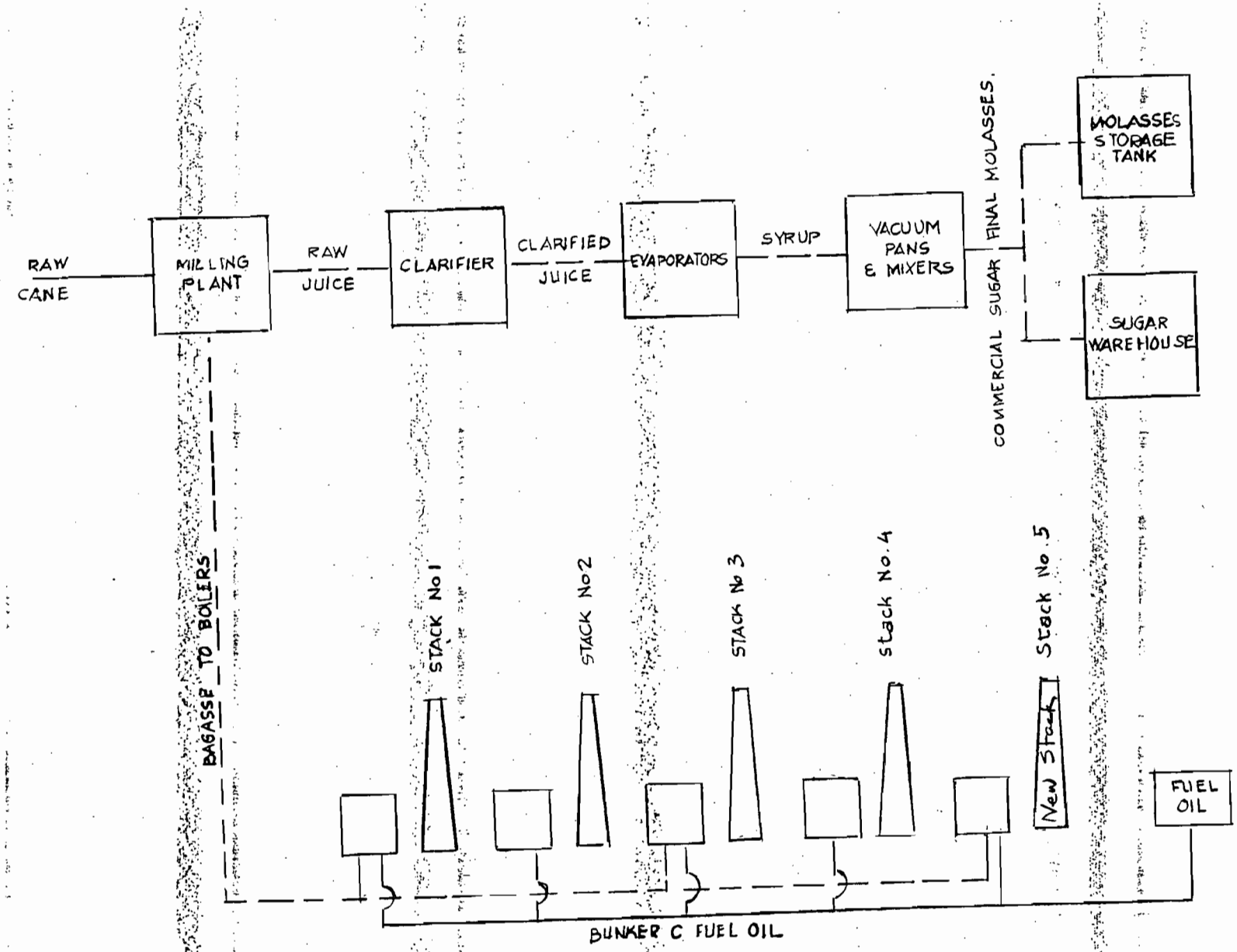
Sanford W. Harvey, Jr.
Regional Counsel

cc: Ms Mary F. Clark
Florida Department of Environmental
Regulation

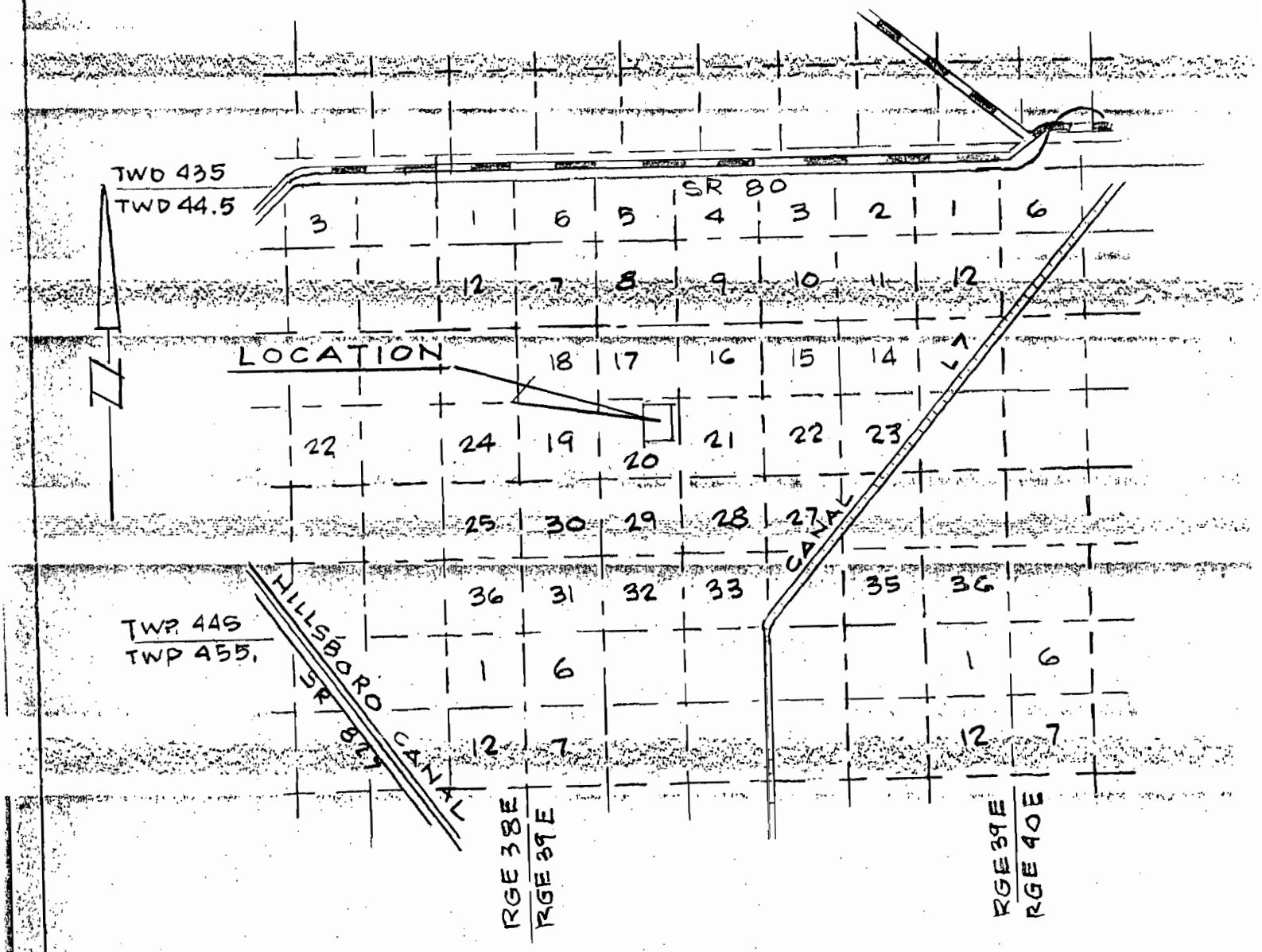
TABLE - D-9 EMISSIONS

Summary of Particulate Emissions Compliance Test Data from all Atlantic Sugar Association Boilers burning bagasse and fuel oil from 1975-76, 1976-77, 1977-78 1978-79 and 1979-80.

BOLER # AND YEAR	$lb/10^6$ BTU'S CONTROL EMISSIONS
1 - 1975-1976	0.25
1 - 1976-1977	0.24
1 - 1977-1978	0.26
1 - 1978-1979	0.20
1 - 1979-1980	0.30
2 - 1975-1976	0.26
2 - 1976-1977 (Average	0.43
2 - 1977-1978	0.21
2 - 1978-1979	0.20
2 - 1979-1980	0.26
3 - 1975-1976	0.27
3 - 1976-1977	0.28
3 - 1977-1978	0.26
3 - 1978-1979	0.26
3 - 1978-1980	0.24
4 - 1975-1976	0.30
4 - 1976-1977	0.25
4 - 1977-1978	0.26
4 - 1978-1979	0.25
4 - 1979-1980	0.25
Average all years	0.266

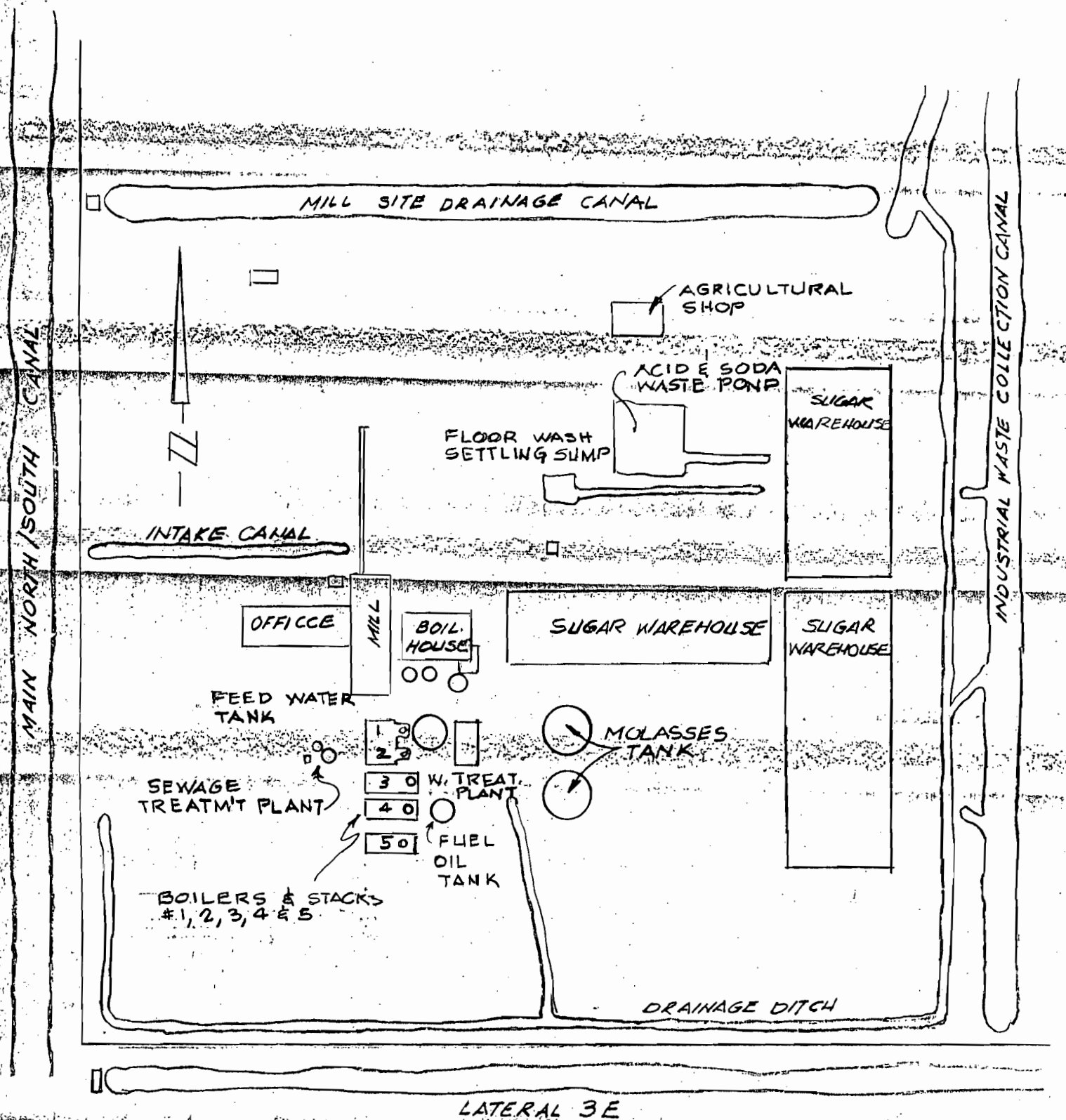


SCHEMATIC FLOW DIAGRAM
ATLANTIC SUGAR ASSOC.
BELLEGLADE FLA



ATLANTIC SUGAR ASSOCIATION
LOCATION MAP
SEC 20 TWP 44S RGE 39E
PALM BEACH COUNTY, FLORIDA

DWG # 1
DATE



MILL SITE
ATLANTIC SUGAR ASSOC.

DWG. # 2
DATE:

WESTERN PRECIPITATION DIVISION

JOY MANUFACTURING COMPANY
4565 COLORADO BOULEVARD
LOS ANGELES, CALIFORNIA 90039
Phone: (213) 240-2300

February 8, 1974

Florida Sugar Cane League, Inc.
P.O. Box 1148
Clewiston, Florida 33440

Attention: Mr. J. Nelson Fairbanks
Vice President & General Manager

Gentlemen:

Confirming our conversations of January 30, 1974, we wish to present, herewith, the guarantees we are prepared to make to any member of the Sugar Cane League on the performance of our Type D "TURBULAIRE" Scrubber when used in conjunction with bagasse fired boilers.

With an inlet loading to the scrubber of 1 gr/dry standard CFM (DSCFM), we will guarantee a particulate outlet not to exceed .05 gr/DSCFM. If the condensables are to be included with particulate emission, we will then guarantee an outlet not to exceed .06 gr/DSCFM. These guarantees are based on operating the equipment at a pressure drop across the unit of not less than 5" water column (w.c.) and not more than 9" w.c. In addition, these guarantees are based on sampling with the EPA Train, Method 5, described in the Federal Register, Volume 36, No. 247, Thursday, December 23, 1971, copy enclosed.

The aforementioned guarantees are made on our equipment as originally designed or as modified with our approval. Any unauthorized modifications will abrogate these guarantees.

Very truly yours,

Allen H. Jones
Vice President, Standard Products

AHJ:js

Encl. EPA Train, Method 5.

cc: F. Arroyo - Arroyo Process Equipment
cc: L. Newton - Western Precipitation
cc: R. Fernandez - Western Precipitation

WESTERN PRECIPITATION DIVISION
JOY MANUFACTURING COMPANY
4565 COLORADO BOULEVARD
LOS ANGELES, CALIFORNIA 90039
Phone: (213) 240-2300

February 8, 1974

Florida Sugar Cane League, Inc.
P.O. Box 1148
Clewiston, Florida 33440

Attention: Mr. J. Nelson Fairbanks
Vice President & General Manager

Gentlemen:

Confirming our conversations of January 30, 1974, we wish to present, herewith, the guarantees we are prepared to make to any member of the Sugar Cane League on the performance of our Type D "TURBULAIRE" Scrubber when used in conjunction with bagasse fired boilers.

With an inlet loading to the scrubber of 2 gr/dry standard CFM (DSCFM), we will guarantee a particulate outlet not to exceed .07 gr/DSCFM. If the condensables are to be included with particulate emission, we will then guarantee an outlet not to exceed .08 gr/DSCFM. These guarantees are based on operating the equipment at a pressure drop across the unit of not less than 5" water column (w.c.) and not more than 9" w.c. In addition, these guarantees are based on sampling with the EPA Train, Method 5, described in the Federal Register, Volume 36, No. 247, Thursday, December 23, 1971, copy enclosed.

The aforementioned guarantees are made on our equipment as originally designed or as modified with our approval. Any unauthorized modifications will abrogate these guarantees.

Very truly yours,

Allen H. Jones
Vice President, Standard Products

AHJ:js

Encl. EPA Train, Method 5.

cc: F. Arroyo - Arroyo Process Equipment
cc: L. Newton - Western Precipitation
cc: R. Fernandez - Western Precipitation

October 24, 1977 - other article

INSTALLATION, OPERATING, AND MAINTENANCE INSTRUCTIONS

FOR

TURBULAIRE© SCRUBBER

TYPE D

JOY MANUFACTURING COMPANY
Western Precipitation Division
1000 W. Ninth St.
Los Angeles, California 90015

CONTENTS

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FIELD INSTALLATION	4
PREPARATION OF THE SCRUBBER FOR OPERATION	5
OPERATION	6
MAINTENANCE	8
AUTOMATIC CONTROL RECOMMENDATION	9

FIGURES

Figure 1. Turbulaire® Scrubber, Type D-B, Sizes 20 thru 64 1

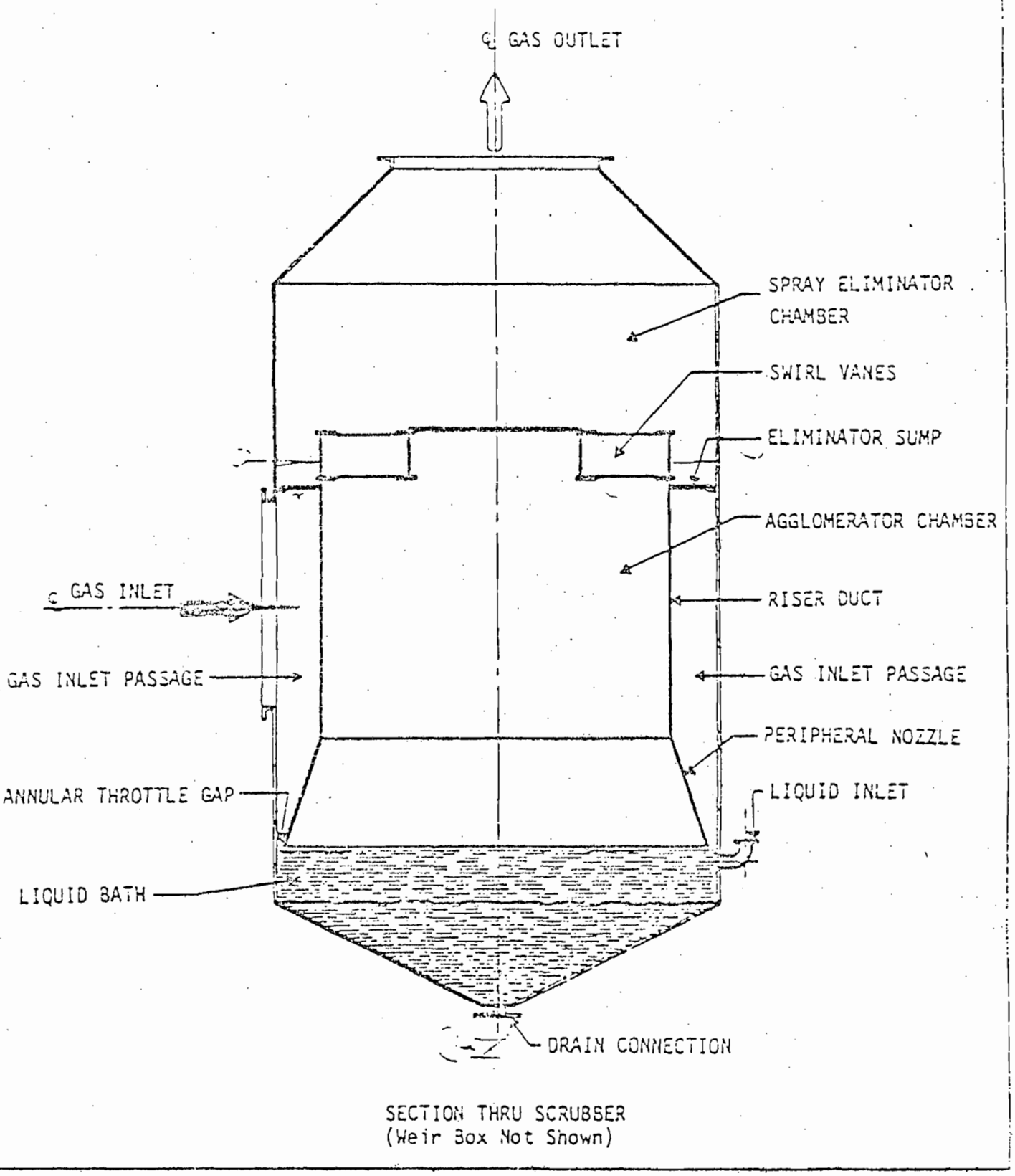


Figure 1. Turbulaire® Scrubber, Type D-3, Sizes 20 thru 64

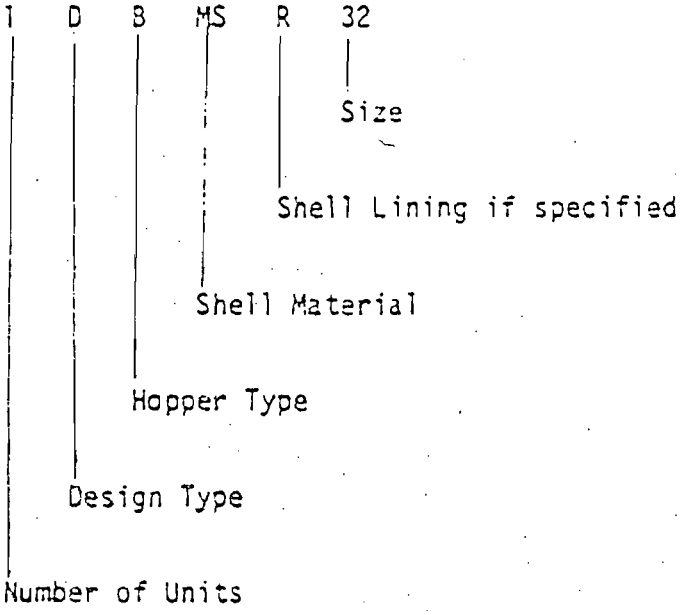
DESCRIPTION

The Type D Turbulaire® Scrubber (Figure 1) consists of a vertical cylindrical shell with conical top and conical hopper on the lower end. The scrubber is divided into two chambers; the agglomerator chamber and the eliminator chamber.

The agglomerator chamber is in the lower portion of the scrubber and consists of the hopper with liquid bath, the gas inlet passage with conical throttle and the liquid level regulating assembly.

The eliminator chamber is above the agglomerator chamber and consists of a set of swirl vanes and a sump preceding the gas outlet.

TYPE & SIZE DESIGNATION



The scrubber has the gas inlet located radially on the side of the shell and the gas outlet at the top center. The agglomerator cylinder is surrounded by the gas inlet passage. The shell and the peripheral nozzle of the agglomerator chamber form an annular throttling gap at the bottom of the gas inlet passage. The normal operating level of the scrubbing liquid bath is just below the throttling gap.

Swirl vanes are mounted in the top of the agglomerator cylinder. A horizontal plate joining the agglomerator with the shell forms the eliminator sump. Weep holes drain the liquid from the eliminator sump into the scrubbing liquid bath in the hopper.

A liquid level regulating assembly is mounted on the lower exterior region of the shell. This assembly consists of a gas lock release pipe, weir box with liquid level control, and a seal pipe with overflow. The liquid inlet is located just above the hopper. Access doors are provided in the hopper and in the upper region of the shell.

Construction material for the standard scrubber is mild steel. Optional materials of construction may be: mild steel lined with rubber, lead or coated with epoxy resin; 304 or 306 stainless steel; and fiber reinforced polyester.

FIELD INSTALLATION

Field installation of the scrubber is as follows:

1. Set the unit on the foundation and attach the anchor bolts. Level unit by shimming between unit and foundation.

NOTE: Vertical and horizontal alignment of the scrubber is important to ensure an even circumferential dimension between the peripheral nozzle and quiescent liquid level.

2. Connect the inlet and outlet flues to the unit. It is recommended that inspection doors, adjacent to the scrubber, be included in the customer's flues.

NOTE: Dynamic and dead load forces from customer's fan, equipment and flues must not be transmitted to the scrubber equipment.

3. Attach the sight glass and weir box to the scrubber, then connect the seal pipe overflow to a drain line.

4. Connect the hopper outlet to a drain line. The drain line should contain a valve for flow balancing purposes.

PREPARATION OF THE SCRUBBER FOR OPERATION

The scrubber is designed to operate under the conditions in the operating data sheet in the front of the manual.

Prior to turning on the flue gas, liquid flow and liquid level should be established as follows:

1. Remove the weir box cover.

2. Turn on the liquid supply. By means of a flow meter or other measuring device, adjust the flow of the inlet liquid until the rate prescribed on the data sheet is attained.

3. Open the valve at the hopper outlet and establish a flow of liquid adequate to remove the slurry from the hopper.

4. Raise or lower the liquid level control as required until the liquid in the scrubber reaches and maintains a steady level, approximately 1/2-inch below the peripheral nozzle. This level is indicated by a red line painted on the weir box. Tighten the clamp which secures the level control in place.

NOTE: The liquid level control and liquid inlet rate may require adjustment to comply with rated pressure drop and outlet gas conditions.

5. Replace the weir box cover. The scrubber is now ready to receive flue gas.

If the tank is lined with lead, rubber, epoxy resins or other material which may deteriorate at high temperatures, the temperature of the inlet gas must be adjusted within limits compatible with these materials as noted after operating instruction.

NOTE: Unless otherwise recommended, 95% to 99% of the slurry should be removed through the valve at the hopper outlet. Only 1% to 5% should be removed through the weir box overflow pipe.

OPERATION

Operation of the scrubber requires only that the fan be turned on to move flue gas through the scrubber.

As flue gas enters the scrubber through the inlet, its speed is increased to the desired operating velocity as it passes through the throttling gap. The dust-laden gas is then discharged at high velocity and penetrates deeply into the liquid bath wherein the dust combines with the liquid to form a slurry which is discharged through the hopper outlet valve. The turbulence resulting from the entrance of the high velocity gas into the scrubbing bath is sufficient to produce a dense spray. This spray is removed from the gas by the swirl vanes.

The scrubber should continue to operate at constant efficiency if the gas volume, temperature and dust load do not change. If there is an increase in the dust load, it may be necessary to increase the flow rate of the scrubbing liquid, in which case, the hopper outlet valve must be adjusted to maintain the operating liquid level. A decrease in the dust load will permit decreasing the scrubbing liquid flow rate.

The efficiency of the unit may be increased by: increasing pressure drop through unit, cooling inlet gases if necessary, and increasing the inlet liquid rate, described as follows:

1. Increase pressure drop through the unit by restricting the nozzle opening or by increasing the gas flow through the unit.

The nozzle opening can be restricted by adding material to the nozzle opening and thus cut down the size of the opening. The opening is designed so that at the gas density and volume specified, the required pressure drop should be obtained. Sometimes the gas density or the volume are not that which is calculated and, if the pressure drop is low, it is necessary to close down on the opening. This is fairly easily accomplished and, by doing this, the velocity of the jet is increased into the liquid pool and, therefore, increases the efficiency of the unit.

The volume of air should never exceed the maximum allowable outlet gas volume as specified on the data sheet. This maximum volume cannot be exceeded without entraining some of the scrubbing liquid, and carrying it into the outlet flue.

Gas flow through the unit can be increased by opening the fan dampers or by introducing infiltration air into the flue through a damper.

If the scrubber is operating well below the maximum outlet gas volume, the simplest way to increase the pressure drop through the unit is to increase the fan delivery until the design pressure drop is reached.

2. Introduce liquid sprays ahead of the scrubber inlet to humidify the gases entering the scrubber. This system is employed whenever inlet gas temperatures are high enough to damage the lining of the shell. Changing the specified water flow to the spray nozzles is not recommended since this will change inlet gas density beyond scrubber design limits.

3. Increase the inlet liquid rate. This will also bring the temperatures of the gas down to saturation quickly. However, as the liquid rate is increased, the liquid level control will have to be reset until equilibrium conditions are maintained without gas passing through the unit. Increase of the liquid rate will give lower outlet gas temperatures and also lower outlet liquid temperatures.

MAINTENANCE

Although the scrubber should operate continuously with minimum maintenance some may be required. This includes: removing any build-up of dust on the peripheral nozzle which would impair operation, and periodically cleaning out the scrubber and liquid seal pipe to prevent clogging of the outlet.

In addition, situations may be encountered which may impair the operation of the scrubber:

1. Plugging of the Overflow Pipe
   Occasionally on some dusts (generally those associated with fluorides), there may be some plugging of the overflow pipe which leads from the scrubber to the weir box. This plugging is due to settling out or deposition of particles in the pipe and can generally be relieved by one or two methods.

   One method is to periodically clean out the pipe with a reamer or a scraper of some sort. For those scrubbers with rubber, lead, or plastic lining, care should be taken that the lining is not pierced.

   Another method is to increase the velocity of liquid through the pipe by closing down on the cross sectional area. This is accomplished by laying pieces of tubing in the overflow pipe and building up enough tubing so that the cross sectional area of the pipe is gradually reduced. The velocity of liquid for materials which tend to settle out should be a minimum of 2 to 3 fps or higher.

2. Cold Weather Operation
   During periods of cold weather, care must be taken to prevent freezing of the liquid in the scrubber and in the supply lines. It may be necessary to insulate one or both. During periods of shutdown, the scrubber and liquid lines should be drained unless some method is employed to keep temperatures above the freezing point.

AUTOMATIC CONTROL RECOMMENDATION

An automatic liquid level control system is available as an optional extra from Western Precipitation Division.

The system consists of the following components:

a. Displacer type level control unit (Magnetrol)

b. Solenoid valve

c. Strainer

d. Piping and pipe fittings as required for field assembly.

The system is normally shipped loose for field assembly by the customer. Hook-up connections are provided on the hopper and the scrubber body.

OPERATION

The liquid level control unit uses a solid block displacer - heavier than the liquid - which is suspended from a helical spring. A rising liquid level imparts buoyancy to the displacer, lessening the load on the spring, thus, the displacer moves upward. A magnetic sleeve connected to the displacer also moves upward inside a non-magnetic enclosing tube, attracting a permanent magnet attached to a mercury switch (or pneumatic pilot valve). This actuates and closes the solenoid valve, and make-up water to the scrubber is shut-down. As the liquid level recedes, the magnetic sleeve and displacer drops allowing the magnet and switch element to return to the normal operating level. This actuates and opens the solenoid valve allowing flow of makeup water to the scrubber.

Thus, there is no possibility of excessive high or low liquid levels in the scrubber.

A cross is provided in the line to allow periodic flushing and cleanout of the system.

This information is provided to give a general idea of the dust collection mechanisms employed by Western Precipitation scrubbers as well as some of our competitors.

[redacted] so that it is directed downward toward the liquid level located immediately under peripheral nozzle which provides the venturi. The unusual aerodynamics in the gap area causes liquid to be sucked from the surface of the water. Thus the water is propelled in a direction which sends droplets across the high velocity zone immediately below the venturi and in a horizontal direction perpendicular to the downward moving gas flow such that the same conditions experienced in the classical venturi scrubber are achieved. Once in the high velocity gas stream, these droplets are shredded into very fine droplets whose size decreases with increased gas velocity. [redacted]

[redacted] Of course higher gas velocities caused by reductions in the size of the scrubbing gap cause higher pressure doprs. For this purpose dust collection efficiency is presented a a function of the scrubber pressure drop. Both dust particles and water droplets are surrounded by a gas boundary layer which cushions the impact. Because of this buffer, the finer dust particles can dodge the droplets by following the gas streamlines around them. Increased momemtum, obtained by higher impact velocity, is required to penetrate this boundary layer and effect collision. Obviously the smaller the mass (or size) of the particle, the higher the necessary velocity requir for the penetration. For this reason, increases in pressure drop are required to maintain a constant efficiency as particle size drops.

The same classical venturi impaction principle can be achieved in the Type "D" "TURBULAIRE" Scrubber even with low liquid levels, if scrubbi liquid is added to the venturi region via sprays. The liquid flows down the walls to the venturi area. As the gas accelerates to pass through the convergence zone of the venturi, it rips liquid from the lip of the converging wall and atomizes this liquid as well as any droplets in the gas stream, into a great number of fine droplets. It is in this zone that the dust is impacted into the droplets due to the high relative velocity of the dust particle to the droplets.

Up to a point, higher water flow rates increase the number of fine dro lets, thus increasing the dust collection efficiency. Inadequate wate

supply results in not only lower probability of collision, but also causes incomplete water coverage of the venturi zone so that high velocity dust particles may have few or even no droplets to collide with, thus reducing the overall efficiency of the scrubber. The effect of liquid to gas ratio in the scrubbing zone can be generally depicted in Fig. #1.

In order to present a more concrete example, Fig. #1 is shown with specific scrubber pressure drops, dust concentrations, and efficiencies with values in the range which may be experienced ~~at Weyerhaeuser's plant.~~ However, the values are not exact and should not be interpreted as engineering data. The subject graph is a plot of dust collection efficiency as a function of liquid flow rate to the venturi with scrubber pressure drops of 5" and 10" water gauge as parameters. As indicated the higher pressure drop produces a higher dust collection efficiency which corresponds to an outlet dust loading of .05 grains/DSCF. As shown, the efficiency rises rapidly from 0/0 at no liquid flow rate until it asymtotically approaches an efficiency of 95% at a liquid flow rate of approximately 200 GPM. From this point the efficiency remains essentially constant as liquid rate is increased until the liquid flow is so high that the venturi is flooded and inefficient use is made of the dust particle velocity and liquid. At the lower scrubber pressure drop of 5" the trend of the efficiency vs liquid rate curve is similar, but dust collection efficiency is always less than that of the 10" pressure drop. Employing this set of curves will allow a better understanding and evaluation of our present situation in regard to quantity of spray liquor provided to the venturi. If only 90 GPM of liquor is used, the full 10" pressure drop will be required to produce the guaranteed outlet dust loading of .1 grain/DSCF, and if only a 5" pressure drop is used across the scrubber, the efficiency will drop way below that required to meet the code. In the case where the liquid rate is increased to 200 GPM, the outlet dust loading will decrease significantly to .05 grain/DSCF at the higher 10" water gauge pressure drop. However, since the efficiency at the higher irrigation rate will be more than adequate, this would allow a reduction in pressure drop to 5" water gauge, while still meeting ~~the code~~ 0.1 grains and also reap the benefit of lower fan power consumption due to the lower scrubber pressure drop. Although the values of the parameters just discussed may not be wholly accurate, the general relationship of pressure drop, dust collection efficiency, and liquid flow rate is accurate enough to show the general relationships so that both the economies and inefficiencies of the various operating points can be easily understood.

Because of the inefficiencies resulting from using a minimum quantity of spray liquid we recommend the use of the higher liquid rate. The

only reasonable way to achieve these higher flows is to utilize recycle slurry from the scrubber sump. The maximum flow available from the drag chain tank is 90 GPM, with the drag tank hold time maintained above 40 minutes. This flow rate is inadequate for efficient use of the scrubber pressure drop. There may be a concern for the possibility of large chunks of char clogging the 9/16" diameter spray nozzle orifice should the "MULTICLONE" fail in some way. The installation of a simpler, low pressure drop, line strainer (with large 3/8" diameter perforations) in the appropriate slurry pipelines would prevent this. This device would have a manual backwash to purge any large debris and would require maintenance only during the infrequent times when a failure occurred. Should there be a catastrophic failure that plugged the strainer, the sprays would still operate 90 GPM of fluid from the drag chain tank during the corrective period.

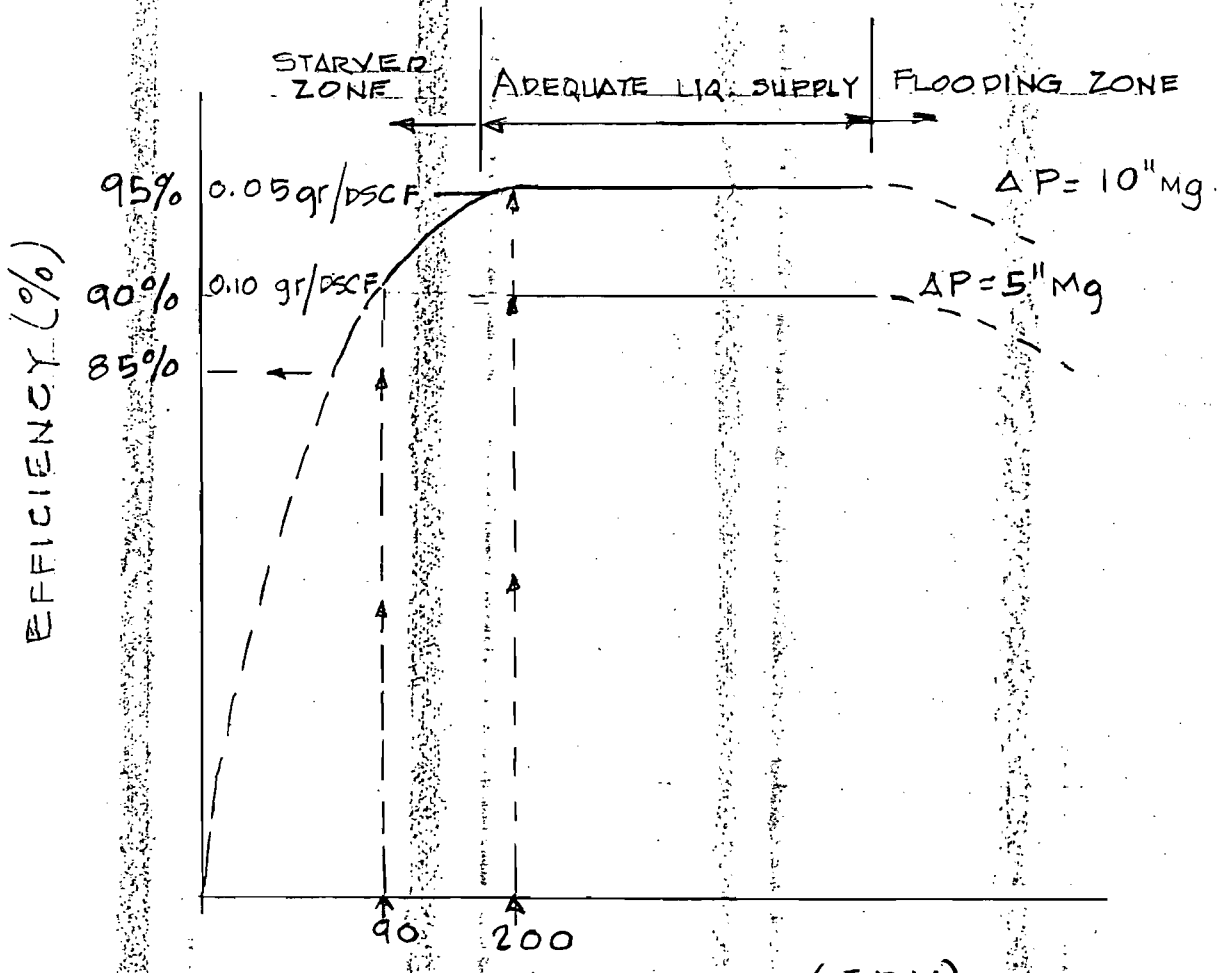
The sprays serve another purpose also in that the water washes the internal gap area especially in the zone just above the gap where plugging has sometimes been experienced due to low liquid quantities when hot gases above 300°F are being scrubbed. The splashing of dirty water at the dry/wet interface with low liquid quantities has allowed the solids to be baked onto the hot surfaces, leaving a residual crust composed of the solids. This soon builds up a formidable deposit. The high flushing rate of the cleaning sprays provides adequate continuous flushing of the surface so that no thin films of liquid ever occur.

Several other modifications have been made to the Type "D" Scrubber to improve its reliability even under very difficult conditions. One change has been the replacements of the weep holes in the eliminator vane which provided drainage of liquor back from the demister sump by several large 3" diameter pipes which seal below the liquid level in the scrubber hopper. These pipes are of adequate size to quickly pass any large debris back into the sump region, thus keeping the demister sump from plugging and flooding.

In cases where plugging has developed in the scrubber sump, higher liquid velocities have been employed to eliminate the accumulation and eventual bridging of solids at the sump discharge nozzle. This has been achieved by increasing the flow through the discharge nozzle by the addition of a recycle pump. The recycle pump delivers liquid to the sump nozzle which has been located to provide a maximum of agitation in the trouble zone. These high recycle rates have also been effective in causing sufficient agitation so that any floaters at the liquid surface can be wetted and swept down to the discharge nozzle.

FIGURE Nº 1

EFFICIENCY VS LIQUID AT VENTURY



Ventury

STATE OF FLORIDA
DEPARTMENT OF POLLUTION CONTROL
2562 EXECUTIVE CENTER CIRCLE, EAST
MONTGOMERY BUILDING, TALLAHASSEE, FLORIDA 32301

VINCENT D. PATTON
EXECUTIVE DIRECTOR

DIVISION OF OPERATIONS

3319 Maguire Boulevard
Suite 232
Orlando, Florida 32803

DAVID H. LEVIN
CHAIRMAN

May 21, 1973

Frank S. Kleeman, P. E.
Engineering Consultant
Florida Sugar Cane League, Inc.
Post Office Box 1148
Clewiston, Florida 33440

Dear Mr. Kleeman:

Pursuant to our meeting with the representive of Florida's sugar industry held on April 12, 1973, this office agreed to coordinate the Department's response to all the questions discussed.

Please be advised that the following is the Department's official response to those questions.

Process Weight Determination:

The process weight is defined as all materials entered into the process. This would include "natural" or "adsorbed" moisture found in the bagasse as it comes from the milling operation or from the by-product resulting from the production of furfural. The term "uncombined water" is directed toward water added to the baggasse just before entering the boilers would be considered uncombined water.

Latest Technology

The technical staff of this Department has determined that the scrubbers proposed by the Florida Sugar Cane League in the April 12, 1973 meeting would constitute latest technology. The modifications necessary to accommodate scrubbers to each plant may change, therefore, the performance of these units would be considered on an individual basis.

Source Testing Method:

Some questions have arisen concerning the necessity of changing from our present testing procedures. These were discussed by Mr. Oven with Mr. Henderson during recent conversations. Concern exists over the solubility of particulate matter in the thimble because of a "wet" stack. This may result in particulate emissions greater than that obtained from the stack analysis. Consequently, our present test method must apply. If test data can be submitted which would justify the "dry" stack sampling method as a more accurate indication of particulate matter emitted from baggasse boilers, a change in test methods will definately be considered.

If you have any questions concerning the above, please feel free to contact this office and if necessary another meeting can be held.

Very truly yours,

A. Senkevich, P. E.
Director
Division of Operations

AS/KK/rm

cc: Mr. H. Oven
Mr. P. Baljet
Mr. Nelson Fairbanks, Fla. Sugar Cane League, Inc.
Mr. W. Straham
Mr. J. Cooper, Palm Beach County Health Dept.

9. An application fee of $20, unless exempted by Section 17-4.05(3), F.A.C. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?
[ ] Yes [ ] No

Contaminant	Rate or Concentration
NOT APPLICABLE	NOT APPLICABLE

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy) [X] Yes [ ] No

Contaminant	Rate or Concentration
Particulate (from Bagasse	0.15 # 10^6 BTU's.
Particulate (from Fuel Oil)	0.10 # 10^6 BTU's
Sulfure Dioxide	0.8 # 10^6 BTU's

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration
Particulate (Bagasse)	0.20 # 10^6 BTU's
Particulate (Fuel Oil Bunker C)	0.10 # 10^6 BTU's
Sulfur Dioxide	1.0% Low Sulfur Fuel Oil

D. Describe the existing control and treatment technology (if any). (Four existing boilers)

1. Control Device/System: Joy Turbulaire Spray Impingement Scrubbers
2. Operating Principles: See attached literature
3. Efficiency:* 90%
4. Capital Costs: 100,000.00/boiler
5. Useful Life: 10 years
6. Operating Costs: $ 5,000.00
7. Energy: ΔP = 5"-6" W.C.
8. Maintenance Cost: 3,000.00
9. Emissions: See attached sheet D-9 Emissions

Contaminant	Rate or Concentration
Particulate Matter	0.266#/10^6 BTU's (xx)

(xx) Average of all boilers (4) from 1975-1980.

*Explain method of determining D 3 above. Potential Particulate Emissions = 16# Particulate per ton of bagasse burned minus Actual Emissions (lbs. particulate per hour) divided by Potential particulate is equal to the efficiency.

10. Stack Parameters

Area 28.27

a. Height: 60'-1" ft. b. Diameter: 6'-0" ft.

c. Flow Rate: 54,044 ACFM d. Temperature: 154° F Average 4 Boilers °F

e. Velocity: 31.86 FPS Average (4 Boilers)

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

a. Control Device: Turbulaire Scrubber (Spray Impingement)

b. Operating Principles: Impaction of large particules on water surface, removal of small particles by Venturi effect; inertial separation of droplets from gas by use of swirl vanes

c. Efficiency*: 90% d. Capital Cost: 100,000.00

e. Useful Life: 10 years f. Operating Cost: Proportional to pressure drop

g. Energy*: 350 h. Maintenance Cost: Low

i. Availability of construction materials and process chemicals: Readily available, require a vertical cylindrical steel shell with conical top and conical hoppers. Water required is available.

j. Applicability to manufacturing processes: Applicable to processes emitting a wide range of particle sizes. Widely used by Sugar Cane Industry for pollution control.

k. Ability to construct with control device, install in available space, and operate within proposed levels: Applications throughout industry have shown that they can be easily installed at the same time as new boilers. Sugar mills have ample space to allow retrolitting with duct modification.

2. All plants meet particulate emission limits with those Scrubbers.

a. Control Device: Venturi Scrubbers

b. Operating Principles: Intimate contact between particulate laden gases and water spray in throat of venturi. Could be horizontal or vertical.

c. Efficiency*: 90% d. Capital Cost: 200,000

e. Useful Life: 10 f. Operating Cost: Probably two or three times more than Turbulaire Scrubbers

g. Energy**: 750 h. Maintenance Costs: Low

i. Availability of construction materials and process chemicals: Readily available. More water required than Turbulaire Scrubbers. Water can be recirculated and also used to flood cane field.

j. Applicability to manufacturing processes: Can be used but has to be preceded by dust collector to remove large particles.

k. Ability to construct with control device, install in available space, and operate within proposed levels: There are no limitations related to construction and installations. Will meet particulate emission levels with higher pressure drops.

*Explain method of determining efficiency.

**Energy to be reported in units of electrical power – KWH design rate.

3.

a. Control Device: Fabric Filter

b. Operating Principles: Dust laden gases are passed through fabric filter-bags where a filte cake is developed. Dust particles are removed from the gas stream as the gases are passed through the filter cake area.

c. Efficiency*: 99% d. Capital Cost: 150,000.00

e. Life: Non-predictable due to fire hazards. f. Operating Cost: Proportional to pressure drop.

g. Energy: 300 KwH h. Maintenance Cost: Very high.

*Explain method of determining efficiency above.

l. Availability of construction materials and process chemicals: Available

j. Applicability to manufacturing processes: Not likely

k. Ability to construct with control device, install in available space and operate within proposed levels: Needs more space than scrubbers. Will meet emission levels if installed.

4.

a. Control Device Electrostatic Precipitators

b. Operating Principles: Will not work with bagasse burning boilers.

c. Efficiency*:

d. Capital Cost:

e. Life:

f. Operating Cost:

g. Energy:

h. Maintenance Cost:

l. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device: Joy Turbulaire Spray Impingement Scrubber type D- Size 90

2. Efficiency*: 92%

3. Capital Cost: 100,000.00

4. Life: 10 years

5. Operating Cost: $ 5,000.00

6. Energy: 350 KWH

7. Maintenance Cost: 3,000.00

8. Manufacturer: Joy Manufacturing

9. Other locations where employed on similar processes:

a.

(1) Company: Osceola Farms Company

(2) Mailing Address: P.O. Box 679

(3) City: Pahokee

(4) State: Florida 33476

(5) Environmental Manager: Mr. Alberto Recio

(6) Telephone No.: (305) 924-7156

*Explain method of determining efficiency above. See Emission Calculations attached.

(7) Emissions*:

Contaminant	Rate or Concentration
Particulate (Average All Boilers) 1975-76	0.193 lbs/10^6 BTU
Particulate (Average All Boilers) 1976-77	0.265 lbs/10^6 BTU
Particulate (Average All Boilers) 1977-78	0.177 lbs/10^6 BTU
Particulate (Average All Boilers) 1978-79	0.283 lbs/10^6 BTU

(Cont. Adendum A)

(8) Process Rate*:

b. 155,250 lbs/ of bagasse average per hour per day of crop.

(1) Company: U.S. Sugar Corporation (Clewiston)

(2) Mailing Address: P.O. Box 1206

(3) City: Clewiston

(4) State: Florida 33440

*Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

(5) Environmental Manager: Mr. A. R. Mayo

(6) Telephone No.: (813) 983-8121

(7) Emissions*: 1975-76-77-78-79-80 Compliance Tests

Contaminant	Rate or Concentration
Particulate (Average 3 Boilers) 1975-76	0.166 lbs/10^6BTU
~~Particulate (Average 4 Boilers) 1976-77~~	~~0.192 lbs/10^6BTU~~
Particulate (Average 5 Boilers) 1977-78	0.188 lbs/10^6BTU
Particulate (Average 4 Boilers) 1978-79	0.193 lbs/10^6BTU
~~Particulate (Average 5 Boilers) 1979-80~~	~~0.24 lbs/10^6BTU~~

(8) Process Rate*: 340,250 lbs of bagasse per hour per day of crop (Average)

10. Reason for selection and description of systems:

The selected Joy Turbulaire spray impingement scrubber is currently employed by a majority of the Sugar Mill bagasse burning boilers to meet existing state particulate emission rates for existing and new boilers.

The Technical Staff of the Department of Pollution Control determined that the Joy Scrubbers proposed by the Florida Sugar Cane League constitute latest technology. (See Letter Attached)

In the case of the new boiler #5 installed at Bryant Mill U.S.S. Corporation the Department of Environmental Regulations determined that this selected system is capable of meeting and lowering the existing emission rate for new boilers.

The selected system is the most economical to install and to operate.

The existing four bagasse burning boilers at Atlantic Sugar Association are served by Joy Turbulaire Spray Impingement Scrubbers with the Fan down stream of the Scrubber.

The system consists of one Joy Turbulaire Scrubber size 90 (14'-0" diameter) type D receiving the hot gases from the boiler and with the fan down stream. One set of water sprays will be installed ahead of the Scrubber inlet for quenching. The pressure drop will be changed by changing the nozzle opening. The liquid rate could be changed readily. All controls will be the same as the ones on the existing Scrubbers with the newest improvements availables.

*Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

Section VI- Best Available Control Technology

C. Propose emission levels:

Particulate (Bagasse)	0.20 lb./10^6 BTU'S
Particulate (Fuel Oil)	0.10 lb/10^6 BTU'S
Sulfur Dioxide	1.0 Low Sulfur Fuel Oil.

The reason for proposing an emission limit of 0.20 lb/10^6 BTU. is that we are of the opinion that the proposed Atlantic Sugar Association boiler #5 will not be capable at meeting an emission limit of 0.15 lbs/10^6 BTU'S on a continuous basis due to the type of bagasse burned at Atlantic Sugar. It is the DER'S position that the quality of bagasse burned is one of the major variables affecting emission rates. Also DER'S information suggests that the bagasse burned at the Bryant mill is the best in the industry. By looking at the bagasse sample analysis from Atlantic Sugar Association is considerably of worst quality than Bryant. The bagasse at Bryant is better because of lower moisture content, higher heating value and cleaner cane.

Another reason is that as it is shown in Sheet D-9 Emissions: the average controlled emissions on all compliance test on all the Atlantic Boilers from 1975 to 1980 is 0.26 lb/10^6BTU's.

(1) United States Sugar Corporation (Bryant)

(2) Mailing Address: P.O. Drawer 1207

(3) City: Clewiston

(4) State: Florida 33440

(5) Environmental Manager: Mr. A.R. Mayo

(6) Telephone No.: (813) 983-8121

(7) Emissions: 1975-76 to 1979-80 Compliance Test

CONTAMINANT	RATE OF CONCENTRATION
Particulate (Average All Boilers:1975-76)	0.106 lb./10^6 BTU
Particulate (Average All Boilers:1976-77)	0.113 lb./10^6 BTU
Particulate (Average All Boilers:1977-78)	0.126 lb./10^6 BTU
Particulate (Average All Boilers:1978-79)	0.133 lb./10^6 BTU
Particulate (Average All Boilers:1979-80)	0.223 lb./10^6 BTU

(8) Process Rate: 327,675 lbs. of Bagasse per hour per day of crop (Average)

(1) Company: Sugar Cane Growers Cooperative of Florida

(2) Mailing Address: P.O. Box 86

(3) City: Belle Glade,

(4) State: Florida

(5) Environmental Manager: Mr. Enrique Arias

(6) Telephone No.: (305) 996-5556

(7) Emissions: 1975-76-1979-80 Compliance Tests

CONTAMINANT	RATE OF CONCENTRATION	
Particulate (Average All Boilers:1975-76)	0.162 lbs/10^6 BTU	(x)
Particulate (Average All Boilers:1976-77)	0.142 lbs/10^6 BTU	(x)
Particulate (Average All Boilers:1977-78)	0.138 lbs/10^6 BTU	(x)
Particulate (Average All Boilers:1978-79)	0.146 lbs/10^6 BTU	(x)
Particulate (Average All Boilers:1979-80)	0.134 lbs/10^6 BTU	(x)

(x) These boilers are burning mostly residue.

(8) Process Rate: 135,340 lbs/hour of Residue per day of crop.
118,433 lbs/hour of Bagasse per day of Crop
- Average -

ADDENDUM A---- CONTINUED

CONTAMINANT	RATE OR CONCENTRATION
Particulate (Average All Boilers) 1979-80	0.297 lbs/ 10^6 BTU

SECTION VII – PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data NA: See PSD Report, Section 5.0

1. _____ no sites _____ TSP _____( ) SO^2* _____ Wind spd/dir

Period of monitoring ___/___/___ to ___/___/___
month day year month day year

Other data recorded _____

Attach all data or statistical summaries to this application.

2. Instrumentation, Field and Laboratory

a) Was instrumentation EPA referenced or its equivalent? _____ Yes _____ No

b) Was instrumentation calibrated in accordance with Department procedures? _____ Yes _____ No _____ Unknown

B. Meteorological Data Used for Air Quality Modeling

1. 5 Year(s) of data from 1 / 1 / 70 to 12 / 31 / 74
month day year month day year

2. Surface data obtained from (location) West Palm Beach

3. Upper air (mixing height) data obtained from (location) Miami

4. Stability wind rose (STAR) data obtained from (location) West Palm Beach

C. Computer Models Used

1. ISC Short term (ISCST) 5 - year Modified? If yes, attach description.

2. ISC Long term (ISCST) 5 - year Modified? If yes, attach description.

3. _____ Modified? If yes, attach description.

4. _____ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate
TSP	4.49 grams/sec
SO^2	9.62 grams/sec

E. Emission Data Used in Modeling See PSD Report

Attach list of emission sources. Emission data required is source name, description on point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review. See PSD Report

*Specify bubbler (B) or continuous (C).

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources. See Bact Section

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology. See Bact. Section

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions*:

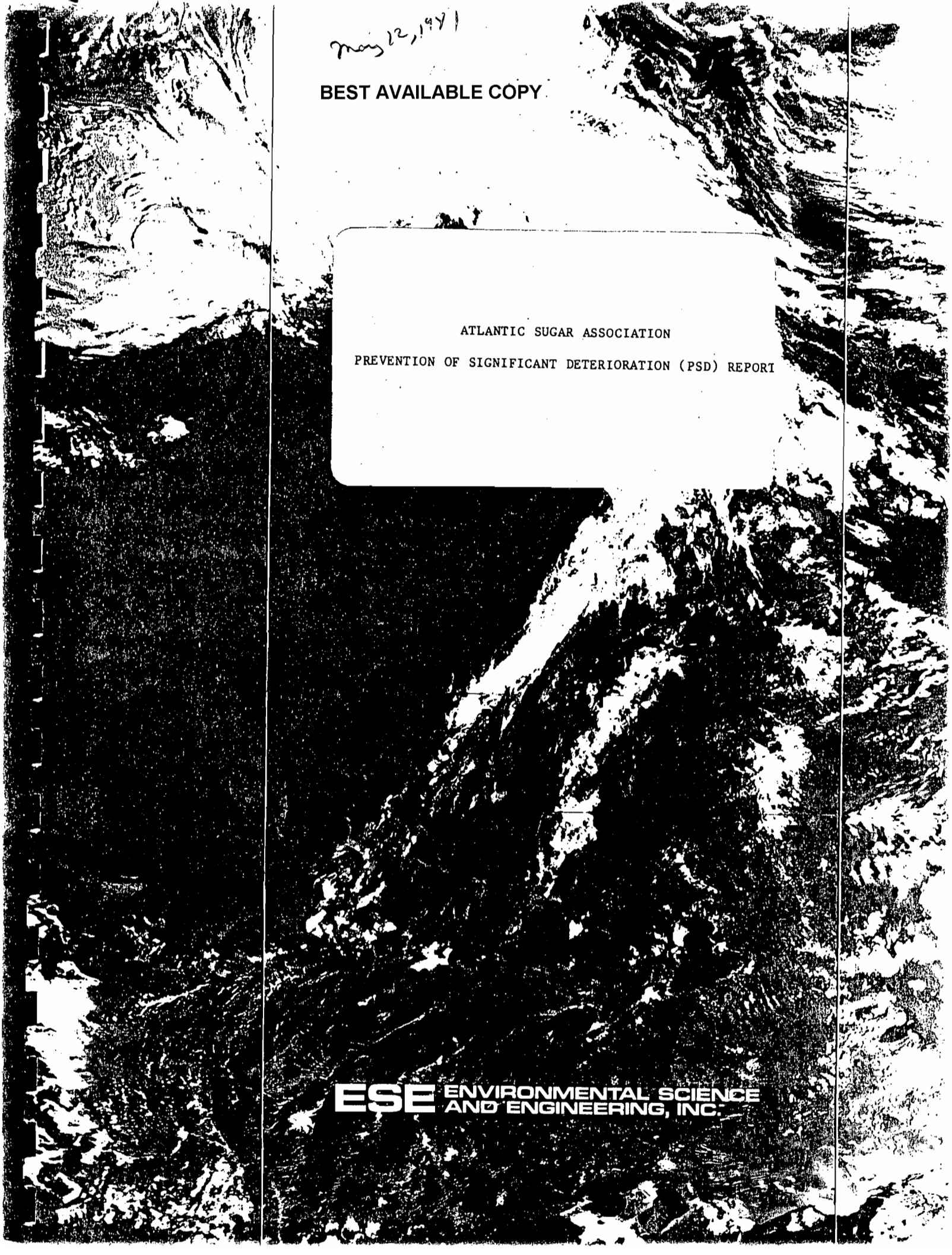
Contaminant	Rate or Concentration

(8) Process Rate*:

10. Reason for selection and description of systems:

*Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

May 12, 1981



ATLANTIC SUGAR ASSOCIATION

PREVENTION OF SIGNIFICANT DETERIORATION (PSD) REPORT

ESE ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.

ATLANTIC SUGAR ASSOCIATION

PREVENTION OF SIGNIFICANT DETERIORATION (PSD) REPORT

Prepared for:

ATLANTIC SUGAR ASSOCIATION

Prepared by:

ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.
Gainesville, Florida

ESE No. 81-120-100

May 1981

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1.0 SUMMARY

Atlantic Sugar Association (ASA) is proposing to construct and operate a bagasse-fired boiler at its existing sugar cane processing plant near the City of Belle Glade, Florida, in Palm Beach County (see Figure 5-1). Process steam to the existing sugar cane grinding mill will be supplied by the proposed boiler at a capacity of 100,000 lb steam/hour (lb/hr) at 250 psig and 500°F. The firing rate of wet bagasse for this maximum steam production will be 54,681 lb/hr.

The State of Florida Department of Environmental Regulation (DER) and United States Environmental Protection Agency (EPA) have promulgated regulations concerning the Prevention of Significant Deterioration (PSD). All new major sources of air pollution must undergo a PSD review to determine if significant deterioration will be caused by the proposed new source. The proposed action constitutes a new major source under both state and federal PSD regulations by virtue of an increase over specified emission levels for several air pollutants.

In response to these requirements, ASA contracted ESE to perform a PSD analysis for the proposed action. The analysis was conducted using suggested and approved EPA and Florida DER atmospheric dispersion models and modeling techniques. Results showed that allowable PSD increments and Ambient Air Quality Standards (AAQS) of the State of Florida will not be violated as a result of increased operation capacity of the mill due to the proposed boiler. The analysis was based upon the maximum predicted emissions from the proposed and existing units.

Best Available Control Technology (BACT) for all affected pollutants will be met by the proper utilization of appropriate control techniques and proper operation and maintenance procedures for the proposed boiler. A BACT analysis is presented in the construction permit aplications, which were submitted on March 24, 1981, to the State of Florida for state and federal review.

The operation of the proposed bagasse boiler is not expected to have a significant impact upon visibility, soils or vegetation, or any area which has been designated Class I for PSD purposes. This report provides an evaluation of the PSD analysis and provides a complete description of the methods, data bases, results, and conclusions of the study.

2.0 PROJECT DESCRIPTION

This PSD report concerns the impact analysis for a proposed major modification to the existing ASA sugar cane processing plant. The primary plant operation consists of sugar cane grinding. The by-products of the grinding operation are the raw juice and the fibrous cane residue, referred to as bagasse. This bagasse is then used to fire the process steam boilers.

Process steam for the grinding operation is currently produced by four power boilers. Two of the existing boilers (No. 1 and No. 2) are fired by bagasse and fuel oil. The remaining two boilers (No. 3 and No. 4) are fired by bagasse only. The proposed boiler No. 5, to be fired by bagasse, is an existing boiler which will be transferred from Glades Sugar to ASA. Site construction is scheduled for May 1981, with completion targeted for November 1981. Boilers No. 1 and No. 2 are required to fire a minimum amount of fuel oil. Boilers No. 3 and No. 4 show no fuel oil consumption in annual operating reports submitted to Florida DER for the years 1976 through 1980.

Stack parameters for all boilers are presented in Table 2-1. The modeled emissions for the boilers are presented in Table 2-2. The emissions for the existing boilers represent maximum fuel usage of both fuel oil and bagasse. The proposed emissions for boiler No. 5 represent maximum estimated emissions as submitted in the Florida DER construction permit application. Operating permit renewals for boilers No. 1, No. 2, and No. 3 were submitted to Florida DER in January, 1981. Boiler No. 4 is not scheduled for permit renewal until 1983.

Table 2-1. Stack Parameters for Atlantic Sugar Association Boilers

Source (Boiler No.)	Stack Height (m)	Temperature (°K)	Velocity (m/s)	Diameter (m)
1	18.90	346	12.71	1.92
2	18.90	342	10.89	1.92
3	18.90	341	17.52	1.83
4	18.29	344	15.03	1.83
5*	27.40	344	6.64	1.98

* Proposed. Parameters as submitted in Florida DER Construction Permit Application.

Source: ASA, 1981.

Table 2-2. Modeled Emissions for Existing ASA Boilers*

Boiler No.	Particulate (lb/hr)	SO_2 (lb/hr)	NO_x (lb/hr)
1	55.56	136.83	35.4
2	52.14	178.73	40.45
3	73.41	133.97	40.2
4	73.41	133.97	40.2
5†	35.65	76.37	41.46

* These emissions from boiler No. 5 were based on a maximum fuel usage of 55,749 lb/hr. This usage rate was later revised to 54,681 lb/hr (see Section 1.0). The revised rate would create slightly lower emissions than indicated here.

† Proposed. These emissions represent the estimated maximum emissions as submitted in the Florida DER construction permit application.

Sources: Atlantic Sugar Association, 1981.
ESE, 1981.

3.0 AIR QUALITY REVIEW REQUIREMENTS

The following discussion pertains to the air quality regulatory requirements that must be met for the major modification proposed by ASA. These requirements include demonstrating compliance with AAQS and PSD increment consumption.

3.1 AMBIENT AIR QUALITY STANDARDS (AAQS)

As a result of the requirements of the 1970 Amendments to the Clean Air Act (CAA), EPA enacted Primary and Secondary National AAQS (Federal Register, 1971) for six air pollutants. Primary National AAQS are required to protect the public health, and Secondary National AAQS are required to protect the public welfare from any known or anticipated adverse effects associated with the presence of pollutants in the ambient air.

Table 3-1 presents the existing applicable National and State of Florida AAQS. The State of Florida in January 1972 promulgated the Secondary National AAQS as the State AAQS. Since states have the discretion of adopting (or maintaining) AAQS more stringent than those established by EPA, the State of Florida has chosen to retain the annual AAQS and 24-hour secondary AAQS for sulfur dioxide (SO_2) that have been eliminated by EPA since 1971. Pollutants for which AAQS have been established are termed "criteria" pollutants.

Areas of the country in violation of any of the AAQS are designated as "nonattainment areas," and new or modified sources to be located in or near these areas may be subject to more stringent air permitting requirements than those in non-attainment areas. Palm Beach County has been designated as a nonattainment area for ozone. However, no areas within 100 km of the ASA site have received a nonattainment designation for any pollutant other than ozone.

Table 3-1. National and State of Florida AAQS Applicable to the Proposed Atlantic Sugar Association Modification

Pollutant	Averaging Time	National Primary Standard	National Secondary Standard	Florida
Suspended Particulate Matter	Annual Geometric Mean	75 ug/m^3	60 ug/m^3	60 ug/m^3
	24-Hour Maximum*	260 ug/m^3	150 ug/m^3	150 ug/m^3
Sulfur Dioxide	Annual Arithmetic Mean	80 ug/m^3	NA†	60 ug/m^3
	24-Hour Maximum*	365 ug/m^3	NA†	260 ug/m^3
	3-Hour Maximum*	NA†	1,300 ug/m^3	1,300 ug/m^3
Carbon Monoxide	8-Hour Maximum*	10 mg/m^3	10 mg/m^3	10 mg/m^3
	1-Hour Maximum*	40 mg/m^3	40 mg/m^3	40 mg/m^3
Hydrocarbons	3-Hour Maximum* (6 to 9 A.M.)	160 ug/m^3	160 ug/m^3	160 ug/m^3
Nitrogen Dioxide	Annual Arithmetic Mean	100 ug/m^3	100 ug/m^3	100 ug/m^3
Ozone	1-Hour Maximum*	235 ug/m^3	235 ug/m^3	160 ug/m^3
Lead	Calendar Quarter Arithmetic Mean	1.5 ug/m^3	1.5 ug/m^3	NA†

* Maximum concentration not to be exceeded more than once per year.
† No standard exists.

Source: 40CFR Part 50, 1980.

3.2 PREVENTION OF SIGNIFICANT DETERIORATION (PSD)

3.2.1 General Requirements

Under federal PSD review requirements, all major new or modified sources of air pollutants regulated under the CAA must be reviewed and approved by EPA (or in this case, reviewed by Florida DER since technical and administrative review authority before final approval by EPA has been delegated to the state). A "major stationary source" is defined as any one of 28 named source categories which has the potential to emit 100 tons per year or more, or any other stationary source which has the potential to emit 250 tons per year or more, of any pollutant regulated under the Act. "Potential to emit" means the capability at maximum design capacity to emit a pollutant after the application of control equipment (40 CFR 52.21).

"Major modification" means any physical change in the design or operation of a major stationary source, or a series of contemporaneous changes in the design or operation of a major stationary source, that would result in a significant net increase in the source's potential to emit the pollutant for which the source is major (40 CFR 52.21). "Significant" is defined as any increase in emissions in excess of specified levels (Table 3-2).

The PSD review is used to determine whether significant air quality deterioration will result from the new or modified source. This section addresses PSD requirements contained in 40 CFR 52.21, Prevention of Significant Deterioration of Air Quality, and in the State of Florida PSD Regulations, Chapter 17-2, Florida Administrative Code. Major sources are required to undergo the following federal reviews related to PSD:

1. Control technology review,
2. Air quality review,
3. Monitoring,

Table 3-2. Significant Emission Rates and De Minimis Air Quality Impact Levels

Pollutant	De Minimis Emission Rate (tons per year)	De Minimis Air Quality Impact Level
Carbon Monoxide	100	575 ug/m^3, 8-hour average
Nitrogen Dioxide	40	14 ug/m^3, 24-hour
Total Suspended Particulates	25	10 ug/m^3, 24-hour
Sulfur Dioxide	40	13 ug/m^3, 24-hour
Ozone*	40 (volatile organic compounds)	
Lead	0.5	0.1 ug/m^3, 3-month
Mercury	0.1	0.25 ug/m^3, 24-hour
Beryllium	0.0004	0.0005 ug/m^3, 24-hour
Asbestos	1	†
Fluorides	3.0	0.25 ug/m^3, 24-hour
Sulfuric Acid Mist	7	†
Vinyl Chloride	1.0	15 ug/m^3, maximum value
Total Reduced Sulfur Hydrogen sulfide	10	10 ug/m^3, 1-hour
Reduced Sulfur Compounds (including H_2S)	10	10 ug/m^3, 1-hour
Hydrogen sulfide	10	0.023 ug/m^3, 1-hour
Benzene	0	0
Radionuclides	0	0
Inorganic Arsenic	0	0

* A de minimis air quality level is not given for ozone. However, a plant which is subject to PSD review and has a net increase of 100 tons per year of volatile organic compounds would be required to perform an ambient air quality analysis.

† No satisfactory monitoring technique available at this time.

Source: EPA, 1980, 40CFR Part 52, Section 52.21.

4. Source information, and
5. Additional impact analyses.

The control technology review includes determination of BACT for each applicable pollutant. BACT information is contained in the DER construction permit application submitted March 24, 1981.

Source impact analysis requires demonstration of compliance with federal and state AAQS and allowable increment limitations (see Table 3-3). Projected ambient impacts upon designated nonattainment areas and federally promulgated Class I PSD areas must also be addressed. The monitoring portion of PSD review requires an analysis of continuous ambient air monitoring data to be performed for the impact area of the proposed source. Source information, including process design parameters and control equipment information, must be submitted to the reviewing agencies. Additional impact analyses of the proposed source's impact upon soils, vegetation, and visibility, especially pertaining to Class I PSD areas, must be performed.

Florida DER has promulgated PSD regulations similar to those of EPA. Table 3-4 presents the applicable PSD regulations of both Florida DER and EPA. Some important differences between the state and federal review requirements do exist. The first is in the definition of "potential to emit," which determines if a new or modified source is "major" and therefore subject to PSD review. EPA defines "potential to emit" as emissions after control and takes into account any decrease in emissions due to the application of control equipment which has been incorporated into the design of the source. Florida DER defines "potential emissions" as those emissions before the application of control equipment, unless such equipment is an inherent part of the process. The second major difference is in the EPA and Florida DER definition of "baseline" air quality. The discussions that follow describe in more detail the PSD requirements for the state and federal regulations, including the difference in baseline analysis.

Table 3-3. Federal and State of Florida PSD Allowable Increments (ug/m^3)

Pollutant/Averaging Time	Class I	Class II	Class III
Particulate Matter			
Annual Geometric Mean	5	19	37
24-Hour Maximum*	10	37	75
Sulfur Dioxide			
Annual Arithmetic Mean	2	20	40
24-Hour Maximum*	5	91	182
3-Hour Maximum*	25	512	700

* Maximum concentration not to be exceeded more than once per year.

Sources: Public Law 95-95, Clean Air Act Amendments of 1977.
Federal Register, Vol. 43, No. 118, June 19, 1978.

Table 3-4. PSD Regulations Applicable to the Proposed Atlantic Sugar Association Modification

Requirement	Federal Regulation*	State of Florida Regulation†
General Source Applicability	40 CFR 52.21(i)	FAC 17-2.04(1)
Control Technology Review	40 CFR 52.21(j)	
New Source Performance Standards	40 CFR 52.21(j)(1)	FAC 17-2.03(1)(a)
Best Available Control Technology	40 CFR 52.21(j)(2)	FAC 17-2.04(6)(c)
Source Impact Analysis	40 CFR 52.21(k)	
Ambient Air Quality Standards	40 CFR 52.21(k)(1)	FAC 17-2.04(6)(a)
Allowable Increments	40 CFR 52.21(k)(2)	FAC 17-2.04(6)(a)
Air Quality Analysis (Monitoring)	40 CFR 52.21(m)	
Source Information	40 CFR 52.21(n)	FAC 17-2.04(6)(a)
Stack Heights	40 CFR 52.21(h)	
Additional Impact Analyses	40 CFR 52.21(o)	
Public Participation	40 CFR 52.21(q)	FAC 17-2.04(9)
Referenced Requirements		
Best Available Control Technology	40 CFR 52.21(b)(10)	FAC 17-2.03
Ambient Air Quality Standards	40 CFR 50	FAC 17-2.06(1)
Allowable Increments	40 CFR 52.21(c)	FAC 17-2.04(1)

* CFR = Code of Federal Regulations, 1980.
† FAC = Florida Administrative Code, Chapter 17-2, Supplement 101.

Sources: Code of Federal Regulations, 1980.
Florida Administrative Code, Chapter 17-2, Supplement 101.

3.2.2 EPA PSD Review Requirements

3.2.2.1 Applicability--When determining the level of EPA PSD review applicable to ASA's proposed modification, the predicted net emissions increase from the modification is compared with the significant emission rates presented in Table 3-2 (the proposed boiler's emissions, shown in Table 2-2, represent the net change in emissions because no contemporaneous emission reductions are associated with the proposed action). Each pollutant showing a net emissions increase which is predicted equal to or greater than the appropriate significant rate must undergo PSD review. As the comparison shows, emissions of particulate matter, SO_2, hydrocarbons (HC), and nitrogen dioxide (NO_2) are above the appropriate levels. As such, an air quality analysis (AAQS and/or increment consumption) was conducted for these pollutants for EPA review.

3.2.2.2 Ambient Monitoring--Proposed new and modified sources are exempt from the new monitoring requirements associated with the air impact analysis if an otherwise complete PSD application is submitted prior to June 7, 1981 and the applicant complies with the 1978 PSD monitoring requirements. Since ASA is submitting this PSD application prior to June 7, 1981, the use of existing ambient data (see Section 5.0) upon approval of the reviewing agency is permitted under the 1978 regulations; therefore, this exemption applies to ASA.

3.2.2.3 Baseline--The term "baseline" evolves from federal and state PSD regulations and denotes a fictitious concentration level corresponding to a specified baseline date and certain additional baseline sources. Baseline should not be confused with "background," which, for this PSD report, refers to concentration levels due to sources not accounted for in the point source emission inventories (i.e., natural and distant manmade sources).

EPA defines baseline concentration as:

> . . . that ambient concentration level which exists in the baseline area at the time of the applicable baseline date. A baseline concentration is determined for each pollutant for which a baseline date is established and shall include:
>
> 1. The allowable emissions of major stationary sources which commenced construction before January 6, 1975, but were not in operation by the applicable baseline date;
>
> 2. The actual emissions representative of sources in existence on the applicable baseline date, except for those listed below, which will affect the maximum allowable increases:
>   a. Actual emissions from any major stationary source on which construction commenced after January 6, 1975; and
>   b. Actual emissions increases and decreases at any stationary source occurring after the baseline date.

When considering actual emission rates, EPA is referring to emissions estimated from source records and any other information reflecting actual source operation over the 2-year time period preceding the baseline date. The baseline date is 1977 and is applicable for both particulate matter and SO_2 for all attainment areas of the state. When applying the baseline emissions concept, EPA does not require the establishment of a formal baseline concentration.

When considering factors such as hours of operation, capacity utilization, and types of materials combusted, processed, and/or stored, the values existing at the baseline date will generally be used; however, the EPA baseline emissions concept can also include future increases in hours of operation or capacity utilization as they occur, if it is demonstrated that a source's operation after the baseline date is more representative of normal operation than its operation preceding the baseline date (Federal Register, 1980).

3.2.2.4 Additional Impact Analysis--In addition to air quality impact analyses, the federal PSD regulations require additional analyses of the impairment to visibility and the impacts upon soils and vegetation that would occur as a result of the source. This analysis is to be conducted primarily for Class I PSD areas. Impacts due to general commercial, residential, industrial, and other growth associated with the source must also be addressed.

3.2.3 Florida DER PSD Review Requirements

3.2.3.1 Applicability--All new or modified major emitting facilities ("major stationary source" under EPA regulations) located in attainment areas are subject to PSD review on the state level. According to Florida DER guidelines, once BACT is determined, the applicant (ASA) may proceed with a PSD analysis on the proposed facility. A BACT application was submitted to DER on March 24, 1981.

3.2.3.2 Ambient Monitoring--All preconstruction monitoring to determine the air quality status of an area should be conducted in accordance with the 1978 EPA PSD regulations (i.e., "Ambient Monitoring Guidelines for Prevention of Significant Deterioration," EPA-450/2-78-019). Compliance with these requirements are presented in Section 4.0.

3.2.3.3 Baseline--State of Florida--The State of Florida has defined baseline concentration for PSD purposes to mean:

> For sulfur dioxide and particulate matter, the applicable ambient concentration levels existing during 1974 plus any additional concentrations for the area of impact estimated to result from sources permitted for construction but not operating prior to January 1, 1975 . . . In the case of the 3-hour and 24-hour concentrations, only the second highest concentrations shall be considered [Florida Administrative Code, Chapter 17-2.02(14)].

In October 1978, the Florida DER Bureau of Air Quality Management published "Guidelines on Prevention of Significant Deterioration (PSD)--PSD Review." The document states: "Baseline emissions data consist of the January 1, 1975 allowable emission rates and January 1, 1975 stack configurations for all sources holding either an operating or construction

permit during any part of 1974." As a result, Florida DER requires the formal establishment of a baseline concentration level. Because of the adopted definition, only modeling can be utilized to determine the baseline levels.

3.2.4 Modeling

The PSD regulations specifically require the use of atmospheric dispersion models in performing impact analysis, estimating baseline and future air quality levels, and determining compliance with the AAQS and the allowable PSD increments. Guidance for the use and application of dispersion models is presented in the EPA publication, "Guideline on Air Quality Models" (EPA, 1978a). (Note: Recently, EPA has held conferences and distributed revised guidelines in draft form.) The models used in the ASA PSD analysis were the long-term (ISCLT) and short-term (ISCST) Industrial Source Complex models.

Various lengths of record for meteorological data can be utilized for short-term modeling. A 5-year period can be used with corresponding evaluation of highest, second-highest concentrations for comparison to AAQS or PSD increments. The term "highest, second-highest" refers to the highest at all receptors of the second-highest concentrations (i.e., the highest concentration at each receptor is discarded). The second-highest concentration is significant because the short-term AAQS specify that the level should not be exceeded at any location more than once a year. If less than 5 years of meteorological data are used, the highest concentration at any location must be used.

3.2.5 Good Engineering Practice Stack Height

The 1977 Clean Air Act Amendments (CAAA) require that the degree of emission limitation required for control of any pollutant not be affected by a stack height that exceeds good engineering practice (GEP) or any other dispersion technique. On January 12, 1979, EPA promulgated proposed regulations on stack heights. The proposed GEP stack height means the highest of:

a) 30 meters, or

b) a height established by applying the formula:

$$H_g = H + 1.5L \qquad \text{Equation 1}$$

where: H_g = GEP stack height,

H = Height of the structure or nearby structure, and

L = Lesser dimension (height or width of the structure or nearby structure).

"Nearby" is defined for a specific structure or terrain feature as that distance equal to five times the lesser of the height or width dimension of the structure or terrain feature not greater than one-half mile (EPA, 1978d). While the actual stack height employed can exceed this height, modeling for determining compliance with AAQS and PSD increments must incorporate the GEP stack height.

The influencing structure for the proposed boiler stack is the Mill building, which has a height of 93 feet, 10 inches, and a width of 97 feet, 9 inches. Using Equation 1, GEP stack height for the proposed boiler stack is 234.5 feet. The proposed stack height is 90 feet.

4.0 ATMOSPHERIC DISPERSION MODELING METHODOLOGY

4.1 GENERAL

To evaluate completely the impact of emissions and to determine compliance with AAQS and other regulations, the relationship between atmospheric emissions and air quality must be established. One approach to determine this relationship is to assume that a change in emissions would cause a proportionate change in air quality. This approach, however, does not explicitly include the effects of meteorology, topography, and stack gas parameters. Therefore, this method does not ensure an accurate estimate of the impact of emissions on the overall air quality.

In response to this deficiency, the air quality dispersion model has become an accepted method for estimating the spatial distribution of pollutant concentrations. Currently, the dispersion models are generally restricted to nonreactive or slow-reacting pollutants, such as SO_2, particulate matter, and CO. Current state-of-the-art techniques in dispersion modeling cannot accurately predict concentrations for reactive pollutant species such as NO_2, HC, and photochemical oxidants.

Mathematical dispersion models simulate the effects of stack height, stack flow parameters, source distributions, and atmospheric elements such as air flow and mixing on the transport and dispersion of pollutants emitted into the atmosphere. Dispersion models are useful for calculating the spatial distribution of concentrations that result from various sources, and these models can be utilized to estimate ground-level concentrations for extreme meteorological conditions. Figure 4-1, which illustrates the procedure to follow in applying a mathematical model, shows that by compiling existing emissions, meteorological, and air quality data, a dispersion model can estimate the impact of source emissions on air quality. The model is also useful in predicting the relative change in air quality as a result of varying emission parameters, meteorological conditions, and source distributions.

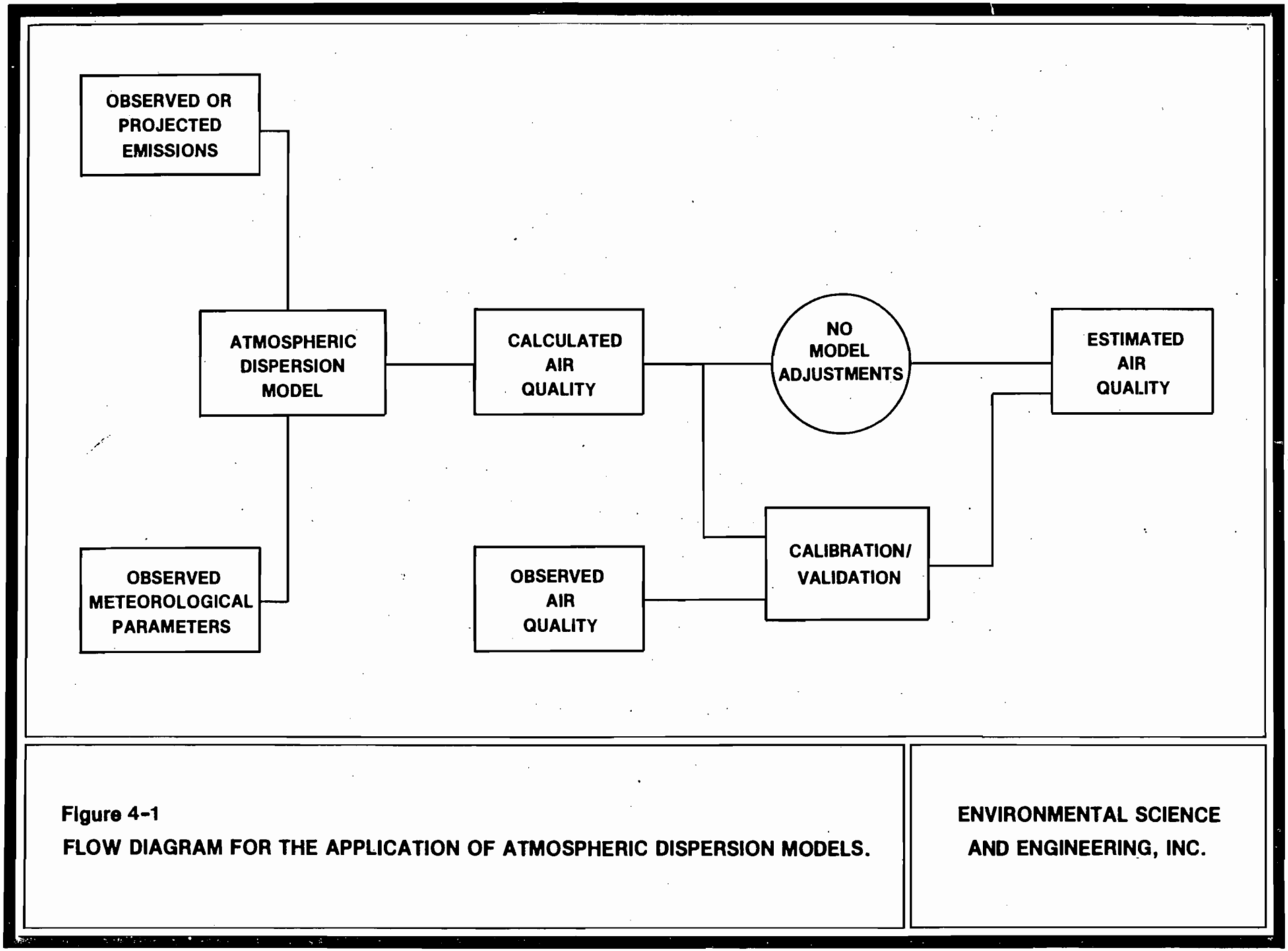

Figure 4-1

FLOW DIAGRAM FOR THE APPLICATION OF ATMOSPHERIC DISPERSION MODELS.

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EPA has developed several dispersion models which use the Gaussian diffusion equation. The basic formulation of the Gaussian equation assumes that the ground-level concentration is inversely proportional to the mean wind speed. The Gaussian distribution describes the horizontal and vertical pollutant dispersion in a plane normal to the wind direction.

An atmospheric dispersion model can be defined as a mathematical description of the transport, dispersion, and transformation processes that occur in the atmosphere. In the case of SO_2, it is generally assumed that chemical conversion of this substance is small with respect to its average residence time in the atmosphere. In the case of particulate matter, it is assumed that no particles are scavenged from the atmosphere by fallout or washout. These conservative assumptions tend to result in higher predicted concentrations than actual measured concentrations.

Florida DER and EPA Ambient Air Quality Standards are for annual, 24-hour, 8-hour, and 3-hour periods of time; therefore, the dispersion models must predict concentrations for various averaging times. Most dispersion models, however, estimate concentrations for a 1-hour period or for seasonal or annual time periods. If an average concentration for an intermediate period is required, then, two options, both of which are approved by EPA and Florida DER, are available:

1. The short-term model can be used to estimate concentrations hour by hour for the period of interest, and an average of all hours can be taken with consideration given to an appropriate calibration factor.
2. Statistical techniques suggested by Larsen (1971) for log-normally distributed data or empirical techniques as summarized by Strom (1976) for point sources can be utilized to convert a concentration from one averaging time to another.

In this study, Method 1 was utilized to determine point source impacts for the annual, 24-hour, 8-hour, 3-hour, and 1-hour averaging times.

The long-term AAQS for TSP is expressed in terms of an annual geometric mean. The air dispersion models, however, calculate annual arithmetic mean concentrations. Therefore, a method of conversion from arithmetic mean to geometric mean concentration is necessary in order to compare estimates with air quality standards. Larsen (1971) has developed an equation which expresses the relationship for log-normally distributed data:

$$Mg = \frac{M_{aa}}{\exp\ (0.5\ \ln^2 S_g)} \qquad \text{Equation 2}$$

where: M_g = geometric mean
M_{aa} = arithmetic mean
S_g = standard geometric deviation

An analysis of many years of ambient TSP data indicates that the log-normal assumption is a good approximation for suspended particulates in suburban and rural areas. This analysis also shows that S_g values normally range from 1.0 to 2.0 for an annual period, with a typical value of 1.5. Inserting an S_g of 1.5 into Equation 2 results in a M_g/M_{aa} ratio of 0.92. This ratio is used to convert arithmetic mean TSP levels to geometric mean TSP levels, based upon the modeling results.

4.2 COMPUTER MODELS

Two EPA-approved computer models were used to estimate or predict the grond-level pollutant concentrations in this study. The Industrial Source Complex Model Long Term (ISCLT) was used to predict annual impacts, and the Industrial Source Complex Model Short Term (ISCST) was used for impact predictions for shorter averaging times.

In the ISCLT, sources within a 50-km radius were modeled. The impact area receptor grid for the model covered a 25-km area surrounding the ASA site, with receptors placed at a 0.1-km spacing.

In the ISCST, the receptors were spaced at 0.2-km radials beginning at the nearest properly line, 3.9 km from the site. The worst case meteorology was determined from this modeling. The ISCST model allows the user to input spacially distributed sources and was also used for receptor refinement (at a 0.1-km spacing) to resolve the maximum impact predictions. The short-term modeling case runs and meteorological periods are presented in Table 4-1.

4.3 METEOROLOGY

Meteorological data used in the ISC modeling were obtained from the West Palm Beach Airport for the years 1970 through 1974. Approximately 181 days of the meteorological data were used for each year to cover the operation of the sugar mill from October to April. The recorded data included wind direction, wind speed, stability class, mixing depth, and ambient temperature for each hour. The wind directions are randomized within a 10-degree sector by EPA's randomization scheme. In the ISCST, the model processed each hour of the data set to estimate hourly concentrations over the 5-year period. These concentrations were averaged over each applicable averaging period to provide the user with the desired concentrations.

The ISCLT utilized the data record as a joint frequency distribution of wind direction, wind speed, and atmospheric stability class over the 5-year period. This data format is provided by the National Climatic Center's (NCC) "Star" program. In addition, annual averaged values of temperature, pressure, and maximum afternoon mixing heights are utilized. These data are used in the ISCLT to estimate the spacial distribution of annual averaged concentrations of baseline and future ambient concentration levels.

4.4 EMISSIONS INVENTORY

The area within 50 km of the ASA site was inventoried for point sources or particulate and SO_2 emissions. The basis for this inventory was the Air Permit Inventory System (APIS).

Table 4-1. Short-Term Modeling Case Runs and Corresponding Meteorological Periods for ASA

ASA Maximum Impacts	Day/Year
3-hr SO_2	23,2/1973
24-hr SO_2	325/1973
24-hr TSP	325/1973

Maximum Interactions With:	3-hr SO_2 Day/Year	24-hr SO_2 Day/Year	24-hr TSP Day/Year
Osceola Farms	61,8/1970	50/1973	50/1973
U.S. Sugar Bryant	277,1/1970	50/1973	50/1973
Florida Refinery	15,8/1970	14/1971	14/1971
Gulf & Western	363,1/1973	62/1973	62/1973
Tallisman	331,7/1971	356/1971	363/1970
SCGC	87,2/1972	280/1972	280/1972

Source: ESE, 1981.

In addition, construction permit applications submitted during 1981 were also accounted for, and the maximum emission rates contained therein were used.

4.5 AIR QUALITY IMPACT DETERMINATION

As discussed in Section 4.3, 181 days of meteorological data were used in the computer models. The time period from October to April represents the seasonal operating time of the sugar mill. This mainly affects the long-term modeling since the results will represent 181-day averages as opposed to the 365-day annual standard averages. The ISCLT model was used to estimate annual average ground-level concentrations for TSP and SO_2. For these pollutants, modeling was performed for permitted sources within a 50-km radius, including the ASA boilers. For annual NO_x, only the ASA boilers were modeled using the ISCLT. A conservative assumption that all NO_x is emitted in the form of NO_2 or is converted to NO_2 by the time the plume impacts the ground was made. In addition, it was also assumed that NO_2 is nonreactive. All annual model printouts are included in Appendix A.

The evaluation of short-term maximum concentrations for TSP and SO_2 for the proposed Boiler No. 5 and the four existing units in operation was made using the ISCST. The appropriate highest, second-highest concentrations were determined for ASA only, as well as ASA interaction with the following sources:

1. The Florida Sugar Refinery (6.1 km from ASA),
2. U.S. Sugar Bryant (28.3 km from ASA),
3. Osceola Farms (23.9 km from ASA),
4. Talisman Sugar (27.4 km from ASA),
5. Gulf & Western (28.4 km from ASA), and
6. Sugar Cane Growers Coop (19.7 km from ASA).

4.6 INCREMENT CONSUMPTION DETERMINATION

It has been determined through a review of the Florida DER emission inventory that two increment consuming sources are currently in the

area, and two sources are in the process of submitting PSD applications. Both sources (U.S. Sugar Bryant, Gulf Western, Osceola Farms, and Sugar Cane Growers Coop) are located over 15 km from ASA; however, these sources were nevertheless considered for short term interaction.

Because of the different baseline dates and because EPA considers actual baseline concentrations while Florida DER considers allowable baseline emissions, two baseline scenarios were modeled. Worst-case meteorological conditions were determined from ISCST executions considering DER and EPA baseline emissions for ASA.

Baseline interactions with U.S. Bryant and Osceola were not made because the maximum impacts from ASA alone exceeded any air quality interactions with the two sources for projected conditions. As a result, considering the distances to all increment consuming sources, increment consumption would occur primarily from ASA.

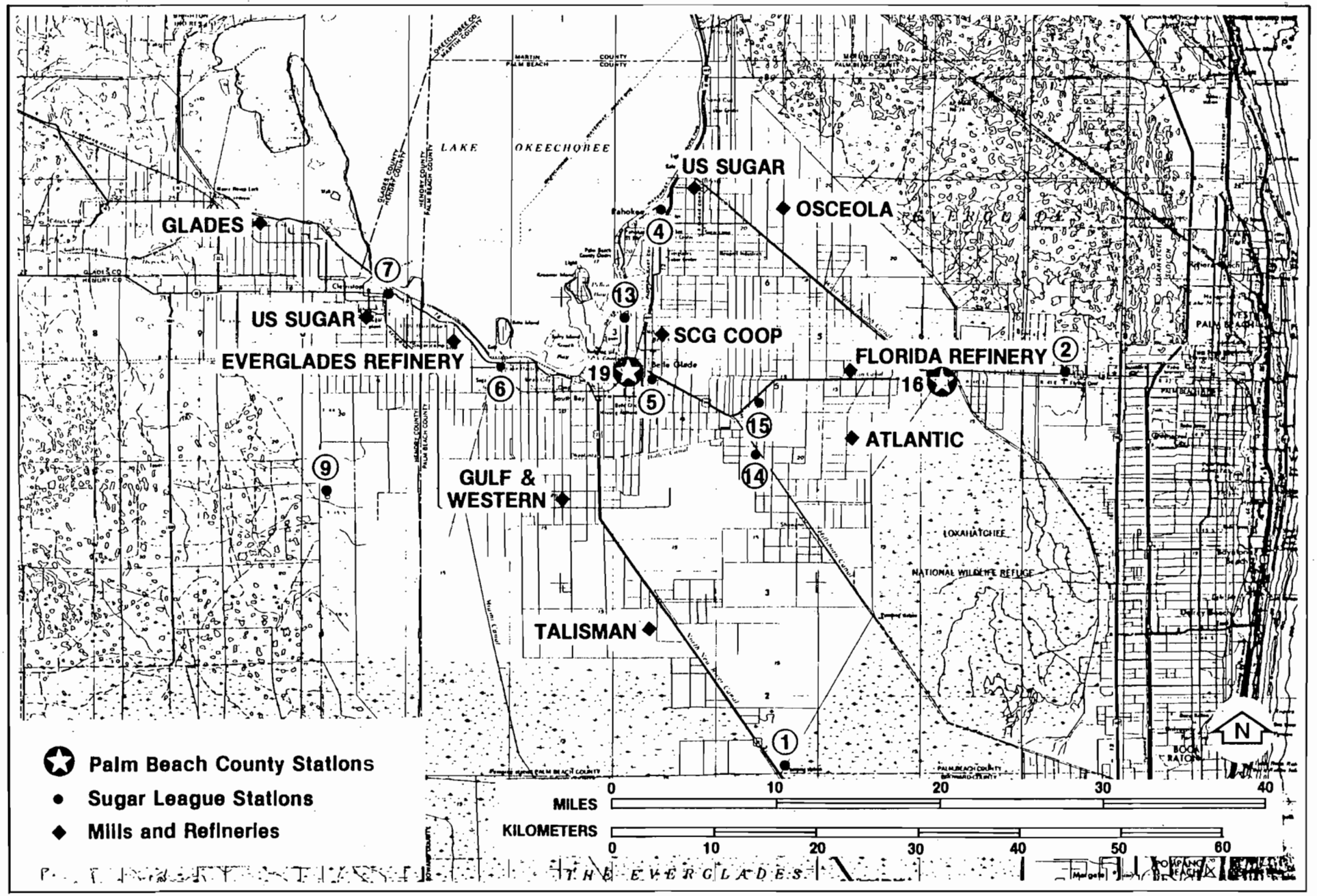
5.0 MONITORING DATA

The Clean Air Act Amendments of August 1977 require that the owner of any proposed major air pollution source conduct ambient air monitoring for applicable pollutants for a period of 1 year prior to submission of a construction permit application. The use of existing representative data may be permitted in lieu of monitoring, provided the data meet EPA PSD monitoring criteria. Assuming this application is complete before June 8, 1981, the monitoring provisions of the 1978 PSD regulations will apply. Under these regulations, monitoring was required only for criteria pollutants for which the source was major or a major modification. A major modification was defined as an increase in potential uncontrolled emissions from a new facility within the source of either 100 tons per year (28 listed source categories) or 250 tons per year. The ASA plant is one of the 28 named categories on the basis of a combined boiler heat input rate of greater than 250 MMBtu/hr. As such, the proposed modification, under the 1978 PSD regulations would be subject to ambient monitoring data submission for SO_2, particulate matter, and NO_x.

5.1 TOTAL SUSPENDED PARTICULATE (TSP)

The Florida Sugar Cane League (FSCL) and Palm Beach County (PBC) maintain a network of hi-vol monitors in the sugar producing area of the state. The monitoring is conducted on a 6-day monitoring cycle using the EPA reference method (40 CFR Part 50 App. B). Figure 5-1 shows the location of these monitors, and four additional monitors considered appropriate for determination of a background concentration value. Table 5-1 summarizes the most recently available data from the monitors. No violations of the 150-ug/m^3 24-hour or 60-ug/m^3 annual geometric mean standards have been observed during 1980.

For each station, the concentration one (1) standard deviation above the geometric mean was calculated. For lognormally distributed data, 84 percent of the observed values are below this value. Correlation coefficients for a lognormal fit of the FSCL data are all above 0.990,



SOURCES: FLORIDA SUGAR CANE LEAGUE.
ENVIRONMENTAL SCIENCE AND ENGINEERING, INC., 1981.

Figure 5-1 REGIONAL HI-VOL MONITORS

Table 5-1. Summary of 1980 Ambient TSP Monitoring Data (24-Hour Average, ug/m^3)

Station*	Number of Observations	Maximum	Second Maximum	Arithmetic Mean	Geometric Mean	Geometric Standard Deviation	Correlation Coefficient	84th Percentile†
SL-1	54	103	79	46	42	1.50	0.979	64
SL-2	57	78	68	30	27	1.55	0.989	42**
SL-4	60	110	89	54	50	1.42	0.983	72
SL-5	58	107	107	64	60	1.40	0.978	85
SL-6	60	115	100	43	39	1.56	0.995	61
SL-7	53	102	83	45	42	1.44	0.968	61
SL-9	56	49	44	24	23	1.45	0.992	32**
SL-13	57	106	92	36	32	1.66	0.969	53
SL-14	60	102	100	40	35	1.65	0.993	58
SL-15	51	105	90	47	43	1.51	0.990	65
PB-16	60	68	67	34	32	1.44	--††	46**
PB-19	61	110	96	59	57	1.34	--††	76

* SL = Sugar League Data
PB = Palm Beach County Data.

† $C_{.84}$ = M Sg (1-0.5 in Sg)
$C_{.84}$ = 84th percentile concentration
M = arithmetic mean
Sg = geometric standard deviation (Larson, 1971).

** Background station.

†† Not available from annual report.

Source: ESE, 1981.

indicating a very close approximation of the lognormal distribution (correlations not available for PBC stations). Stations 1, 2, 9 and PB16 are greater than 10 km from any point source and yet affected by the same meteorology as the proposed source. As such, they are considered regional monitors, and a statistical analysis of their data was performed to establish a background concentration.

Construction on Highway U.S. 27 near Station 1 began in January 1980 and clearly influenced results at that station during that year. The average 84th-percentile value among the remaining three stations was 40 ug/m^3, which was taken to be an appropriate short-term background concentration. The probability of the 84th-percentile or higher concentration occurring in combination with meteorological conditions causing highest, second-highest 24-hour point source impacts is less than once in 15 years. The highest geometric mean of the three background stations is 32 ug/m^3 and was used as the annual background TSP level in the ASA computer modeling study.

5.2 SULFUR DIOXIDE (SO_2)

The only continuous SO_2 monitoring data available were obtained with a Beckman 906A analyzer n combination with selective scrubbers. During 1976 and the first three quarters of 1977, the monitor was located in downtown Belle Glade. The highest 1-hour reading during this period was 257 ug/m^3.

In November 1977, the monitor was moved to the IFAS Agricultural Research and Education center outside Belle Glade. The data recorded at that location are summarized in Table 5-2. The highest values recorded were 210 ug/m^3 (3-hour), 115 ug/m^3 (24-hour), and 18 ug/m^3 (annual). Monitoring for SO_2 was discontinued in June 1979 because of consistently low readings during the previous 4 years.

The Palm Beach County Health Department operated a continuous SO_2 monitor at the Belle Glade Water Treatment Plant until May 1978. The highest 3-hour and 24-hour averages recorded in 1977 were 76 ug/m^3

Table 5-2. Summary of Sulfur Dioxide Monitoring Data, 1978 to 1979, Florida Sugar Cane League

Year	Quarter	Number of Observations	Highest 3-Hour (ug/m^3)	Highest 24-Hour (ug/m^3)	Arithmetic Average (ug/m^3)
1978	1	--	210	115	34
	2	--	47	24	8
	3	1,788	123	55	26
	4	1,762	52	31	13
	Annual	--	--	--	18
1979	1	1,900	52	26	9
	2	1,893	66	45	5
	Year to date	--	--	--	8

Note: Monitor is located at the IFAS Agricultural Research and Educational Center outside the city of Belle Glade.

Source: Florida Sugar Cane League, 1981.

and 42 ug/m^3, respectively. The highest 3-hour and 24-hour averages recorded in 1978 before the monitor was discontinued were 113 ug/m^3 and 50 ug/m^3, respectively.

A background concentration of 20 ug/m^3 was assumed for modeling purposes (EPA, 1978a).

5.3 NITROGEN OXIDES (NO_x)

NO_x monitoring data is not available for the ASA area. On the basis that the ASA plant is a remote source and does not pose a threat to the NO_2 AAQS (see Section 6.1.3), a background level of 20 ug/m^3 was assumed (EPA 79).

6.0 IMPACT ANALYSIS RESULTS

6.1 AIR QUALITY

6.1.1 Sulfur Dioxide (SO_2)

SO_2 emissions are generated by the firing of both fuel oil and bagasse in the ASA process steam boilers. Table 6-1 presents the predicted highest, second-highest ground level SO_2 concentrations for the projected conditions (maximum for annual average) and compares these concentrations with the standards. This comparison shows that the predicted results are all well below AAQS.

The maximum predicted seasonal impact is 73 including background. The highest, second-highest 24-hour and 3-hour predicted concentrations are 110.6 ug/m^3 and 357.4 ug/m^3, respectively, including the background concentration. These predicted levels are 91 percent, 43 percent, and 27 percent of the applicable AAQS, respectively. The maximum predicted interaction SO_2 impacts between ASA and the Florida Refinery, U.S. Sugar, Bryant, and Osceola are presented in Table 6-2. Also presented are the maximum impacts from ASA alone showing that the interaction concentrations do not determine the maximum impact from the proposed action.

6.1.2 Particulate Matter

Particulate emissions are generated by the firing of both fuel oil and bagasse in the ASA boilers. The highest, second-highest predicted 24-hour ground-level concentration is 79.4 ug/m^3 (see Table 6-1) and includes a 40 ug/m^3 background concentration. The predicted maximum seasonal geometric mean TSP impact is 47 ug/m^3 (including background). The TSP interaction modeling results are presented in Table 6-2. As with SO_2, modeling predicted concentrations form ASA alone represent the maximum impact.

6.1.3 Nitrogen Oxides (NO_x)

The AAQS for NO_x is determined on an annual basis. The maximum predicted annual NO_x concentration, (including background) ASA only, is 29 ug/m^3 (see Table 6-1) and is 29 percent of the standard.

Table 6-1. Proposed Atlantic Sugar Association Modification: Maximum Predicted Ground-Level Concentrations (ug/m^3)

Pollutant	Averaging Time	Highest, Second-Highest Concentration (ug/m^3) Without Background	Background Concentration**	With Background	State of Florida Standard
Sulfur Dioxide	3-Hour	337.4	20	357.4	1,300*
	24-Hour	110.6	20	130.6	260*
	184-Day	53	20	73	
Particulate Matter	24-Hour	39.4	40	79.4	150*
	184-Day	15		47	75
Nitrogen Dioxide	184-Day	9	20	29	100

* Can be exceeded once per year.
† Calculated from the 181-day arithmetic mean and geometric standard deviation obtained from ambient monitoring.
** Based upon highest recorded concentrations from ambient monitoring.

Source: ESE, 1981.

Table 6-2. Highest, Second-Highest Predicted Short-Term TSP and SO_2 Concentrations (ug/m^3)*

	3-Hour SO_2	24-Hour SO_2	24-Hour TSP
ASA Only	337.4	90.6	39.4
U.S. Sugar Bryant/ ASA	191.2	61.3	28.0
Osceola Farms/ ASA	263.0	62.4	27.5
Florida Refinery/ ASA	263.0	39.8	16.7
Gulf & Western/ ASA	357.7	58.8	24.6
SCGC/ASA	302.6	53.4	25.5
Tallisman/ASA	232.2	39.1	16.2

* Levels do not include background concentrations.

Source: ESE, 1981.

6.2 PSD INCREMENTS

Because of the difference in baseline dates as well as the basis of emissions (see Section 3) the PSD increment consumption analysis was different for Florida DER review than for EPA review. As such, increment consumption for EPA will be discussed independent of Florida DER.

6.2.1 EPA Increment Consumption

The EPA baseline date is August 7, 1977, and considers actual emissions over the 2-year period prior to that date for baseline modeling. For the EPA baseline modeling, the ASA inventory included boilers No. 1 through 4 with the emissions controlled by scrubbers. The predicted maximum short-term increment consumption of the proposed action for ASA is based upon the greatest difference, on a receptor-by-receptor basis, between the baseline ISCST modeling results and the ISCST modeling results representing the proposed condition. The maximum predicted increment consumptions are presented in Table 6-3 as well as the maximum allowable increment consumption for comparison. This comparison shows that predicted ground-level concentrations from the action proposed by ASA will not exceed the allowable increments.

The worst case impacts on Air Quality of ASA far exceeded the concentrations for interaction executions in the vicinity of ASA. Therefore, increment consumption from interaction with U.S. Sugar and Osceola was not considered.

6.2.2 Florida DER Increment Consumption

The Florida DER baseline date, which considers maximum allowable emissions, is 1974. For the Florida DER baseline modeling, the ASA inventory includes boilers No. 1, No. 2, and No. 3 without scrubber control. The predicted maximum short-term increment consumption of the proposed action is based upon the maximum difference between the baseline modeling results and the projected conditions, again on a receptor-by-receptor basis. The maximum predicted short-term increment

Table 6-3. Summary of PSD Increment Consumption Results, Proposed ASA Modification

Pollutant	Maximum Increment Consumption (ug/m^3)					
	EPA			DER		
	3-hr	24-hr	Annual*	3-hr	24-hr	Annual*
Sulfur Dioxide						
ASA, Maximum Increment Consumption	86	34	13	161	54	17
Allowable Increment	512	91	20	512	91	20
Particulate						
ASA, Maximum Increment Consumption	—	10	3	—	<0	<0
Allowable Increment	—	37	19	—	37	19

* Actually 181-day average

Source: ESE, 1981.

consumptions are presented in Table 6-3, along with the maximum allowable increments for comparison. As with the EPA analysis, this comparison shows that there is no danger of exceeding the allowable increments.

6.3 NONATTAINMENT AND CLASS I AREAS

The action proposed by ASA should not significantly impact any Class I or nonattainment areas. The nearest Class I area is located approximately 103 km from the ASA site (Everglades National Park), and the nearest nonattainment area (excluding ozone) is over 100 km away (Hillsborough County).

6.4 DOWNWASH

As shown in Section 3.2.5, the proposed stack height (90 feet) is significantly less than the GEP height (234.5 feet). Therefore, further analysis is necessary to estimate the ground-level impacts of pollutants due to the enhanced dispersion caused by the shorter stack. This analysis was conducted in accordance with the procedures of Huber (1979).

Modifications to the dispersion coefficients in the Gaussian plume dispersion model can account for the enhanced dispersion in the lee of nearby buildings. The Gaussian equation and a definition of the variables follow.

Equation 3:

$$X(x,y,z,H) = \frac{Q}{2\pi\sigma_y\sigma_z u} \exp\left[-\frac{1}{2}\left(\frac{y}{\sigma_y}\right)^2\right]\left\{\exp\left[-\frac{1}{2}\left(\frac{z+H}{\sigma_z}\right)^2\right] + \exp\left[-\frac{1}{2}\left(\frac{z-H}{\sigma_z}\right)^2\right]\right\}$$

where: x = Concentration in grams/meters^3 (g/m^3)
Q = Source strength in g/s
u = Average wind speed in m/s
σ_y, σ_z = Diffusion coefficients in y and z direction in meters
H = Effective height of source emission in meters

Huber (1979) presented modifications to the dispersion coefficients for downwind distances greater than 10 times the height of the influencing building. These coefficients are:

$$\sigma_y' = \sigma_y (x + Sy) \quad \text{and} \quad \sigma_z' = \sigma_z (x + Sz)$$

where: x is the downwind distance,
Sy is the virtual source distance such that σ_y' (10 Hw) = 0.7 Hw/2 + 0.5 Hb,
Sz is the virtual source distance such that σ_z' (10 Hb) = 1.2 Hb,
Hw is the building height, and
Hb is the building width normal to wind.

Under EPA's definition of ambient air, the impact from the proposed boiler is required to be evaluated at the nearest area of reasonable public access. The closest such area is approximately 3.9 km from the stack.

This downwind distance to the ASA property line and a "D" stability class were used in conjunction with Figures 4-4 and 4-5 of the EPA guidance document (EPA, 1977) to obtain σ_y and σ_z values. The "width" of the influential building, as previously discussed, is 97 feet, 9 inches (29.8 m) and the height of that building is 93 feet 10 inches (28.6 m). The virtual source distances were then calculated to be 44 m and 0, respectively. This gives modified dispersion coefficients of 250 m and 77 m for σ_y and σ_z, respectively.

Both the wind speed and effective stack height parameters must also be estimated. The 5-year West Palm Beach meteorological data was consulted, and two wind speeds were selected. The higher speed of 18.4 mph was selected as approximately the 85th percentile speed. A speed of 5.7 mph was selected as representing the lower speed producing downwash conditions. Effective stack heights were calculated using the procedures of EPA (1977).

The Gaussian equation calculates concentrations based on a 1-hour averaging time. The EPA recommends multiplication factors of 0.9($\pm$0.1), 0.7($\pm$0.2), and 0.4($\pm$0.2) for 3-hour, 8-hour, and 24-hour averaging times, respectively (EPA, 1977). To represent worst-case conditions, the upper limits of the factors were used.

The variables discussed above and the maximum allowable emission rates listed in Table 2-2 were used as input into the modified Gaussian equation. Maximum ground-level concentrations due to worst-case aerodynamic effects of the nearby structure were calculated. The resulting values were then adjusted by the appropriate multiplication factors, and a 3-hour maximum SO_2 concentration of 132.2 ug/m^3 was calculated for the plant. The maximum 24-hour SO_2 concentration was calculated as 79.32 ug/m^3. These concentrations represent emissions from all 5 boilers and the lower wind speed and are below the applicable AAQS. As such, the proposed stack height of 90 feet should be sufficient to ensure that emissions from the proposed facility do not result in excessive ground-level concentrations as a result of aerodynamic effects of nearby structures.

7.0 ADDITIONAL IMPACTS ANALYSIS

7.1 IMPACTS ON SOILS AND VEGETATION

Impacts on soils and vegetation due to operation of the proposed sources are expected to be minor. The projected highest, second-highest 3-hour SO_2 concentration of 336 ug/m^3 and crop season average concentration of 25 ug/m^3 (see Table 2-5) are below levels generally reported as damaging to most plant species. As an example of such damage levels, European studies have found one-half-hour levels of 3,406 ug/m^3 and long-term means of 393 ug/m^3 to approximate threshold levels for several species (Heck and Brandt, 1977). Alfalfa, which is commonly thought to be one of the most SO_2-sensitive species, has a 2-hour threshold level of at least 2,620 ug/m^3 and an 8-hour threshold of 655 ug/m^3 (Heck and Brandt, 1977). No data are available on the sensitivity of sugar cane to SO_2 concentrations. No evidence of damage to the cane surrounding the ASA mill has been observed to date. The proposed modification will result in reduced concentration impacts on surrounding vegetation. No discernible impacts are predicted from this source.

Particulate matter is generally considered to have a relatively unimportant effect on vegetation (Jacobson and Hill, 1970). The particulate matter generated by this source is largely ash from the burning of the same vegetation which would be impacted. Emitted particulate will be mostly suspended and will deposit on vegetation primarily through plume impaction.

Plant species classified as "sensitive" to NO_2, such as pinto bean, cucumber, lettuce, and tomato, displayed injury when exposed to NO_2 levels of 3,760 to 4,960 ug/m^3 for a 2-hour period. Extremely resistant species, such as heath, were unaffected by an exposure of 1,900,000 ug/m^3 for 1 hour. Blue grass, orange tree plants, and rye are all classified as "intermediate" in resistance to NO_2 injury. According to Jacobson, et al., (1970), NO_x concentration is more

important to plant injury than the duration of exposure. Because of the low levels of NO_2 predicted to result from the proposed modification (less than 10 ug/m^3, estimated annual average), no effect on plants or soils is expected.

Effects of SO_2, NO_2, and particulate matter emissions on soils are are expected to be negligible. According to the Florida Sulfur Oxides Study, Inc., (1978) acid rain effects in the area are generally unknown, due to a lack of data for the region. The potential for long-range pollutant transport or significant acid rain effects from the proposed source is considered to be very low.

7.2 VISIBILITY IMPACTS

A Level I visibility screening analysis (EPA, 1980) was conducted which confirmed that no visibility impairment should occur in the Class I area. The absolute values of the three Level I contrast parameters (C1--plume contrast against the sky; C2--plume contrast against terrain; and C3--change in the sky/terrain contrast caused by primary and secondary aerosol) are well below 0.10. Thus, it is highly unlikely that the emissions source would cause adverse visibility impairment in Class I areas.

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