AC 26-238006
PSD-FL-208

0510003

Application (in its entirety)

[redacted]

PREVENTION OF SIGNIFICANT DETERIORATION REPORT AND PERMIT APPLICATION

For

U.S. Sugar Corporation
Clewiston Mill
Boiler Number 7

September 1993

TABLE OF CONTENTS

List of Figures

List of Tables

List of Attachments

AAQS	ambient air quality standards
AC	annualized cost
ACE	average cost effectiveness
acfm	actual cubic feet per minute.
APIS	Air Pollutant Information System
BACT	Best Available Control Technology
BLIS	BACT/LAER Informational System
Btu/lb	British thermal units per pound
$CaCO_3$	calcium carbonate
$CaSO_3 \cdot 0.5H_2O$	calcium sulfite
$CaSO_4 \cdot 2H_2O$	calcium sulfate
$Ca[OH]_2$	lime slurry
CEC	cation exchange capacity
CFR	Code of Federal Regulations
CO	carbon monoxide
DSI	dry sorbent injection
ENP	Everglades National Park
EPA	Environmental Protection Agency
EPRI	Electric Power Research Institute
ESP	electrostatic precipitator
F.A.C.	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FGD	flue gas desulfurization
FGR	flue gas recirculation
FSCL	Florida Sugar Cane League
GEP	good engineering practice
gpm	gallons per minute
H_2SO_4	sulfuric acid
HSH	highest-second-highest
ICE	incremental cost effectiveness
in. H_2O	inches of water
ISCST2	Industrial Source Complex Short-term
km	kilometers
lb/hr	pounds per hour
LNB	low-NOx burners
MM Btu/hr	million Btu per hour

m/s	meters per second.
$NaHCO_3$	sodium bicarbonate
$NaHSO_3$	sodium bisulfite
NH_3	ammonia
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NSCR	nonselective catalytic reduction
NSPS	new source performance standards
NTL	no-threat level or limit
NWS	National Weather Service
OFA	overfire air
OSC	off-stoichiometric combustion
PM	particulate matter
PM-10	Particulate matter smaller than 10 microns
PSD	prevention of significant deterioration
rpm	revolutions per minute
SCR	selective catalytic reduction
SIP	State Implementation Plan
SNCR	selective non-catalytic reduction
SO_2	sulfur dioxide
SO_3	sulfur trioxide
TCI	total capital investment
TSP	toal suspended particulate
TPY	tons per year
UNAMAP	User's Network for Applied Modeling of Air Pollution
UTM	Universal Transverse Mercator
VOCs	volatile organic compounds
$\mu g/m^3$	micrograms per cubic meter

1.0 EXECUTIVE SUMMARY

U.S. Sugar Corporation is proposing to install a new bagasse and fuel-oil-fired boiler at the Clewiston sugar mill located south of Clewiston, Florida, in Hendry County (an attainment area for all criteria pollutants). U.S. Sugar Corporation is also proposing to decommission two existing bagasse-fired boilers (No. 5 and 6), although they would be retained on standby. Thus, the increased emissions from the proposed new boiler would be partially offset by the reduction in emissions from the existing boilers. In addition, U.S. Sugar Corporation is proposing to raise the stacks of the existing boilers No. 1, 2 and 3 to that of the current boiler No. 4 (150 feet above grade). This will decrease the ambient impact of these existing units significantly.

The proposed boiler (boiler No. 7) will combust primarily bagasse to generate up to 350,000 lb/hr of steam for the mill. The total heat release of boiler No. 7 at this maximum steam production rate will be 738 million (MM) Btu/hr. The proposed boiler No. 7 will be essentially identical to the existing boiler No. 4, which was built in 1985 and has a capacity of 335,000 lb/hr of 600 psig/750°F steam.

It is U.S. Sugar Corporation's desire to burn 100% bagasse fuels in the proposed boiler, as the bagasse from the sugar-grinding operation will provide most of the annual fuel requirements of the boiler. Because the supply of bagasse may fluctuate, however, it is necessary to have the ability to burn limited amounts of fuel oil in the event that the supply of bagasse is not adequate. Therefore, the proposed facility will have the capability to burn bagasse and fuel oil either alone or in combination. Residual fuel oil utilized for boiler No. 7 will be limited to 10% of the total annual heat input to the boiler in any given year. The fuel oil for boiler No. 7 will have maximum sulfur and nitrogen contents of 0.5% and 0.3% by weight, respectively.

This report addresses the requirements of the prevention of significant deterioration (PSD) review procedures, pursuant to the regulations implementing the Federal Clean Air Act. The Florida Department of Environmental Protection (FDEP) has PSD review and approval authority in Florida. Based on the current actual emissions from the Clewiston mill and worst-case maximum emissions from the proposed boiler No. 7, the proposed project will result in a "significant increase" (in terms of PSD review) in emissions of particulate matter (PM)[1], sulfur dioxide (SO_2), nitrogen oxides (NO_x)[2], carbon monoxide (CO), volatile organic compounds (VOCs), beryllium, and sulfuric-acid-mist, thus requiring a PSD review for these pollutants.

---

1 PM is discussed here in a general sense to mean both total suspended particulate (TSP) and particulate with an aerodynamic diameter less than or equal to 10 microns (PM10), as we have conservatively assumed that all PM emissions are PM10. PM10 is the form regulated as a criteria pollutant; however, the PSD increment system for PM is still based on TSP.

2 Nitrogen dioxide (NO_2) is the compound regulated as a criteria pollutant; however, significant emission rates are based on the sum of all oxides of nitrogen. Air quality regulations frequently use the term "nitrogen oxides" but the quantitative standards are generally stated as NO_2. Similarly, this application text will generally refer to NO_x emissions, but comparisons of emissions and ground-level concentrations to a specific regulatory standard will be expressed as NO_2.

Top-down Best Available Control Technology (BACT) analysis for PM, SO_2, NO_x, CO, and VOCs was performed for the worst-case annual emission scenario where the proposed boiler will burn fuel oil and bagasse at maximum capacity. The PM and SO_2 BACT analysis concludes that both wet and semi-dry scrubbing technologies are technically feasible for the boiler, however, significant economic, environmental, and energy costs are associated with the semi-dry scrubber option. The wet impingement scrubber and low-sulfur fuel oil were therefore selected as BACT for PM and SO_2. The NO_x BACT analysis concludes that selective noncatalytic reduction, low-NO_x burners, and flue gas recirculation technologies are technically feasible for the boiler, however, significant economic, environmental, and energy costs are associated with those add-on controls. Low-nitrogen fuel oil and overfire air were therefore selected as BACT for NO_x. CO and VOC emissions will be controlled by application of good combustion practices. Beryllium and sulfuric-acid-mist emissions will be controlled by the wet impingement scrubber.

The air quality impact analysis for criteria pollutants demonstrates that the proposed project, even when operating under worst-case conditions of fuel oil and bagasse burning, will comply with all ambient air quality standards and PSD increments. Raising the stacks of the existing boilers No. 1, 2, and 3 will result in a general air quality improvement for all pollutants. In addition, no adverse air quality impacts will result upon the Everglades National Park PSD Class I area.

U.S. Sugar Corporation will demonstrate compliance with boiler No. 7 pollutant emission limits by monitoring such parameters as steam temperature, pressure and flow rate; fuel oil input rate, and heating value and sulfur content; and scrubber pressure drop, water flow and pH. In addition, stack testing will be performed for PM, SO_2, NO_x, CO, and VOCs every year during the first 2 years of operation. If these tests show compliance with the permitted emission limits, the stack testing frequency will be reduced to that typically required by the Florida Department of Environmental Regulation (i.e., once every year or once every 5 years, depending upon pollutant).

2.1 EXISTING MILL OPERATIONS

2.1.1 Sugar Cane Processing

U.S. Sugar Corporation currently owns and operates a sugar cane processing mill in Clewiston, Hendry County, Florida (Figures 2-1 and 2-2). The mill is fairly isolated from other significant air pollution sources, the nearest such sources being the Okeelanta sugar mill, located 17 kilometers (km) southeast, and the Sugar Cane Growers Cooperative, Inc. sugar mill, located 29 km to the east. The plant is located near the southwestern edge of Lake Okeechobee in a rural setting and is almost totally surrounded by sugar cane fields.

Sugar cane is a large grass with a bamboo-like stalk that grows 8 to 15 feet tall. Only the stalk contains sufficient sucrose for processing into sugar. All other parts of the sugar cane (i.e., leaves, top growth, and roots) are extraneous material. The cane is normally burned in the field to remove a major portion of the leaves and top growth. The objective of harvesting is to deliver the sugar cane to the mill with a minimum of debris as soon as possible, because failure to process it within 24-48 hours after cutting causes yield loss by deterioration of sucrose.

The cane that is delivered to the sugar mill will vary in extraneous material content depending on the cane variety, type of soil, harvesting method and weather conditions. Inside the mill, cane milling for extraction involves shredding and a combination of crushing and maceration. Juice is extracted in the milling portion of the plant. The matted cellulose-fiber residue remaining after milling is bagasse. The juice is heated, clarified, concentrated by evaporation with low-pressure steam, crystallized, cured, and separated into sugar crystals and molasses.

Bagasse is a fuel of varying composition, consistency, and heating value. These characteristics depend on the climate, type of soil upon which the cane is grown, variety of cane, harvesting method, amount of cane washing, and the efficiency of the milling process. In general, bagasse has a heating value between 3,000 and 4,000 Btu/lb on a wet, as-fired basis. Most bagasse has a moisture content between 50 and 55% by weight.

A flow diagram of the operations at the Clewiston mill is shown in Figure 2-3. High-pressure process steam for the mill (stream A in Fig. 2-3) is provided by burning bagasse (stream B) in six boilers (No. 1-6) and occasionally fuel oil (stream C) in four boilers (No. 1-4). This steam is used to power the grinding mill turbines, electrical turbogenerators, and other equipment drives. The exhaust (low-pressure) steam is sent to the boiling house for use in juice heaters, evaporators, vacuum pans, and other processing equipment.

Best Available Copy

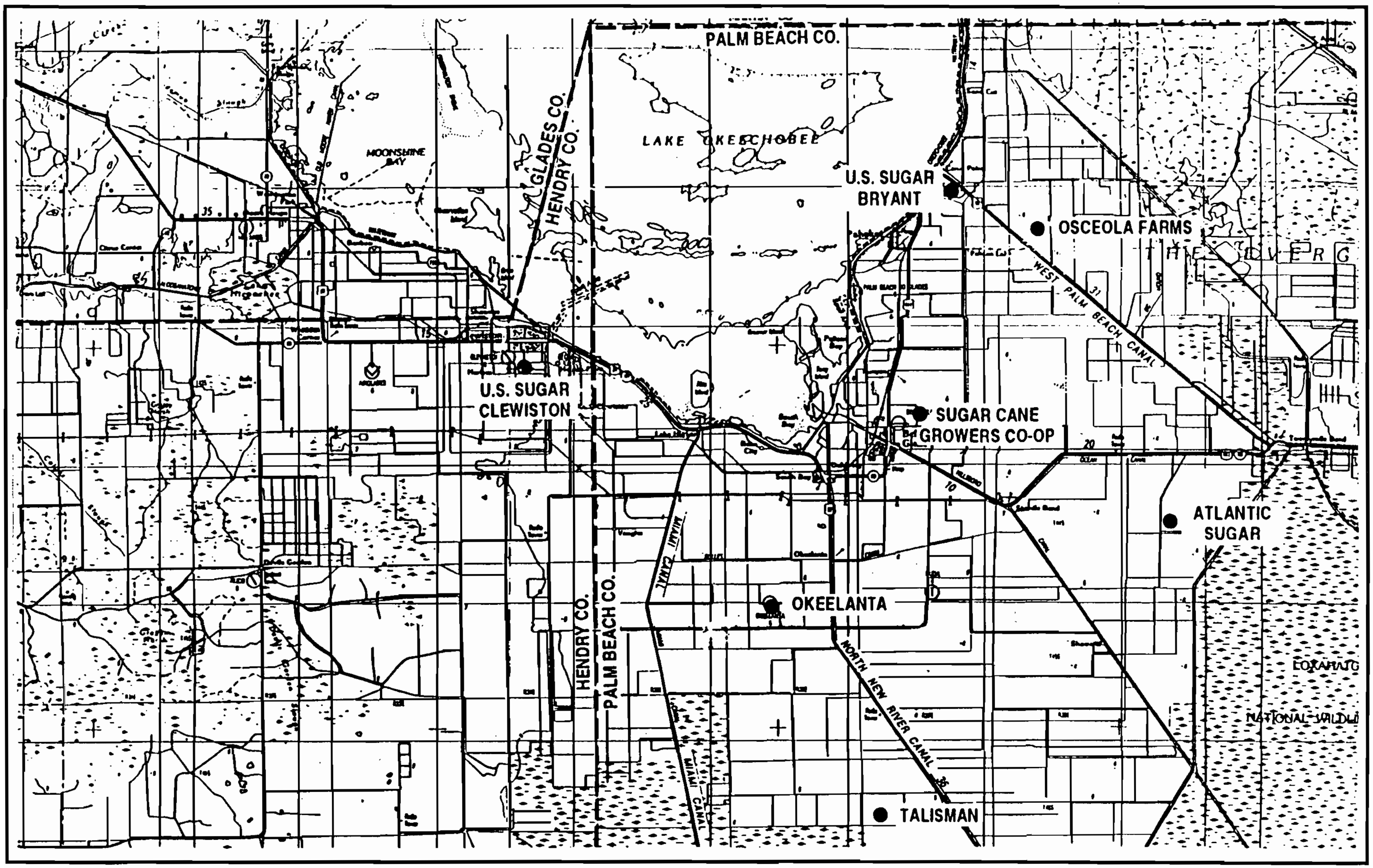


Figure 2-1
Location of U.S. Sugar Corporation
with Respect to Surrounding Area

UNITED STATES SUGAR CORPORATION
Clewiston, Florida

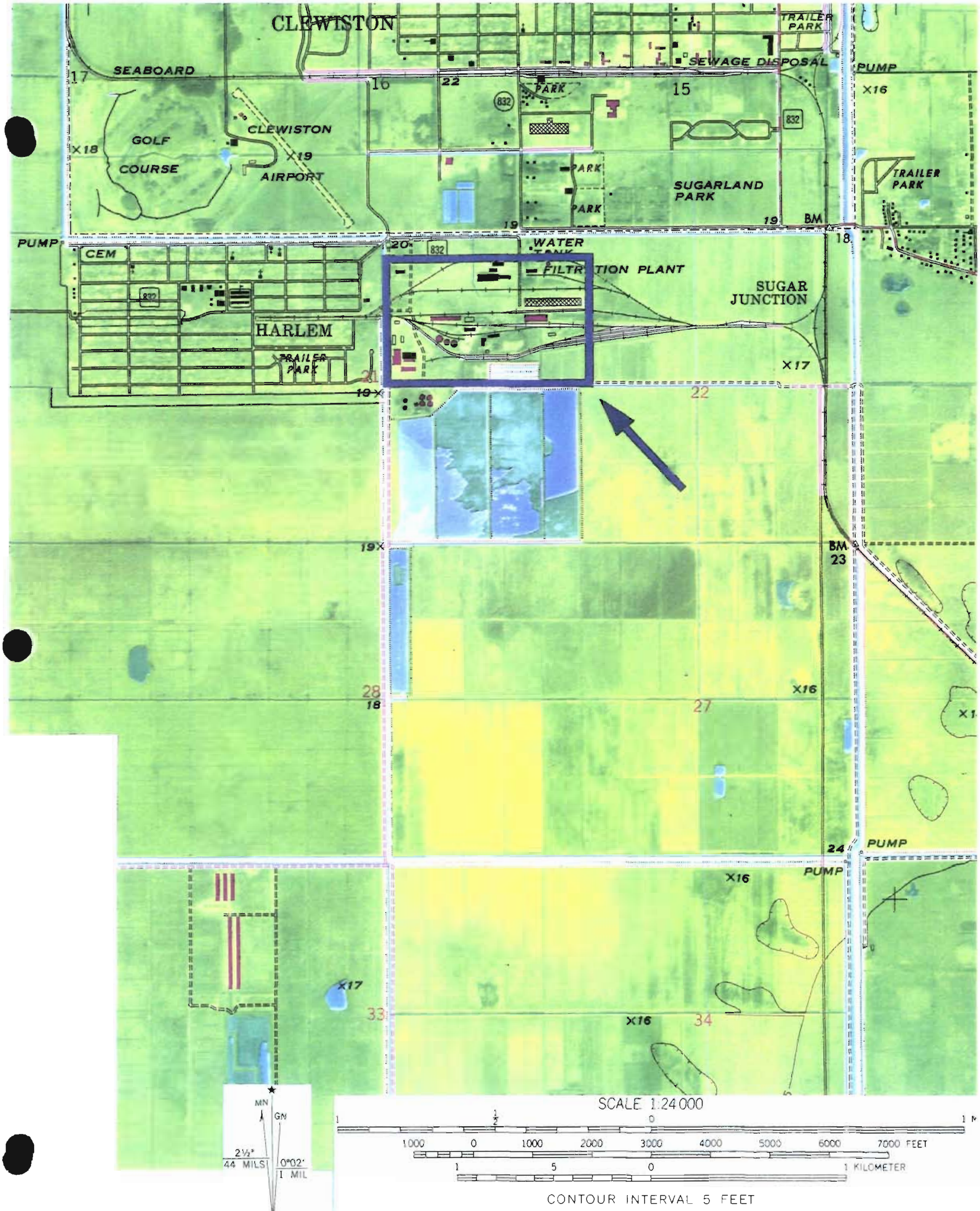
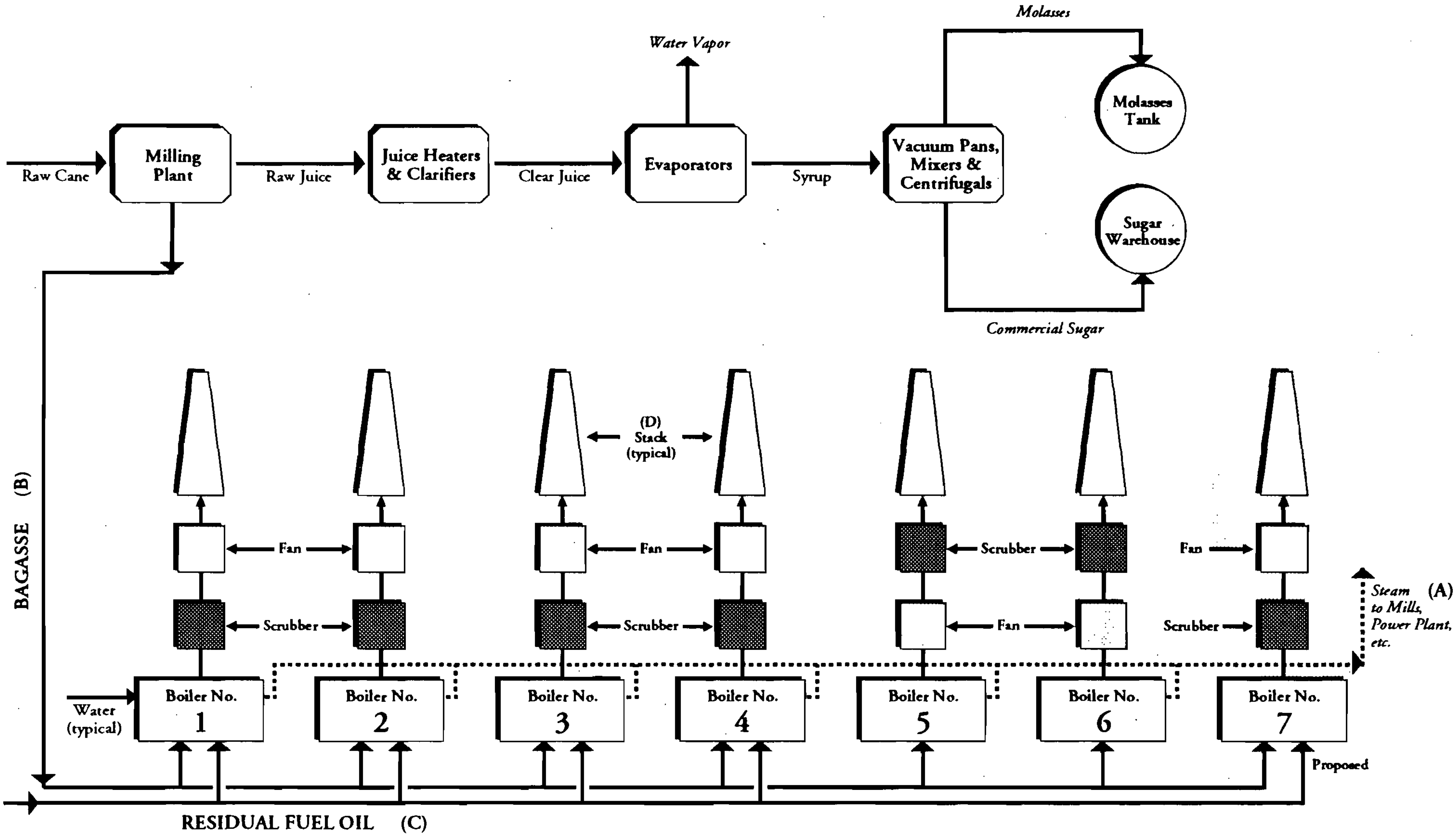


Figure 2-2
Vicinity Map of U.S. Sugar Corporation's Clewiston Mill

Figure 2-3

Process Flow Diagram – U. S. Sugar Corporation, Clewiston, Florida



ECMSG PKMisc

About 3-4 lbs of steam is needed to produce 1 lb of raw sugar; thus processing of sugar cane is quite energy-intensive, and the combustion of bagasse is an integral part of mill operations.

2.1.2 Bagasse Boilers

Boilers No. 1-4 burn bagasse and fuel oil (boilers No. 5-6 burn bagasse only) to produce steam for the sugar mill. Fuel oil is burned for boiler startup and process upsets, but is generally not used once bagasse is fed to the boiler. The total plant steam generating capacity is currently 850,000 pounds per hour (lb/hr).

Several different types of boilers are used to burn bagasse. In cell-type furnaces (most common among older boilers, such as No. 5 and 6), bagasse is metered and gravity-fed through chutes and piles up on a refractory hearth. Primary and overfire combustion air flows through ports in the furnace walls and burning begins on the surface pile. These units do not allow ash removal during operation.

In more-recently built boilers (e.g., No. 1, 2, and 4) bagasse is burned in spreader-stoker units. Bagasse feed to these boilers is metered and controlled, and then enters the furnace through a fuel chute and is spread mechanically across the furnace, where most of the fuel burns while in suspension. Simultaneously, heavier pieces of fuel are spread in a thin, even bed on a vibrating or traveling grate. The flame over the grate radiates heat back to the fuel to aid combustion. The combustion area of the furnace is lined with waterwalls. In these newer vibrating/traveling grate, stoker-type boilers, ash is continuously removed at the front of the boiler. Ash is discharged at the end of the grate adjacent to the boiler wall.

U.S. Sugar Corporation's vibrating/traveling grate boilers have both primary and secondary air supply. Primary air is introduced beneath the grate. Secondary overfire air is provided above the grate. Air dampers for both primary and secondary air are manually set, and typically the damper settings are not changed. The boilers operate at an excess air level of 30-50% and at 4-7% oxygen.

Residual (bunker C) fuel oil can also be fired in four of the Clewiston mill boilers (all boilers except for boilers No. 5 and 6). Firing is accomplished with fuel oil in burners mounted on the walls of the boilers. Oil is generally only fired at startup and during malfunctions; once bagasse combustion is stabilized, the fuel oil is usually shut off. A single fuel oil storage tank of 400,000-gallon capacity feeds all of the existing boilers. Individual boiler fuel oil supply lines are routed from the main supply line, and each individual boiler line is fitted with a metering device to measure the amount of oil fed to the boiler. No additives are used in the oil; oil is burned as received from Coastal Oil Company.

Bagasse is fed to the boilers by conveyors and feeders. The inherent moisture content of the incoming bagasse effectively minimizes potential fugitive particulate matter (PM) emissions from bagasse handling. The amount of bagasse fed to each boiler is not directly measured. However, steam temperature and pressure, boiler feedwater temperature and pressure, and steam flow rate are measured. Bagasse consumption is determined through the following procedure:

1. The enthalpy of the steam and the boiler feedwater is calculated from the temperature and pressure measurements.

2. Total heat input to the steam is calculated from the enthalpy difference and the steam flow.

3. Heat input to the boiler due to oil firing is calculated from the fuel oil consumption data and the fuel oil heating value, this latter parameter provided by the oil supplier (see Attachment A for representative fuel analysis). An 80% boiler efficiency is assumed when firing fuel oil and is used to determine the heat input to the steam.

4. The remaining required heat input to the steam due to bagasse firing is then calculated as the difference between total heat input to the steam (Item 2 above) and the heat input due to oil firing (Item 3 above).

5. Heat input to the boiler from bagasse firing is then determined based on 55% efficiency, and the amount of bagasse required is calculated based upon an average of 8,000 British thermal units per pound (Btu/lb) of bagasse (dry basis) (see Attachment A for representative fuel analysis).

All the boilers at the Clewiston mill are equipped with water spray impingement scrubbers to control PM emissions. Exhaust gases from each boiler pass through a scrubber, a fan, and finally the exhaust stack, as shown in Figure 2-3. The existing boilers at the mill must meet a PM emission limit of 0.15 - 0.3 lb/MM Btu when burning bagasse and 0.1 lb/MM Btu when burning fuel oil.

Production in the sugar cane industry is seasonal: the Clewiston mill typically operates 150 days per year, from late October through March. To be conservative, all analyses presented in this report are based on a 160-day crop year (October 15 through March 23), except for boiler No. 7, which is assumed to operate 365 days per year.

2.2 PROPOSED MODIFICATION

2.2.1 General

To meet anticipated steam demands at the Clewiston mill, U.S. Sugar Corporation wishes to install a new bagasse/oil-fired boiler of 350,000 lb/hr steam capacity (6-hour average) and 385,000 lb/hr maximum (1-hour average) at 600 psig, 750°F. The new boiler is planned to be operational for the 1994-1995 crop year (i.e., by January 1995); therefore, construction of the new boiler will commence as soon as a construction permit is obtained. The boiler, designed to burn bagasse and oil, will be manufactured by Alpha, Model Conal ATT-89-18 (or equivalent) and is capable of generating the rated amount of steam by burning bagasse only. The boiler will be of the modern vibrating-grate type, and will represent state-of-the-art bagasse combustion. Steam production due to fuel oil firing will be limited to 175,850 lb/hr, or a heat input of 255 million Btu per hour (MM Btu/hr), and 10% of the boiler annual heat input capacity. Specifications for the new boiler are presented in Attachment B.

Existing boilers No. 5 and 6 will be reduced to standby operating basis, to back up boiler No. 7; they will only operate when boiler No. 7 is not operational. Existing boilers No. 1-3 will have their stacks raised to 150 feet (below GEP stack height) to improve plume dispersion.

2.2.2 Fuel Oil Usage

All existing boilers at the Clewiston mill (except boilers No. 5 and 6) use residual fuel oil from a single oil storage tank and supply system. No. 4 boiler, which was installed in 1985, has a permit condition requiring the use of 1.5% (maximum) sulfur fuel oil. This is managed by adding a quantity of 1.5% sulfur oil to the common tank which is equivalent to that burned in No. 4 boiler. It is proposed to use a similar approach of adding a quantity of 0.5% (maximum) sulfur fuel oil to the common tank which is equivalent to that burned in boiler No. 7.

Because fuel oil is expensive compared to bagasse, every attempt is made to minimize fuel oil usage in boilers at the mill. U.S. Sugar Corporation will limit total fuel oil consumption in the proposed boiler No. 7 to 3,000,000 gallons per year. Actual usage is expected to be below this level.

In addition to the fuel oil usage limitations placed on the proposed boiler, total mill fuel oil consumption (including the proposed boiler No. 7) will be limited to 6,300 gallons for a 3-hour period and 40,800 gallons for a 24-hour period[1]. These current plant permit limitations will ensure that ambient air quality standards are not exceeded in the vicinity of the Clewiston mill due to mill operations while firing fuel oil.

2.2.3 Impingement Scrubber

The proposed boiler No. 7 will be equipped with a spray impingement scrubber similar to the other scrubbers at the Clewiston mill. The scrubber will be capable of controlling PM emissions to a level

1 With the exception that these limits may be exceeded during startup, shutdown or malfunction in accordance with FDEP rule 17-210.700, F.A.C.

of 0.15 lb/MM Btu heat input from bagasse firing and 0.1 lb/MM Btu heat input from fuel oil firing, while simultaneously removing SO_2. Note that this PM limit is more restrictive than the State of Florida emission standards for carbonaceous fuel burning equipment (i.e., bagasse boilers). U.S. Sugar Corporation considers the spray impingement scrubber to be BACT for PM and SO_2 for bagasse boilers, considering its proven ability in the Florida sugar cane industry, along with its economics, energy considerations, and environmental impacts.

The spray impingement scrubber will be manufactured by U.S. Sugar Corporation. There will be two scrubber units mounted in parallel. The design will be equivalent to a Western Precipitation (Joy) Turbulaire scrubber, Type D, Size 260, and will operate at a pressure drop of approximately 5-10 inches of water (in. H_2O) and at a water usage rate of approximately 600 gallons per minute (gpm). Details of the scrubber design, Joy manufacturing literature, and Joy's performance guarantee for this scrubber design are presented in Attachment C.

The exhaust fan, also to be manufactured by U.S. Sugar Corporation, will be of American Standard design, equivalent to Model 537 DI 2/3 DW, series 2014. The fan will operate at a flowrate of approximately 253,630 acfm at 106°F and a static pressure of about 18 in. H_2O. The fan will be electrically driven at approximately 1,000 revolutions per minute (rpm) and 1,750 horsepower.

2.2.4 Worst-case Operational Scenarios

Capacities and stack parameters for both the existing boilers (Nos. 1, 2, 3, 4, 5, and 6) and the proposed boiler No. 7 at the Clewiston mill are shown in Table 2-1. Capacities are shown in terms of lb/hr of steam produced and heat input to the boiler (MM Btu/hr). The air quality analysis presented in Section 5.0 was based on the boilers operating at their maximum permitted capacities.

Boilers No. 1-3 currently have similar stack heights (65 to 75 feet), but U.S. Sugar Corporation proposes to raise their stacks to 150 feet for this project like the existing boiler No. 4. The proposed boiler No. 7 will have a stack height of 225 feet, which is GEP stack height. The stack parameters presented in Table 2-1 do not vary according to boiler operation. Stack height and diameter, of course, are fixed according to design of the stack. The stack temperature does not vary appreciably for any of the boilers, even when fuel oil is fired, as demonstrated by the source test data presented in Attachment D. Stack temperatures shown in Table 2-1 are based on the average temperature measured during recent source tests on each boiler. The exhaust gas flow rate and velocity can vary depending on the combination of fuels being fired in the boilers.

Table 2-1

Capacities and Stack Parameters for Existing and Proposed Boilers at U.S. Sugar Corporation's Clewiston Mill

Boiler No.	Capacity[1]		Stack Height (m)	Stack Diameter (m)	Stack Temperature (°K)
	lb stm/hr	MM Btu/hr[2]			
1	235,000	495.6	22.86	1.86	344
2	235,000	495.6	22.86	1.86	343
3	135,000	342.0	27.43	2.29	342
4	335,000[3,4]	706.6	45.72	2.51	340
5	70,000	144.0	19.81	1.83	338
6	70,000	144.0	19.81	1.83	340
7 (Proposed)	--	--	68.58	2.63	340

Notes:

[1] 24-hour average

[2] When firing bagasse only

[3] 6-hour average at 600 psig, 750°F

[4] 1-hour average of 368,500 lb/hr at 600 psig and 750°F

To ensure that ambient air quality standards (AAQS) for annual, 24-hour and 3-hour emissions are not exceeded by the proposed project, U.S. Sugar Corporation considered the worst-case annual, 24-hour and 3-hour operating conditions for the Clewiston mill. Table 2-2 summarizes the Clewiston mill operating parameters for maximum firing rates. Tables 2-3, 2-4 and 2-5 present the boiler emissions associated with the worst-case annual, 24-hour, and 3-hour scenarios, respectively.

Tables 2-3, 2-4 and 2-5 are based on the following factors and assumptions:

- EPA AP-42 emission factors were used in all cases, except as noted below.
- PM emission are based on current permit limits for boilers No. 1-4 and proposed permit limit for boiler No. 7.
- Boilers No. 1-3 were assumed to be firing 2.5% sulfur fuel oil, while boilers No. 4 and 7 were assumed to be firing 1.5% and 0.5% sulfur oil, respectively. Scrubber SO_2 removal efficiency was assumed to be 0% for oil firing.
- Bagasse CO emissions are based on permit limit of 9 lb/MM Btu for all boilers which has been previously proposed (see Attachment E). The one exception to this is boiler No. 7 during the off-season, which will be limited to 7.74 lb/MM Btu.
- Boiler No. 1-3 bagasse SO_2 emissions were based on mass balance. Bagasse sulfur content was assumed to be 0.1% (wet basis). Scrubber SO_2 removal efficiency was assumed to be 75% for bagasse combustion.
- Boiler No. 4 and 7 bagasse emissions for SO_2, NO_x and VOC were based on current boiler No. 4 permit limits, which are in turn based on stack testing.
- Heating values of 4,000 Btu/lb for wet bagasse and 150,000 Btu/gal for residual oil.
- Boiler efficiency of 80% when firing oil and 55% when firing bagasse.
- Boiler steam enthalpy differential (heat gain) assumed as follows:
    - No. 1, 2: 1150 Btu/lb
    - No. 3: 1111 Btu/lb
    - No. 4, 7: 1160 Btu/lb

Emissions from the existing sugar mill boilers are based on 160 days per year of operation (crop season), but the proposed boiler No. 7 will operate all year. It was therefore necessary to consider the worst-case operational scenario for both the crop season and the off-season.

Table 2-2

Clewiston Mill Emissions and Stack Parameters
Used in Ambient Impact Analysis

Boiler[1]	Fuel	Firing Rate MM Btu/hr	Particulate Emissions		Exhaust Flow Rate[2] (acfm)	Exhaust Gas Velocity (m/s)
			lb/MM Btu	lb/hr		
1	Bagasse/oil	448.4	0.25	96.5	205,336	35.6
2	Bagasse/oil	448.4	0.25	97.9	205,336	35.6
3	Bagasse/oil	246.8	0.3	62.6	127,617	14.7
4	Bagasse/oil[3]	706.6	0.15	106.0	228,285	21.7
7 (Proposed)	Bagasse/oil[3]	738.2	0.15	110.7	250,000	21.7

Notes:

1 Boilers 5 and 6 are assumed to be shut down and on emergency standby.

2 Flow rate associated with source test during which maximum capacity of boiler was reached. For the proposed boiler No. 7, source test data from boiler No. 4 was used (see Appendix D), because this boiler is essentially identical to the proposed boiler. Maximum capacity test was used, and exhaust flow rate was ratioed upwards to obtain flow for boiler No. 7 rated capacity of 350,000 lb stm/hr.

3 Although these boilers can burn both bagasse and fuel oil, the 3-hour and 24-hour worst-case scenarios do not consider fuel oil combustion in boilers No. 4 and 7, as these units burn low-sulfur fuel oil.

Table 2-3
Clewiston Mill Potential Annual Emissions

FUEL OIL COMBUSTION

	Avg. MMBtu/hr	Day/yr	Mgal/yr	PM	SO2	NOx	CO	VOC
Boiler No.1	3.49	160	89.23	0.67	17.51	2.45	0.22	0.01
Boiler No.2	3.38	160	86.51	0.65	16.98	2.38	0.22	0.01
Boiler No.3	1.91	160	48.97	0.37	9.61	1.35	0.12	0.01
Boiler No.4	1.93	160	49.33	0.37	5.81	1.36	0.12	0.01
Boiler No.7 crop	2.01	160	51.54	0.39	2.02	1.42	0.13	0.01
Boiler No.7 off	255	69	2,810	21.08	110.29	77.28	7.03	0.39
Total TPY			3,136	23.5	162.2	86.2	7.8	0.4

BAGASSE COMBUSTION

	Avg. MMBtu/hr	Day/yr	Wet Feed TPY	PM	SO2	NOx	CO	VOC
Boiler No.1	415	160	199,054	199.1	49.8	119.4	7,166	199.1
Boiler No.2	402	160	192,982	193.0	48.2	115.8	6,947	193.0
Boiler No.3	220	160	105,569	126.7	26.4	63.3	3,800	105.6
Boiler No.4	603	160	289,384	173.6	192.2	346.9	10,418	246.0
Boiler No.7 crop	630	160	302,341	181.4	200.8	346.9	10,884	257.0
Boiler No.7 off	450	136	183,564	110.1	121.9	294.9	5,683	156.0
Total TPY			1,272,894	984	639	1,287	44,899	1,157

TOTAL COMBUSTION EMISSIONS

	Avg. MMBtu/hr	PM	SO2	NOx	CO	VOC
Boiler No.1	418	200	67	122	7,166	199
Boiler No.2	405	194	65	118	6,948	193
Boiler No.3	222	127	36	65	3,801	106
Boiler No.4	605	174	198	348	10,418	246
Boiler No.7	493	313	435	721	16,575	413
Total TPY		1,007	801	1,374	44,907	1,157

Table 2-4
Clewiston Mill Potential Emissions (24-hour case)

Fuel Oil Combustion

	MMBtu/hr Avg.		Mgal/yr	PM	SO2	NOx	CO	VOC	Steam Lb/hr
Boiler No.1	103.5		0.69	10.4	270.8	38.0	3.45	0.19	72,000
Boiler No.2	94.5		0.63	9.5	247.3	34.7	3.15	0.18	65,739
Boiler No.3	57.0		0.38	5.7	149.2	20.9	1.90	0.11	41,044
Boiler No.4	0.0		0.00	0.0	0.0	0.0	0.00	0.00	0
Boiler No.7	0.0		0.00	0.0	0.0	0.0	0.00	0.00	0
Total lb/hr			**1.70**	**25.5**	**667.3**	**93.5**	**8.50**	**0.48**	**178,783**

Bagasse Combustion

	MMBtu/hr Avg.		Wet Feed Ton/yr	PM	SO2	NOx	CO	VOC	Steam Lb/hr
Boiler No.1	341		42.6	85.2	21.3	51.1	3,067	85.2	163,000
Boiler No.2	354		44.2	88.5	22.1	53.1	3,185	88.5	169,261
Boiler No.3	190		23.7	56.9	11.9	28.5	1,708	47.4	93,956
Boiler No.4	707		88.3	106.0	117.3	180.7	6,359	150.2	335,000
Boiler No.7	738		92.3	110.7	122.5	180.7	6,644	156.9	350,000
Total lb/hr			**291**	**447**	**295**	**494**	**20,964**	**528**	**1,111,217**

Total Hourly Emissions

	MMBtu/hr Avg.		PM	SO2	NOx	CO	VOC	Steam Lb/hr
Boiler No.1	444		96	292	89	3,071	85	235,000
Boiler No.2	448		98	269	88	3,188	89	235,000
Boiler No.3	247		63	161	49	1,710	48	135,000
Boiler No.4	707		106	117	181	6,359	150	335,000
Boiler No.7	738		111	123	181	6,644	157	350,000
Total lb/hr			**473**	**962**	**588**	**20,973**	**529**	**1,290,000**

Table 2-5
Clewiston Mill Potential Emissions (3-hour case)

Fuel Oil Combustion

	MMBtu/hr Ave.		Mgal/yr	PM	SO2	NOx	CO	VOC	Steam Lb/hr
Boiler No.1	122.3		0.82	12.2	320.0	44.8	4.08	0.23	85,078
Boiler No.2	120.0		0.80	12.0	314.0	44.0	4.00	0.22	83,478
Boiler No.3	72.8		0.49	7.3	190.5	26.7	2.43	0.14	52,421
Boiler No.4	0.0		0.00	0.0	0.0	0.0	0.00	0.00	0
Boiler No.7	0.0		0.00	0.0	0.0	0.0	0.00	0.00	0
Total lb/hr	**315.1**		**2.10**	**31.5**	**824.5**	**115.5**	**10.50**	**0.59**	**220,978**

Bagasse Combustion

	MMBtu/hr Ave.		Wet Feed Ton/yr	PM	SO2	NOx	CO	VOC	Steam Lb/hr
Boiler No.1	313		39.2	78.4	19.6	47.0	2,821	78.4	149,922
Boiler No.2	317		39.6	79.2	19.8	47.5	2,851	79.2	151,521
Boiler No.3	167		20.9	50.0	10.4	25.0	1,501	41.7	82,579
Boiler No.4	707		88.3	106.0	117.3	192.4	6,359	150.2	335,000
Boiler No.7	738		92.3	110.7	122.5	192.4	6,644	156.9	350,000
Total lb/hr			**280**	**424**	**290**	**504**	**20,177**	**506**	**1,069,021**

Total Hourly Emissions:

	MMBtu/hr Ave.		PM	SO2	NOx	CO	VOC	Steam Lb/hr
Boiler No.1	436		91	340	92	2,825	79	235,000
Boiler No.2	437		91	334	92	2,855	79	235,000
Boiler No.3	240		57	201	52	1,504	42	135,000
Boiler No.4	707		106	117	192	6,359	150	335,000
Boiler No.7	738		111	123	192	6,644	157	350,000
Total lb/hr			**456**	**1,114**	**620**	**20,188**	**507**	**1,289,999**

The worst-case annual emission scenario for PM, SO_2, NO_x, CO, and VOC is the operation of the Clewiston mill at maximum bagasse capacity as shown in Table 2-3.

The current PM emission limits for the existing boilers No. 1, 2, 3, and 4 are 0.25, 0.25, 0.3, and 0.15 lb/MM Btu respectively, when firing bagasse and 0.1 lb/MM Btu when firing oil. Similarly, the proposed boiler must meet a PM emission limit of 0.15 lb/MM Btu for bagasse and 0.1 lb/MM Btu for oil. The worst-case 24-hour operating condition for PM emissions is thus the firing of 100% bagasse in all of the boilers during the crop season.

Boilers No. 1-3 burn fuel oil with 2.5% sulfur, while boiler No. 4 burns 1.5% sulfur fuel oil and the proposed boiler No. 7 will burn 0.5% sulfur oil. Therefore, the worst-case 3-hour and 24-hour SO_2 impacts will occur during the crop season when 2.5% fuel oil is burned in boilers No. 1, 2, and 3 at maximum rate. This equates to 2,100 gal/hr for the 3-hour case (6,300 gal per 3 hours) and 1,700 gal/hr (40,800 gal/day). The remainder of maximum steam capacity for each of the boilers is generated by burning bagasse.

The SO_2 emission rates shown in Tables 2-3, 2-4 and 2-5 reflect a 75% reduction in the theoretical amount of SO_2 resulting from burning bagasse. No reduction in theoretical SO_2 is assumed for fuel oil burning. The 75% reduction for bagasse is assumed to be conservative for bagasse burning in boilers equipped with spray-impingement-type scrubbers, as substantiated by the analysis presented in Attachment D.

Due to meteorological effects, the worst-case 1-hour and 8-hour scenarios for CO emissions occur during the off-season when boiler No. 7 is firing at maximum capacity.

To ensure that the FDEP no-threat limit (NTL) for each air toxic annual, 24-hour and 3-hour emissions are not exceeded by the proposed project,'the same worst-case annual, 24-hour and 3-hour operating conditions for the Clewiston mill were used to estimate air toxics emissions. Table 2-6 summarizes the Clewiston mill air toxic emissions associated with the worst-case annual, 24-hour, and 3-hour scenarios. The maximum fuel-oil firing cases were deemed to constitute the worst case for air toxics emissions, because air-toxics emission factors are available for fuel oil but not for bagasse combustion.

2.3 APPLICABILITY OF FEDERAL NEW SOURCE PERFORMANCE STANDARDS

Based on the maximum heat input to boiler No. 7, the boiler will be subject to the federal new source performance standards (NSPS) for industrial steam generating units (40 CFR 60, Subpart Db). The Subpart Db standards are summarized in Table 2-7.

Table 2-6
Clewiston Mill Air Toxics Emissions

POLLUTANT	Annual Emission TPY	24-hour Emission lb/hr	3-hour Emission lb/hr
Antimony	0.00519	0.00593	0.00732
Arsenic	0.00424	0.00485	0.00599
Barium	0.01495	0.01707	0.02109
Beryllium	0.00094	0.00107	0.00132
Bromine	0.00156	0.00178	0.00220
Cadmium	0.00351	0.00400	0.00495
Chromium	0.00469	0.00536	0.00662
Chromium (IV)	0.00094	0.00107	0.00066
Cobalt	0.02621	0.02993	0.03698
Copper	0.06254	0.07140	0.08823
Fluoride	0.00140	0.00160	0.03781
Formaldehyde	0.09046	0.10328	0.12762
Hydrogen Chloride	0.14222	0.16238	0.20065
Lead	0.00625	0.00714	0.00882
Manganese	0.00581	0.00663	0.00819
Mercury	0.00071	0.00082	0.00101
Molybdenum	0.01090	0.01245	0.01538
Nickel	0.28142	0.32130	0.39703
Phosphorus	0.01298	0.01482	0.01831
Selenium	0.00831	0.00948	0.01172
Tin	0.07371	0.08415	0.10399
Zinc	0.01495	0.01707	0.02109

Table 2-7

Federal NSPS for Steam Generating Units Applicable to the Proposed Boiler No. 7

Pollutant	Emission Limitation[1,2]
Particulate Matter	0.1 lb/MM Btu
Visible Emissions	20% opacity (6-minute average), except that up to 27% opacity is allowed for one 6-minute period per hour
Sulfur Dioxide[3]	0.5 lb/MM Btu or the use of very-low-sulfur fuel oil
Nitrogen Oxides[3]	0.30 - 0.40 lb/MM Btu

Notes:

[1] For fuel oil combustion.

[2] Emissions limits for PM, NO_x and SO_2 do not apply during periods of startup, shutdown, or malfunction.

[3] Compliance determined on a 24-hour rolling average basis.

Source: 40 CFR 60, Subpart Db.

For PM, the NSPS limits emissions to 0.1 lb/MM Btu when burning fuel oil. Opacity[2] is also limited when burning fuel oil to 20% (6-minute average), except that up to 27% opacity is allowed for one 6-minute period per hour.

In the case of SO_2, 10% or less of the annual heat input for the proposed boiler No. 7 will be from very-low-sulfur (0.5% maximum) residual fuel oil, and the remainder of the heat release will be from bagasse. For this case, the NSPS limits SO_2 emissions to 0.5 lb/MM Btu based on a 24-hour average. Bagasse has an inherently low sulfur content (i.e., average of about 0.03-0.15% by weight, dry basis).

The NSPS for NO_x will be attained by combusting residual oil with a nitrogen content of 0.3% or less and firing fuel oil for 10% or less of the annual heat release. Compliance with this provision under Subpart Db is based on a 24-hour average.

2.4 POLLUTANT EMISSIONS

2.4.1 Emissions of Criteria Pollutants

Maximum hourly emissions from the proposed boiler for each fuel are presented in Table 2-5. The proposed emission limits for all criteria pollutants emitted by the proposed boiler are presented in Table 2-8. Maximum emissions of PM and SO_2 are based upon a wet scrubber control device to meet the NSPS for industrial steam generating units. The maximum NO_x, CO, and VOCs emissions reflect the proposed boiler design and good combustion practices.

Emissions of SO_2, NO_x, CO and VOCs for fuel oil were based on EPA Publication AP-42 (EPA, 1988a). Emission factors for air toxics from fuel oil combustion were obtained from Toxic Air Emission Factors: A Compilation, revised edition (EPA, 1988a) and Estimating Air Toxic Emissions from Coal and Oil Combustion Sources (EPA, 1989).

Sulfuric acid mist emissions are based upon EPA AP-42 (EPA, 1988a), which indicates sulfuric acid mist is approximately 3% of sulfur dioxide emissions.

Sample calculations using the emission factors are presented in Attachments F and G.

2.4.2 Emissions of Non-Criteria Pollutants

Emissions factors for non-criteria pollutants were obtained from EPA's compilation of toxic air pollutant emission factors (EPA, 1988a and EPA, 1989). Emission factors are available from these

[2] Note that continuous monitoring of opacity from a wet scrubber is not feasible, because the water-saturated gas is almost completely opaque.

Table 2-8
Proposed Emission Limits (lb/MM Btu) for Boiler No. 7

Pollutant	Bagasse	No. 6 Oil
Particulate (TSP)	0.15	0.1
Particulate (PM10)	0.15	0.1
Sulfur Dioxide	0.167	0.5[1]
Nitrogen Oxides	0.26	0.3-0.4[2]
Carbon Monoxide	9.0[3]	0.066
Volatile Organic Compounds	0.21	0.004
Lead	--	56E-06
Mercury	--	6.4E-06
Beryllium	--	8.4E-06
Fluorides	--	12.6E-06
Sulfuric Acid Mist	0.0167	0.05

Notes:

[1] Compliance based on use of very-low-sulfur fuel oil and on 24-hour rolling average per 40 CFR 60, Subpart Db.

[2] Compliance based on use of low-nitrogen fuel oil and on 24-hour rolling average per 40 CFR 60, Subpart Db.

[3] 9.0 lb/MM Btu during crop season, 7.74 lb/MM Btu during off-season.

references for fuel-oil combustion, but bagasse emission factors are not available.

Maximum hourly and annual emissions of non-criteria pollutants are presented in Table 2-6. The emission factors are based upon the sources listed in Attachment G. Sample calculations using these emission factors are presented in Attachment G.

2.4.3 Fugitive Emissions

Sources of fugitive particulate emissions will be the same for the proposed project as for the current Clewiston mill operations.

2.5 STACK PARAMETERS

Stack parameters for the proposed boiler are presented in Table 2-2. The locations of the stacks are shown in Figure 3-1.

2.6 CONTROL EQUIPMENT INFORMATION

The proposed facility will utilize several control techniques to reduce emissions. Particulate and SO_2 emissions will be reduced by a wet impingement scrubber and the firing of low-sulfur fuel oil. NO_x emissions will be reduced by overfire air, low-nitrogen fuel oil and good combustion practices. The boiler will minimize CO and VOC through proper furnace design and good combustion practices.

2.7 PERMIT APPLICATION FORMS

A completed air pollution source construction permit application form for the proposed boiler No. 7 is contained in Attachment J.

2.8 COMPLIANCE DEMONSTRATION

The Clewiston mill will demonstrate compliance with the emission limits for the facility by monitoring fuel input rates and fuel characteristics (e.g., sulfur content and heating value based on calculations provided by the fuel oil vendor). In addition, steam production parameters (i.e., steam amount, pressure, and temperature) and feedwater parameters will be continuously monitored to allow calculation of heat input by use of an assumed heat transfer efficiency for each fuel.

3.0 AIR QUALITY REVIEW REQUIREMENTS AND APPLICABILITY

The following discussion pertains to the federal and state air regulatory requirements and their applicability to U.S. Sugar Corporation's proposed boiler No. 7.

3.1 NATIONAL AND STATE AAQS

The existing national and Florida AAQS are presented in Table 3-1. National primary AAQS were promulgated to protect the public health, and national secondary AAQS were promulgated to protect the public welfare from any known or anticipated adverse effects associated with the presence of pollutants in the ambient air. Areas of the country that exceed the AAQS are designated as nonattainment areas, and new sources to be located in or near these areas may be subject to more stringent air permitting requirements. Hendry County is an attainment area for all criteria pollutants.

3.2 PSD REQUIREMENTS

3.2.1 General Requirements

Federal PSD requirements are contained in the Code of Federal Regulations (CFR), Title 40, Part 52.21, Prevention of Significant Deterioration of air quality. The State of Florida has adopted PSD regulations [Rule 17-212.400, Florida Administrative Code (F.A.C.)] that essentially are identical to the federal regulations. PSD regulations require that all new major stationary sources or major modifications to existing major sources of air pollutants regulated under CAA be reviewed and a construction permit issued. Florida's State Implementation Plan (SIP), which contains PSD regulations, has been approved by the U.S. Environmental Protection Agency (EPA), and, therefore, PSD approval authority in Florida has been granted to FDEP.

A "major facility" is defined under PSD regulations as any one of 28 named source categories that has the potential to emit 100 tons per year (TPY) or more of any pollutant regulated under the CAA, or any other stationary facility that has the potential to emit 250 TPY or more of any pollutant regulated under the CAA. A "source" is defined as an identifiable piece of process equipment or emissions unit. "Potential to emit' means the capability, at maximum design capacity, to emit a pollutant, considering the application of control equipment and any other federally enforceable limitations on the source's capacity. A "major modification" is defined under PSD regulations as a change at an existing major stationary facility that increases emissions by greater than significant amounts. PSD significant emission rates are shown in Table 3-2.

Table 3-1
National and State AAQS, Allowable PSD Increments, and Significant Impact Levels ($\mu g/m^3$)

Pollutant	Averaging Time	AAQS			Allowable PSD Increments		Significant[4] Impact Levels
		National		State of Florida			
		Primary Standard	Secondary Standard		Class I	Class II	
Particulate Matter (TSP)	Annual Geometric Mean 24-Hour Maximum[1]	NA NA	NA NA	NA NA	5 10	19 37	1 5
Particulate Matter (PM10)	Annual Arithmetic Mean 24-Hour Maximum[2]	50 150	50 150	50 150	4[3] 8[3]	17[3] 30[3]	1 5
Sulfur Dioxide	Annual Arithmetic Mean 24-Hour Maximum[2] 3-Hour Maximum[2]	80 365 NA	NA NA 1,300	60 260 1,300	2 5 25	20 91 512	1 5 25
Carbon Monoxide	8-Hour Maximum[2] 1-Hour Maximum[2]	10,000 40,000	10,000 40,000	10,000 40,000	NA NA	NA NA	500 2,000
Nitrogen Dioxide	Annual Arithmetic Mean	100	100	100	2.5	25	1
Ozone	1-Hour Maximum[5]	235	235	235	NA	NA	NA[6]
Lead	Calendar Quarter Arithmetic Mean	1.5	1.5	1.5	NA	NA	NA

Notes:
[1] Maximum concentration not to be exceeded more than once per year.
[2] Achieved when the expected number of exceedances per year is less than or equal to 1.
[3] Promulgated by EPA in the Federal Register on June 5, 1993; effective June 1994.
[4] This does not apply to Class I areas. If a proposed source is located within 100 kilometers of a Class I area, an impact of 1 $\mu g/m^3$ on a 24-hour basis is significant.
[5] Achieved when the expected number of days per year with concentrations above the standard is less than 1.
[6] No significant ambient impact concentration has been established. Instead, any net emissions increase of 100 tons per year of VOC subject to PSD would be required to perform an ambient impact analysis.

Abbreviations:
- Particulate matter (TSP) = total suspended particulate matter.
- Particulate matter (PM10) = particulate matter with aerodynamic diameter less than or equal to 10 micrometers.
- $\mu g/m^3$ = micrograms per cubic meter.
- NA = Not applicable, i.e., no standard exists.

Sources:
Federal Register Vol. 43, No. 118, June 19, 1978.
40 CFR 50.
40 CFR 52.21.
Rule 17-272.300 and 272.500, F.A.C.

Table 3-2
PSD Significant Emission and
De Minimus Monitoring Concentrations

Pollutant	Regulated Under	Significant Emission Rate (TPY)	*De Minimus* Monitoring Concentration ($\mu g/m^3$)
Sulfur Dioxide	NAAQS, NSPS	40	13 (24-hour)
Particulate Matter (TSP)	NSPS	25	10 (24-hour)
Particulate Matter (PM10)	NAAQS	15	10 (24-hour)
Nitrogen Oxides[1]	NAAQS, NSPS	40	14 (annual)
Carbon Monoxide	NAAQS	100	575 (8-hour)
Volatile Organic Compounds (Ozone)	NAAQS	40	100 TPY[2]
Lead	NAAQS	0.6	0.1 (3-month)
Sulfuric Acid Mist	PSD	7	NM
Total Fluorides	PSD	3	0.25 (24-hour)
Total Reduced Sulfur	PSD	10	10 (1-hour)
Asbestos	NESHAP	0.007	NM
Beryllium	NESHAP	0.0004	0.001 (24-hour)
Mercury	NESHAP	0.1	0.25 (24-hour)
Vinyl Chloride	NESHAP	1	15 (4-hour)

Notes:

1 Nitrogen dioxide (NO_2) is the compound regulated as a criteria pollutant; however, significant emission rates are based on the sum of all oxides of nitrogen.

2 No *de minimus* concentration. An increase in VOC emissions of 100 TPY or more will require an ambient monitoring analysis for ozone.

Note: Ambient monitoring requirement for any pollutant may be exempted if the impact of the emissions increase is below *de minimus* monitoring concentrations.

Abbreviations:

PSD	=	Prevention of Significant Deterioration
NAAQS	=	National Ambient Air Quality Standards
NM	=	No ambient measurement method
NSPS	=	New Source Performance Standards
NESHAP	=	National Emission Standards for Hazardous Air Pollutants
$\mu g/m^3$	=	Micrograms per cubic meter

Source: F.A.C., Rule 17-212.400, Tables 212.400-2 and 212.400-3.

PSD review is used to determine whether significant air quality deterioration will result from the new or modified facility. Major new facilities and major modifications are required to undergo the following analysis related to PSD for each pollutant emitted in significant amounts:

- Source information
- Control technology review
- Source impact analysis
- Preconstruction air quality monitoring analysis
- Additional impact analyses

In addition to these analyses, a new source must be reviewed with respect to good engineering practice (GEP) stack height regulations. If the proposed new source or modification is located in a nonattainment area for any pollutant, the source may be also subject to nonattainment new source review requirements.

Discussions concerning each of these requirements are presented in the following sections.

3.2.2 Increments/Classifications

The 1977 CAA amendments address the prevention of significant deterioration of air quality. The law specifies that certain increases in air quality concentrations above the baseline concentration level of SO_2 and PM (TSP) would constitute significant deterioration. The magnitude of the allowable increment depends on the classification of the area in which a new source (or modification) will be located or will have an impact. Congress also directed EPA to evaluate PSD increments for other criteria pollutants and, if appropriate, promulgate PSD increments for such pollutants.

Three area classifications were designated, based on criteria established in the CAA amendments. Certain types of areas (international parks, national wilderness areas, memorial parks larger than 5,000 acres, and national parks larger than 6,000 acres) were designated as Class I areas. All other areas of the country were designated as Class II. PSD increments for Class III areas were defined, but no areas were designated as Class III. Congress made provisions in the law to allow the redesignation of Class II areas to Class III areas, however, none have yet been redesignated.

In 1977, EPA promulgated PSD regulations related to the requirements for classifications, increments, and area designations as set forth by Congress. PSD increments were initially set for only SO_2 and PM (TSP). Subsequently, in 1988, EPA promulgated final PSD regulations for NO_x and established a PSD increment for nitrogen dioxide (NO_2).

The current federal PSD increments are shown in Table 3-1. As shown, Class I increments are the most stringent, allowing the smallest amount of air quality deterioration, while the Class II increments allow a greater amount of deterioration. FDEP has adopted the EPA class designations and allowable PSD increments for PM (TSP), SO_2, and NO_2. The Florida NO_2 increments were adopted in August 1990.

On June 5, 1993, EPA issued PSD increments for PM10. Those increments, which are effective in June 1994, are shown in Table 3-1. The PM10 increments are somewhat lower in magnitude than the current PM (TSP) increments.

The term "baseline concentration" evolves from federal and state PSD regulations and refers to a hypothetical concentration corresponding to a specified baseline date and certain additional baseline sources. In reference to the baseline concentration, the baseline date actually includes three different dates:

- The major source baseline date, which is January 6, 1975, in the cases of SO_2 and PM (TSP), and February 8, 1988, in the case of NO_2

- The minor source baseline date, which is the earliest date after the trigger date on which a major stationary source or major modification subject to PSD regulations submits a complete PSD application

- The trigger date, which is August 7, 1977, for SO_2 and PM (TSP), and February 8, 1988, for NO_2

By definition in the PSD regulations, baseline concentration means the ambient concentration level that 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 includes:

- The actual emissions representative of sources in existence on the applicable minor source baseline date

- The allowable emissions of major stationary facilities that began construction before January 6, 1975, for SO_2 and PM (TSP) sources, or February 8, 1988, for NO_x sources, but which were not in operation by the applicable baseline date

The following emissions are not included in the baseline concentration and, therefore, affect PSD increment consumption:

- Actual emissions representative of a major stationary source on which construction began after January 6, 1975, for SO_2 and PM (TSP) sources, and after February 8, 1988, for NO_x sources

- Actual emission increases and decreases at any stationary facility occurring after the major source baseline date that result from a physical change or change in the method of operation of the facility

The minor source baseline date for SO_2 and PM (TSP) has been set as December 27, 1977, for the entire State of Florida. The minor source baseline date for NO_2 has been set as March 28, 1988, for all of Florida (Rule 17-275.700, F.A.C.).

3.2.3 Control Technology Review

The control technology review requirements of the federal and state PSD regulations require that all applicable federal and state emission-limiting standards be met, and that BACT be applied to control emissions from the source [Rule 17-212.400(5)(c), F.A.C]. The BACT requirements are applicable to all regulated pollutants for which the increase in emissions from the facility or modification exceeds the significant emission rate (see Table 3-2).

BACT is defined in Rule 17-212.200(16), F.A.C. as:

> *An emissions limitation, including a visible emission standard, based on the maximum degree of reduction of each pollutant emitted which the department, on a case by case basis, taking into account energy, environmental, and economic impacts, and other costs, determines is achievable through application of production processes and available methods, system, and techniques (including fuel cleaning or treatment or innovative fuel combustion techniques) for control of such pollutant. If the Department determines that technological or economic limitations on the application of measurement methodology to a particular part of a source or facility would make the imposition of an emission standard infeasible, a design, equipment, work practice, operational standard or combination thereof, may be prescribed instead to satisfy the requirement for the application of BACT. Such standard shall, to the degree possible, set forth the emissions reductions achievable by implementation of such design, equipment, work practice, or operation.*

The requirements for BACT were promulgated within the framework of PSD in the 1977 amendments of the CAA (Public Law 95-95; Part C, Section 165(a)(4)). The primary purpose of BACT is to optimize consumption of PSD air quality increments and thereby enlarge the potential for future economic growth without significantly degrading air quality (EPA, 1978; 1980). Guidelines for the evaluation of BACT can be found in EPA's New Source Review Workshop Manual (EPA, 1990a). These guidelines were promulgated by EPA to provide a consistent approach to BACT and to ensure that the impacts of alternative emission control systems are measured by the same set of parameters. In addition, through implementation of these guidelines, BACT in one area may not be identical to BACT in another area. According to EPA (1980), *BACT analyses, for the same types of emissions unit and the same pollutants in different locations or situations may determine that different control strategies should be applied to the different sites, depending on site-specific factors. Therefore, BACT analyses must be conducted on a case-by-case basis.*

3.2.4 Air Quality Monitoring Requirements

In accordance with requirements of 40 CFR 52.21(m) and Rule 17-212.400(5)(d), F.A.C, any application for a PSD permit must contain an analysis of ambient air quality data in the area affected by the proposed major stationary facility or major modification. For a new major facility, the affected pollutants are those that the facility potentially would emit in significant amounts. For a major modification, the pollutants are those for which the net emissions increase exceeds the significant emission rate (see Table 3-2).

Under Rule 17-212.400(3)(e)1, F.A.C., a proposed major stationary facility or major modification is exempt from the monitoring requirements with respect to a particular pollutant if the emissions increase of the pollutant from the facility or modification would cause, in any area, air quality impacts less than the *de minimus* levels presented in Table 3-2.

3.2.5 Source Impact Analysis

A source impact analysis must be performed for a proposed major source subject to PSD for each pollutant for which the emissions exceed the significant emission rate (Table 3-2). The PSD regulations specifically provide for the use of atmospheric dispersion models in performing impact analyses, estimating baseline and future air quality levels, and determining compliance with AAQS and allowable PSD increments. Designated EPA models normally must be used in performing the impact analysis. Specific applications for other than EPA-approved models require EPA's consultation and prior approval. Guidance for the use and application of dispersion models is presented in the EPA publication Guideline on Air Quality Models (EPA, 1987b). The source impact analysis for criteria pollutants can be limited to the new or modified source if the net increase in impacts as a result of the new or modified source is below specified significant impact levels, as presented in Table 3-1.

A 5-year period of meteorological data is usually used for impact analyses. A 5-year period can be used with corresponding evaluation of "highest-second-highest" (HSH) short-term concentrations for comparison to AAQS or PSD increments. The term HSH refers to the highest of the second-highest concentrations at all receptors (i.e., the highest concentration at each receptor is discarded). The second-highest concentration is significant because most short-term AAQS specify that the standard should not be exceeded at any location more than once a year. If less than 5 years of meteorological data are used in the modeling analysis, the highest concentration at each receptor must normally be used for comparison to air quality standards.

3.2.6 Additional Impact Analyses

In addition to air quality impact analyses, federal and State of Florida PSD regulations require analysis of the impairment to visibility and the impacts on soils and vegetation that would occur as a result of the proposed source [40 CFR 52.21; Rule 17-212.400(5)(e), F.A.C.]. These analyses are to be conducted primarily for PSD Class I areas. Impacts from general commercial, residential, industrial, and other growth associated with the source also must be addressed. These analyses are required for each pollutant emitted in significant amounts (Table 3-2).

3.2.7 GEP Stack Height Analysis

A GEP stack height analysis must be performed for a proposed major source subject to PSD per Rule 17-212.400(5)(h). This analysis is presented in Section 3.3.1.3.

3.3 SOURCE APPLICABILITY

3.3.1 PSD Review

3.3.1.1 Pollutant Applicability

The Clewiston sugar mill is considered to be an existing major source because potential emissions of criteria pollutants exceed 100 TPY. As a result, PSD review is required for the proposed modification for each pollutant for which the net increase in emissions exceeds the PSD significant emission rates presented in Table 3-2 (i.e., a major modification).

Baseline emissions for PSD source applicability are based on emission factors and operational data from the Clewiston sugar mill. For bagasse, the PM emission factor in terms of lb PM/MM Btu was determined from stack test results under measured steam production. The tests were performed on each boiler separately. The total steam produced during the year is not exclusively from bagasse; a small portion is from oil firing. By determining the fuel inputs during the years, the total amount of steam due to bagasse firing was determined. The emission factors for bagasse were then applied to the steam rate produced from bagasse.

The baseline emissions for Clewiston for each regulated pollutant are presented in Table 3-3. Detailed calculations and derivations for the emission factors and source activity factors are presented in Attachment F.

Table 3-3
PSD Source Applicability Analysis for Clewiston Boiler No. 7

Regulated Pollutant	Baseline[1] Emissions (TPY)	Boilers No. 1-4 and 7 Proposed Project Emissions (TPY)	Net Change (TPY)	Significant Emission Rate (TPY)	PSD Applies
Particulate (TSP)	822	1,048	226	25	Yes
Particulate (PM10)	822	1,048	226	15	Yes
Sulfur Dioxide	393	850	457	40	Yes
Nitrogen Oxides	717	1,368	651	40	Yes
Carbon Monoxide	32,157	44,907	12,750	100	Yes
VOC	850	1,213	363	40	Yes
Lead	0.00058	0.00683	0.00625	0.6	No
Mercury	0.00007	0.00078	0.00071	0.1	No
Beryllium	0.00009	0.00102	0.00093	0.0004	Yes
Fluorides	0.00013	0.00153	0.00140	3	No
Sulfuric Acid Mist	39	85	46	7	Yes
Total Reduced Sulfur	--	--	0	10	No
Asbestos	--	--	0	0.007	No
Vinyl Chloride	--	--	0	0	No

[1] See Attachment H for the derivation of baseline emissions.

Also shown in Table 3-3 are the maximum annual emissions for the Clewiston mill. The net increase in maximum annual emissions from the proposed boiler No. 7 are compared to the PSD significant emission rates in Table 3-3. As shown, potential emissions of PM, SO_2, NO_x, CO, VOCs, beryllium and sulfuric acid mist will exceed the PSD significant emission rate. Therefore, the proposed facility is subject to PSD review for these pollutants.

3.3.1.2 Ambient Monitoring

Based upon the increase in emissions due to the proposed project, a PSD preconstruction ambient monitoring analysis is required for PM, SO_2, NO_x, CO, VOCs, beryllium and sulfuric acid mist. However, if the increased impact of a pollutant is less than the *de minimus* monitoring concentration, then that pollutant is exempt from the preconstruction ambient monitoring requirement. In addition, if an acceptable ambient monitoring method for the pollutant has not been established by EPA, monitoring is not required.

The maximum PM, SO_2, NO_x, CO and VOCs ground-level concentrations due to the proposed boiler are predicted to be less than the corresponding *de minimus* concentrations for these pollutants (see Table 3-2). Therefore, no preconstruction ambient monitoring is required for these pollutants. The ambient monitoring analysis is presented in Section 4.0. The methodology used to predict these impacts is presented in Section 6.0, along with the impact analysis results.

There is no acceptable monitoring method for sulfuric acid mist; therefore this pollutant is exempt from the preconstruction monitoring requirements. For non-criteria pollutants such as beryllium, it is EPA's policy not to require ambient monitoring (EPA, 1987a). Modeling results will be used to determine if impacts of these pollutants are acceptable.

3.3.1.3 GEP Stack Height Analysis

The GEP stack height regulations allow any stack to be the highest of at least 65 m [213 feet (ft)] high or a height established by applying the formula:

$$Hg = H + 1.5L$$

where: Hg = GEP stack height

H = Height of the structure or nearby structure

L = Lesser dimension (height or projected width) of nearby structure(s)

Figure 3-1 is a plan view of the Clewiston Mill in the vicinity of the proposed boiler. The Power House, which houses all of the existing boilers and will also house the proposed boiler No. 7, is on the average about 60 ft high and 101 ft by 303 ft long. The GEP stack height for this building is:

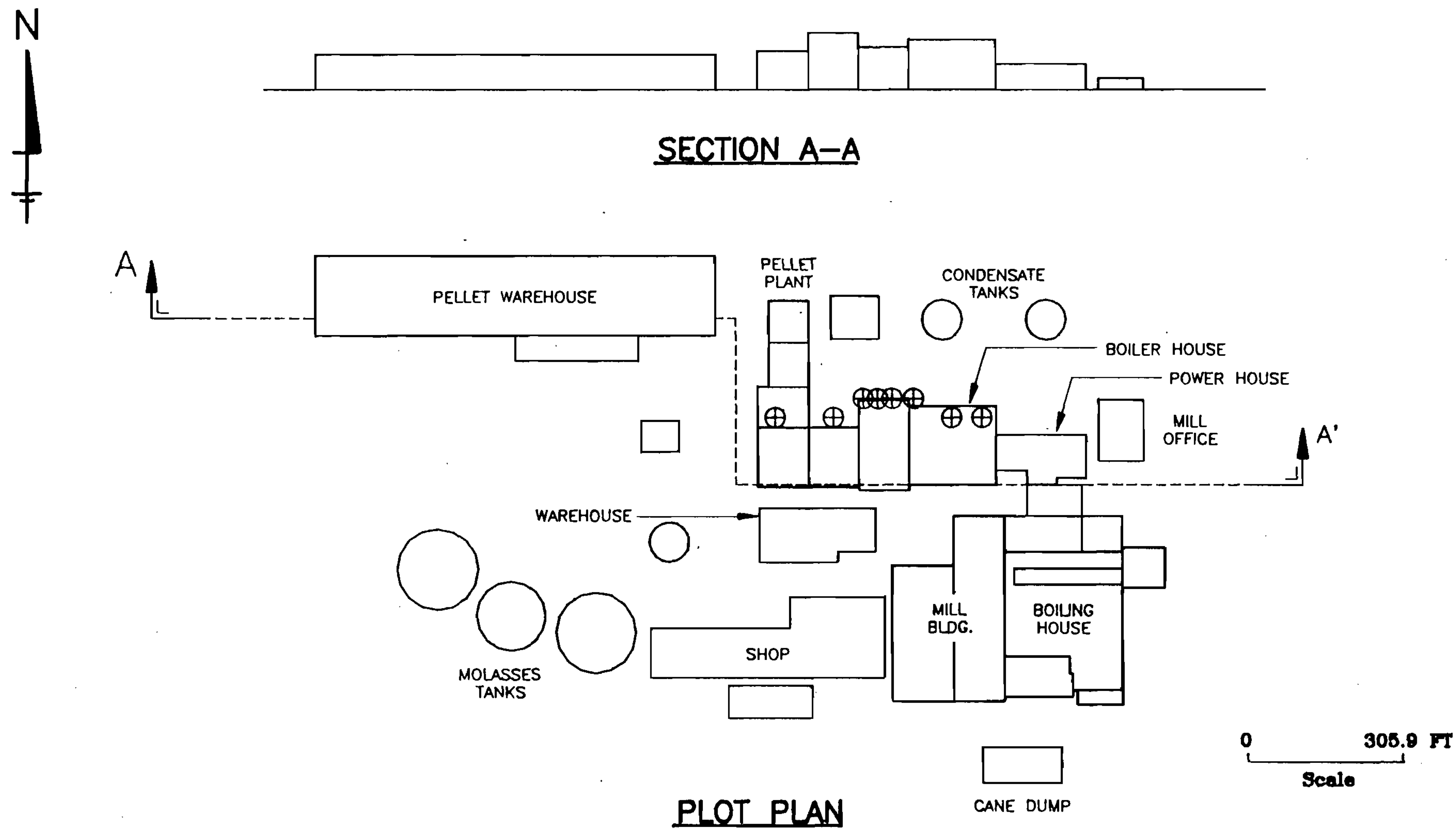


FIGURE 3-1

LEGEND:

⊕ BOILER STACK

U.S. SUGAR CORPORATION CLEWISTON, FLORIDA	PLOT PLAN FOR CLEWISTON MILL
ICF KAISER ENGINEERS PITTSBURGH, PA	DATE: 7/13/93 DR.: B. SNYDER SCALE: AS NOTED FILE NAME: 41185-A1

$$Hg = 60 + (1.5 \times 60) = 150 \text{ ft}$$

The Boiling House is the most significant structure in the proximity of the proposed boiler. This building has a height of 90 ft and is 217 ft long by 220 ft wide. This building would only influence the boiler stacks for certain wind directions (e.g., from about 280-350° and from about 100-170° from the north). From the above formula, the GEP stack height is:

$$Hg = 90 + (1.5 \times 90) = 225 \text{ ft}$$

The stack for the proposed boiler will be 225 ft high and therefore does not exceed the GEP stack height. The potential for downwash of the emissions from the facility due to the presence of nearby structures is discussed in Section 6.0, Source Impact Analysis.

4.0 PRECONSTRUCTION AMBIENT MONITORING ANALYSIS

As discussed in Section 3.3, Source Applicability, a preconstruction ambient monitoring analysis is required for SO_2, PM, NO_x, CO, and VOCs (ozone). The preconstruction monitoring analysis is presented in this section.

Guidelines concerning the requirements for PSD preconstruction monitoring are given in the Ambient Monitoring Guidelines for Prevention of Significant Deterioration (EPA, 1987a). The guidelines cover the collection of new data to fulfill the requirements, as well as the use of existing representative air quality data. To determine if existing data are "representative", the major considerations are monitor location, quality of the data, and currentness of data.

The Florida Sugar Cane League (FSCL) has operated an ambient monitoring network in the sugar cane growing area for several years. The network contains one continuous ambient SO_2 monitor and 12 ambient PM10 monitors.

The first criterion in determining if existing data are representative is monitor location. According to the PSD guidelines, a "regional" monitoring site may be used if the proposed source will be located in an area that is generally free from the impact of other points and area sources associated with human activities. The regional site must be located in an area of similar terrain and represent the air quality across a broad region. The FSCL monitoring sites in the Lake Okeechobee region meet this criterion.

The second criterion relates to the quality of the monitoring data (i.e., the data must meet all PSD quality assurance requirements). The FSCL monitoring network has had full PSD approval for several years and meets the PSD requirements.

The third criterion states that the data must be current. Generally, this means the data must not be more than 3 years old. Monitoring of SO_2 and PM10 by FSCL continues and therefore meets the PSD criteria.

FSCL does not monitor ambient concentrations of NO_x or CO. Consequently, a modeling analysis was conducted to demonstrate that impacts from the proposed modification would not exceed established *de minimus* ambient impacts. Rule 17-212.400(3)(e), F.A.C., allows exemptions from the preconstruction monitoring requirements if a modification's impacts do not exceed *de minimus* levels. The allowable *de minimus* impacts for CO and NO_x are 575 $\mu g/m^3$ (8-hour average) and 14 $\mu g/m^3$ (annual average), respectively.

The modeling analysis was conducted with the ISCST2 model. Selection of the model, meteorological data and the receptor grid used are discussed in detail in Section 6 of this application. The stack parameters used in the analysis are presented in Table 4-1. The NO_x analysis conservatively assumed that the U.S. Sugar Corporation sources operated continuously throughout the year. Sources included in the analysis were existing boilers No. 1, 2, and 3 (with the proposed stack heights) and proposed boiler No. 7; and the existing configuration of boilers No. 1, 2, 3, 5, and 6. Boiler No. 4 was not included because its emission configuration will not change as a result of the proposed modification. Emissions from the existing stacks were entered as negative so as to compute the net change in air quality produced by the proposed modification.

The CO analysis was split into two seasons: a crop season and an off-season. The crop season inventory was developed for the period October 1 through April 30 and the off-season inventory was developed for the period March 1 through October 31. Further details regarding the crop and off-season emission inventories are provided in Section 6 of this application. Sources included in the crop season analysis were boilers No. 1, 2, 3 (at the proposed stack height) and proposed boiler No. 7; and the existing configuration of boilers No. 1, 2, 3, 5, and 6. Boiler No. 4 was not included because its emission configuration will not change as a result of the proposed modification. The only source included in the off-season analysis is the proposed boiler No. 7. U.S. Sugar Corporation does not presently operate sources during the off-season, nor does U.S. Sugar Corporation propose to operate sources other than boiler No. 7 during the off-season.

The results of the modeling analysis are presented in Table 4-2. The results show that NO_x impacts from the proposed modification will not exceed the *de minimus* level of 14 $\mu g/m^3$. Similarly, the results show that CO impacts from the proposed modification will not exceed the *de minimus* level of 575 $\mu g/m^3$.

U.S. Sugar Corporation proposes to be exempted from the ozone monitoring requirements for reasons set forth in Section 6. As discussed in the VOC impact analysis presented in Section 6, U.S. Sugar Corporation will operate only Boiler No. 7 during the ozone season. Predicted VOC impacts are low relative to historical monitored concentrations in Palm Beach County. Consequently, U.S. Sugar Corporation is not expected to contribute to future ozone nonattainment conditions in Palm Beach County. Furthermore, ozone monitoring sites are already located in Palm Beach County that should meet the preconstruction monitoring criteria.

In summary, the SO_2 and PM10 data collected at the FSCL monitoring sites fulfill the PSD preconstruction monitoring criteria. A modeling analysis was used to demonstrate that U.S. Sugar Corporation can be exempted from NO_x and CO preconstruction monitoring.

Table 4-1
Summary of Emission, Stack, and Operating Data
Used in the *De Minimus* Modeling Analysis

ISCST2 Source Identification	Source Description	Coordinates Relative to Boiler No. 7 (m)		Stack Data (m)		Operating Data		Modeled Emissions (g/sec)
		X	Y	Height	Diameter	Temperature (K)	Velocity (m/sec)	
Proposed								
1	Boiler 1	83.2	0.0	45.7	1.86	344	30.2	386.9 (CO) 8.0 (NO_2)
2	Boiler 2	71.0	0.0	45.7	1.86	343	35.7	401.7 (CO) 7.8 (NO_2)
3	Boiler 3	55.8	7.6	45.7	2.29	342	14.7	215.4 (CO) 4.24 (NO_2)
5	Boiler 7	0.0	0.0	68.6	2.63	340	21.7	837.1 (CO-crop) 514.3 (CO-off) 20.6 (NO_2)
Existing								
6	Boiler 1	83.2	0.0	23.1	1.86	344	30.2	-386.9 (CO) -8.0 (NO_2)
7	Boiler 2	71.0	0.0	23.1	1.86	343	35.7	-401.7 (CO) -7.8 (NO_2)
8	Boiler 3	55.8	7.6	27.4	2.29	342	14.7	-215.4 (CO) -4.24 (NO_2)
9	Boiler 5	47.2	7.6	20.9	1.83	338	11.4	-3.2 (CO) -1.92 (NO_2)
10	Boiler 6	35.7	7.6	20.9	1.83	340	11.0	-3.81 (CO) -2.28 (NO_2)

Abbreviations:
- g/sec = grams per second
- K = Kelvin
- m = meters
- m/sec = meters per second

Table 4-2
Maximum Predicted CO and NO_2 for
DeMinimus Modeling Analysis

Averaging Time	Concentration ($\mu g/m^3$)	Receptor Location[1]		Period Ending (YYMMDDHH)
		Direction (degrees)	Distance (m)	
Annual (NO_2)				
	0.0279	250	15,000	85------
	0.0158	240	15,000	86------
	0.0410	260	10,000	87------
	0.0352	250	15,000	88------
	0.0343	270	15,000	89------
8-Hour Highest (CO)				
Crop Season	399	280	2000	85042516
	358	220	1000	86042916
	281	140	2000	87102716
	248	50	2000	88041116
	321	230	2000	89041916
Off-Season	460	340	2000	85101116
	547	250	1000	86060316
	373	60	1000	87081216
	485	260	1000	88061816
	365	230	1000	89041916

Abbreviations:

YY = Year
MM = Month
DD = Day
HH = Hour

Notes:

[1] All receptor coordinates are reported with respect to the Boiler No. 7 stack location.

5.0 BEST AVAILABLE CONTROL TECHNOLOGY EVALUATION

5.1 BACT APPLICABILITY

5.1.1 Pollutants Requiring BACT Analysis

As presented in Section 3.4, the net increase in the emissions of the following pollutants from the Clewiston mill proposed boiler No. 7 will exceed their respective PSD significant emission rates when oil is fired as an auxiliary fuel (see Table 3-3):

- PM
- SO_2
- NO_x
- CO
- VOCs
- Beryllium
- Sulfuric acid mist

Therefore, BACT analyses for these pollutants is required for the proposed spreader-stoker boiler No. 7 firing bagasse and residual oil. The complete "top-down" BACT evaluation for each PSD pollutant includes the following:

- Identification of the respective available control technologies

- Evaluation of environmental, energy, and economic impacts of all technically feasible control methods

- BACT analysis summary

5.1.2 Regulatory Guidance

Previous BACT determinations for oil-fired boilers represent the starting point or "top" for the top-down BACT analysis; the minimum acceptable BACT is the applicable NSPS or SIP limit.

BACT determination information was obtained from the USEPA BACT/LAER Informational System (BLIS) database (EPA 1993a) through EPA's National Computer Center located at Research Triangle Park in North Carolina. No BACT determinations for bagasse-fired boilers since 1984 are available from EPA.

5.1.2.1 PM

The minimum BACT limit for PM is the NSPS from 40 CFR 60.43b for facilities that combust oil: 0.1 lb/MM Btu, which is also the Florida emission standard for fuel oil combustion. As a minimum, the proposed boiler must also meet an emission limit of 0.2 lb/MM Btu when firing bagasse, which is the State of Florida emission limit for combustion of carbonaceous fuel.

5.1.2.2 SO_2

The minimum BACT limit for SO_2 emissions from fuel oil is the NSPS from 40 CFR 60.42b for facilities that combust oil: 90% SO_2 removal or the use of very-low-sulfur (no more than 0.5% sulfur) fuel oil. There are no applicable emission standards for SO_2 from bagasse-fired boilers; the most relevant precedent appears to be the Clewiston boiler No. 4 permit limit of 0.166 lb/MM Btu when firing bagasse.

5.1.2.3 NO_x

The minimum BACT limit for NO_x emissions is the NSPS from 40 CFR 60.44b for facilities that combust residual oil: NO_x emissions less than 0.3 lb/MM Btu (low heat release) and 0.4 lb/MM Btu (high heat release), except for facilities which have an annual capacity factor for oil of 10% or less. There are no applicable emission limits for NO_x from bagasse-fired boilers; the most relevant precedent appears to be the Clewiston boiler No. 4 permit limit of 180.6 lb/hr when firing bagasse. This equates to 0.24 lb/MM Btu.

5.2 BACT DETERMINATION FOR PM AND SO_2 EMISSIONS

5.2.1 Identification of PM and SO_2 Emission Control Technologies for Industrial Boilers

In this section, the available control technologies capable of reducing PM and SO_2 emissions produced from firing bagasse and residual oil as an auxiliary fuel will be identified and evaluated. Potential application of these technologies as BACT for the proposed spreader-stoker boiler is discussed. Table 5-1 is a summary of the potential PM and SO_2 control technologies presented in this section.

In boilers firing fossil fuels, sulfur compounds are produced by the combustion process in which nearly complete oxidation of the fuel-bound sulfur occurs. These sulfur compounds are primarily SO_2 with a smaller quantity of sulfur trioxide (SO_3) that eventually is converted to sulfuric acid (H_2SO_4) mist. The amount of SO_2 emissions is directly proportional to the sulfur and sulfate content in the fuel. Reducing SO_2 emissions by boiler modification is not feasible because the firing mechanism

Table 5-1
Summary of Potential PM and SO_2 Control Technologies[1]

Control Technology	Typical Effic. (% PM)	Typical Effic. (% SO_2)	In Service On Bagasse Combustors?	In Service On Other Combustion Sources?	Technically Feasible For This Combustor?
Semi-dry scrubber (Fabric Filter/ESP)	90-99	70-90	No	Yes	Yes[2]
Dry Sorbent Injection (Fabric Filter/ESP)	90-99	40-70	No	Yes	No[3]
Wet Scrubber (Electrostatic Type)	70-98	70-90	No	Yes	No[4]
Wet Scrubber (Impingement Type)	60-90	70-90	Yes	Yes	Yes
Low-sulfur Fuel Oil	N/A[5]	40-80	Yes	Yes	Yes[6]

Notes:
[1] Source: Air Pollution Engineering Manual, AWMA, 1992.
[2] Unproven technology for this application.
[3] No technical or economic advantage over semi-dry scrubber; similar technology.
[4] Unproven technology for this application.
[5] Not applicable.
[6] Would only reduce SO_2 for fuel oil combustion; most of annual heat release comes from bagasse.

does not affect SO_2 emissions. Generally, complete oxidation of sulfur in fuel is readily achieved before the complete combustion of the primarily carbon fuel element in fossil fuel. Typically, SO_2 emission reduction is accomplished along with PM removal by treating the fluegas with a variety of fluegas desulfurization (FGD) processes.

Standard FGD processes for spreader-stoker boilers are wet or semi-dry scrubbers. The following discussion of each potential SO_2 scrubber type includes a description of the technology and, if it is concluded that the technology is technically feasible, the potential SO_2 emission reduction level.

5.2.1.1 Wet Scrubbing Systems

Wet scrubbing of acid gas is an absorption process which involves mass transfer between a soluble gas component (e.g., SO_2) and a solvent liquid (e.g. water). The driving force for gas absorption into the scrubbing liquid is the difference between the partial pressure of the soluble gas in the gas mixture and the vapor pressure of the solute gas in the liquid film in contact with the gas. Therefore the scrubbing liquid must be continually desorbed or a blowdown stream must be routed to wastewater treatment (and replaced with fresh water) in order to maintain a high driving force. Alkaline reagents which change the molecular species of the absorbing pollutant by reaction in the water film are sometimes added to the scrubbing water to increase the driving force for mass transfer.

Wet scrubbing can also remove PM by one or both of the following mechanisms:

- Centrifugal deposition - PM may be "spun out" of a gas stream by centrifugal force induced by a change in gas flow direction. This is not very effective for PM smaller than 5 micron.

- Inertial impaction and interception - when a gas stream flows around a small object, the inertia of the particles causes them to continue to move toward the object, and some of them will be collected.

Wet scrubbing systems include many types of mass transfer units:

- Packed-bed absorbers

- Spray chambers

- Plate columns

- Baffle/impingement chambers

- Inertial types (e.g., venturi)

PM removal is achieved simultaneously with SO_2 removal in these systems. Alternately, specific PM removal systems (e.g., wet electrostatic precipitators or wet fabric filters) can be used instead of, or in combination with, the above units. These PM removal systems have not been used for bagasse combustors or for large industrial boilers, are judged technically infeasible for this application, and will thus not be considered further. The most common by far of the above wet scrubbers for bagasse combustors are the impingement and venturi scrubbers.

In an impingement scrubber, the gas to be cleaned passes through a peripheral nozzle and is guided downward at high velocity into a liquid bath. The level of the liquid bath is maintained slightly below the nozzle by means of an adjustable weir. Collection of fluegas particles is by both direct inertial impaction with the liquid bath and by collision with droplets atomized by the action of the gas stream upon the liquid bath. Mist elimination, achieved by centrifugal action and swirl vanes, precedes gas discharge.

In the venturi scrubber, the gases are passed through a venturi throat where low-pressure water is added. The throat provides a smaller cross-sectional area for gas flow, and thus increases gas velocity. Extreme turbulence in the throat atomizes the water into small droplets and promotes intimate contact with the gas and PM. The droplets and wetted particles are then collected in a mist elimination device. For a given collection efficiency, these devices normally require a greater pressure drop than the impingement scrubber. In addition, pretreatment mechanical collectors are normally necessary downstream of bagasse combustors to remove the larger abrasive particles in order to decrease wear on the venturi throat.

Wet scrubbing processes are capable of achieving high removal efficiencies for soluble acidic gases (e.g., HCl and HF) with water which has a neutral or lower pH. Gases of more limited solubility (e.g., SO_2 or Cl_2) can be absorbed more readily in an alkaline solution than in water alone. There is little test data available for absorption of SO_2 from fuel oil combustion in a wet scrubber using water only, so we have conservatively assumed that there will be no removal efficiency for non-alkaline wet scrubbing for fuel oil firing.

The pH of the process water used at the Clewiston mill has been measured in the range of 7 to 8, which is alkaline to neutral, and theoretically should absorb some SO_2 from the gas stream. The emissions test data from bagasse boilers show a significant reduction in theoretical SO_2 emissions upstream of the scrubber, resulting in overall reduction of greater than 90% of the theoretical amount of SO_2. This additional reduction probably takes place in the boiler, where the bottom ash and fly ash absorb much of the SO_2.

There is significant test data on the performance of wet scrubbers for bagasse combustion. Although the wet scrubbing process can potentially achieve 95% removal efficiency for SO_2 and PM, a somewhat more conservative value of 90% will be used in the BACT analysis.

The combustion gases entering the wet scrubber at 300-350°F are cooled and saturated by the scrubbing liquid to an adiabatic saturation temperature of about 160°F. This low temperature will also enhance the removal of condensible trace elements, such as toxic metals, in the wet scrubber.

5.2.1.2 Semi-dry Scrubbing Systems

In the semi-dry scrubbing process, the fluegas enters a spray dryer and contacts an atomized slurry of lime ($Ca[OH]_2$), sodium bicarbonate ($NaHCO_3$) or sodium carbonate sorbent. The SO_2 gas reacts with lime or sodium sorbent to form initially either calcium sulfite ($CaSO_3 \cdot 0.5H_2O$) or sodium bisulfite ($NaHSO_3$). Upon further oxidation or SO_2 absorption enhanced by the drying process, the sulfite salts will be transformed into calcium sulfate ($CaSO_4 \cdot 2H_2O$) or sodium sulfite/sulfate solids. Industrial and utility spray dryers typically use lime as the reagent because it is more readily available and cheaper than sodium bicarbonate.

Lime slurry is injected into the spray dryer chamber through either a rotary atomizer or pressurized dual-fluid nozzles. In rotary atomizers, the slurry is fed to the center of a rapidly rotating disk where it flows outward to the edge of the rapidly rotating disk. The slurry is atomized by centrifugal force as it leaves the surface of the disk. Dual-fluid nozzles use kinetic energy to atomize the slurry. High-velocity air or steam is injected into the nozzle, breaking the slurry into fine droplets, which are ejected at near-sonic velocities into the spray drying chamber.

As the combustion gases contact and pass through the cloud of atomized lime slurry, the water content of the slurry will cool the gases while being vaporized. Simultaneously, the lime in the slurry will react with the SO_2 in the fluegas to produce calcium salts. This concurrent evaporation and reaction in the spray drying process increases the moisture and particulate content of the fluegas and reduces the fluegas temperature. The dried solids exiting the spray-dryer/absorber contains fly ash, calcium salts and excess lime. Moisture content of the dried solids leaving the absorber is about 3-5%. The spray-dryer/absorber is designed to provide sufficient residence time (10 to 15 seconds) to complete the drying and absorbing processes.

In the spray-dryer/absorber, the amount of water used is optimized to produce an exit gas stream with dried material and no liquid discharge. The fluegas temperature exiting the spray dryer is typically 20-40°F above adiabatic saturation. The dried reaction products and fly ash are both removed from the fluegas by a particulate collection device downstream.

Key design and operating parameters that can significantly affect spray dryer performance are reagent-to-sulfur stoichiometric ratio, slurry droplet size, makeup water characteristics, gas residence time, and scrubber outlet temperature. An excess amount of lime above the theoretical requirement is fed to the spray dryer to compensate for mass transfer limitations and incomplete mixing. Smaller droplet size increases the surface area for reaction between lime and acid gases and increases the rate of water evaporation. A longer residence time results in higher chemical reactivity. The scrubber outlet temperature is controlled by the amount of water in the slurry. Typically, effective utilization of lime and effective sulfur dioxide removal occur at temperatures close to adiabatic saturation, but the fluegas temperature must be kept high enough to ensure the slurry and reaction products are adequately dried prior to the particulate collection process.

The semi-dry scrubber is located upstream of the particulate control device, which is either an electrostatic precipitator (ESP) or a fabric filter (baghouse) system. A baghouse can provide greater SO_2 removal compared to an ESP system. When a baghouse is used, a layer of porous filter cake forms on the filter bag surfaces. This filter cake contains unspent reagent which provides for additional SO_2 removal because the fluegases pass through the filter cake. Thus, for this BACT analysis, the semi-dry scrubber consists of a spray dryer absorber and a fabric filter.

Based on BACT determinations previously issued, the semi-dry scrubber system can achieve between 70-95% SO_2 removal for residual-oil-fired boilers, with 90% removal being assumed for this analysis based on discussions with FGD vendors.

In order to attain this high SO_2 removal efficiency, the semi-dry scrubbing process must include recirculation of the dried solids to the lime slurry. This recirculation will increase the concentration of toxic metals (e.g., lead, chromium) on the dried solids, thereby potentially increasing metals emissions from the stack. In addition, the higher temperature of the stack gas compared to the wet scrubber may lead to higher gas-phase metal emissions compared to a wet scrubber.

5.2.1.3 Fabric Filters and Dry Sorbent Injection

Fabric filters consist of semipermeable woven or felted materials that constitute the substrate for the approaching dust. The deposited PM layer enables the high-efficiency capture of the particles once a uniform surface layer has been established. The fabric is periodically partially cleaned of accumulated particles by compressed air pulses, mechanical shaking, or reverse flow. Particles are captured by the following mechanisms:

- Interception - the particle is carried by a gas streamline directly toward a fiber target.

- Inertial impaction - the particle is on a gas streamline that would carry it around the fiber target, but the particle's inertia causes it to leave its streamline and strike the target.

- Diffusion - the particle is so small that its path is highly erratic and random excursions carry the particle to a target fiber (for particles less than 0.1 micron)

- Sieving - the particle is trapped because it is too large to pass through the specific pore

Many baghouses have been installed on coal, wood and solid-waste-fired boilers. The principal drawback foreseen by potential users of baghouses is a fire danger resulting from collection of combustible carbonaceous fly ash. The fire potential could possibly be reduced by extensive precautions, but such measures have not been demonstrated in actual application on bagasse-fired boilers.

Additional problems with baghouses are plugging, solid waste disposal of a dry product, and potential high maintenance costs for filter replacement. Particulate emission controls via fabric filtration have not been installed on any bagasse-fired boiler. Few full-scale baghouses have been installed on any types of large nonfossil-fuel-fired boilers. Because of the unproven ability of baghouses to operate reliably and effectively on bagasse-fired boilers, they were not considered further in the BACT analysis.

Another disadvantage to fabric filtration is its inability to remove gaseous pollutants from the gas stream (e.g., SO_2); another control device would be required to remove pollutants such as SO_2. This is generally addressed by the use of a spray dryer absorber upstream of the fabric filter, as in the case of the semi-dry scrubber previously discussed. Alternately, a dry sorbent injection (DSI) system can be used. In the DSI system, the combustion gas is usually humidified to within 25-50°F of the adiabatic saturation temperature with water sprays in a spray chamber. A dry sorbent, such as hydrated lime or sodium bicarbonate, is then injected into the fluegas.

The DSI can not attain as high of an SO_2 removal efficiency as a semi-dry scrubbing system, because the dry solid does not absorb the acid gas as readily as the moist lime does in a semi-dry system. Although there is little technical or economic reason to choose a DSI system for a new installation, DSI has proved to be a good retrofit technology for existing combustion systems which already have a fabric filter or ESP, but no acid gas removal. Because the DSI system has no technical, environmental or economic advantages over a semi-dry system for this application, it is considered infeasible for this combustor, and will not be considered further.

5.2.1.4 Electrostatic Precipitators

Electrostatic precipitators (ESP) particulate collection is accomplished by first imparting an electrical charge to the particles, allowing the charged particles to migrate to a collecting electrode, and dislodging the collected particles from the collecting electrodes. Particle charging is normally accomplished with a high-voltage DC corona. Particle removal is performed by rapping or vibrating the collecting electrodes.

ESPs have the inherent disadvantage of removing only particulate matter. Another control device would be needed to remove gaseous pollutants such as SO_2. This is typically addressed by the use of dry sorbent injection, as discussed previously. Disposal of a dry solid waste product would also be required.

ESPs are in operation on many wood, solid-waste and coal-fired boilers. They have not, however, been applied to bagasse-fired boilers. Precipitator vendors contacted recently and a study conducted several years ago indicate that electrostatic precipitation of bagasse ash would probably not be feasible. The vendors also caution against possible fire hazard and explosion potential. Information does not currently exist on the resistivity of bagasse fly ash, and, therefore, the design of an ESP for this fly ash cannot be easily defined. Because of the uncertainty associated with application of ESPs to bagasse boilers, this technology is considered to be unproven and thus was not considered further in the BACT analysis.

5.2.1.5 Low-sulfur Fuel Oil

The sulfur content of residual oil typically ranges from 0.3-3.0% by weight. Because the level of SO_2 emissions is directly related to the amount of sulfur in the fuel, a low-sulfur-containing fuel can be used to meet the SO_2 emission limitation specified by the NSPS regulations.

Under the current NSPS regulations for industrial steam generators (40 CFR 60, Subpart Db), an SO_2 emission rate of 0.5 lb/MM Btu must be met by the proposed boiler No. 7. The sulfur content of the residual oil used in boilers No. 1, 2 and 3 is 2.5% which is equivalent to an uncontrolled SO_2 emission factor of approximately 2.7 lb/MM Btu. U.S. Sugar Corporation is proposing to use "very-low-sulfur" fuel oil (no more than 0.5% sulfur) to meet the NSPS limit, as 40 CFR 60.42b specifically allows. This is equivalent to an uncontrolled SO_2 emission factor of approximately 0.5 lb/MM Btu.

The intent of U.S. Sugar Corporation has and always will be to minimize the burning of fuel oil in the existing boilers as well as the proposed boiler No. 7. For example, during 1992 fuel oil provided less than 1% of the Clewiston mill's total heat input requirements. Oil is normally required for starting up the boilers at the beginning of the crop-year (generally requires less than 24 hours). After startup, oil will only be fired when the supply of bagasse to the boiler is interrupted.

Oil is very costly; therefore, simple economics dictate minimization of fuel oil usage. The permit application provides for up to 3,000,000 gallons per year of fuel oil to be burned in the proposed boiler. Actual fuel oil usage is expected to be below this level.

The SO_2 emissions due to oil firing are also conservatively estimated in the application, because no SO_2 removal across the impingement scrubbers was assumed. Only limited test data currently exist for the Florida sugar cane industry on SO_2 removal while burning oil, partly because such tests are very costly in terms of fuel. But owing to the somewhat alkaline nature of the scrubber water, it is likely that some SO_2 removal does occur when firing oil.

The firing of a very-low-sulfur-content fuel oil in the proposed boiler will be costly to U.S. Sugar Corporation, owing to the differential between 2.5% and 0.5% sulfur fuel oils, which is currently $8/bbl and could be substantially higher in the future.

5.2.2 Evaluation of Technically Feasible PM and SO_2 Control Methods

This section examines the three technically feasible alternative SO_2 control methods (i.e., the wet scrubber, the semi-dry scrubber and low-sulfur fuel oil) identified in the previous discussion. Each alternative will be further examined with regard to its technical issues, environmental effects, energy requirements, and economic impacts.

5.2.2.1 Ranking of Feasible Control Technologies

A baseline emission level must be established as the basis for top-down BACT ranking and for economic analysis purposes. The baseline is defined as the uncontrolled emission rate of the process being reviewed. Thus, the SO_2 and PM emission level associated with the firing of only 2.5% sulfur oil in boiler No. 7 and no add-on SO_2 or PM controls will be used as the baseline emission level.

As discussed previously, both the wet and semi-dry scrubbers can be designed to achieve SO_2 removal efficiencies of 90% for bagasse. The wet scrubber can not, however, achieve 90% SO_2 removal efficiency for fuel oil without using alkali. U.S. Sugar Corporation does not use alkali scrubbing liquid in any of its existing impingement scrubbers, and therefore does not plan to use it for the boiler No. 7 scrubber. In addition, the semi-dry scrubber can achieve higher removal efficiency for PM. Therefore, the BACT top-down hierarchy ranks the semi-dry scrubber first and the wet scrubber second.

5.2.2.2 Analysis of Add-On Scrubbing Systems

Technical Issues

Wet Scrubber. The impingement and inertial-type wet scrubbers can typically achieve SO_2 removal efficiencies in the 70-95% range and are designed for simultaneous particulate removal. Of all the potential add-on control technologies discussed in the previous section, only the impingement and venturi wet scrubbers have been proven on bagasse-fired boilers.

A venturi scrubber was not chosen for consideration in the detailed BACT evaluation because it has not proven to be a more efficient control device than the impingement scrubber. BACT guidelines do not require further analysis of alternative control systems which cannot achieve a greater degree of emission reduction than a functionally similar alternative. The venturi is also considerably more expensive to install and operate, requires a greater pressure drop (2 to 3 times that of the impingement scrubber), with a correspondingly greater energy consumption, and requires more water. The higher maintenance costs are due to the abrasive nature of the fly ash and high gas velocities encountered in the venturi and across the exhaust fan, which accelerates wear of exposed surfaces. Venturis must be preceded by mechanical collectors to reduce wear, which further increases capital and operating costs of the system.

Venturi scrubbers are currently operating on a total of six boilers in the Florida sugar industry. At both Okeelanta and Talisman, mechanical cyclone collectors precede the venturi scrubbers in order to remove larger particles. At Okeelanta, the venturi scrubber typically operates at a pressure drop of 16 inches H_2O. At Talisman, the venturis operate typically at 14 inches H_2O pressure drop. Compliance test results have varied widely, ranging from 0.09 lb/MM Btu to 0.30 lb/MM Btu. The average of all tests for all boilers is 0.20 lb/MM Btu. The data show that the venturi scrubbers have not achieved a greater degree of emission reduction than that achieved with the impingement scrubber.

Wet scrubbers are the only control devices currently in operation on bagasse/oil-fired steam boilers in the Florida sugar industry. These scrubbers are mainly of the impingement type. Venturi scrubbers are also utilized on a few bagasse/oil-fired boilers in Florida. The Background Information document for Nonfossil Fuel-Fired Industrial Boilers (EPA, 1982) shows that wet scrubbers are the only PM control devices currently in use on bagasse-fired boilers in the United States, other than low-efficiency centrifugal collectors (e.g., cyclones). The following is a summary of current scrubber installations on bagasse/oil-fired boilers in Florida:

Mill	No. of Bagasse/ Oil Boilers	No. of Impingement Scrubbers	No. of Venturi Scrubbers
U.S. Sugar Clewiston	6	6	0
U.S. Sugar Bryant	4	4	0
Sugar Cane Growers Coop.	6	6	0
Osceola Farms	5	5	0
Atlantic Sugar Association	5	5	0
Okeelanta	8	5	3
Talisman	3	0	3
TOTAL	37	31	6

The venturi scrubber and impingement scrubber are currently the only types operating in the Florida sugar industry; note that impingement scrubbers represent 84% of all scrubbers currently in use, with venturi scrubbers accounting for the remaining 16%.

U.S. Sugar Corporation has installed six impingement scrubbers at the Clewiston mill and four at the Bryant mill. There were some problems with the first units installed many years ago; as these "first generation" problems were identified, they were corrected by retrofit and by improved system designs. Some specific improvements made to earlier designs include:

- Changing spray location and flowrate
- Modifying weir height
- Relocating induced draft fans from upstream to downstream of the wet scrubbers, thus avoiding flyash abrasion problems

U.S. Sugar Corporation has therefore improved the performance of these impingement scrubbers over the years and has an in-depth understanding of the scrubber technology.

The most important design parameter for wet scrubbers is the impingement effect, which causes the intimacy of contact between the liquid and gas phases. Important operational parameters include scrubber pressure drop and scrubbing liquid flowrate.

The impingement scrubber can attain a particulate emission of 0.15 lb/MM Btu and will remove 90% or more of the theoretical SO_2. The pH of the scrubber water used at the Clewiston mill has been measured in the range of 7 to 8, which is alkaline to neutral, and will thus absorb some SO_2 from the gas stream. The SO_2 test data from bagasse boilers also show a significant reduction in theoretical SO_2 emissions elsewhere in the process, resulting in overall reduction of greater than 90% of the theoretical amount of SO_2. This additional reduction probably takes place in the boiler, where the bottom ash and fly ash absorb the SO_2.

Semi-dry Scrubber. The semi-dry scrubber requires a separate particulate control system to be installed downstream of the spray dryer. In addition, it requires more precise control and operator attention than the wet scrubber system. From an operating standpoint, a narrow operating temperature window (inlet and outlet of the spray dryer) has to be strictly adhered to in order to avoid potential problems, such as:

- Low spray dryer inlet temperature, which will reduce the amount of lime slurry which can be dried in order to absorb acid gas
- High fabric filter inlet temperature and potential for baghouse fire
- Low baghouse inlet temperature and potential incomplete drying of solids and subsequent coating/plugging of bags

Most importantly to U.S. Sugar Corporation, the reliability of a semi-dry scrubber is not proven for bagasse-fired boilers.

Environmental Effects

Wet Scrubber. The primary environmental concern of using the wet scrubber is the process wastewater and the wastewater sludge generated. These waste streams require proper treatment and disposal, but the Clewiston mill already has a wastewater treatment system with adequate capacity.

Semi-dry Scrubber. The major environmental issues concerning the use of the semi-dry scrubber process are solid waste disposal and water demand. Calcium salts will be generated from the semi-dry scrubbing process that will require disposal. For every ton of SO_2 removed, there will be 6 tons of solid waste generated. A dry FGD system for Clewiston could therefore generate up to 6,350 tons of solid waste each year, which would be landfilled off-site.

Low-sulfur Oil. There will be no incremental environmental impacts due to using low-sulfur oil instead of standard residual oil.

Energy Requirements

Both the wet and semi-dry scrubber require electricity to drive various mechanical equipment, including fans and pumps. The estimated energy requirement is approximately 1340 kw for the wet scrubber and approximately 1640 kw for the semi-dry scrubber. These estimated energy requirements are calculated assuming the maximum allowable oil-firing for the facility. No additional energy is required to fire low-sulfur fuel oil instead of the current 2.5% sulfur fuel oil.

Economic Analysis

This section presents the total capital investment (TCI) and the total annualized cost (AC) of both the wet scrubber and the semi-dry scrubber processes for the proposed Clewiston boiler No. 7. Capital costs were developed from basic equipment costs for each process and with standard cost factors for estimating the direct and indirect costs of the emission control systems (EPA, 1990b).

The equipment cost for the semi-dry scrubber system was based on the budgetary quotations obtained from control system vendors. This cost is $3.99 million for the semi-dry scrubber.

The equipment cost for the wet scrubber system is approximately $0.42 million or about 1/10 the cost of the semi-dry scrubber. This factor was developed from vendor quotation and U.S. Sugar Corporation experience with other comparable wet scrubbers (e.g., boiler No. 4).

All operating costs were developed based on an equivalent 1,752 hr/yr operation on oil for boiler No. 7. This represents the number of hours at maximum oil-firing capacity to achieve 10% of the total facility annual heat input (i.e., 4,861 MM Btu/yr divided by 255 MM Btu/hr).

The cost estimates for both scrubber systems are presented in Table 5-2. The TCI estimated for the semi-dry scrubber is $10.3 MM and for the wet scrubber is $1.12 MM. The AC for the semi-dry scrubber is approximately $3.8 MM/yr and for the wet scrubber is $0.9 MM/yr. The TCI for low sulfur fuel oil is $50,004, and the AC is $0.6 MM/yr.

5.2.2.3 PM and SO_2 BACT Summary

The BACT analysis for PM and SO_2 control has evaluated the two feasible add-on control alternatives (i.e., the wet scrubber and the semi-dry scrubber). This section will summarize the overall technical, environmental, energy, and economic impacts of both alternatives and compare them with the alternative of firing low-sulfur fuel oil.

Comparison of Technical Issues

Wet scrubbers and semi-dry scrubbers can reduce SO_2 emissions from bagasse combustion by 90%, PM emissions by more than 90%, and are considered technically feasible for the Clewiston project. SO_2 removal efficiencies range from 90-95% with the higher range assigned to a wet scrubber system with a long averaging time period for compliance (i.e, 30-day rolling average).

Table 5-2
Cost Analysis for PM and SO_2 Emissions Control

Cost Items	Cost Factors	Dry Scrubber	Wet Scrubber	Low-S Oil
DIRECT CAPITAL COSTS (DCC)				
(1) Purchased Equipment Cost:				
(a) Basic Equipment/Services	Vendor Quotation	$3,990,000	$420,000	$0
(b) Auxilary Systems	Vendor Quote (included in 1a)	$0	$0	$0
(c) Instrumentation & Controls	0.10(1a + 1b)	$399,000	$42,000	$0
(d) Structural Support	0.10(1a + 1b)	$399,000	$42,000	$0
(e) Freight	0.05(1a + 1b + 1c + 1d)	$239,400	$25,200	$0
(f) Florida Sales Tax	0.06(1a + 1b + 1c + 1d)	$287,280	$30,240	$0
(g) Purchased Equipment Subtotal	(1a + 1b + 1c + 1d + 1e + 1f)	$5,314,680	$559,440	$0
(2) Direct Installation Cost:	0.30(1g)	$1,594,404	$167,832	$0
Total DCC:	(1g + 2)	$6,909,084	$727,272	$0
INDIRECT CAPITAL COSTS (ICC)				
(3) Indirect Installation Cost:				
(a) Engineering & Supervision *	0.10(DCC)	$690,908	$72,727	$0
(b) Construction & Field Expenses *	0.10(DCC)	$690,908	$72,727	$0
(c) Construction & Contractor Fee *	0.05(DCC)	$345,454	$36,364	$0
(d) Contingencies *	0.20(DCC)	$1,381,817	$145,454	$0
(4) Other Indirect Cost:				
(a) Start-up & Testing *	0.03(DCC)	$207,273	$21,818	$0
(b) Working Capital	30 Day DOC **	$118,458	$46,130	$50,004
Total ICC	(3) + (4)	$3,434,818	$395,221	$50,004
TOTAL CAPITAL INVESTMENT (TCI)	DCC + ICC	$10,343,902	$1,122,493	$50,004
DIRECT OPERATING COST (DOC):				
(5) Operating Labor:				
(a) Operator	8,760 hr/yr @ $22/hr	$192,720	$192,720	$0
(b) Supervisor	15% of operator cost	$28,908	$28,908	$0
(6) Maintenance *	5% of total DCC	$345,454	$36,364	$0
(7) Replacement Parts	3% of total DCC	$207,273	$21,818	$0
(8) Utilities	$0.08/kw-hr, $0.27/Mgal			
(a) Electricity	KW: 595 dry, 340 wet	$416,976	$238,272	$48
(b) Water	gpm 71 semi-dry, 500 wet	$4,967	$35,478	$0
(9) Chemicals and Fuel				
(a) Lime (97% purity)	$50/ton x 1,075 TPY	$53,750	$0	$0
(b) Oil Premium (cost difference)	$0.2/gallon x 3 MM gal/yr	$0	$0	$600,000
(10) Solids Disposal	$27/ton x 6,350 TPY	$171,450	$0	0
Total DOC	(5)+(6)+(7)+(8)+(9)+(10)	$1,421,498	$553,560	$600,048
INDIRECT OPERATING COST (IOC)				
(11) Overhead *	60% of (5) and (6)	$340,249	$154,795	$0
(12) Property Taxes *	1% of TCI	$103,439	$11,225	$500
(13) Insurance *	1% of TCI	$103,439	$11,225	$500
(14) Administration *	2% of TCI	$206,878	$22,450	$1,000
Total IOC	(11) + (12) + (13) + (14)	$754,005	$199,695	$2,000
TOTAL OPERATING COST (TOC)	DOC + IOC	$2,175,503	$753,254	$602,048
CAPITAL RECOVERY COST (CRC)	0.1627(TCI)	$1,682,953	$182,630	$8,136
ANNUALIZED COST (AC)	**DOC + IOC + CRC**	**$3,858,456**	**$935,884**	**$610,183**

Notes:
* Cost factors are based on EPA's OAQPS Control Cost Manual, Fourth Edition.
** 30 days of direct operating costs (i.e. Total DOC/12)
1. Operating hours are 7,008 hr/yr on bagasse and 1,752 hr/yr on oil

Comparison of Environmental Impacts

Both wet and dry FGD processes will produce wastewater and solid waste as byproducts. The wet scrubber produces a large volume of wastewater which must be treated before disposal; whereas the semi-dry scrubber does not. For the semi-dry scrubber, fly ash, excess lime, and calcium salts are collected by the particulate removal system. These solids must be disposed off-site as a waste material.

The wet scrubber system produces a visible moisture plume due to its being at the moisture dew point. The semi-dry scrubber system plume, being above the dew point, would tend to disperse horizontally and vertically before condensing into a visible plume. However, with cool ambient conditions a plume would sometimes form downstream of the stack. Thus the wet scrubber would produce a visible moisture plume more frequently than a semi-dry scrubber.

Comparison of Energy Impacts

Both wet and semi-dry scrubbers will consume additional energy for their operation. The estimated energy requirement is approximately 2,978 MW-hr for the wet scrubber and approximately 5,212 MW-hr for the semi-dry scrubber. No additional energy or electricity is required for firing low sulfur fuel oil.

Comparison of Economic Impacts

Based on the annualized costs presented in Table 5-3 for the dry and wet scrubber systems and low-sulfur fuel oil, the average cost effectiveness (ACE) and incremental cost effectiveness (ICE) for these approaches are shown in Tables 5-3 and 5-4. The cost effectiveness figures are based on the worst-case condition of firing up to 10% fuel oil (with 2.5% sulfur) and 90% bagasse in a single year (producing 4,435 TPY of PM and 1,136 TPY of SO_2).

The ACE values are $910, $234 and $20,479 per ton of PM removed for the semi-dry scrubber, wet scrubber and low-sulfur oil, respectively. The ICE values are $11,832, $82 and $20,476 per ton of PM removed for the semi-dry scrubber, wet scrubber, and low-sulfur oil, respectively. The ICE value for low-sulfur oil is higher than the levels that FDEP and EPA have considered as reasonable for controlling PM emissions (i.e., $2,000 per ton of PM removed). Therefore, the use of low-sulfur oil is considered as economically infeasible for PM removal.

The ACE values are $3,773, $915 and $1,305 per ton of SO_2 removed for the semi-dry scrubber, wet scrubber and low-sulfur oil, respectively. The ICE values are $290 MM, $587 and $1,305 per ton of SO_2 removed for the semi-dry scrubber, wet scrubber, and low-sulfur oil, respectively. The ICE value for the semi-dry scrubber are higher than the levels that FDEP and EPA have considered as

Table 5-3

Summary of Top-Down BACT Impact Analysis for PM

FEASIBLE CONTROL TECHNOLOGY	REMOVAL EFFICIENCY	CONTROLLED EMISSIONS TPY	EMISSION REDUCTION TPY (a)	AC $/YR (b)	ACE $/Ton (c)	ICE $/Ton (d)	IEI (e) MW-hr	TOXICS IMPACT?	AEI? (f)
Semi-dry scrubber	98%	106.0	4,239.5	3,858,456	910	11,832	14,366	Yes	Yes
Wet scrubber	92%	353.0	3,992.5	935,884	234	82	11,738	No	No
Low-sulfur oil	1%	4,315.7	29.8	610,183	20,476	20,476	0	No	No
Baseline	0%	4,345.5	0	0	0	0	0	No	Tes

(a). Emissions reduction over baseline level of no controls. PM baseline of 4,345.5 TPY derived from AP-42 factor of 15.6 lb PM/ton bagasse at maximum annual throughput and AP-42 factor for PM from fuel oil. Low-sulfur oil PM removal efficiency for oil firing is 71%.

(b). AC: total annualized cost (capital, direct and indirect) of purchasing, installing and operating the proposed control alternative.

(c). ACE (average cost effectiveness) is annualized cost for the control option divided by the emission reductions resulting from the option.

(d). ICE (incremental cost effectiveness) is difference in annualized cost for the control option and the next most effective control option divided by difference in emission reduction resulting from the respective alternatives.

(e). IEI (incremental energy impact) difference in total project energy requirements with the control alternative and the baseline expressed in equivalent MW-hr

(f). AEI: adverse environmental impact

Table 5-4

Summary of Top-Down BACT Impact Analysis for SO_2

FEASIBLE CONTROL TECHNOLOGY	REMOVAL EFFICIENCY	CONTROLLED EMISSIONS TPY	EMISSION REDUCTION TPY (a)	AC $/YR	ACE $/Ton	ICE $/Ton	IEI MW-hr	TOXICS IMPACT?	AEI?
Semi-dry scrubber	90%	113.6	1,022.7	3,858,456	3,773	2.9E+08	14,366	Yes	Yes
Wet scrubber	90%	113.6	1,022.7	935,884	915	587	11,738	No	No
Low-sulfur oil	41%	668.8	467.5	610,183	1,305	1,305	0	No	No
Baseline	0%	1,136	0	0	0	0	0	No	Tes

(a). Emissions reduction over baseline level of no controls. SO2 baseline of 1,136 based on AP-42 factors for firing 2.5% S oil at maximum annual rate and mass balance calculations for firing bagasse in No. 7 boiler. SO2 removal efficiency for low-sulfur oil is only for SO2 from oil firing.

reasonable for controlling SO_2 emissions (i.e., \$2,000 per ton of SO_2 removed). Therefore, the use of a semi-dry scrubber is considered economically infeasible for SO_2 removal.

Conclusion

The top-down BACT analysis for PM and SO_2 for the proposed boiler firing residual oil as the auxiliary fuel is summarized in Tables 5-3 and 5-4. As discussed above, the analysis has indicated that significant economic, environmental and energy costs are associated with the two alternative scrubber options. The estimated costs for add-on SO_2 controls are unreasonable for the semi-dry scrubber, particularly considering that it is not intended to burn oil for more than a 10% annual capacity factor, and that oil will be burned only if the supply of bagasse is not adequate.

No other facility in the United States has been identified where add-on SO_2 controls were required as BACT when the heat input due to fossil fuels was less than 30%. In three recent BACT determinations for multifuel stoker boilers, coal is used as supplementary fuel for up to 30% of the heat input without the use of add-on SO_2 controls. Based on these considerations, **using low-sulfur fuel oil (maximum of 0.5% sulfur) as the compliance fuel, not to exceed 10% of the total annual heat input, represents BACT for SO_2 emissions for the proposed boiler No. 7 when firing oil.**

Because of its high removal efficiency for PM and SO_2, along with its unparalleled success record in the sugar industry in general and with U.S. Sugar Corporation in particular, **the impingement scrubber is proposed as BACT for PM and for SO_2 emissions for the proposed boiler No. 7 when firing bagasse.**

The proposed PM and SO_2 BACT limits for boiler No. 7 are as follows:

- Bagasse-firing: 0.15 lb PM/MM Btu
  0.1667 lb SO_2/MM Btu

- Oil-firing: 0.1 lb PM/MM Btu
  0.5 lb SO_2/MM Btu

No other available PM and SO_2 control techniques, such as the semi-dry scrubber, can reliably and cost-effectively reduce SO_2 fluegas concentrations by 90% and attain PM emissions of 0.15 lb/MM Btu. A semi-dry system applied to the proposed boiler would have a capital cost of greater than \$10.3 MM and annual operating and maintenance costs of greater than \$3.8 MM. Such a system would have little additional air quality benefit, would create a significant solid and liquid waste problem, and would consume a significant amount of energy.

On the basis of environmental, energy, and economic impacts, the Western Precipitation (Joy) Turbulaire impingement scrubber, Type D, Size 200, or equivalent design, was selected as BACT for PM and SO_2 for the proposed bagasse/oil-fired boiler. This system is well demonstrated on existing bagasse/oil-fired boilers in the industry, has a proven operational record with high reliability and low maintenance, and displays low-energy requirements. The proposed scrubbing will operate at a pressure drop of about 5-10 inches H_2O. Above this range, increased wear of scrubber surfaces, particulate entrainment, and energy requirements reduce the effectiveness of the system. Water flow rate through the scrubber will be in the range of approximately 600 gallons per minute (gpm). More details on this scrubbing system are provided in Attachment C.

5.3 BACT EVALUATION FOR NO_X EMISSIONS

5.3.1 Identification of NO_x Emission Control Technologies for Industrial Boilers

In this section, the available control technologies capable of reducing NO_x emissions produced from firing bagasse and residual oil as an auxiliary fuel will be identified and evaluated. Potential application of these technologies as BACT for the proposed spreader-stoker boiler, rated on oil at 225 MM Btu/hr, is discussed. Table 5-5 is a summary of the potential NO_x control technologies presented in this section.

NO_x emissions from combustion of bagasse and fuel oil consist of thermal NO_x and fuel-bound NO_x. Thermal NO_x is formed from the reaction of oxygen and nitrogen in the combustion air at high temperatures. Formation of thermal NO_x depends on flame temperature, gas residence time in the peak temperature zone, and fuel-air stoichiometric ratio. In general, lower operating temperature, less gas residence time, and off-stoichiometric fuel-air ratio will reduce thermal NO_x formation.

Fuel-bound NO_x is created by the oxidation of nitrogen in the fuel; on the average, about 45% of the nitrogen in fuel oil is converted to NO_x. Controlling the nitrogen content of the fuel is the primary factor in reducing fuel-bound NO_x formation.

The control of NO_x emissions from steam generators can be accomplished through the application of combustion modifications and/or post-combustion technology (EPA, 1991a). The combustion modifications evaluated include:

- Low-NO_x burners (LNB)
- Off-stoichiometric combustion (OSC)
- Overfire air (OFA)
- Flue gas recirculation (FGR)
- Low-nitrogen fuel oil

Table 5-5

Summary of Potential NO_x Control Technologies[1]

Control Technology	Typical Efficiency (%)	In Service On Bagasse Combustors?	In Service On Other Combustion Sources?	Technically Feasible For This Combustor?
Selective Catalytic Reduction	60-90	No	Yes	No
Selective Noncatalytic Reduction	40-70	No	Yes	Yes[2]
Fluegas Recirculation	20-40	No	Yes	Yes[3]
Low-NOx Burner	30-60[4]	No	Yes	Yes
Low-nitrogen Fuel Oil	25-50[5]	Yes	Yes	Yes
Overfire Air/Good Combustion Practices	10-30	Yes	Yes	Yes[6]

Notes:

1 Source: Air Pollution Engineering Manual, AWMA, 1992.

2 Unproven technology for this application.

3 Unproven technology for this application.

4 Would only reduce NOx for fuel oil combustion; most of annual heat release comes from bagasse.

5 Would only reduce NOx for fuel oil combustion; most of annual heat release comes from bagasse.

6 Currently part of combustor design.

Post-combustion technologies include selective non-catalytic reduction (SNCR) and selective catalytic reduction (SCR).

5.3.1.1 Combustion Modifications

Low-NO_x Burners

LNB technology reduces NO_x emissions by staging combustion in the burner. This is accomplished through the creation of fuel-rich and fuel-lean zones in the central and outer portions of the flame, respectively. This limits the flame temperature and thus the amount of thermal NO_x formed during combustion. The amount of reduction achievable is dependent upon the boiler and burner design, and actual operating practices.

LNB technology is not applicable to bagasse combustion, because the bagasse is burned on a vibrating grate and not in a burner. Fuel oil is used only for supplemental firing in relatively minor quantities compared to bagasse, but LNB is feasible for fuel oil.

Over-Fire Air

OFA for a bagasse boiler involves supplying combustion air through ports above the vibrating grate. Bagasse boilers generally use OFA for 20% of the total air requirements; about 80% is supplied under the grates.

Data are not readily available to support a definitive NO_x reduction for additional OFA. Bagasse boilers are generally operated in an air-rich condition (30-50% excess air) which effectively produces lower NO_x emissions.

Flue Gas Recirculation

FGR involves recycling a portion of the fluegas back into the primary combustion zone. NO_x emissions are reduced by lowering the peak flame temperature and lowering the oxygen concentration in the primary flame zone. Although FGR is effective in reducing NO_x emissions from coal, natural gas, and oil firing, it is unknown whether FGR will substantially reduce NO_x emissions in bagasse boilers. FGR would substantially affect the unit efficiency through lowering fuel efficiency and increasing fan power. In addition, the recirculation of the abrasive flyash would greatly increase wear on the fan and ductwork. This technology is deemed technically feasible for bagasse combustion, although it has not yet been proven.

Low-nitrogen Fuel Oil

The nitrogen content of residual oil typically ranges from 0.2-0.6% by weight. Because the level of fuel-bound NO_x emissions is directly related to the amount of nitrogen in the fuel, a low-nitrogen-containing fuel can be used to meet the NO_x emission limitation specified by the NSPS regulations for industrial boilers.

Under the current NSPS regulations for industrial steam generators (40 CFR 60, Subpart Db), a facility firing less than 250 MM Btu/hr which combusts distillate oil or residual oil with a nitrogen content of 0.3% or less, and having a federally enforceable annual capacity factor of 10% or less for oil is not subject to quantitative NO_x emission limits.

5.3.1.2 Post-combustion Controls

Selective Non-Catalytic Reduction

SNCR describes post-combustion control technologies that remove NO_x by the addition of a reactant such as urea or ammonia into the fluegas and subsequent reduction of NO_x. Two available technologies are thermal $DeNO_x$ and the NO_xOUT process.

Thermal $DeNO_x$--Thermal $DeNO_x$ is Exxon Research and Engineering Company's patented process for NO_x reduction. The process is a high-temperature SNCR of NO_x, using ammonia as the reducing agent. Thermal $DENO_x$ requires the fluegas temperature to be a relatively narrow range (1800°F +/- 100°F). The limiting phenomenon is the injection of ammonia in the optimum boiler locations so as to achieve maximum ammonia/NO_x mixing within the desired temperature window, consistent with normal boiler operation. This requires boiler temperature profile mapping as a function of load.

Ammonia is a toxic chemical which has the potential to be accidentally released. The handling of this chemical would require stringent safety precautions and procedures, as well as additional facilities.

NO_xOUT Process--The NO_xOUT process originated from research by the Electric Power Research Institute (EPRI) on the use of urea to reduce NO_x. EPRI licensed the proprietary process to Fuel Tech, Inc. for commercialization. In the NO_xOUT process, aqueous urea is injected into the fluegas stream ideally within a temperature range of 1600°F to 1900°F. In the presence of oxygen, the following reaction results:

$$CO(NH_2)_2 + 2NO + 1/_2\,O_2 \dashrightarrow 2N_2 + CO_2 + 2H_2O$$

The amount of urea required is most cost-effective when the treatment rate is 0.5 to 2 moles of urea per mole of NO_x. The potential advantages of the system over Thermal $DeNO_x$ is lower capital and operating costs of urea injection, and use of a nontoxic and nonhazardous reactant.

Potential disadvantages of the system are formation of ammonia from excess urea treatment and sulfur trioxide (SO_3), if present, will react with ammonia created from the urea to form ammonium bisulfate, potentially plugging the cold-end equipment downstream.

Commercial application of the NO_xOUT system is limited to three reported cases, with removal efficiencies of 60-65%. For either SNCR process, the gas residence time is important. The suggested residence time for SNCR is about 0.5 to 1 second.

There are no proven applications of SNCR technology for bagasse combustion, but the Thermal $DeNO_x$ process has been applied to industrial boilers. Thus SNCR is deemed technically feasible for bagasse combustors.

Selective Catalytic Reduction

The SCR process uses ammonia (NH_3) to react with NO_x in the gas stream in the presence of a catalyst. NH_3, which is diluted with air to about 5 percent by volume, is introduced into the gas stream at reaction temperatures between 600-750°F. The reactions are as follows:

$$4NH_3 + 4NO + O_2 \rightarrow 4N_2 + 6H_2O$$

$$4NH_3 + 2NO_2 + O_2 \rightarrow 3N_2 + 6H_2O$$

The SCR equipment in an oil-fired boiler would have to be placed between the economizer and air preheater to achieve proper temperature conditions. This allows a relatively constant temperature for the reaction of NH_3 and NO_x on the catalyst surface.

Although the operating experience on oil-fired boilers is limited, certain cost, technical, and environmental considerations have surfaced. Most of these considerations were discussed in the preceding section under SNCR, which has similar considerations. Ammonium salts (ammonium sulfate and bisulfate) are formed by the reaction of NH_3 and sulfur combustion products. Ammonium bisulfate can be corrosive and could cause damage to the air preheater and flue surfaces that follow the catalyst, as well as to the stack. Corrosion protection for these areas would be required. Ammonium sulfate is emitted as particulate matter; although the formation of ammonium salts is primarily associated with oil firing, sulfur combustion products from carbonaceous fuels also could form ammonium salts.

Zeolite catalysts, which are reported to be capable of operating in temperature ranges from 600°-950°F, have been available commercially only recently. Optimum performance of an SCR system using a zeolite catalyst is reported to range from about 800-900°F. At temperatures of 1000°F and above, the zeolite catalyst will be irreparably damaged. The fibrous and moisture-laden nature of particulate matter generated by bagasse boilers would likely cause blockage in the catalyst. Even with large pore openings, particulate would likely adhere to catalyst sites and render the catalyst ineffective. In addition, it may not be possible to achieve the desired fluegas temperature without reheating because exhaust temperatures of bagasse boilers are relatively low (500-600°F).

There are no applications of SCR on bagasse boilers. Based on this and the complex problems associated with applying a catalyst bed to this type of combustor, the applicability of this technology is unknown. Therefore SCR is judged infeasible for this application.

5.3.2 Evaluation of Technically Feasible NO_x Control Methods

5.3.2.1 Ranking of Feasible Control Technologies

A baseline emission level must be established as the basis for top-down BACT ranking and for economic analysis purposes. The baseline is defined as the uncontrolled emission rate of the process being reviewed. For the impact analysis, the uncontrolled NO_x emission rate was estimated to be 1.2 lb/ton or 0.167 lb/MM Btu based on bagasse combustion. This is the AP-42 emission factor for bagasse boilers, and appears to be a reasonable average emission rate based on industry test data.

As discussed previously, SNCR can potentially achieve an NO_x removal efficiency of up to 70%, but 55% was assumed as a more conservative approach for this unproven application. FGR can potentially achieve an NO_x removal efficiency of up to 40%, but 30% was assumed as a more conservative approach for this unproven application. LNB can achieve an NO_x removal efficiency of 30-60% (for fuel oil combustion only), but 45% was used as a conservative estimate for this analysis. Low-nitrogen fuel oil can achieve 25-50% reduction in fuel-bound NO_x (for fuel oil combustion only), but 35% was used as a conservative estimate. OFA can achieve an NO_x removal efficiency of 10-30% but 0% was used for this analysis, as it is an inherent part of the combustor design, and thus is part of the baseline emission.

Therefore, the BACT top-down hierarchy ranks SNCR first, FGR second, LNB third and low-nitrogen fuel oil fourth.

5.3.2.2 Analysis of Control Technology Impacts

Technical Issues

Of the combustion modification techniques, only OFA is currently used for bagasse and is integral to the design of bagasse-fired boilers. This technology is one of the likely reasons for the relatively low NO_x emissions exhibited from these boilers. Additional overfire air would not likely reduce NO_x emissions significantly from current levels. LNB technology is not currently used nor is this technology applicable to bagasse combustion due to the nature of the fuel and existing burning methods. LNB can be applied to fuel oil combustion, however. FGR, while potentially applicable to bagasse-fired boilers, has not been applied and its effectiveness for NO_x reduction is questionable.

SNCR and SCR, the post-combustion control technologies, have not been applied to bagasse-fired boilers. The application of SNCR, although possible, would be extremely difficult to implement, because the required temperature zones for reaction will spatially vary within a bagasse boiler as a function of boiler load. This variability, coupled with the relatively small boiler space make the overall technical feasibility of SNCR questionable. Other technical issues related to SNCR include:

- Ammonia distribution: NH_3 must be uniformly distributed in the exhaust stream to ensure optimum mixing with NO_x in the narrow temperature window.

- Temperature profile: the narrow temperature range that SNCR systems operate within (i.e., about 100°F) must be maintained even during load changes.

- Ammonia control: a molar ratio of at least 1:1 NH_3 to NO_x generally is needed to ensure high removal efficiencies. The quantity of NH_3 introduced must be carefully controlled: with too little NH_3, the desired control efficiency is not reached; with too much NH_3, emissions of NH_3 (referred to as "slip") can occur.

- Gas residence time: residence time of the combustion gas after ammonia injection must be within a narrow range to ensure satisfactory removal efficiency.

- Special storage and handling equipment are required for ammonia.

Environmental Effects

SNCR has several environmental effects which should be considered:

- Ammonia slip: NH_3 slip (NH_3 that passes unreacted into the atmosphere) can occur if:

  - Too much ammonia is added
  - NH_3 distribution is not uniform
  - The velocity is not within the optimum range
  - The proper temperature is not maintained

- Ammonium salts: ammonium salts (ammonium sulfate and bisulfate) can lead to increased corrosion. These salts can form when firing oil or bagasse, and are emitted as particulates.

- Ammonia transportation and storage: storage and handling of anhydrous ammonia poses additional environmental risks. Appropriate contingency plans and controls in the event of a release required.

There are no significant environmental issues associated with FGR, LNB, or low-nitrogen fuel oil.

Energy Requirements

Additional energy will be required to operate ammonia pumps and dilution air fans (100 kw) for SNCR. There will also be additional energy requirements associated with the large FGR fan (428 kw).

Economic Analysis

An economic analysis of SNCR and is presented in Table 5-6. This table shows that the TCI of SNCR applied to this bagasse boiler would be at least $1.6 MM, and the AC would be $910,000/yr. The economic analysis also shows that the TCI of FGR applied to this bagasse boiler would be at least $942,300 and the AC of FGR would be at least $897,500/yr. The analysis also establishes that the TCI of LNB applied to this bagasse boiler would be at least $95,400 and the AC would be $20,300/yr. The TCI for low-nitrogen fuel oil is $55,000 and the AC is $450,000/yr.

5.3.3 BACT Analysis Summary for NO_x

The top-down BACT analysis for NO_x for the proposed boiler firing bagasse and residual oil as the auxiliary fuel is summarized in Table 5-7.

The ACE values are $4,006, $7,244, $246, and $7,264 per ton of NO_x removed for the SNCR, FGR, LNB and low-nitrogen oil, respectively. The ICE values are $121, $21,240 $-20,809 and $7,264 per ton of NO_x removed for the SNCR, FGR, LNB and low-nitrogen oil, respectively. The ICE values for many of these alternatives are higher than the levels that FDEP and EPA have considered as reasonable for controlling NO_x emissions. Therefore, the use of SNCR and FGR are considered economically infeasible for SO_2 removal.

The economics of low-nitrogen fuel oil look much worse than that of LNB, but this is based on the assumed use of 2.5% sulfur fuel oil with its relatively high nitrogen content (0.3-0.5%). As discussed in the previous section, very-low-sulfur fuel oil has been proposed as BACT for SO_2. Per discussions

Table 5–6 Cost Analysis for NOx Emissions Control

Cost Items	Cost Factors	SNCR	FGR	LNB	Low–N Oil
DIRECT CAPITAL COSTS (DCC)					
(1) Purchased Equipment Cost:					
(a) Basic Equipment/Services	Vendor Quotation	$350,000	$375,000	$90,000	$0
(b) Auxilary Systems	Vendor Quote (included in 1a)	$0	$0	$0	$0
(c) Instrumentation & Controls	0.10(1a + 1b)	$35,000	$37,500	$0	$0
(d) Structural Support	0.10(1a + 1b)	$35,000	$37,500	$0	$0
(e) Freight	0.05(1a + 1b + 1c + 1d)	$21,000	$22,500	$0	$0
(f) Florida Sales Tax	0.06(1a + 1b + 1c + 1d)	$25,200	$27,000	$5,400	$0
(g) Purchased Equipment Subtotal	(1a + 1b + 1c + 1d + 1e + 1f)	$466,200	$499,500	$95,400	$0
(2) Direct Installation Cost:	SNCR = .67(1g) ; FGR = .30(1g)	$312,354	$149,850	$0	$0
Total DCC	(1g + 2)	$778,554	$649,350	$95,400	$0
INDIRECT CAPITAL COSTS (ICC)					
(3) Indirect Installation Cost:					
(a) Technology License Fee	None	$50,000	$0	$0	$0
(b) Engineering & Supervision *	SNCR = .20(DCC) ; FGR = .10(DCC)	$155,711	$64,935	$0	$0
(c) Construction & Field Expenses *	SNCR = .20(DCC) ; FGR = .10(DCC)	$155,711	$64,935	$0	$0
(d) Construction & Contractor Fee *	SNCR = .10(DCC) ; FGR = .05(DCC)	$77,855	$32,468	$0	$0
(e) Contingencies *	SNCR = .20(DCC) ; FGR = .10(DCC)	$155,711	$64,935	$0	$0
(4) Other Indirect Cost:					
(a) Start–up & Testing *	SNCR = .15(DCC) ; FGR = .03(DCC)	$116,783	$19,481	$0	$0
(b) Model Study	Vendor Quotation	$110,000	$0	$0	$0
(c) Working Capital	30 Day DOC **	$35,178	$46,170	$0	$0
Total ICC	(3) + (4)	$856,949	$292,923	$0	$0
TOTAL CAPITAL INVESTMENT (TCI)	**DCC + ICC**	**$1,635,503**	**$942,273**	**$95,400**	**$0**
DIRECT OPERATING COST (DOC)					
(5) Operating Labor:					
(a) Operator	8,760 hr/yr @ $22/hr	$192,720	$192,720	$0	$0
(b) Supervisor	15% of operator cost	$28,908	$28,908	$0	$0
(6) Maintenance *	5% of total DCC	$38,928	$32,468	$4,770	$0
(7) Utilities (electrical)	$0.08/kw–hr				
(a) Ammonia Injection System	100 kw	$70,080	$0	$0	$0
(b) Recirculation Fan	428 kw	$0	$299,942	$0	$0
(8) Chemicals and Fuel					
(a) Ammonia	$250/ton	$91,500	$0	$0	$0
(b) Oil price difference	$0.15/gallon premium	$0	$0	$0	$450,000
Total DOC	(5) + (6) + (7) + (8)	$422,136	$554,038	$4,770	$450,000
INDIRECT OPERATING COST (IOC)					
(9) Overhead *	60% of (5) and (6)	$156,333	$152,457	$0	$0
(10) Property Taxes *	1% of TCI	$16,355	$9,423	$0	$0
(11) Insurance *	1% of TCI	$16,355	$9,423	$0	$0
(12) Administration *	2% of TCI	$32,710	$18,845	$0	$0
					$0
Total IOC	(9) + (10) + (11) + (12)	$221,754	$190,148	$0	$0
TOTAL OPERATING COST (TOC)	**DOC + IOC**	**$643,889**	**$744,186**	**$4,770**	**$450,000**
CAPITAL RECOVERY COST (CRC)	0.1627(TCI)	$266,096	$153,308	$15,522	$0
ANNUALIZED COST (AC)	**DOC + IOC + CRC**	**$909,986**	**$897,494**	**$20,292**	**$450,000**

Notes:
* Indicates that the cost factors are based on EPA's OAQPS Control Cost Manual, Fourth Edition.
** 30 days of direct operating costs (i.e. Total DOC/12)
1. Operating hours are 7,008 hr/yr on bagasse and 1,752 hr/yr on oil
2. Low–Nox burner equipment cost is premium over regular burner cost.

Table 5-7
Summary of Top-Down BACT Impact Analysis for NO_x

FEASIBLE CONTROL TECHNOLOGY	REMOVAL EFFICIENCY	CONTROLLED EMISSIONS TPY	EMISSION REDUCTION TPY (a)	AC $/YR	ACE $/Ton	ICE $/Ton	IEI MW-hr	TOXICS IMPACT?	AEI?
SNCR	55%	185.9	227.2	909,986	4,006	121	876	Yes	Yes
FGR	30%	289.1	123.9	897,494	7,244	21,240	3,749	No	No
Low-NOx burner	20%	330.4	82.6	20,292	246	(20,809)	0	No	No
Low-nitrogen oil	15%	351.1	61.9	450,000	7,264	7,264	0	No	No
Baseline	0%	413.0	0	0	0	0	0	No	Yes

(a). Emissions reduction over baseline level of no controls (413 TPY of NOx).
NOx baseline emissions derived from AP-42 factors for oil and bagasse firing.

with fuel oil vendors, there is no special process to remove nitrogen from fuel oil, as there is for removing sulfur. Fuel oil nitrogen content does, however, seem to correlate fairly well with sulfur content. Thus, very-low-sulfur fuel oil should have less than 0.3% nitrogen by weight, although fuel oil vendors seem unwilling to guarantee this absolute value.

The preceding analysis has indicated that significant economic, environmental and energy costs are associated with the add-on control technology for NO_x. The estimated costs for add-on NO_x controls are unreasonable for fuel oil, particularly considering that it is not intended to burn oil for more than a 10% annual capacity factor, and that oil will be burned only if the supply of bagasse is not adequate.

Based on these considerations, **using low-nitrogen residual fuel oil (maximum of 0.3% nitrogen) as the compliance fuel, not to exceed 10% of the total annual heat input, represents BACT for NO_x emissions for the proposed boiler No. 7 when firing oil.**

Because of its utility in reducing NO_x emissions, along with its success record in the sugar industry, **overfire air, high excess air rates, and good combustion practices are proposed as BACT for NO_x emissions for the proposed boiler No. 7 when firing bagasse.**

The following considerations, described previously, support this proposed BACT:

- The current operations minimize NO_x emissions through use of overfire air, high excess air levels, and good combustion practices

- Sugar industry NO_x emissions are substantially less than fossil-fuel-fired steam generators, and thus NO_x control cost ($/ton of NO_x removed) will be higher for this unit than for those boilers

- Applications of alternative NO_x control technologies are technically and/or economically infeasible

The proposed NO_x BACT limit for boiler No. 7 is as follows:

- Bagasse-firing: 2.05 lb/ton of wet feed (about 0.26 lb/MM Btu)

- Oil-firing: 0.3 lb/MM Btu (low heat release)
0.4 lb/MM Btu (high heat release)

5.4 BACT EVALUATION FOR CO AND VOC EMISSIONS

In this section, the available control technologies capable of reducing CO and VOC emissions produced from firing bagasse and residual oil will be identified and evaluated. Potential application of these technologies as BACT for the proposed spreader-stoker boiler, rated on oil at 255 MM Btu/hr, is discussed. Table 5-8 is a summary of the potential CO and VOC control technologies presented in this section.

The EPA BACT/LAER clearinghouse has no BACT determinations for CO or VOC emission from bagasse combustors or residual oil combustion in boilers. Historically, BACT and LAER emission limits for CO and VOC on bagasse and oil-fired boilers have been based on the use of good combustion practices, rather than add-on control systems.

In bagasse-fired boilers, the fuel characteristics and the combustion practices result in CO and VOC emissions that are somewhat high, relative to fossil-fuel fired boilers. Improving combustion would likely require improving fuel quality (e.g., lowering bagasse moisture content through drying), which would make use of this waste fuel uneconomical and result in higher fossil fuel usage. The use of FGR could theoretically reduce CO and VOC emissions by reburning a portion of the VOCs in the recirculated exhaust. The overall effectiveness of fluegas recirculation would be limited because:

- The extremely high particulate loading of the combustion gas and the abrasive nature of the flyash would make this system very unreliable
- This has never been applied to a bagasse combustor
- This technology would not be economically feasible, per the analysis done for NO_x control

Post-combustion VOC controls have not been applied to bagasse-fired boilers. Such common techniques as direct-flame incineration, catalytic oxidation, and carbon absorption are also inappropriate technologies for bagasse boilers for the same reasons as above.

The only technically feasible CO and VOC control technology for bagasse-fired boilers is good combustion practices.

Because of their utility in reducing CO and VOC emissions, along with its success record in the sugar industry, **good combustion practices are proposed as BACT for emissions for the proposed boiler No. 7 when firing bagasse or oil.**

Table 5-8

Summary of Potential CO and VOC control Technologies[1]

Control Technology	**Typical Effic. (% CO)**	**Typical Effic. (% VOC)**	**In Service On Bagasse Combustors?**	**In Service On Other Combustion Sources?**	**Technically Feasible For This Combustor?**
Direct-flame Oxidation	90-99	90-99	No	Yes	No[2]
Catalytic Oxidation	90-95	90-95	No	Yes	No[3]
Fluegas Recirculation	30-50%	30-50%	No	No	Yes[4]
Good Combustion Practices	15-50	15-50	Yes	Yes	Yes

Notes:

[1] Source: Air Pollution Engineering Manual, AWMA, 1992.

[2] Abrasive Particulate loading to high in combustor.

[3] Same as above.

[4] See discussion under NO_x control.

For the proposed boiler No. 7, the most appropriate BACT precedent for VOC, CO and NO_x appears to be the permit for Clewiston boiler No. 4, which relies on the inherent design features of the bagasse boiler along with the appropriate operating procedures to ensure that emission will be maintained at the lowest possible level. That permit imposes no requirement for add-on control technology, and that is the approach recommended here for the U.S. Sugar Corporation Clewiston mill boiler No. 7.

5.5 BACT EVALUATION FOR SULFURIC ACID MIST EMISSIONS

Sulfuric acid mist is generated from the emissions of SO_3 when oil is combusted. Sulfur trioxide can further react with water present in the fluegas to form sulfuric acid mist. The control of acid gas emissions is primarily controlled by removing the precursor pollutants from the fluegas with either wet or semi-dry scrubbing processes. Sulfuric acid mist emissions will be therefore be controlled by reducing the amount of sulfur in the stack gases by the following methods discussed previously:

- Installation of a wet impingement scrubber for SO_2 emissions from bagasse combustion

- Use of low-sulfur fuel oil for SO_2 emissions from residual oil combustion

5.6 BACT EVALUATION FOR BERYLLIUM EMISSIONS

Beryllium emissions were estimated using EPA factors for fuel oil combustion and assuming no removal in the scrubbing system, as there are no published factors for beryllium removal efficiency in the scrubber. Beryllium emissions are primarily controlled by removing the gaseous or particulate metal from the fluegas with either wet or semi-dry scrubbing processes. Beryllium emissions will be therefore be controlled for this project by installation of a wet impingement scrubber for PM emissions from fuel oil combustion.

6.1 GENERAL MODELING APPROACH

An air quality analysis for the proposed boiler No. 7 was conducted for the criteria pollutants subject to PSD review: PM, SO_2, NO_x, CO and VOCs. The purpose of the analysis is to demonstrate compliance with Florida AAQS and, because the proposed boiler No. 7 is an increment-consuming source, demonstrate compliance with the allowable EPA/FDEP PSD Class I and Class II increments. The purpose of the VOC impact analysis is to demonstrate that U.S. Sugar Corporation's emissions will have minimal impact on the Palm Beach County ozone nonattainment area. An impact analysis was also performed for air toxics for comparison to FDEP's no-threat levels (NTLs).

The general modeling approach followed EPA and FDEP modeling guidelines for determining compliance with AAQS and PSD increments. For each criteria pollutant that is emitted in excess of the PSD significant emission rate due to a proposed project, a significant impact analysis is performed to determine whether the emission increase will result in predicted impacts in excess of the EPA/FDEP significant impact levels (SILs). Refined modeling analysis was performed for pollutants with predicted significant impacts.

The existing sugar mill boilers operate only part of the year, but the proposed boiler No. 7 will operate all year. For modeling purposes, it was necessary to account for the partial-year operation of these boilers by utilizing two emission inventories, a crop season inventory and an off-season inventory. The maximum crop season period was assumed to extend from October 1 through April 30. The maximum off-season period was assumed to extend from March 1 through October 31. Because the beginning and ending dates of the crop season vary from year to year, the two seasons were defined such that they overlap several months of the year. Defining the periods in this manner allows the dispersion model to assess all the potential days of operation.

The crop season inventory included the existing boilers No. 1, 2, 3 and 4 emissions. The two emission inventories are identical in regards to all non-Clewiston-mill sources and emissions from boiler No. 7.

6.2 MODEL SELECTION

The selection of an appropriate air dispersion model was based on the model's ability to simulate impacts in areas surrounding the Clewiston site. The Industrial Source Complex Short-term (ISCST2, Version 92062) dispersion model (EPA, 1992b) was used to evaluate the pollutant emissions from the proposed U.S. Sugar Corporation project and other existing major facilities. The ISCST2 model is designed to calculate hourly concentrations based on hourly meteorological parameters (i.e., wind direction, wind speed, atmospheric stability, ambient temperature, and mixing heights).

Major features of the ISCST2 model are as follows:

- Plume rise as a result of momentum and buoyancy as a function of downwind distance for stack emissions (Briggs, 1969, 1971, 1972, and 1975)
- Procedures suggested by Huber and Snyder (1976); Huber (1977); Schulmann and Hanna (1986); and Schulmann and Scire (1980) for evaluating building wake effects
- Direction-specific building heights and projected widths for all sources for which downwash is considered
- Procedures suggested by Briggs (1974) for evaluating stack-tip downwash
- Separation of multiple-point sources
- Capability of simulating point, line, volume, and area sources
- Variation of wind speed with height (wind speed-profile exponent law)
- Concentration estimates for 1-hour to annual average
- Terrain-adjustment procedures for elevated terrain, including a terrain truncation algorithm
- Receptors located above local terrain (i.e., "flagpole" receptors)
- Consideration of time-dependent exponential decay of pollutants
- Method by Pasquill (1976) to account for buoyancy-induced dispersion
- Wind speeds less than 1 m/s are set to 1 m/s
- Consideration of effects of gravitational settling and dry deposition on ambient PM concentrations
- Polar or Cartesian coordinate systems for receptor locations
- Regulatory default option to set various model options and parameters to EPA-recommended values

In this analysis the regulatory default options were used to predict all maximum impacts. The regulatory default options were:

- Final plume rise at all receptor locations
- Stack-tip downwash
- Buoyancy-induced dispersion
- Default wind speed profile coefficients for rural option
- Default vertical potential temperature gradients
- Calm-wind processing

The ISCST2 model has both rural and urban mode options which affect the wind-speed-profile exponent law, dispersion rates, and mixing-height formulations used in calculating ground-level concentrations. The criteria used to determine when the rural or urban mode is appropriate are based on land use near the source's surroundings (Auer, 1978). The <u>rural</u> option is more appropriate for U.S. Sugar Corporation's Clewiston mill, due to the predominantly agricultural land use in the vicinity.

The ISCST2 model is applicable to sources located in either flat or rolling terrain where terrain heights do not exceed stack heights. Within 50 km of the site, the terrain can be described as simple, i.e., flat to gently rolling. As defined in EPA modeling guidelines, simple terrain is considered to be an area where the terrain features are all lower in elevation than the top of the stack(s) under evaluation. Therefore, a simple terrain model was selected to predict maximum ground-level concentrations.

6.3 MODELING ANALYSIS

The modeling analysis was conducted in two phases. The first phase, the screening or significant impact analysis, involved comparing predicted impacts against EPA SILs. The second phase, the refined impact analysis, ultimately consisted of comparing the sum of ambient background concentrations and predicted (modeled) impacts against AAQS and PSD increments. For this analysis, the only difference between the two phases was the density of the receptor grid spacing employed when predicting concentrations. The ISCST2 model was used for both phases.

6.3.1 Significant Impact Analysis

The significant impact analysis has two purposes: to predict whether or not a significant impact will occur and, if so, the areal extent of that impact. For purposes of the analysis, the maximum concentration predicted at each receptor is compared against the SIL (see Table 3-1). The significant impact area (SIA) is defined by the most distant radius at which predicted impacts exceed SILs.

The SIA is used to:

- Set the boundaries within which ambient air quality monitoring data may need to be collected

- Define the area over which a full impact analysis (one that considers the contribution of all sources) must be undertaken

- Guide the identification of other sources to be included in the modeling analysis

The SIA for each pollutant was based on U.S. Sugar Corporation's proposed boiler configuration, without taking credit for emission offsets from boilers No. 5 and 6. Stack parameters and emissions for the proposed project are presented in Tables 6-1 and 6-2. The proposed project includes emissions from the existing boiler No. 4 and the proposed higher stacks for boilers No. 1, 2, and 3, and the proposed boiler No. 7. Dimensions of nearby buildings were included in the modeling to account for building-induced wake effects. The pollutants modeled included PM, SO_2, NO_x, and CO.

Table 6-1
Summary of Stack and Operating Data
Used in the Modeling Analysis

ISCST2 Source Identification No.	Source Description	Coordinates Relative to Boiler No. 7 (m)		Stack Data (m)		Operating Data	
		X	Y	Height	Diameter	Temperature (K)	Velocity (m/sec)
PSD Baseline							
6	Boiler No. 1	83.2	0	23.1	1.86	344	30.2
7	Boiler No. 2	71.0	0	23.1	1.86	343	35.7
8	Boiler No. 3	55.8	7.6	27.4	2.29	342	14.7
12	Boiler No. 4	23.5	0	45.7	2.51	340	21.7
9	Boiler No. 5	47.2	7.6	20.9	1.83	338	11.4
10	Boiler No. 6	35.7	7.6	20.9	1.83	340	11.0
Proposed							
1	Boiler No. 1	83.2	0	45.7	1.86	344	30.2
2	Boiler No. 2	71.0	0	45.7	1.86	343	35.7
3	Boiler No. 3	55.8	7.6	45.7	2.29	342	14.7
4	Boiler No. 4	23.5	0	45.7	2.51	340	21.7
5	Boiler No. 7	0	0	68.6	2.63	340	21.7

Abbreviations:

K = degrees Kelvin.
m = meters.
m/sec = meters per second.

Table 6-2
Summary of Emission Data
Used in the Modeling Analysis

ISCST2 Source Identification	Source Description	SO_2 3-Hour (g/s)	SO_2 24-Hour (g/s)	SO_2 Annual (g/s)	PM 24-Hour (g/s)	PM Annual (g/s)	NO_2 Annual (g/s)	CO 1 & 8-Hour (g/s)
PSD Baseline								
6	Boiler No. 1	-7.35	-7.35	-7.35	-4.78	-4.78	-7.17	NA
7	Boiler No. 2	-7.86	-7.86	-7.86	-4.86	-4.86	-6.93	NA
8	Boiler No. 3	-12.66	-12.66	-12.66	-3.40	-3.40	-3.74	NA
12	Boiler No. 4	NA	NA	NA	NA	NA	-10.75	NA
9	Boiler No. 5	-0.05	-0.05	-0.05	-0.20	-0.20	-1.27	NA
10	Boiler No. 6	-0.50	-0.50	-0.50	-2.14	-2.14	-1.36	NA
Proposed								
1	Boiler No. 1	42.79	36.80	4.42	13.11	13.11	8.00	386.87
2	Boiler No. 2	42.06	33.94	4.28	12.71	12.71	7.76	401.70
3	Boiler No. 3	25.31	20.30	2.36	8.34	8.34	4.24	215.44
4	Boiler No. 4	14.78	14.78	12.99	13.36	11.42	22.85	801.22
5 (crop)	Boiler No. 7	15.44	15.44	13.90	13.95	10.17	20.57	837.13
6 (off)	Boiler No. 7	20.77	16.82	13.90	9.97	10.17	20.57	514.26

Note: PSD Baseline emissions based on fuel use figures and stack tests from 1977 and 1988.

Significant impacts were not predicted for ozone because SILs have not yet been established. Ozone impacts are, however, considered significant, because the proposed VOC emission increase exceeds the significance level established by PSD.

6.3.2 AAQS/PSD Modeling Analysis

Refined impact analyses were performed for all pollutants that were predicted to have significant impacts. A VOC impact analysis was also conducted because of the significant increase in VOC emissions. The purpose of the refined impact analysis is to demonstrate that predicted impacts from the proposed facility, in conjunction with predicted impacts from non-Clewiston-mill existing and proposed sources, will comply with AAQS and allowable PSD increments.

In cases where predicted impacts were compared against annual standards, the highest predicted impact in the receptor grid was evaluated against the standard. In cases where predicted impacts were compared against short-term standards (i.e., standards based on averaging periods of 24 hours or less), the highest, second-highest (HSH) short-term concentrations are to be compared to the applicable AAQS and allowable PSD increments. The HSH concentration is calculated for a receptor field by:

- Eliminating the highest concentration predicted at each receptor,
- Identifying the second-highest concentration at each receptor, and
- Selecting the highest concentration among these second-highest concentrations.

This approach is consistent with AAQS and allowable PSD increments, which permit a short-term average concentration to be exceeded once per year at each receptor.

A more detailed description of the meteorological data, emission inventory, and receptor grids used in the refined analysis is presented in the following sections.

6.4 METEOROLOGICAL DATA

Meteorological data used in the ISCST2 model to determine air quality impacts consisted of a concurrent 5-year period (from 1985 through 1989) of hourly surface weather observations and twice-daily upper air soundings from the National Weather Service (NWS) stations at West Palm Beach. The NWS station at West Palm Beach, located approximately 100 km east of the Clewiston site, was selected for use in the study because it is the closest primary weather station to the study area and is most representative of the plant site. The surface observations included wind direction, wind speed, temperature, cloud cover, and cloud ceiling. Figure 6-1 is a composite windrose for the 5-year period.

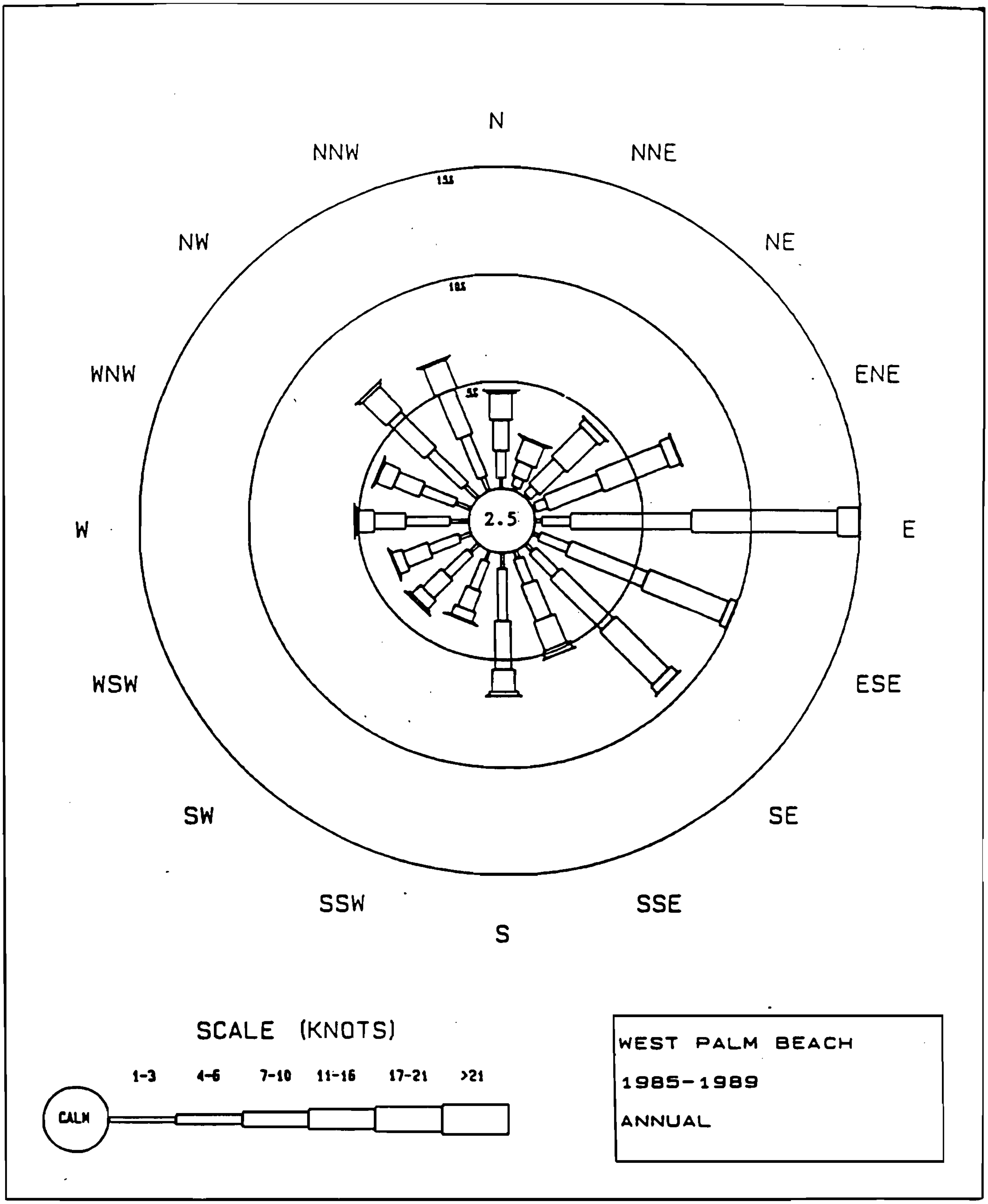


Figure 6-1 ANNUAL WIND ROSE FOR WEST PALM BEACH

ICF KAISER ENGINEERS

Sequential hourly data bases were computed for each year by using EPA's randomized meteorological (RAMMET) preprocessor program. RAMMET estimates atmospheric stability from wind speed, cloud cover, and cloud ceiling values, and estimates mixing heights using the Holzworth approach (Holzworth, 1972). RAMMET also randomizes the observed wind directions, which are rounded to the nearest tenth degree by the NWS, in an effort to account for expected variability in the actual wind field.

6.5 EMISSION INVENTORY

6.5.1 U.S. Sugar Corporation Clewiston Mill

Stack and operating parameters for the PSD baseline and proposed sources are presented in Table 6-1. The proposed configuration consists of boilers No. 1, 2, 3, 4, and 7. The PSD baseline configuration for SO_2 and PM (TSP) during the year 1977 consists of boilers No. 1, 2, 3, 5, and 6. The PSD baseline configuration for NO_x during the year 1988 consists of boilers No. 1, 2, 3, 4, 5, and 6 (Boiler No. 4 was constructed in 1985).

6.5.2 Other Air Emission Sources

An inventory of all facilities used in the modeling analyses is presented in Tables 6-3 and 6-4. This list was developed from Air Pollutant Information System (APIS) reports provided by FDEP, supplemented by existing source permits and other recent modeling analyses performed in this area. This list includes all sources emitting 25 ton/year (tpy) or more located within the SIA of a pollutant. Also included are several sources located outside the SIA, but which may have a significant effect on the SIA or are PSD increment-consuming sources. Beyond the SIA, sources were selected for inclusion based on emission rate and distance from the SIA as follows:

$$25 * \left(\frac{E}{D^2}\right) \geq 1$$

where E is the emission rate (tpy) and D is the distance (km) from the SIA. Thus, this criterion includes all sources emitting 25 tpy within 25 km of the SIA. The criterion also includes all sources emitting 100 tpy within 50 km of the SIA.

A summary of all stack and operating parameters used in the modeling analysis is presented in Table 6-3. A summary of emissions data used in the modeling analysis, including which sources were designated as PSD increment-consuming or expanding sources, is presented in Table 6-4. This table details which sources were used in the AAQS, PSD Class II, and PSD Class I modeling analyses. In general, stack parameters, emissions, and operating information were obtained from APIS for the year 1991.

Table 6-3
Summary of Non-Clewiston Source Data Used in Modeling Analysis

APIS Number	Facility	Height (m)	Diameter (m)	Stack Temp (m)	Velocity (m/s)
52FTM080028	Ajax Paving Industries	12.8	1.59	422	20.7
52FTM500016	Atlantic Sugar				
	Unit 1[1]	18.9	1.92	346	12.7
	Unit 2[1]	18.9	1.92	342	10.9
	Unit 3[1]	21.9	1.83	341	17.5
	Unit 4[1]	18.3	1.93	344	15.0
	Unit 5 PSD[1]	27.4	1.68	339	15.7
52WPB430012	Bay State Milling Co.				
	Unit 1	6.4	0.70	298	7.0
	Unit 2	6.4	0.70	298	22.6
	Unit 3	7.9	1.10	298	8.2
	Unit 4	5.2	0.70	298	4.0
	Unit 8	6.4	0.70	298	10.7
50WPB430102	Bechtel Indiantown PSD	130.9	4.88	333	30.5
52FTM260006	Berry Citrus Products				
	Unit 1[1]	27.1	0.98	339	11.3
	Unit 2[1]	9.1	0.64	466	8.2
	Unit 3[1]	9.1	0.64	589	21.9
	Unit 4[1]	11.0	0.76	516	4.0
52FTM260004	Citrus Belle				
	Boilers[1]	8.5	0.82	478	10.4
	Heat Evaporators[1]	18.0	0.85	348	14.0
50DAD130348	Dade County RRF PSD				
	Units 1&2 proposed mod.	64.9	3.66	405	15.9
	Units 3&4 proposed mod.	64.9	3.66	405	15.9
	Units 5&6 proposed	76.2	4.20	399	15.7
50WPB430007	Dickerson	12.8	1.83	322	9.8
52FTM260001	Everglades Sugar				
	Unit 1[1]	19.5	1.22	308	3.4
	Unit 2[1]	21.9	1.10	477	10.1
	Unit 4[1]	21.3	0.91	311	13.1
	Unit 5[1]	16.5	0.91	305	7.0
	Unit 6[1]	14.0	0.15	294	20.4
52FTM500005	Flo-Energy/Okeelanta				
	Unit 4 PSD Baseline[1]	22.9	2.29	333	7.4
	Unit 5 PSD Baseline[1]	22.9	2.29	333	12.1
	Unit 6 PSD Baseline[1]	22.9	2.29	334	8.7

Table 6-3
Summary of Non-Clewiston Source Data Used in Modeling Analysis (Contd)

APIS Number	Facility	Height (m)	Diameter (m)	Stack Temp (m)	Velocity (m/s)
	Unit 10 PSD Baseline[1]	22.9	2.29	334	10.4
	Unit 11 PSD Baseline[1]	22.9	2.29	342	9.9
	Unit 12 PSD Baseline[1]	22.9	2.29	330	8.2
	Unit 14 PSD Baseline[1]	22.9	2.29	333	8.3
	Unit 15 PSD Baseline[1]	22.9	2.29	332	10.2
	Cogen. Units 1-3	60.7	2.44	450	21.2
50BRO060037	FPL- Fort Lauderdale				
	Ct's 1-4 PSD	45.7	4.88	411	11.0
	4&5 PSD Baseline	46.0	4.27	422	14.6
52FTM360002	FPL - Fort Myers				
	Unit 1	92.1	2.90	422	29.9
	Unit 2	124.1	2.52	408	19.2
	Peaking Units	9.8	3.47	797	57.6
50WPB430001	FPL - Martin				
	Units 1&2	152.1	7.99	420	21.0
	Aux Blr PSD	18.3	1.10	535	15.2
	Diesl Gens PSD	7.6	0.30	795	39.6
	Units 3&4 PSD	64.9	6.10	410	18.9
50BRO060036	FPL - Port Everglades				
	GT 1-2	15.5	5.49	733	21.3
	Units 1&2	104.9	4.27	416	18.6
	Units 3&4	104.5	5.52	108	19.2
50PMB500042	FPL - Riviera Beach				
	Unit 2	45.7	4.57	430	7.6
	3&4	90.8	4.98	408	18.9
50WPB560060	Florida Gas Transmission				
	Units 1-3	8.5	0.49	589	21.9
	Unit 4	19.8	0.34	641	76.5
50WPB560003	Fort Pierce Utilities				
	CCGT	18.3	3.26	505	19.8
	Unit 7	39.0	2.16	396	10.7
	Unit 8	45.7	2.44	408	12.5
52FTM280005	Georgia Pacific	8.5	0.67	491	5.5
50PMB500086	Glades Corr Institute	9.8	0.40	389	11.3
50BRO060045	Hardrives Asphalt Co.	10.1	0.55	394	10.1
50PMR500045	Lake Worth				

Table 6-3
Summary of Non-Clewiston Source Data Used in Modeling Analysis (Contd)

APIS Number	Facility	Height (m)	Diameter (m)	Stack Temp (m)	Velocity (m/s)
	Units 1&2	18.2	1.52	434	6.2
	Units 3&4	38.1	2.29	408	9.7
	Unit 5	22.9	0.95	450	18.3
NA	Lee County RRF - PSD	83.8	1.88	399	19.8
50WPB062120	North Broward RRP PSD	58.5	3.96	381	18.0
50WPB500234	Palm Beach RRF - 1&2 PSD	76.2	2.04	505	24.9
50PMB500021	Pratt & Whitney				
	ACHR-1	1.8	0.91	500	40.2
	ACHR-2	15.2	0.91	500	40.2
	ACHR-3	4.6	3.38	700	13.4
	BO-12	4.6	0.76	300	6.9
	LI-1 MW	9.2	0.67	2000	8.4
52FTM500018	QO Chemicals				
	Units 1&2	35.1	1.22	1033	4.0
	Unit 3	35.1	1.22	589	4.6
52FTM500019	Sol-Energy/Osceola Farms				
	Unit 1 PSD Baseline[1]	22.0	1.52	342	8.2
	Unit 2 PSD Baseline[1]	22.0	1.52	341	18.1
	Unit 3 PSD Baseline[1]	22.0	1.93	341	14.5
	Unit 4 PSD Baseline[1]	22.0	1.83	341	18.8
	Cogenerator Units 1&2	54.9	2.13	449	26.1
50WPB062119	South Broward RRF PSD	59.4	3.96	381	18.0
52FTM260015	Southern Gardens PSD				
	Units 1&2	12.2	0.64	480	17.1
	Unit 3	26.5	0.98	347	10.7
	Units 4&5	12.2	0.61	316	22.3
50WPB430021	Stuart Contracting	11.9	1.2	422	24.1
52FTM500026	Sugar Cane Growers				
	Unit 3[1]	24.4	1.60	344	15.6
	Unit 4 PSD Baseline[1]	33.5	1.63	344	10.6
	Unit 4 PSD Baseline[1]	25.9	2.82	344	10.6
	Unit 5[1]	24.4	1.40	344	15.2
	Unit 8 PSD[1]	47.2	3.05	344	10.6
	Unit 1&2[1]	24.4	1.40	344	11.4
	Unit 6&7[1]	12.2	2.13	606	11.2
52FTM500073	Talisman Sugar				

Table 6-3
Summary of Non-Clewiston Source Data Used in Modeling Analysis (Contd)

APIS Number	Facility	Height (m)	Diameter (m)	Stack Temp (m)	Velocity (m/s)
	Units 4&5[1]	21.3	1.59	336	22.9
	Unit 6[1]	22.9	3.05	361	9.1
52FTM280018	Tampa Electric - Phillips	45.7	1.83	441	24.1
50DAD130020	Tarmac				
	Kiln 2 PSD Baseline	61	2.44	465	12.8
	Kiln 3 PSD Baseline	61	4.57	472	10.8
	Kiln 2 PSD	61	2.44	422	9.1
	Kiln 3 PSD	61	4.57	450	11.0
50WPB560004	Tropicana Products				
	Generators	9.1	0.61	584	95.1
	Driers	29.0	0.98	333	18.9
52FTM500061	US Sugar-Bryant				
	Unit 5 PSD[1]	42.7	2.90	345	11.5
	Unit 1,2&3[1]	19.8	1.64	342	36.4
30ORL310029	Vero Beach Power				
	Unit 1	61.0	1.83	451	6.4
	Unit 2	61.0	1.71	451	25.3
	Unit 3	61.0	2.13	485	10.4
	Unit 4	61.0	2.13	463	15.5
50BR0062094	Waste Management PSD	11.3	1.22	722	36.8

Notes:

[1]These sources operate only during the crop season, October 1 through April 30.

Table 6-4
Summary of Non-Clewiston Emissions Data Used in Modeling Analysis

APIS Number	Facility	SO_2 (g/s)	PM (g/s)	NO_2 (g/s)	CO (g/s)
52FTM080028	Ajax Paving Industries	10.79	--	--	--
52FTM500016	Atlantic Sugar				
	Unit 1[1]	17.24	6.28	3.49	53.20
	Unit 2[1]	22.50	6.55	3.25	53.20
	Unit 3[1]	16.88	9.21	2.80	73.18
	Unit 4[1]	16.88	8.13	2.56	81.29
	Unit 5 PSD[1]	11.80	3.52	5.92	207.27
52WPB430012	Bay State Milling Co.				
	Unit 1	--	26.50	--	--
	Unit 2	--	10.40	--	--
	Unit 3	--	10.40	--	--
	Unit 4	--	3.94	--	--
	Unit 8	--	1.89	--	--
50WPB430102	Bechtel Indiantown PSD	75.64	--	--	--
52FTM260006	Berry Citrus Products				
	Unit 1[1]	3.15	--	3.35	--
	Unit 2[1]	2.84	--	0.84	--
	Unit 3[1]	6.10	--	2.60	--
	Unit 4[1]	2.87	--	2.01	--
52FTM260004	Citrus Belle				
	Boilers[1]	4.82	--	--	--
	Heat Evaporators[1]	3.27	--	--	--
50DAD130348	Dade County RRF PSD				
	Units 1&2 proposed mod.	12.30	--	--	--
	Units 3&4 proposed mod.	12.30	--	--	--
	Units 5&6 proposed	17.20	--	--	--
50WPB430007	Dickerson	1.69	--	--	--
52FTM260001	Everglades Sugar				
	Unit 1[1]	--	0.61	--	--
	Unit 2[1]	11.80	1.15	5.56	--
	Unit 4[1]	--	3.04	1.81	--
	Unit 5[1]	--	3.04	--	--
	Unit 6[1]	--	0.75	--	--
52FTM500005	Flo-Energy/Okeelanta				
	Unit 4 PSD Baseline[1]	-10.95	-6.97	-2.99	--
	Unit 5 PSD Baseline[1]	-15.64	-8.92	-6.42	--
	Unit 6 PSD Baseline[1]	-15.64	-9.79	-8.32	--

Table 6-4
Summary of Non-Clewiston Emissions Data Used in Modeling Analysis (contd)

APIS Number	Facility	SO_2 (g/s)	PM (g/s)	NO_x (g/s)	CO (g/s)
	Unit 10 PSD Baseline[1]	-17.15	-10.75	-9.14	--
	Unit 11 PSD Baseline[1]	-16.79	-10.53	-8.95	--
	Unit 12 PSD Baseline[1]	-20.58	-12.93	-10.99	--
	Unit 14 PSD Baseline[1]	-20.03	-12.60	-5.78	--
	Unit 15 PSD Baseline[1]	-16.79	-10.56	-5.89	--
	Cogen. Units 1-3	222.26	8.13	40.56	94.61
50BRO060037	FPL - Fort Lauderdale				
	Ct's 1-4 PSD	271.00	22.80	45.70	8.83
	4&5 PSD Baseline	-457.00	--	46.00	--
52FTM360002	FPL - Fort Myers				
	Unit 1	192.90	17.51	80.84	6.03
	Unit 2	499.20	45.36	209.16	15.61
	Peaking Units	24.80	0.29	39.73	9.09
50WPB430001	FPL - Martin				
	Units 1&2	1743.79	140.59	421.76	23.37
	Aux Blr PSD	12.90	--	--	--
	Diesl Gens PSD	0.51	--	--	--
	Units 3&4 PSD	470.40	--	--	--
50BRO060036	FPL - Port Everglades				
	GT 1-2	488.39	0.00	33.26	1.73
	Units 1&2	637.54	48.26	703.07	11.77
	Units 3&4	1067.16	116.17	1054.60	17.75
50PMB500042	FPL - Riviera Beach				
	Unit 2	124.86	--	--	--
	3&4	846.33	67.25	457.37	33.26
50WPB560060	Florida Gas Transmission				
	Units 1-3	--	--	15.59	--
	Unit 4	--	--	1.34	--
50WPB560003	Fort Pierce Utilities				
	CCGT	--	--	6.07	--
	Unit 7	--	--	0.87	--
	Unit 8	77.90	--	3.30	--
52FTM280005	Georgia Pacific	1.64	--	--	--
50PMB500086	Glades Corr Institute	2.82	--	--	--
50BRO060045	Hardrives Asphalt Co.	5.52	--	--	--
50PMR500045	Lake Worth				

Table 6-4
Summary of Non-Clewiston Emissions Data Used in Modeling Analysis (contd)

APIS Number	Facility	SO_2 (g/s)	PM (g/s)	NO_x (g/s)	CO (g/s)
	Units 1&2	72.58	--	--	--
	Units 3&4	237.90	--	9.64	--
	Unit 5	11.59	--	8.00	--
NA	Lee County RRF- PSD	14.00	--	--	--
50WPB062120	North Broward RRP PSD	35.40	--	--	--
50WPB500234	Palm Beach RRF- 1&2 PSD	85.05	--	31.76	--
50PMB500021	Pratt & Whitney				
	ACHR-1	16.02	--	--	--
	ACHR-2	47.92	--	--	--
	ACHR-3	23.46	--	--	--
	BO-12	9.08	--	--	--
	LI-1 MW	6.18	--	--	--
52FTM500018	QO Chemicals				
	Units 1&2	2.13	--	4.43	--
	Unit 3	1.07	--	2.22	--
52FTM500019	Sol-Energy/Osceola Farms				
	Unit 1 PSD Baseline[1]	-5.07	-8.89	-5.08	--
	Unit 2 PSD Baseline[1]	-16.32	-7.36	-8.14	--
	Unit 3 PSD Baseline[1]	-7.26	-7.59	-4.34	--
	Unit 4 PSD Baseline[1]	-13.61	-5.62	-4.76	--
	Cogenerator Units 1&2	139.20	5.04	20.11	58.66
50WPB062119	South Broward RRF PSD	37.91	--	--	--
52FTM260015	Southern Gardens PSD				
	Units 1&2	4.99	0.45	3.09	--
	Unit 3	--	2.27	3.97	--
	Units 4&5	--	2.52	--	--
50WPB430021	Stuart Contracting	1.99	--	--	--
52FTM500026	Sugar Cane Growers				
	Unit 3[1]	4.40	7.22	2.16	3.60
	Unit 4 PSD[1]	24.20	14.41	5.44	9.07
	Unit 4 PSD Baseline[1]	-24.20	-14.41	-5.44	--
	Unit 5[1]	16.20	13.21	3.96	12.10
	Unit 8 PSD[1]	26.70	9.53	15.50	17.64
	Unit 1&2[1]	24.20	18.02	5.47	9.04
	Unit 6&7[1]	51.00	--	--	--
52FTM500073	Talisman Sugar				

Table 6-4
Summary of Non-Clewiston Emissions Data Used in Modeling Analysis (contd)

APIS Number	Facility	SO_2 (g/s)	PM (g/s)	NO_x (g/s)	CO (g/s)
	Units 4&5[1]	--	22.68	81.77	35.85
	Unit 6[1]	--	10.84	6.36	29.37
52FTM280018	Tampa Electric - Phillips	115.92	--	229.82	24.95
50DAD130020	Tarmac				
	Kiln 2 PSD Baseline	-5.71	--	--	--
	Kiln 3 PSD Baseline	-2.76	--	--	--
	Kiln 2 PSD	24.50	--	--	--
	Kiln 3 PSD	51.40	--	--	--
50WPB560004	Tropicana Products				
	Generators	0.39	--	--	--
	Driers	0.58	--	--	--
52FTM500061	US Sugar-Bryant				
	Unit 5 PSD[1]	81.36	9.88	17.54	336.16
	Unit 1,2&3[1]	204.54	39.31	37.80	37.83
30ORL310029	Vero Beach Power				
	Unit 1	65.80	--	--	--
	Unit 2	84.40	--	--	--
	Unit 3	144.50	--	--	--
	Unit 4	69.00	--	--	--
50BR0062094	Waste Management PSD	5.39	--	--	--

Notes:

[1]These sources operate only during the crop season, October 1 through April 30.

Sources within one facility were sometimes combined if the stack heights were the same and the sources had similar operating parameters. Some small sources were sometimes combined with larger sources within the same facility (their emissions were added to the larger source).

For all facilities, 3-hour worst-case emission rates were used for all pollutant and averaging time analyses. Crop season and off-season inventories were developed for all impact analyses with averaging periods of 24 hours or less. All crop season sources, including U.S. Sugar Corporation's Clewiston sources, were conservatively assumed to operate year-round for the annual impact analyses.

Three separate modeling emission inventories were prepared for the modeling effort; an ambient air quality analysis inventory, a PSD Class II inventory, and a PSD Class I inventory:

- The AAQS analysis included all existing and proposed sources within the SIA and the screening area.

- The Class II inventory included PSD increment-consuming and/or expanding sources and PSD baseline sources[1].

- An emission inventory for modeling PSD Class I increment consumption at the Everglades National Park (ENP) was developed to include all PSD sources within 100 km from ENP. The inventory included regional resource recovery facilities (e.g, Lee, Dade, and Broward counties), future expansion at the FPL Martin power facility in Martin County, the proposed Sol-Energy and Flo-Energy cogeneration facilities, and all increment-consuming sugar mill sources. Like the ambient and PSD Class II inventories, the PSD Class I inventory was subdivided into crop and off-season inventories.

6.6 RECEPTOR LOCATIONS

6.6.1 Significant Impact Analysis

For short- and long-term averaging periods, ground-level concentrations were predicted at receptors located in a radial grid centered on the proposed boiler No. 7 stack. Receptors were located in 25 "rings," with 36 receptors per ring spaced at 10-degree intervals at distances of 0.35 to 100 km. The large number of rings were used to determine the radius of significant impact for each pollutant and averaging-time scenario.

---

[1] PSD baseline sources are those which were existing in 1977 or 1988, but which have since been modified or ceased operation.

6.6.2 AAQS Impact Assessments

For the AAQS analysis, receptor grids were based on the radius of significant impact for the pollutant modeled. All runs included 36 receptors for each 10-degree sector located on the following rings: 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1, 2, 3, 4, 5, 6, 7, 8, 10, and 15 km. Impact analyses for pollutants with significant impacts beyond 15 km included the following distances as necessary: 20, 25, 30, 40, 50, 65, 80, and 100 km. Receptors in the grid located on inaccessible U.S. Sugar Corporation property were not included in the modeling. The south, west, north, and east property boundaries are approximately 300, 350, 400, and 1550 meters, respectively, from the proposed boiler No. 7 stack.

6.6.3 PSD Class II Impact Assessment

The PSD Class II receptor grids were the same as the AAQS analysis grids.

6.6.4 PSD Class I Impact Assessment

ENP is a PSD Class I area that is located just beyond 100 km of the Clewiston plant site. In this analysis, ENP is represented by 51 discrete receptors, including 47 receptors covering the eastern and northern boundaries of the park from the Florida Keys to the Gulf of Mexico and 4 receptors inside the northeast corner of ENP (see Figure 6-2). The Universal Transverse Mercator (UTM) coordinates of these Class I receptors are listed in Table 6-5. The closest receptor to the Clewiston mill is 102 km distant.

6.7 BUILDING DOWNWASH CONSIDERATIONS

The procedures used for addressing the effects of building downwash are those recommended in the ISC2 Dispersion Model User's Guide. The building height, length, and width are input to the model, which uses these parameters to modify the dispersion parameters. For short stacks (i.e., physical stack height is less than $H_b + 0.5\ L_b$, where H_b is the building height and L_b is the lesser of the building height or projected width), the Schulman and Scire (1980) method is used. The features of this method are as follows:

- Reduced plume rise as a result of initial plume dilution
- Enhanced plume spread as a linear function of the effective plume height
- Specification of building dimensions as a function of wind direction

For cases where the physical stack is greater than $H_b + 0.5\ L_b$ but less than GEP, the Huber and Snyder (1976) method is used. For this method, the ISCST2 model calculates the area of the building using the length and width, assumes the area is representative of a circle, and then calculates a building width by determining the diameter of the circle. For both methods the direction-specific

Best Available Copy

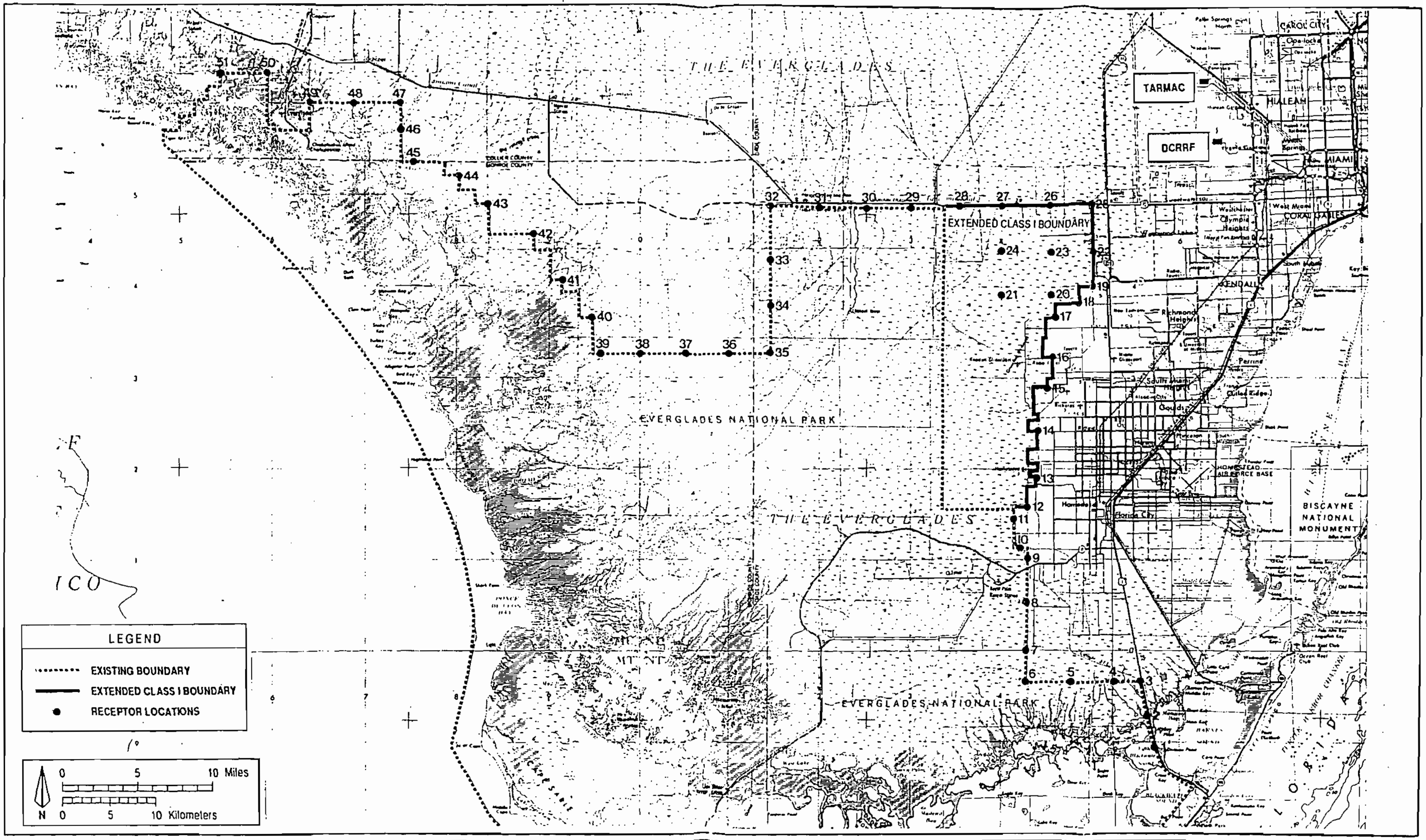


Figure 6-2 RECEPTOR LOCATIONS USED FOR THE EVERGLADES NATIONAL PARK PSD CLASS I SCREENING ANALYSES

ICF KAISER ENGINEERS

Table 6-5
Everglades National Park Receptors Used
for the Class I Screening Analysis

Receptor	UTM Coordinate (km)		Receptor	UTM Coordinates (km)	
	East	North		East	North
1	557.0	2789.0	27	540.0	2848.6
2	556.6	2792.0	28	535.0	2848.6
3	556.0	2796.0	29	530.0	2848.6
4	553.0	2796.5	30	525.0	2848.6
5	548.0	2796.5	31	520.0	2848.6
6	542.7	2796.5	32	515.0	2848.6
7	542.7	2800.0	33	515.0	2843.0
8	542.7	2805.0	34	515.0	2838.0
9	542.7	2810.0	35	515.0	2833.0
10	542.0	2811.0	36	510.0	2833.0
11	541.3	2814.0	37	505.0	2833.0
12	542.7	2816.0	38	500.0	2833.0
13	544.1	2820.0	39	495.0	2833.0
14	543.5	2824.6	40	494.5	2837.0
15	545.0	2829.0	41	491.5	2841.0
16	545.7	2832.2	42	488.5	2845.5
17	546.2	2835.7	43	483.0	2848.5
18	548.6	2837.5	44	480.0	2852.5
19	550.3	2839.0	45	475.0	2854.0
20	445.0	2839.0	46	473.5	2857.0
21	440.0	2839.0	47	473.5	2860.0
22	550.5	2844.0	48	469.0	2860.0
23	545.0	2844.0	49	464.0	2860.0
24	540.0	2844.0	50	459.5	2864.0
25	550.3	2848.6	51	454.0	2864.0
26	545.0	2848.6			

Abbreviations:

km = kilometers.
UTM = Universal Transverse Mercator.

building dimensions are input for H_b and L_b for 36 radial directions, with each direction representing a 10-degree sector.

With the exception of the Boiler No. 7 stack, the existing, proposed, and PSD baseline Clewiston stacks have heights that are below GEP. Therefore, the modeling analysis addresses the effects of aerodynamic downwash for these stacks. The building dimensions used in the downwash analysis were obtained from the site plan provided as Figure 3-1. The dimensions of each building used in the analysis are provided in Appendix K in Volume II.
The potential for downwash was determined for each degree within every 10-degree direction sector. For each direction, a building structure was determined to be within the zone of influence of a stack if the stack is within $5L_b$ downwind of the building, $2L_b$ upwind of the building, or $0.5L_b$ crosswind of the building. Based on this analysis, direction-specific building heights and widths were developed for each 10-degree direction sector and included for both existing and proposed stacks on the site.

6.8 BACKGROUND AMBIENT AIR CONCENTRATIONS

Background ambient air quality concentrations are added to the refined model's predicted impacts before comparison against AAQS. The selected background concentration is intended to represent the air quality impacts of sources not included in the dispersion model. Because modeling of PM, SO_2, NO_x, and CO was required for comparison against AAQS, background concentrations for these pollutants were estimated.

The FSCL has operated an ambient monitoring network in the area for a number of years. The network includes one SO_2 and 12 PM10 monitors. Background SO_2 and PM air quality was estimated from monitored air quality at the FSCL sites. Background NO_x and CO air quality was estimated from data in EPA's Aerometric Information Retrieval System (AIRS).

Background SO_2 concentrations were estimated for 3-hour, 24-hour, and annual averages. These concentrations were based on data collected at FSCL's monitor in Belle Glade during the period 1988-1991. Conservative estimates were used; the 3-hour and 24-hour estimates were set equal to the second-highest concentration observed during the 3-year period. Similarly, the annual estimate was set equal to the highest concentration observed during the 3-year period. The background concentrations used in the refined impact analysis were 53 $\mu g/m^3$, 21 $\mu g/m^3$, and 8 $\mu g/m^3$ for the 3-hour, 24-hour, and annual average, respectively.

Background PM concentrations were estimated for 24-hour and annual averages. These concentrations were based on data collected at all of FSCL's PM10 monitors during the period 1988-1991. For the annual estimate, the highest annual average concentration observed at each monitor was first selected. The median concentration of the twelve monitors was then selected for the annual estimate. For the 24-hour estimate, the fourth highest 24-hour average concentration (i.e., design value) observed at each monitor during the three-year period was first selected. The median design value was then selected for the 24-hour estimate. The background concentrations used in the refined impact analysis were 53 $\mu g/m^3$ and 26 $\mu g/m^3$ for the 24-hour and annual average, respectively.

An annual average background NO_x concentration was based on data collected from the state and local air monitoring system (SLAMS) monitor located in West Palm Beach. The background estimate was set equal to the highest annual average observation during the period 1987-1992. The background annual average NO_2 concentration used in the refined impact analysis was 26 $\mu g/m^3$.

Background CO air quality was also based on data collected from the SLAMS monitor located in West Palm Beach. Background estimates were set equal to the HSH 1-hour and 8-hour CO concentrations observed during the period 1987-1992. The background CO concentrations used in the refined impact analysis were 4580 $\mu g/m^3$ and 7790 $\mu g/m^3$ for the 8-hour and 1-hour periods, respectively.

6.9 AIR QUALITY MODELING RESULTS

6.9.1 Significant Impact Analysis

The significant impact areas for the proposed Clewiston mill project are presented in Table 6-6. The radius of each significant impact area was based on the maximum radius of significant impact predicted for each pollutant, regardless of averaging time.

The 100 km radius for SO_2 was based on the 1985 3-hour averaging time run, the 35 km radius for PM was based on the 1986 24-hour averaging time run, and the 30 km radius for CO was based on the 1985 8-hour averaging time run. The significant impact radius of 15 km for NO_x was based solely on annual averaging time runs. The radius of significant impact was used in the selection of sources for the respective emission inventories, as discussed in Section 6.5.

6.9.2 AAQS Analysis

The results of the ambient air quality impact analyses are presented in Tables 6-7 through 6-9. The results show that the highest and HSH predicted impacts were caused primarily by U.S. Sugar Corporation and were located near the facility. In no circumstance did a predicted impact exceed AAQS.

Reporting of 24-hour PM results in Tables 6-7 and 6-8 is conservatively based on the highest predicted impact for each year, in order to demonstrate that the AAQS will be achieved. The 24-hour PM AAQS is exceeded when the sixth-highest 24-hour concentration during a five-year period exceeds the standard.

Table 6-6
Radius of Significant Impact for
the Proposed Clewiston Facility

Pollutant	**Averaging Time**	**Distance (km)**
SO_2	Annual	11
	24-Hour	80
	3-Hour	100
PM10	Annual	15
	24-Hour	35
NO_2	Annual	15
CO	8-Hour	30
	1-Hour	25

Note: Radius of significant impact based on maximum predicted concentrations.

Table 6-7
Predicted Short-Term Crop Season Impacts for the
Ambient Air Quality Analysis

Pollutant	Averaging Time	Year	Background Concentration ($\mu g/m^3$)	Modeled Concentration ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	AAQS ($\mu g/m^3$)
SO_2	3-Hour	1985	53	374	427	1300
		1986		404	457	
		1987		440	493	
		1988		379	432	
		1989		407	460	
	24-Hour	1985	21	150	171	260
		1986		128	149	
		1987		159	180	
		1988		173	194	
		1989		140	161	
PM10	24-Hour[1]	1985	53	69.8	123	150
		1986		85.7	139	
		1987		69.5	123	
		1988		107	160	
				(HSH) 107	160	
				(HTH) 81.3	134	
		1989		75.7	131	
CO	1-Hour	1985	7,400	6,105	13,505	40,000
		1986		6,481	13,881	
		1987		5,682	13,082	
		1988		6,376	13,776	
		1989		6,190	13,590	
	8-Hour	1985	4,600	3,120	7,720	10,000
		1986		2,458	7,058	
		1987		2,983	7,583	
		1988		3,124	7,724	
		1989		3,270	7,870	

[1] Reported PM10 concentrations are the maximum predicted concentrations with the exception of 1988 HSH and 1988 highest-third-highest (HTH) concentrations.

Table 6-8
Predicted Short-Term Off-Season Impacts
for the Ambient Air Quality Analysis

Pollutant	Averaging Time	Year	Background Concentation ($\mu g/m^3$)	Modeled Concentration ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	AAQS ($\mu g/m^3$)
SO_2	3-Hour	1985	53	319	372	1300
		1986		316	369	
		1987		275	328	
		1988		278	331	
		1989		301	354	
	24-Hour	1985	21	98.1	119	260
		1986		103	124	
		1987		81.3	102	
		1988		90.2	111	
		1989		105	126	
PM10	24-Hour[1]	1985	53	22.5	75.5	150
		1986		24.1	77.1	
		1987		20.5	73.5	
		1988		20.8	73.8	
		1989		18.5	71.5	
CO	1-Hour	1985	7,400	1,307	8,707	40,000
		1986		1,269	8,669	
		1987		963	8,363	
		1988		1,109	8,509	
		1989		1,198	8,598	
	8-Hour	1985	4,600	385	4,985	10,000
		1986		381	4,981	
		1987		296	4,896	
		1988		421	5,021	
		1989		337	4,937	

Note:

[1] Reported PM10 concentrations are the maximum predicted concentrations.

Table 6-9
Predicted Annual Impacts
for the Ambient Air Quality Analysis

Pollutant	Averaging Time	Year	Background Concentation ($\mu g/m^3$)	Modeled Concentration ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	AAQS ($\mu g/m^3$)
SO_2	Annual	1985	8	26.0	34.0	60
		1986		25.1	33.1	
		1987		18.5	26.5	
		1988		21.5	29.5	
		1989		18.6	26.6	
PM10[1]	Annual	Max	26	12.9	38.9	50
		HSH		12.7	38.7	
		HTH		12.5	38.5	
		H4H		12.2	38.2	
		H5H		10.9	36.9	
		H6H		9.98	36.0	
NO_2	Annual	1985	26	9.02	35.0	100
		1986		8.32	34.3	
		1987		9.86	35.9	
		1988		9.08	35.1	
		1989		11.1	37.1	

Note: Impacts conservatively assume that seasonal sources operate year-round.

1 Reported PM10 impacts are maximum through highest-sixth-highest (H6H) impacts for the 1984-1989 period.

6.9.3 PSD Class II Analysis

The results of the PSD Class II impact analysis are presented in Tables 6-10 through 6-12, respectively. In all cases, predicted PSD Class II increment consumption was well within allowable levels.

6.9.4 PSD Class I Analysis

The PSD Class I modeling results are presented in Tables 6-13 through 6-15. In all cases, predicted impacts are below the allowable PSD Class I increments. The proposed facility with other increment-consuming sources will therefore meet the allowable PSD increments in the Class I area.

6.9.5 Toxic Impact Analysis

The maximum impacts of air toxics that will be emitted by the proposed project are presented in Table 6-16. Each pollutant's maximum 8-hour, 24-hour, and annual impact is compared to respective FDEP no-threat level (NTL). The table shows that all toxic pollutant impacts will be below their respective NTLs. Note that these emission estimates were based upon the very conservative assumption of no removal efficiency for toxics in the wet impingement scrubber.

6.9.6 VOC/Ozone Impact Analysis

Because the proposed modification emits a significant amount of VOCs with regard to ozone air quality, a VOC impact analysis was conducted to preliminarily evaluate U.S. Sugar Corporation's potential to contribute to ozone nonattainment in Palm Beach County. Estimates of non-methane hydrocarbon (NMHC) emissions from the proposed off-season U.S. Sugar Corporation configuration were input to ISCST2 with the purpose of predicting ambient impacts of NMHC in Palm Beach County. The off-season configuration was modeled because it corresponds to the high ozone season. The predicted impacts were compared against historical ambient total hydrocarbon (THC) measurements collected in Palm Beach County. The results are presented in Table 6-17.

The results show that predicted NMHC impacts are well below historical ambient THC measurements. Based on the predicted impacts and ambient measurements, U.S. Sugar Corporation's contribution to VOC ambient air concentrations is expected to be less than 1 percent. Consequently, U.S. Sugar Corporation emissions are not anticipated to significantly contribute toward ozone nonattainment conditions in Palm Beach County.

Table 6-10
Predicted Short-Term Crop Season Impacts
for the PSD Class II Increment Analysis

Pollutant	Averaging Time	Year	Predicted Impact ($\mu g/m^3$)	Allowable Increment ($\mu g/m^3$)
SO_2	3-Hour	1985	203	512
		1986	158	
		1987	143	
		1988	157	
		1989	131	
	24-Hour	1985	30.2	91
		1986	34.7	
		1987	36.7	
		1988	34.2	
		1989	30.4	
TSP/PM10[1]	24-Hour	1985	24.2	37/30
		1986	29.8	
		1987	21.0	
		1988	26.5	
		1989	30.7 22.2 (HSH)	

Note:

1 Reported TSP/PM10 impacts are the maximum predicted impacts, with the exception of the 1989 HSH impact. PM10 increments become effective June 1994.

Table 6-11
Predicted Short-Term Off-Season Impacts
for the PSD Class II Increment Analysis

Pollutant	**Averaging Time**	**Year**	**Predicted Impact ($\mu g/m^3$)**	**Allowable Increment ($\mu g/m^3$)**
SO_2	3-Hour	1985	114	512
		1986	96.1	
		1987	124	
		1988	103	
		1989	101	
	24-Hour	1985	35.8	91
		1986	28.3	
		1987	29.9	
		1988	34.6	
		1989	32.8	
TSP/PM10[1]	24-Hour	1985	22.3	37/30
		1986	23.6	
		1987	20.5	
		1988	20.6	
		1989	18.2	

Note:

1 Reported TSP/PM10 impacts are the maximum predicted impacts. PM10 increments become effective June 1994.

Table 6-12
Predicted Annual Impacts
for the PSD Class II Incremental Analysis

Pollutant	Averaging Time	Year	Predicted Impact ($\mu g/m^3$)	Allowable Increment ($\mu g/m^3$)
SO_2	Annual	1985	3.92	20
		1986	3.96	
		1987	3.27	
		1988	3.66	
		1989	2.95	
TSP/PM10[1]	Annual	Maximum	1.67	19/17
		HSH	1.56	
		HTH	1.51	
		H4H	1.13	
		H5H	1.02	
		H6H	1.01	
NO_2	Annual	1985	2.24	25
		1986	1.98	
		1987	1.62	
		1988	2.18	
		1989	1.47	

Note:

1 Reported TSP/PM10 impacts are maximum through highest-sixth-highest (H6H) impacts for the 1984-1989 period. PM10 increments become effective June 1994.

AQCR: 000 AGENCY(J): PRIVATE
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED
AREA: 3420 PARM(42401): SULFUR DIOXIDE
SITE: 003 UNITS(07): PARTS PER MILLION
YEAR: 1989 MONTH(10): OCTOBER
LOCALE: FLORIDA CELERY EXCHANGE BELLE GLADE

COLLECT METH: INSTRUMENTAL
ANALYSIS METH: PULSED FLUORSCENCE
SAMPLING INTR: 01 HOURS
SAROAD KEY: 10/3420/003/J/01
MINIMUM DETEC: 00000+

SLAMS/NAMS(0):
RPT AGNCY/SMSA: 0000
UTM ZONE: 17
UTM EASTING: 000535
TIME ZONE(07): EASTERN

PRIMARY SECONDARY
FEDERAL STANDARD SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01	.003	.003	.003	.003	.002	.003	.002	.003	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.006	.003
02	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.006	.003
03	.003	.003	.003	.003	.003	.004	.004	.004	.003	.003	.003	.003	.003	.002	.003	.003	.003	.002	.002	.002	.002	.002	CALB	.006	.003
04	.003	.003	.003	.003	.002	.003	.003	.003	.003	.003	.003	.002	.002	.002	.003	.002	.002	.002	.002	.002	.002	.002	CALB	.006	.003
05	.003	.003	.002	.003	.002	.002	.003	.002	.003	.003	.003	.002	.002	.002	.002	.002	.003	.002	.003	.002	.003	.003	CALB	.006	.003
06	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.003	.003	.003	.002	.002	.003	.003	.003	CALB	.006	.003
07	.004	.003	.002	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.002	.003	.003	.003	.003	.002	CALB	.006	.003
08	.004	.003	.003	.003	.003	.003	.002	.003	.003	.003	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.007	.003
09	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.006	.003
10	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.007	.003
11	.004	.003	.002	.003	.003	.003	.003	.003	.003	.003	.003	.002	.003	CALB	CALB	.006	.004	.003	.003	.002	.002	.002	CALB	.006	.003
12	.003	.003	.003	.003	.002	.003	.003	.002	.002	.002	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.006	.002
13	.003	.003	.003	.002	.002	.003	.003	.003	.003	.002	.003	.003	.003	.003	.003	.002	.002	.002	.002	.003	.003	.003	CALB	.007	.003
14	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.003	.003	.003	.003	.002	.002	.002	.002	.002	.002	.002	CALB	.007	.003
15	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.006	.003
16	.003	.003	.003	.003	.003	.002	.003	.003	.003	.003	.003	.003	.002	.003	.003	.003	.004	.003	.003	.003	.003	.003	CALB	.007	.003
17	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.002	.002	.002	.002	.003	.002	.002	.003	.002	.003	.003	CALB	.007	.003
18	.004	.003	.003	.003	.003	.003	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.008	.003
19	.005	.006	.004	.004	.003	.003	.003	CALB	CALB	CALB	CALB	CALB	CALB	CALB	CALB	CALB	.004	.003	.002	.002	.002	.001	CALB	.007	.004
20	.003	.003	.002	.002	.001	.001	.001	CALB	CALB	CALB	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	WTHR	CALB	WTHR	.002
21	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	.002	.002	.002	.001	.001	.001	.002	.001	.001	.001	.002	.002	.002	CALB	.004	.002
22	.003	.002	.002	WTHR	WTHR	WTHR	WTHR	WTHR	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.005	.002
23	.003	.002	.003	.003	.003	.003	.003	.003	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.006	.003
24	.003	.002	.002	.002	.002	.002	.002	.002	.002	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.008	.002
25	.004	.003	.003	.003	.003	.003	.005	.004	.003	.003	.003	.003	CALB	CALB	CALB	CALB	.004	.002	.002	.002	.002	.003	CALB	.007	.003
26	.004	.003	.003	.003	.003	.003	.003	.002	.003	.003	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.006	.003
27	.004	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.007	.002
28	.004	.003	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.002	.001	.002	CALB	.007	.002
29	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.007	.002
30	.004	.003	.003	.003	.002	.002	.002	.003	.003	.003	.002	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.005	.003
31	.004	.004	.003	.003	.003	.003	.003	.004	.005	.005	.004	.003	.003	.002	.002	.002	.002	.002	.003	.002	.002	.002	CALB	.006	.003
NO	30	30	30	29	29	29	29	27	28	29	30	30	29	28	28	29	31	31	31	31	31	30		30	679
MEAN	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002		.007	.003
MAX	.005	.006	.004	.004	.003	.004	.005	.004	.005	.005	.004	.003	.003	.003	.003	.006	.004	.003	.003	.003	.003	.003		.009	.009

'MALF' - MACHINE MALFUNCTION
'LAB ' - LAB ERROR
'*** ' - NOT ENOUGH READINGS
'WTHR' - BAD WEATHER
'QUAL' - QUALITY ASSURANCE
' ' - NUL VALUE
'VAND' - VANDALISM
'CALB' - CALIBRATION
'COLL' - COLLECTION ERROR
'WAIV' - MONITORING WAIVED

3hr = .004

STATE: FLORIDA (10) BEST AVAILABLE COPY ... QUALITY DATA REPORT DISPLAY N (9999 ... 1

AQCR: 000 AGENCY(J): PRIVATE	COLLECT METH: INSTRUMENTAL	SLAMS/NAMS(0):
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED	ANALYSIS METH: PULSED FLUORSCENCE	RPT AGNCY/SMSA: 0000
AREA: 3420 PARM(42401): SULFUR DIOXIDE	SAMPLING INTR: 01 HOURS	UTM ZONE: 17
SITE: 003 UNITS(07): PARTS PER MILLION	SAROAD KEY: 10/3420/003/J/01	UTM EASTING: 000535
YEAR: 1989 MONTH(11): NOVEMBER	MINIMUM DETEC: 00000+	TIME ZONE(07): EASTERN

LOCALE: FLORIDA CELERY EXCHANGE BELLE GLADE

PRIMARY SECONDARY

FEDERAL STANDARD SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01	.004	.003	.003	.003	.002	.002	.003	.003	.003	.003	.003	.003	.002	.003	.003	.003	.002	.002	.002	.003	.002	.003	CALB	.008	.003
02	.004	.003	.003	.003	.003	.003	.004	.004	.004	.004	.003	.003	.002	.003	.003	.003	.003	.003	.003	.002	.002	.002	CALB	.008	.003
03	.005	.005	.004	.003	.003	.003	.003	.005	.004	.004	.004	.005	.004	.004	.004	.003	.003	.002	.002	.002	.002	.002	CALB	.007	.004
04	.004	.003	.003	.002	.003	.002	.003	.002	.003	.002	.003	.002	.002	.002	.002	.002	.003	.003	.002	.002	.002	.002	CALB	.010	.003
05	.005	.004	.003	.003	.003	.003	.003	.003	.003	.002	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.009	.003
06	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.002	.002	.002	.002	.002	.002	.003	CALB	.008	.003
07	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.002	.002	CALB	CALB	CALB	.005	.003	.003	.003	.003	CALB	.007	.003
08	.004	.003	.003	.003	.003	.003	.004	.004	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.009	.003
09	.005	.004	.004	.004	.003	.003	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.004	.004	CALB	.009	.004
10	.005	.004	.004	.004	.004	.004	.005	.004	.005	.004	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.008	.004
11	.005	.004	.004	.003	.003	.003	.003	.003	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.007	.003
12	.004	.004	.003	.003	.003	.003	.003	.004	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.007	.003
13	.004	.003	.003	.003	.003	.003	.003	.003	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.008	.003
14	.005	.004	.004	.004	.003	.003	.003	.004	.004	.004	.004	.004	.003	.003	.003	.004	.004	.004	.004	.004	.004	.005	CALB	.011	.004
15	.007	.006	.005	.005	.004	.004	.005	.005	.005	.005	.005	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	CALB	.010	.005
16	.006	.006	.005	.005	.005	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.005	.004	.004	CALB	.007	.004
17	.005	.004	.008	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	.005	.006	.006	.005	.005	.004	.004	.004	.004	.004	.004	.004	.004	CALB	.007	.005
18	.005	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	.004	.005	.005	.004	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.007	.004
19	.004	.004	.004	.004	WTHR	WTHR	WTHR	WTHR	.005	.005	.004	.004	.004	.004	.004	.003	.003	.003	.003	.003	.004	.004	CALB	.008	.004
20	.005	.004	.004	.004	.004	.004	.005	.005	.005	.005	.004	.004	.004	.005	.004	.004	.003	.005	.006	.006	.006	.010	CALB	.014	.005
21	.010	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	.011	.009	.007	.006	.006	.005	.005	.005	.005	.005	.005	.005	.005	CALB	.010	.007
22	.007	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	.006	.009	.015	.020	.013	.007	.006	.005	.005	.005	.004	.005	.005	.004	CALB	.006	.008
23	.005	.005	.004	.004	.004	.004	.004	.004	.004	.004	.005	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	CALB	.009	.004
24	.006	.005	.004	.004	.005	.005	WTHR	WTHR	.005	.005	.005	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	CALB	.008	.005
25	.005	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	CALB	.011	.004
26	.007	.006	.005	.005	.005	.005	.005	.005	.005	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	CALB	.012	.005
27	.007	.006	.005	.005	.005	.005	.005	.006	.006	.005	.005	.005	.005	.004	MALF	CALB	CALB	.006	.005	.005	.005	.005	CALB	.011	.006
28	.007	.006	.005	.005	.005	.005	.006	.006	.005	.005	.005	.005	.005	.004	.004	.004	.004	.004	.004	.005	MALF	MALF	CALB	.012	.005
29	.007	.006	.006	.005	.005	.005	.005	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	CALB	.012	.005
30	.007	.006	.006	.005	.006	.006	.005	.004	.005	.005	.005	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	CALB	.009	.005
NO	30	27	27	26	25	25	24	24	23	30	30	30	30	30	26	28	28	30	30	30	29	29		30	648
MEAN	.005	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.003	.003	.004	.003	.004	.004	.004		.009	.004
MAX	.010	.006	.008	.005	.006	.006	.006	.006	.006	.011	.015	.020	.013	.007	.006	.005	.005	.006	.006	.006	.006	.010		.014	.020

'MALF' - MACHINE MALFUNCTION 'WTHR' - BAD WEATHER 'VAND' - VANDALISM 'COLL' - COLLECTION ERROR

'LAB ' - LAB ERROR 'QUAL' - QUALITY ASSURANCE 'CALB' - CALIBRATION 'WAIV' - MONITORING WAIVED

'*** ' - NOT ENOUGH READINGS ' ' - NUL VALUE

3hr = .016

Best Available Copy

AQCR: 000 AGENCY(J): PRIVATE
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED
AREA: 3420 PARM(42401): SULFUR DIOXIDE
SITE: 003 UNITS(07): PARTS PER MILLION
YEAR: 1989 MONTH(12): DECEMBER
LOCALE: FLORIDA CELERY EXCHANGE   BELLE GLADE

COLLECT METH: INSTRUMENTAL
ANALYSIS METH: PULSED FLUORSCENCE
SAMPLING INTR: 01 HOURS
SAROAD KEY: 10/3420/003/J/01
MINIMUM DETEC: 00000+

SLAMS/NAMS(0):
RPT AGNCY/SMSA: 0000
UTM ZONE: 17
UTM EASTING: 000535
TIME ZONE(07): EASTERN

PRIMARY
FEDERAL STANDARD

SECONDARY
SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01	.006	.005	.006	.006	.004	.004	.005	.006	.005	.005	.005	.004	.004	.004	.003	.003	.003	.003	.004	.004	.003	.003	CALB	.008	.004
02	.005	.004	.004	.004	.004	.004	.004	.005	.005	.005	.004	.004	.004	.004	.004	.003	.004	.004	.005	.004	.004	.004	CALB	.005	.004
03	.005	.004	.004	.004	.004	.005	.004	.004	.004	.004	.003	.003	.003	.003	.003	.004	.004	.003	.003	.003	.004	WTHR	CALB	WTHR	.004
04	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	.006	.005	.006	.005	.004	.004	.020	.008	.008	.007	.007	WTHR	WTHR	CALB	WTHR	.007
05	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	.012	.013	.011	.009	.006	.008	.011	.010	.009	.009	.008	.007	WTHR	CALB	WTHR	.009
06	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	.010	.009	.008	.007	.007	.007	.009	.007	.008	.007	.005	.006	.005	CALB	.008	.007
07	.005	.005	.005	.005	.005	WTHR	WTHR	WTHR	.007	.007	.007	.005	.005	.005	.004	.004	.004	.004	.004	.004	.004	.005	CALB	.011	.005
08	.006	.005	.005	.005	.004	.005	.006	.006	.006	.005	.005	.005	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	CALB	.009	.005
09	.006	.005	.005	.004	.004	.004	.004	.004	.004	.004	.003	.004	.004	.003	.004	.004	.004	.004	.004	.003	.003	.004	CALB	.007	.004
10	.005	.005	.005	.005	.005	.004	.004	.005	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.005	.005	.005	CALB	.007	.005
11	.005	.005	.004	.004	.004	.004	.005	.004	.005	.005	.006	.005	.004	.004	.004	.004	.004	.004	.005	.005	.005	.004	CALB	.005	.005
12	.006	.005	.005	.005	.004	.004	.005	.006	.006	.006	.006	.005	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	CALB	.009	.005
13	.005	.005	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.005	.006	.005	.005	.004	.005	.004	.004	.004	CALB	.007	.004
14	.005	.005	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	CALB	CALB	CALB	.005	.007	.006	.006	.005	.005	.005	.005	.005	.005	CALB	.007	.006
15	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.004	.004	.004	.004	.005	.004	.004	.005	.006	.005	.004	.006	CALB	.007	.005
16	.005	.004	.004	.004	.004	.004	.005	.006	.005	.005	.005	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	CALB	.006	.004
17	.005	.005	.004	.005	.005	.005	.005	.004	.005	.006	.006	.005	.005	.004	.004	.004	.004	.004	.004	.004	.004	.004	CALB	.008	.005
18	.005	.005	.004	.004	.004	.004	.005	.005	.006	.006	.005	.005	.005	.006	.005	.005	.005	.005	.005	.005	.005	.004	CALB	.010	.005
19	.007	.006	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.004	.004	.004	.004	.004	.004	.004	.004	.004	CALB	.009	.005
20	.006	.005	.005	.005	.005	.005	.005	.007	.006	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.004	CALB	.010	.005
21	.006	.005	.005	.005	.004	.004	.004	.005	.004	.005	.005	.005	.004	.004	.004	.004	.004	.004	.004	.004	.004	.005	CALB	.009	.005
22	.005	.005	.005	.005	.005	.004	.005	.005	.005	.005	.005	.005	.005	.006	.005	.005	.006	.005	.005	.004	.004	.004	CALB	.009	.005
23	.006	.005	.005	.004	.004	.005	.004	.004	.004	.004	.004	.004	.004	.004	.004	.005	.004	.004	WTHR	WTHR	WTHR	WTHR	CALB	WTHR	.004
24	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	.006	.006	.006	.006	WTHR	WTHR	WTHR	WTHR	CALB	WTHR	.006
25	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	.007	.006	.005	.005	.005	.005	.005	.005	.006	.005	.006	WTHR	CALB	WTHR	.005
26	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	.006	.006	.006	.006	.005	.005	.005	.006	.007	.007	.006	.006	.006	CALB	.007	.006
27	.006	.005	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	.005	.006	.006	.006	.005	.005	.006	.005	.006	.003	.007	.006	.006	.006	CALB	.007	.006
NO	21	21	19	19	19	16	18	18	20	24	25	25	26	26	27	27	27	27	25	25	24	21		21	523
MEAN	.005	.005	.005	.005	.004	.004	.005	.005	.005	.006	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.004		.008	.005
MAX	.007	.006	.006	.006	.005	.005	.006	.007	.007	.012	.013	.011	.009	.007	.008	.020	.010	.009	.009	.008	.007	.006		.011	.020

'MALF' - MACHINE MALFUNCTION   'WTHR' - BAD WEATHER   'VAND' - VANDALISM   'COLL' - COLLECTION ERROR
'LAB ' - LAB ERROR   'QUAL' - QUALITY ASSURANCE   'CALB' - CALIBRATION   'WAIV' - MONITORING WAIVED
'*** ' - NOT ENOUGH READINGS   '   ' - NUL VALUE

3hr - .012

STATE: FLORIDA (10) AQDHS- R QUALITY DATA REPORT DISPLAY N (9999 1

AQCR: 000 AGENCY(J): PRIVATE
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED
AREA: 3420 PARM(42401): SULFUR DIOXIDE
SITE: 017 UNITS(07): PARTS PER MILLION
YEAR: 1985 MONTH(12): DECEMBER
LOCALE: FLORIDA CELERY EXCHANGE BELLE GLADE

COLLECT METH: INSTRUMENTAL
ANALYSIS METH: PULSED FLUORSCENCE
SAMPLING INTR: 01 HOURS
SAROAD KEY: 10/3420/017/J/01
MINIMUM DETEC: 000001

SLAMS/NAMS(0):
RPT AGNCY/SMSA: 0000
UTM ZONE: 17
UTM EASTING: 000535
TIME ZONE(07): EASTERN

PRIMARY SECONDARY
FEDERAL STANDARD SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
28	.005	.005	.006	.006	.007	.007	.007	.007	CALB	CALB	CALB	CALB	CALB	CALB	.009	.008	.007	.008	.006	.006	.006	.006	CALB	.007	.007
29	.006	.006	.006	.006	.006	.007	.007	.008	.008	.006	.007	.007	.006	.006	.006	.006	.006	.007	.006	.005	.006	.006	CALB	.008	.007
30	.006	.006	.006	.006	.006	.006	.006	.006	.007	.007	.006	.006	.006	.006	.006	.005	.006	.006	.006	.006	.006	.006	CALB	.009	.006
31	.007	.006	.006	.006	.006	.006	.006	.007	.007	.006	.006	.006	.006	.006	.006	.006	.006	.006	.006	.006	.006	.005	CALB	.010	.006
NO	4	4	4	4	4	4	4	4	3	3	3	3	3	3	4	4	4	4	4	4	4	4		4	86
MEAN	.006	.006	.006	.006	.006	.007	.007	.007	.007	.007	.006	.006	.006	.006	.007	.006	.006	.007	.006	.006	.006	.006		.009	.006
MAX	.007	.006	.006	.006	.007	.007	.007	.008	.008	.008	.007	.007	.006	.006	.009	.008	.007	.008	.006	.006	.006	.006		.010	.010

'MALF' - MACHINE MALFUNCTION 'WTHR' - BAD WEATHER 'VAND' - VANDALISM 'COLL' - COLLECTION ERROR
'LAB ' - LAB ERROR 'QUAL' - QUALITY ASSURANCE 'CALB' - CALIBRATION 'WAIV' - MONITORING WAIVED
'*** ' - NOT ENOUGH READINGS ' ' - NUL VALUE

BEST AVAILABLE COPY

.ATE: FLORIDA (10) AQDHS-II AIR Q[illegible]Y DATA REPORT DISPLAY N (9999 PAGE 2

AQCR: 000 AGENCY(J): PRIVATE COLLECT METH: INSTRUMENTAL SLAMS/NAMS(0):
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED ANALYSIS METH: PULSED FLUORSCENCE RPT AGNCY/SMSA: 0000
AREA: 3420 PARM(42401): SULFUR DIOXIDE SAMPLING INTR: 01 HOURS UTM ZONE: 17
SITE: 017 UNITS(07): PARTS PER MILLION SAROAD KEY: 10/3420/017/J/01 UTM EASTING: 000535
YEAR: 1990 MONTH(01): JANUARY MINIMUM DETEC: 00000+ TIME ZONE(07): EASTERN
LOCALE: FLORIDA CELERY EXCHANGE BELLE GLADE

PRIMARY SECONDARY
FEDERAL STANDARD SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01	.007	.006	.006	.006	.006	.006	.006	.006	.006	.006	.006	.006	.006	.008	.008	.008	.007	.007	.006	.005	.005	.005	CALB	.009	.006
02	.007	.008	.007	.007	.008	.007	.007	.007	.007	.006	.006	.006	.006	.006	.006	.006	.006	.006	.005	.006	.005	.005	CALB	.009	.006
03	.006	.006	.006	.006	.006	.006	.007	.007	.007	.007	.006	.006	.005	.005	.006	.006	.006	.006	.006	.006	.005	.005	CALB	.009	.006
04	.006	.006	.006	.005	.006	.005	.006	.006	.006	.006	.006	.006	.003	.005	.006	.006	.006	.006	.005	.006	.006	.006	CALB	.011	.006
05	.008	.007	.007	.007	.007	.007	.007	.006	.006	.006	.006	.006	.006	.006	.006	.006	.006	.006	.006	.006	.006	.006	CALB	.014	.007
06	.009	.008	.007	.007	.006	.006	.006	.006	.006	.006	.006	.006	.006	.006	.006	.006	.005	.005	.006	.007	.007	.007	CALB	.013	.007
07	.009	.008	.007	.006	.006	.006	.006	.006	.006	.006	.006	.006	.006	.006	.005	.005	.005	.005	.005	.005	.005	.005	CALB	.011	.006
08	.007	.006	.006	.005	.006	.005	.006	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	CALB	.014	.006
09	.012	.009	.010	.011	.010	.007	.006	.006	.006	.006	.006	.006	.005	.006	.006	.005	.005	.005	.006	.006	.006	.006	CALB	.012	.007
10	.012	.009	.007	.007	.007	.006	.009	.011	.009	.008	.006	.005	.005	.005	.005	.005	.005	.006	.006	.006	.006	.005	CALB	.008	.007
11	.006	.006	.005	.006	.005	.006	.005	.006	.006	.008	.007	.006	.006	.007	.006	.006	.006	.008	.007	.006	.006	.006	CALB	.009	.006
12	.006	.006	.006	.006	.005	.005	.005	.005	CALB	CALB	CALB	CALB	.007	.006	.005	.004	.004	.004	.004	.004	.004	.004	CALB	.007	.005
13	.007	.006	.005	.007	.005	.005	.005	.005	.005	.006	.006	.006	.005	.005	.004	.005	.005	.004	.004	.004	.005	.004	CALB	.006	.005
14	.005	.005	.006	.004	.004	.005	.005	.005	.005	.005	.005	.004	.004	.004	.004	.004	.004	.004	.004	.004	.005	.004	CALB	.006	.005
15	.005	.004	.004	.004	.004	.004	.005	.005	.006	.005	.004	.004	.004	.004	.004	.004	.004	.004	.004	.005	.005	.004	CALB	.007	.004
16	.005	.005	.005	.005	.005	.004	.005	.005	.005	.005	.004	.004	.004	.004	.005	.004	.004	.004	.004	.004	.004	.004	CALB	.006	.005
17	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	CALB	.010	.005
18	.006	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	CALB	.010	.005
19	.006	.005	.005	.005	.005	.005	.005	.005	.005	.006	.006	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	CALB	.011	.005
20	.007	.006	.006	.006	.005	.005	.006	.007	.006	.006	.006	.006	.006	.005	.005	.005	.005	.005	.005	.005	.005	.005	CALB	.012	.006
21	.008	.007	.007	.006	.006	.006	.006	.006	.006	.006	.006	.006	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	CALB	.011	.006
22	.007	.006	.006	.006	.005	.006	.005	.006	CALB	CALB	CALB	CALB	MALF	CALB	CALB	CALB	.010	.008	.008	.007	.006	.005	CALB	.012	.007
23	.007	.006	.006	.005	.005	.005	.006	.005	.005	.006	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	CALB	.013	.006
24	.008	.007	.006	.006	.006	.006	.006	.007	.006	.006	.006	.006	.005	.005	.005	.005	.005	.005	.005	.004	.004	.005	CALB	.012	.006
25	.008	.007	.006	.005	.005	.005	.006	.006	.006	.005	.006	.006	.006	.005	.005	.005	.005	.005	.005	.005	.005	.004	CALB	.012	.006
26	.007	.006	.006	.005	.005	.005	.005	.005	.005	.005	.004	.004	.004	.004	.004	.004	.004	.005	.004	.004	.004	.004	CALB	.007	.005
27	.005	.005	.005	.004	.004	.004	.004	.005	.005	.005	.004	.004	.004	.004	.004	.004	.004	.005	.004	.004	.004	.004	CALB	.005	.005
28	.006	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.004	.004	.004	.004	.004	.005	.005	.005	.004	CALB	.013	.005
29	.008	.006	.006	.005	.005	.005	.006	.006	.006	.006	.005	.005	.005	.005	.005	.005	.005	.004	.004	.004	.005	.005	CALB	.012	.006
30	.006	.006	.006	.006	.005	.005	.006	.007	.006	.006	.006	.006	.005	.005	.005	.005	.005	.005	.005	.005	.004	.005	CALB	.013	.006
31	.008	.007	.006	.006	.006	.006	.006	.006	.006	.006	.005	.005	.005	.005	.005	.005	.005	.005	.005	.004	.005	.005	CALB	.013	.006
NO	31	31	31	31	31	31	31	31	29	29	29	29	30	30	30	30	31	31	31	31	31	31		31	701
MEAN	.007	.006	.006	.006	.006	.005	.006	.006	.006	.006	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005		.010	.006
MAX	.012	.009	.010	.011	.010	.007	.009	.011	.009	.008	.007	.006	.007	.007	.006	.006	.010	.008	.008	.007	.007	.007		.014	.014

'MALF' - MACHINE MALFUNCTION 'WTHR' - BAD WEATHER 'VAND' - VANDALISM 'COLL' - COLLECTION ERROR
'LAB ' - LAB ERROR 'QUAL' - QUALITY ASSURANCE 'CALB' - CALIBRATION 'WAIV' - MONITORING WAIVED
'*** ' - NOT ENOUGH READINGS ' ' - NUL VALUE

3hr = .010

Best Available Copy

STATE: FLORIDA (10) AQDHS-II A QUALITY DATA REPORT DISPLAY N (9999 PA

AQCR: 000 AGENCY(J): PRIVATE	LECT METH: INSTRUMENTAL	SLAMS/NAMS(0):
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED	ANALYSIS METH: PULSED FLUORSCENCE	RPT AGNCY/SMSA: 0000
AREA: 3420 PARM(42401): SULFUR DIOXIDE	SAMPLING INTR: 01 HOURS	UTM ZONE: 17
SITE: 017 UNITS(07): PARTS PER MILLION	SAROAD KEY: 10/3420/017/J/01	UTM EASTING: 000535
YEAR: 1990 MONTH(02): FEBRUARY	MINIMUM DETEC: 00000+	TIME ZONE(07): EASTERN

LOCALE: FLORIDA CELERY EXCHANGE BELLE GLADE

PRIMARY SECONDARY

FEDERAL STANDARD SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01	.003	.007	.007	.005	.003	.005	.006	.006	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.004	.004	.005	.005	CALB	.014	.006
02	.008	.006	.006	.006	.006	.005	.006	.006	.005	.005	.005	.005	.005	.005	.004	.005	.005	.005	.004	.004	.005	.004	CALB	.013	.006
03	.008	.006	.006	.006	.005	.005	.005	.006	.005	.005	.005	.005	.005	.005	.005	.005	.004	.004	.004	.004	.004	.004	CALB	.013	.005
04	.008	.007	.006	.006	.006	.006	.006	.006	.005	.005	.005	.005	.005	.005	.004	.004	.004	.004	.004	.004	.004	.004	CALB	.012	.005
05	.007	.006	.005	.006	.005	.005	.005	.005	.005	.004	.004	.004	.004	.004	.004	.004	.005	.004	.004	.005	.005	.005	CALB	.008	.005
06	.005	.005	.003	.004	.004	.004	.004	.005	.005	.005	.004	.004	.004	.004	.004	.004	.004	.004	.005	.004	.004	.004	CALB	.009	.005
07	.006	.005	.005	.004	.004	.004	.005	.005	.005	.005	.005	.004	.005	.005	.005	.005	.005	.005	.005	.005	.004	.005	CALB	.011	.005
08	.007	.006	.006	.005	.005	.005	.005	.006	CALB	CALB	CALB	CALB	.007	.006	.005	.006	.006	.006	.006	.005	.005	.005	CALB	.010	.006
09	.007	.006	.005	.005	.005	.005	.006	.007	.007	.007	.006	.006	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	CALB	.010	.006
10	.007	.006	.006	.005	.006	.005	.005	.006	.006	.006	.005	.006	.005	.005	.005	.005	.009	.006	.006	.005	.005	.006	CALB	.012	.006
11	.008	.007	.006	.006	.006	.006	.006	.006	.007	.006	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.006	.005	CALB	.013	.006
12	.009	.007	.006	.006	.006	.006	.006	WTHR	.006	.007	.007	.006	.006	.005	.005	.005	.005	.005	.005	.006	.006	.006	CALB	.009	.006
13	.006	.006	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	.007	.006	.006	.005	.005	.005	.005	.005	.005	.005	.005	.005	.003	CALB	.009	.006
14	.006	.006	.005	.005	.005	.003	.006	.006	.006	.006	.005	.005	.005	.005	.005	.005	.005	.003	.005	.005	.005	.003	CALB	.010	.005
15	.006	.006	.005	.005	.005	.005	.006	.006	.006	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	CALB	.011	.005
16	.007	.006	.006	.005	.005	.005	.006	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.004	.005	.005	.005	CALB	.012	.005
17	.007	.007	.006	.006	.005	.006	.005	.005	.005	.005	.003	.005	.006	.005	.005	.005	.005	.005	.005	.005	.005	.005	CALB	.011	.006
18	.007	.006	.006	.005	.005	.005	.006	.006	.003	.005	.005	.005	.005	.005	.005	.003	.005	.005	.004	.005	.005	.005	CALB	.011	.005
19	.007	.006	.005	.005	.005	.005	.005	.007	.006	.006	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	CALB	.013	.006
20	.009	.007	.006	.006	.006	.005	.005	.006	.006	.005	.005	.005	.005	.005	.005	.005	.005	.005	.004	.005	.005	.005	CALB	.012	.006
21	.008	.007	.006	.006	.006	.005	.006	.006	.006	.003	.005	.005	.005	.003	.005	.005	.005	.005	.005	.005	.005	.005	CALB	.012	.006
22	.007	.007	.006	.005	.006	.005	.005	.005	.005	CALB	CALB	(.010	.008	.006)	.006	.005	.005	.005	.005	.005	.005	.005	CALB	.005	.006
23	.005	.004	.005	.004	.005	.004	.005	.005	.005	.005	.005	.004	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	CALB	.012	.005
24	.008	.006	.006	.005	.006	.005	WTHR	WTHR	WTHR	.005	.005	.005	.005	.004	.005	.004	.005	.004	.005	.003	.005	WTHR	WTHR	WTHR	.005
25	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	.007	.006	.005	.005	.005	.005	.005	.005	.005	.005	.003	.005	.005	.005	CALB	.009	.005
26	.006	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	.006	.006	.005	.005	.005	.005	.005	.005	.003	.005	.005	.005	.005	.005	CALB	.009	.005
27	.006	.006	.006	.005	.005	.005	.005	.003	.005	.005	.005	.005	.003	.005	.003	.005	.005	.005	.005	.005	.005	.005	CALB	.009	.005
28	.005	.006	.006	.006	WTHR	WTHR	WTHR	WTHR	.006	.006	.005	.005	.005	.003	.003	.005	.005	.005	.005	.005	.005	.005	CALB	.010	.006
NO	27	26	25	25	24	24	23	22	25	26	26	27	28	28	20	28	22	23	26	23	28	27		27	006
MEAN	.007	.006	.006	.005	.005	.005	.005	.006	.006	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005		.011	.006
MAX	.009	.007	.007	.006	.006	.005	.006	.007	.007	.007	.007	.010	.006	.006	.006	.006	.009	.006	.006	.006	.006	.006		.014	.014

'MALF' - MACHINE MALFUNCTION 'WTHR' - BAD WEATHER 'VAND' - VANDALISM 'COLL' - COLLECTION ERROR

'LAB ' - LAB ERROR 'QUAL' - QUALITY ASSURANCE 'CALB' - CALIBRATION 'WAIV' - MONITORING WAIVED

'**** ' - NOT ENOUGH READINGS ' ' - NUL VALUE

3hr - .008

BEST AVAILABLE COPY

[illegible]ATE: FLORIDA (10) AQDHS-II AIR [illegible]Y DATA REPORT DISPLAY N (9999 PAGE 4

AQCR: 000 AGENCY(J): PRIVATE COLLECT METH: INSTRUMENTAL SLAMS/NAMS(0):
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED ANALYSIS METH: PULSED FLUORSCENCE RPT AGNCY/SMSA: 0000
AREA: 3420 PARM(42401): SULFUR DIOXIDE SAMPLING INTR: 01 HOURS UTM ZONE: 17
SITE: 017 UNITS(07): PARTS PER MILLION SAROAD KEY: 10/3420/017/J/01 UTM EASTING: 000535
YEAR: 1990 MONTH(03): MARCH MINIMUM DETEC: 00000+ TIME ZONE(07): EASTERN
LOCALE: FLORIDA CELERY EXCHANGE BELLE GLADE

PRIMARY
FEDERAL STANDARD

SECONDARY
SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01	.006	.006	.006	.005	.005	.005	.005	.005	.005	.006	.005	.005	.005	.005	.005	.005	.006	.005	.005	.005	.005	.005	CALB	.010	.005
02	.007	.006	.006	.006	.006	.006	.006	.006	.006	.006	.006	.006	.006	.005	.005	.006	.005	.005	.005	.005	.005	.005	CALB	.012	.006
03	.007	.007	.006	.006	.006	.006	.005	.005	.005	.005	.005	.006	.006	.005	.006	.005	.005	.005	.006	.006	.006	.005	MALF	.013	.006
04	.006	.007	.006	.006	.006	.006	.006	.007	.007	.008	.007	.006	.006	.006	.006	.006	.006	.006	.006	.005	.006	.006	CALB	.010	.006
05	.007	.006	.006	.006	.006	WTHR	WTHR	WTHR	.006	.007	.006	.006	.006	.006	.006	.006	.006	.006	.006	.006	.006	.006	CALB	.010	.006
06	.007	.006	.006	.006	.006	.006	.006	.006	.006	.006	.006	.006	.006	CALB	CALB	CALB	CALB	.005	.004	.003	.004	.003	CALB	.007	.006
07	.004	.003	.003	.003	.003	.003	.003	.003	.003	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.009	.003
08	.004	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.007	.003
09	.004	.004	.004	.003	.004	.003	.004	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.007	.003
10	.005	.004	.004	.004	.004	.004	.003	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.007	.004
11	.004	.004	.004	.003	.004	.003	.004	.004	.004	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.003	.004
12	.005	.004	.004	.004	.003	.003	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.003	.003	.004	.003	.003	.003	CALB	.009	.004
13	.004	.004	.004	.003	.004	.003	.004	.004	.004	.004	.004	.004	.003	.004	.004	.004	.003	.003	.003	.003	.003	.003	CALB	.008	.004
14	.005	.004	.004	.004	.004	.004	.004	.004	.004	.003	.003	.004	.003	.004	.003	.004	.003	.003	.003	.003	.004	.003	CALB	.009	.004
15	.005	.004	.004	.004	.004	.003	.004	.004	.004	.004	.004	.004	.004	.003	.003	.003	.004	.003	.004	.003	.003	.003	CALB	.010	.004
16	.006	.005	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.003	.004	.004	.003	.004	.003	.004	CALB	.012	.004
17	.006	.006	.005	.005	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.003	.004	.004	.004	.004	.003	CALB	.012	.005
18	.008	.007	.006	.005	.004	.005	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.003	.004	.003	CALB	.008	.005
19	.005	.004	.004	.004	.004	.004	.004	.004	.003	.004	.004	.004	.004	.004	.004	.004	.004	.003	.004	.004	.004	.004	CALB	.012	.004
20	.007	.006	.006	.006	.006	.006	.005	.005	.005	.005	.005	.005	.005	.004	.004	.004	.004	.004	.004	.004	.005	.004	CALB	.006	.005
21	.005	.004	.004	.004	.005	WTHR	WTHR	WTHR	.005	CALB	MALF	CALB	.006	.001	.001	.000	.000	.001	.001	.001	.001	.001	CALB	.004	.003
22	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.004	.001
23	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.003	.003	.002	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.005	.001
24	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.000	.001	.000	.001	.001	.001	.001	.001	CALB	.005	.001
25	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.006	.001
26	.002	.001	.001	.001	.001	.001	.001	.002	.002	.001	.001	.001	.001	.002	.002	.001	.002	.001	.001	.001	.001	.001	CALB	.006	.002
27	.003	.002	.002	.002	.002	.002	.003	.003	.002	CALB	CALB	CALB	CALB	.006	.004	.002	.002	.001	.002	.002	.002	.001	CALB	.007	.003
28	.003	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.000	.000	.000	.000	.000	CALB	.003	.001
29	.002	.001	.001	.001	.001	.001	.001	.001	.001	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.011	.002
30	.003	.002	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.000	CALB	.012	.002
31	.004	.003	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.000	.000	.001	.000	.000	.000	.000	.000	.001	.000	CALB	.013	.001
NO	31	31	31	31	31	29	29	29	31	29	29	29	30	30	30	30	30	31	31	31	31	31		31	696
MEAN	.005	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003		.009	.003
MAX	.008	.007	.006	.006	.006	.006	.006	.007	.007	.008	.007	.006	.006	.006	.006	.006	.006	.006	.006	.006	.006	.006		.013	.013

'MALF' - MACHINE MALFUNCTION 'WTHR' - BAD WEATHER 'VAND' - VANDALISM 'COLL' - COLLECTION ERROR
'LAB ' - LAB ERROR 'QUAL' - QUALITY ASSURANCE 'CALB' - CALIBRATION 'WAIV' - MONITORING WAIVED
'*** ' - NOT ENOUGH READINGS ' ' - NUL VALUE

3[illegible] .007

Best Available Copy

AQCR: 000 AGENCY(J): PRIVATE
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED
AREA: 3420 PARM(42401): SULFUR DIOXIDE
SITE: 017 UNITS(07): PARTS PER MILLION
YEAR: 1990 MONTH(04): APRIL
LOCALE: FLORIDA CELERY EXCHANGE BELLE GLADE

ECT METH: INSTRUMENTAL
LYSIS METH: PULSED FLUORSCENCE
SAMPLING INTR: 01 HOURS
SAROAD KEY: 10/3420/017/J/01
MINIMUM DETEC: 00000+

SLAMS/NAMS(O):
RPT AGNCY/SMSA: 0000
UTM ZONE: 17
UTM EASTING: 000535
TIME ZONE(07): EASTERN

PRIMARY
FEDERAL STANDARD

SECONDARY
SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01	.004	.003	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.002	.004	.005	.005	.003	.002	.001	.000	.001	CALB	.011	.002
02	.004	.002	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.001	.000	.000	CALB	.010	.002
03	.003	.002	.001	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.001	.000	.001	.001	.000	.000	CALB	.008	.001
04	.004	.003	.002	WTHR	WTHR	WTHR	WTHR	WTHR	.003	.002	.001	.001	.000	.000	.000	.000	.000	.000	.001	.001	.001	.001	CALB	.005	.001
05	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	.003	.002	.001	.001	CALB	CALB	CALB	.002	.001	.001	.001	.001	.001	.001	CALB	.003	.002
06	.001	.001	WTHR	WTHR	WTHR	WTHR	WTHR	.003	.003	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.004	.001
07	.001	.001	.001	.001	.001	.001	.000	.001	.000	.000	.001	.001	.001	.001	.000	.001	.001	.001	.001	.001	.001	.001	CALB	.006	.001
08	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.001	.001	.001	.001	CALB	.006	.001
09	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.006	.001
10	.002	.002	.001	.001	.001	.001	.001	.001	.001	.002	.003	.004	.003	.003	.003	.002	.002	.002	.002	.001	.001	.001	CALB	.008	.002
11	.003	.002	.002	.002	.002	.003	.002	.002	.001	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.003	.003	.002	CALB	.009	.002
12	.003	.002	.002	.003	.002	.001	.001	.001	.001	.002	.002	.002	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.005	.002
13	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.001	.001	.001	.000	.001	.001	.001	CALB	.005	.001
14	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.007	.001
15	.002	.001	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.008	.001
16	.003	.002	.002	.001	.001	.002	.001	.001	.001	.001	.002	.004	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.008	.002
17	.003	.002	.001	.001	.002	.002	.002	CALB	CALB	CALB	CALB	CALB	CALB	CALB	CALB	CALB									.002
18								CALB	CALB																
19											CALB	CALB	.003	.001	.001	.001	.001	.000	.000	.000	.000	.000	CALB	.008	.001
20	.002	.001	.001	.001	.001	.001	.001	.000	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.005	.001
21	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.006	.000
22	.001	.001	.001	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.000	.001	.001	.000	.000	.000	.000	.000	.000	CALB	.006	.001
23	.001	.001	.001	.001	.001	.002	.002	.001	.001	.001	.001	.000	.000	.001	.001	.000	.001	.000	.000	.001	.001	.001	CALB	.003	.001
24	.003	.002	.002	.001	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.000	.000	.000	.000	.000	.000	CALB	.004	.001
25	.001	.001	.001	.001	.001	.000	.001	.001	.001	.001	.002	.003	.003	.003	.004	.006	.006	.006	.006	.006	.005	.005	CALB	.009	.003
26	.005	.004	.003	.002	.002	.002	.002	.002	.002	.003	.003	.003	.003	.004	.003	.004	.004	.004	.005	.005	.006	.005	CALB	.003	.004
27	.005	.004	.003	.003	.003	.003	.003	.003	.003	.002	.002	.002	.002	.002	.002	.001	.002	.002	.001	.002	.002	.002	CALB	.006	.003
28	.002	.002	.002	.001	.001	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.003	.002
29	.003	.002	.002	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.009	.002
30	.003	.002	.002	.002	.002	.002	.002	.002	.001	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.003	.002
NO	27	27	26	25	25	25	25	25	27	27	27	27	27	27	27	28	26	28	28	28	28	28		28	618
MEAN	.003	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001		.007	.002
MAX	.005	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.004	.003	.004	.004	.006	.006	.006	.006	.006	.006	.005		.011	.011

'MALF' - MACHINE MALFUNCTION 'WTHR' - BAD WEATHER 'VAND' - VANDALISM 'COLL' - COLLECTION ERROR
'LAB ' - LAB ERROR 'QUAL' - QUALITY ASSURANCE 'CALB' - CALIBRATION 'WAIV' - MONITORING WAIVED
'*** ' - NOT ENOUGH READINGS ' ' - NUL VALUE

3hr=.006

STATE: FLORIDA (10) AQDHS-II AIR QUALITY DATA REPORT DISPLAY N (9999 PAGE 6

AQCR: 000 AGENCY(J): PRIVATE
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED
AREA: 3420 PARM(42401): SULFUR DIOXIDE
SITE: 017 UNITS(07): PARTS PER MILLION
YEAR: 1990 MONTH(05): MAY
LOCALE: FLORIDA CELERY EXCHANGE BELLE GLADE

COLLECT METH: INSTRUMENTAL
ANALYSIS METH: PULSED FLUORSCENCE
SAMPLING INTR: 01 HOURS
SAROAD KEY: 10/3420/017/J/01
MINIMUM DETEC: 00000+

SLAMS/NAMS(0):
RPT AGNCY/SMSA: 0000
UTM ZONE: 17
UTM EASTING: 000535
TIME ZONE(07): EASTERN

PRIMARY SECONDARY
FEDERAL STANDARD SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01	.003	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.008	.001
02	.003	.002	.002	.002	.003	.003	.003					.002	.002	MALF	MALF	.002	.001	.001	.001	.001	.002	.002	CALB	.008	.002
03	.003	.002	.002	.002	.002	.002	.001	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.001	.001	.001	.001	CALB	.003	.002
04	.003	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.001	CALB	.007	.001
05	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.000	.000	CALB	.005	.001
06	.003	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.000	.001	.001	.000	.000	.000	.001	.000	CALB	.007	.001
07	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.001	.000	.000	.000	CALB	.005	.001
08	.001	.001	.001	.000	.000	.001	.001	.000	.000	.007	.016	.021	(.024	.028	.025)	.017	.014	.012	.010	.008	.008	.007	CALB	.013	.003
09	.007	.006	.005	.004	.004	.004	.003	.003	.004	.014	.018	.017	CALB	CALB	CALB	.018	.007	.006	.005	.005	.004	.004	CALB	.010	.007
10	.005	.005	.004	.004	.004	.003	.004	.003	.003	.003	.002	.002	.002	.001	.002	.001	.001	.001	.001	.001	.001	.001	CALB	.010	.003
11	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.008	.002
12	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.001	.001	.001	.000	.000	.000	.000	.000	.000	.000	CALB	.006	.001
13	.003	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.001	.000	.000	.000	.001	CALB	.003	.001
14	.003	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.000	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.009	.001
15	.003	.002	.002	.002	.001	.002	.001	.001	.002	.004	.003	.003	.003	.003	.002	.002	.002	.002	.001	.001	.001	.001	CALB	.001	.002
16	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.002	.002	.003	.004	.004	.004	.005	.005	.004	CALB	.013	.003
17	.006	.005	.004	.004	.004	.003	.004	.002			.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.003	.003	CALB	.011	.003
18	.005	.004	.003	.003	.003	.003	.005	.003	.003	.003	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.011	.003
19	.004	.003	.003	.003	.002	.003	.003	.002	.001	.002	.002	.002	.002	.002	.002	.001	.002	.002	.002	.002	.002	.002	CALB	.012	.003
20	.005	.003	.003	.003	.003	.003	.003	.002	.001	.002	.002	.001	.001	.001	.001	.002	.001	.001	.001	.001	.001	.001	CALB	.011	.002
21	.003	.003	.002	.001	.002	.002	.002	.002	.002	.001	.001	.001	.002	.001	.001	.002	.001	.001	.001	.001	.001	.001	CALB	.011	.002
22	.005	.003	.003	.002	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.015	.002
23	.005	.003	.003	.002	.002	.002	.002	.002	CALB	CALB	.008	.005	.004	.003	.003	.003	.002	.001	.001	.001	.001	.001	CALB	.011	.003
24	.004	.004	.003	.003	.002	.002	.002	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.013	.002
25	.004	.003	.003	.002	.002	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.014	.002
26	.004	.004	.003	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.000	.000	.001	.001	CALB	.010	.002
27	.006	.003	.003	.002	.002	.001	.001	.001	.001	.001	.000	.000	.001	.001	.001	.000	.000	.000	.000	.000	.000	.000	CALB	.014	.002
28	.004	.003	.003	.002	.001	.001	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	MALF	MALF	.000	.000	.000	.000	CALB	.013	.001
29	.003	.003	.002	.002	.001	.001	.001	.000	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.012	.001
30	.005	.003	.002	.002	.002	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.011	.001
31	.005	.003	.002	.002	.002	.002	.001	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.012	.001
NO	31	31	31	31	31	31	31	30	28	28	30	31	30	29	29	31	30	30	31	31	31	31		31	698
MEAN	.004	.003	.002	.002	.002	.002	.002	.001	.001	.002	.002	.002	.002	.002	.002	.002	.002	.001	.001	.001	.001	.001		.010	.002
MAX	.007	.006	.005	.004	.004	.004	.005	.003	.004	.014	.018	.021	.024	.028	.025	.018	.014	.012	.010	.008	.008	.007		.015	.028

'MALF' - MACHINE MALFUNCTION 'WTHR' - BAD WEATHER 'VAND' - VANDALISM 'COLL' - COLLECTION ERROR
'LAB ' - LAB ERROR 'QUAL' - QUALITY ASSURANCE 'CALB' - CALIBRATION 'WAIV' - MONITORING WAIVED
'*** ' - NOT ENOUGH READINGS ' ' - NUL VALUE

3hr = .026

STATE: FLORIDA (10) AQDHS-II (AIR) QUALITY DATA REPORT DISPLAY N (9999 PAGE

AQCR: 000 AGENCY(J): PRIVATE
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED
AREA: 3420 PARM(42401): SULFUR DIOXIDE
SITE: 017 UNITS(07): PARTS PER MILLION
YEAR: 1990 MONTH(06): JUNE
LOCALE: FLORIDA CELERY EXCHANGE BELLE GLADE

COLLECT METH: INSTRUMENTAL
ANALYSIS METH: PULSED FLUORSCENCE
SAMPLING INTR: 01 HOURS
SAROAD KEY: 10/3420/017/J/01
MINIMUM DETEC: 00000+

SLAMS/NAMS(0):
RPT AGNCY/SMSA: 0000
UTM ZONE: 17
UTM EASTING: 000535
TIME ZONE(07): EASTERN

PRIMARY
FEDERAL STANDARD

SECONDARY
SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01	.003	.002	.003	.002	.002	.002	.001	.001	.001	.000	.000	.000	.000	.001	.000	.001	.001	.000	.000	.000	.000	.000	CALB	.015	.002
02	.007	.003	.003	.002	.003	.002	.001	.001	.000	.001	.000	.000	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.013	.002
03	.005	.003	.002	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.014	.002
04	.004	.004	.002	.002	.001	.001	.001	.000	.001	MALF	.000	.000	.000	.000	.000	.000	.001-	.000	.000	.000	.000	.000	CALB	.012	.001
05	.004	.003	.002	.001	.001	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001-	.000	.000	CALB	.011	.001
06	.003	.002	.002	.001	.001	.001	.001	.000	.000	.001	.001	.001	.001	.000	.001	.000	.000	.000	.000	.000	.000	.000	CALB	.014	.001
07	.003	.003	.002	.002	.002	.001	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.013	.001
08	.004	.003	.002	.002	.002	.001	.001	CALB	CALB	CALB	.004	.004	.003	.003	.002	.002	.001	.001	.001	.001	.001	.000	CALB	.017	.003
09	.006	.004	.004	.004	.003	.003	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.000	.000	.000	.000	CALB	.014	.002
10	.005	.004	.003	.002	.001	.002	.001	.001	.001	.001	.001	.001	.001	.001	.000	.001	.000	.000	.000	.000	.000	.000	CALB	.012	.002
11	.004	.002	.002	.002	.001	.001	.001	.000	.001	.001	.001	.002	.001	.001	.001	.000	.001	.000	.000	.000	.000	.000	CALB	.011	.001
12	.005	.003	.001	.002	.001	.001	.001	.001	.000				.003	.002	.001	.001	.001	.001	.000	.000	.000	.000	CALB	.010	.002
13	.002	.001	.001	.001	.001	.001	.000	.000	.000	.001	.000	.000	.000	.000	.000	.000	.001-	.000	.000	.001-	.000	.001-	CALB	.009	.001
14	.002	.001	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.009	.001
15																									
16	.002	.001	.001	.001	.000	.001	.001	.000	.001	.000	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.000	.001	CALB	.011	.001
17	.003	.001	.001	.001	.000	.001	.000	.000	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.000	.000	.000	CALB	.010	.001
18	.003	.002	.002	.001	.001	.001	.001	.001	.000	.001	.001	.001	.001	.001	.000	.001	.001	.001	.000	.001	.001	.001	CALB	.012	.002
19	.004	.002	.002	.002	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.001	.001	CALB	.017	.002
20	.005	.004	.003	.002	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.001	.000	.000	.001	CALB	.012	.002
21	.004	.003	.002	.002	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.000	.001	.001	.000	.001	.001	.001	.000	CALB	.017	.002
22																									
23																									
24																									
25											.008	.008	.007	.007	.007	.006	.005	.003	.002	.002	.001	.002	CALB	.019	.006
26	.006	.006	.004	.004	.003	.002	.002	.002	.002	.001	.002	.002	.002	CALB	CALB	.009	.005	.004	.004	.003	.002	.002	CALB	.014	.004
27	.004	.004	.003	.002	.002	.002	.001	.001	.001	.001	.002	.001	CALB	MALF	.006	.003	.002	.001	.001	.001	.001	.001	CALB	.011	.002
28	.004	.004	.003	.002	.002	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.000	.000	.000	.000	.000	.001	.000	CALB	.011	.002
29	.003	.003	.002	.002	.001	.001	.001	.001	.000	.001	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.014	.001
30	.005	.004	.003	.003	.002	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.000	.001	.000	.000	.000	.000	.000	CALB	.017	.002
NO	25	25	25	25	25	25	25	24	24	22	25	25	25	24	25	26	26	26	26	26	26	26		26	577
MEAN	.004	.003	.002	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.000	.000	.000		.013	.002
MAX	.007	.006	.004	.004	.003	.003	.002	.002	.002	.001	.008	.008	.007	.007	.007	.009	.005	.004	.004	.003	.002	.002		.019	.019

'MALF' - MACHINE MALFUNCTION 'WTHR' - BAD WEATHER 'VAND' - VANDALISM 'COLL' - COLLECTION ERROR
'LAB ' - LAB ERROR 'QUAL' - QUALITY ASSURANCE 'CALB' - CALIBRATION 'WAIV' - MONITORING WAIVED
'*** ' - NOT ENOUGH READINGS ' ' - NUL VALUE

3hr = .006

ATE: FLORIDA (10) AUDHS-II AIR Y DATA REPORT DISPLAY N (9999 PAGE 8

AQCR: 000 AGENCY(J): PRIVATE
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED
AREA: 3420 PARM(42401): SULFUR DIOXIDE
SITE: 017 UNITS(07): PARTS PER MILLION
YEAR: 1990 MONTH(07): JULY
LOCALE: FLORIDA CELERY EXCHANGE BELLE GLADE

COLLECT METH: INSTRUMENTAL
ANALYSIS METH: PULSED FLUORSCENCE
SAMPLING INTR: 01 HOURS
SAROAD KEY: 10/3420/017/J/01
MINIMUM DETEC: 00000+

SLAMS/NAMS(0):
RPT AGNCY/SMSA: 0000
UTM ZONE: 17
UTM EASTING: 000535
TIME ZONE(07): EASTERN

PRIMARY FEDERAL STANDARD

SECONDARY SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01	.006	.007	.005	.005	.004	.004	.002	.001	.001	.001	.001	.000	.001	.001	.001	.001	.001	.001	.001	.000	.000	.000	CALB	.011	.002
02	.002	.002	.001	.001	.001	.001	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.000	.000	.000	.000	CALB	.011	.001
03																									
04																									
05																									
06																									
07																									
08																									
09																									
10																									
11																									
12																									
13																									
14																									
15																									
16																									
17																									
18																									
19													.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.001	.001
20	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.000	.001
21	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.001	.001	.001	.001	.001	.000	.001	CALB	.000	.001
22	.001	.001	.001	.001	.001	.001	.000	.001	.001	.001	.001	.001	.001	.001	.001	.000	.001	.001	.000	.001	.001	.001	CALB	.000	.001
23	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.004	.004	.003	.002	.002	.002	.002	.002	.001	.001	.001	.001	CALB	.000	.002
24	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.000	.001	.001	.001	.001	.001	.001	CALB	.001	.001
25	.001	.001	.001	.001	.001	.001	.001	.002	.001	.001	.001	.001	.000	.001	.000	.001	.001	.001	.001	.001	.001	.001	CALB	.001	.001
26	.001	.001	.001	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.001	.001
27	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001		.001	.001	.001	.001	.001	.001	.001	CALB	.001	.001
28	.001	.001	.001	.001	.001	.002	.001	.002	.001	.001	.001	.001	.001	.001	.001	.002	.001	.001	.001	.001	.001	.001	CALB	.001	.001
29	.001	.002	.001	.001	.001	.001	.001	.001	.002	.002	.002	.001	.001	.001	.002	.001	.001	.001	.001	.001	.001	.001	CALB	.002	.001
30	.001	.002	.002	.002	.002	.001	.002	.002	.002	.001	.001	.001	.002	.001	.002	.001	.001	.001	.001	.001	.001	.002	CALB	.002	.001
31	.001	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.002	.001	.002	.001	.002	.002	.001	.001	.001	.001	.001	CALB	.002	.002
NO	14	14	14	14	14	14	14	14	14	14	14	14	15	15	14	15	15	15	15	15	15	15		15	332
MEAN	.001	.002	.001	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001		.002	.001
MAX	.006	.007	.005	.005	.004	.004	.002	.002	.002	.002	.004	.004	.003	.002	.002	.002	.002	.002	.001	.001	.001	.002		.011	.011

'MALF' - MACHINE MALFUNCTION 'WTHR' - BAD WEATHER 'VAND' - VANDALISM 'COLL' - COLLECTION ERROR
'LAB ' - LAB ERROR 'QUAL' - QUALITY ASSURANCE 'CALB' - CALIBRATION 'WAIV' - MONITORING WAIVED
'*** ' - NOT ENOUGH READINGS ' ' - NUL VALUE

3h... 004

STATE: FLORIDA (10) AQDHS-II QUALITY DATA REPORT DISPLAY N (9999 PA

AQCR: 000 AGENCY(J): PRIVATE
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED
AREA: 3420 PARM(42401): SULFUR DIOXIDE
SITE: 017 UNITS(07): PARTS PER MILLION
YEAR: 1980 MONTH(08): AUGUST
LOCALE: FLORIDA CELERY EXCHANGE BELLE GLADE

LECT METH: INSTRUMENTAL
ANALYSIS METH: PULSED FLUORSCENCE
SAMPLING INTR: 01 HOURS
SAROAD KEY: 10/3420/017/J/01
MINIMUM DETEC: 00000+

SLAMS/NAMS(0):
RPT AGNCY/SMSA: 0000
UTM ZONE: 17
UTM EASTING: 000535
TIME ZONE(07): EASTERN

PRIMARY
FEDERAL STANDARD

SECONDARY
SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01	.001	.002	.001	.001	.002	.001	.002	.002	.002	.002	.002	.002	.002	.002	.001	.001	.002	.001	.001	.001	.002	.002	CALB	.002	.002
02	.002	.002	.001	.002	.002	.002	.002	.002	.004	.004	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.002	.002
03	.002	.002	.002	.002	.002	.002	.002	.002	CALB	CALB	CALB	CALB	.003	.002	.002	.001	.002	.002	.002	.002	.001	.002	CALB	.002	.002
04	.002	.002	.002	.002	.002	.002	.002	.002	.002	.003	.002	.002	.002	.002	.002	.002	.002	.001	.002	.002	.001	.002	MALF	.002	.002
05	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.002	.002
06	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.002	.002
07	.002	.002	.002	.002	.002	.002	.002	.003	.002	.003	.002	.002	.002	.002	.002	.003	.003	.002	.002	.002	.002	.002	CALB	.003	.002
08	.002	.002	.002	.002	.002	.002	.002	.002	.003	MALF	MALF	MALF	MALF	MALF	MALF	.002	.002	.002	.002	.002	.002	.001	CALB	.001	.002
09	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.002	.002
10	.002	.002	.002	.002	.002	.003	.002	.003	.003	.002	.003	.002	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002
11	.002	.002	.002	.002	.002	.002	.003	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002
12	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.003	.002	.003	.002	.002
13	.003	.003	.002	.002	.002	.003	.002	.003	.003	.002	.002	.002	.002	.003	.002	.003	.002	.002	.002	.003	.002	.002	.002	CALB	.002
14	.002	.002	.002	.002	.002	.003	.003	.003	.003	.003	.003	.002	.003	.003	.003	.003	.002	.002	.002	.002	.002	.002	.003	.002	.002
15	.003	.003	.003	.003	.003	.003	.003	.003			.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.002	.002
16	.002	.002	.003	.002	.002	.003	.003	.003	.002	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.002	.002
17	.002	.003	.002	.003	.003	.003	.003	.003			CALB	.003	.003	.003	.003	.003	.003	.003	.002	.003	.002	.003	CALB	.004	.003
18	.003	.002	.003	.003	.002	.003	.003	.003	.003	.003	.003	.003	.002	.003	.003	.003	.003	.003	.002	.002	.003	.003	CALB	.005	.003
19	.003	.003	.003	.002	.003	.003	.002	.003	.003	.002	.003	.002	.003	.002	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.005	.003
20	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.005	.003
21	.003	.003	.003	.003	.003	.003	.004	.003	.003	CALB	.004	.002	.001	.002	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.004	.002
22	.002	.002	.002	.002	.002	.002	.003	.003	.002	.002	.002	.002	.002	.002	.002	.001	.002	.002	.001	.002	.001	.002	CALB	.004	.002
23	.002	.002	.002	.002	.002	.002	.002	.001	.002	.002	.001	.001	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.004	.002
24	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.001	.001	.001	.002	.001	.002	.002	.002	.002	.002	CALB	.005	.002
25	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.002	.001	.001	.002	.001	.001	.001	.002	.002	.002	CALB	.005	.002
26	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.001	.002	.001	.001	.001	.001	.001	.002	CALB	.004	.002
27	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.003	.002	.002	.002	.002	.001	.001	.002	.001	.002	.002	.002	CALB	.004	.002
28	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.001	.002	.002	.001	.001	.002	.002	.001	.001	CALB	.004	.002
29	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.002	CALB	.005	.002
30	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.001	.002	.002	.002	.002	.002	CALB	.005	.002
31	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.004	.002	.002	.002	.002	.003	.002	.002	.002	.002	.002	.002	.002	CALB	.005	.002
NO	31	31	31	31	31	31	31	31	27	26	28	29	30	30	30	31	31	31	31	31	31	31	5	30	700
MEAN	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.003	.002
MAX	.004	.003	.003	.003	.003	.003	.004	.003	.004	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.005	.005

'MALF' - MACHINE MALFUNCTION 'WTHR' - BAD WEATHER 'VAND' - VANDALISM 'COLL' - COLLECTION ERROR
'LAB ' - LAB ERROR 'QUAL' - QUALITY ASSURANCE 'CALB' - CALIBRATION 'WAIV' - MONITORING WAIVED
'*** ' - NOT ENOUGH READINGS ' ' - NUL VALUE

3hr - .004

BEST AVAILABLE COPY

AQCR: 000 AGENCY(J): PRIVATE
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED
AREA: 3420 PARM(42401): SULFUR DIOXIDE
SITE: 017 UNITS(07): PARTS PER MILLION
YEAR: 1980 MONTH(09): SEPTEMBER
LOCALE: FLORIDA CELERY EXCHANGE BELLE GLADE

COLLECT METH: INSTRUMENTAL
ANALYSIS METH: PULSED FLUORSCENCE
SAMPLING INTR: 01 HOURS
SAROAD KEY: 10/3420/017/J/01
MINIMUM DETEC: 00000+

SLAMS/NAMS(0):
RPT AGNCY/SMSA: 0000
UTM ZONE: 17
UTM EASTING: 000535
TIME ZONE(07): EASTERN

PRIMARY
FEDERAL STANDARD

SECONDARY
SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01	.003	.002	.003	.003	.003	.002	.003	.003	.003	.002	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.003	CALB	.008	.003
02	.004	.003	.003	.003	.003	.003	.002	.003	.003	.003	.002	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.005	.003
03	.003	.003	.002	.002	.002	.003	.002	.003	.003	.003	.003	.002	.003	.003	.003	.003	.002	.002	.002	.003	.003	.002	CALB	.005	.003
04	.003	.002	.002	.003	.003	.002	.002	.002	.003	.003	.003	.003	.003	.003	.002	.002	.003	.002	.002	.002	.002	.002	CALB	.005	.003
05	.003	.003	.002	.003	.003	.003	.003	.002	.002	.003	.002	.002	.002	.003	.002	.003	.002	.002	.002	.002	.003	.003	CALB	.006	.003
06	.003	.003	.002	.003	.003	.003	.002	.003	.002	.002	.002	.003	.002	.002	.003	.002	.003	.002	.002	.002	.002	.003	CALB	.005	.003
07	.003	.003	.002	.002	.002	.003	.003	.003	.003	.003	.003	.002	.002	.003	.003	.002	.002	.002	.002	.002	.002	.002	CALB	.005	.003
08	.003	.002	.003	.003	.002	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.003	.002	.002	.002	.002	CALB	.006	.003
09	.003	.002	.003	.003	.003	.003	.003	.002	.003	.003	.003	.003	.002	.003	.003	.003	.003	.003	.002	.002	.002	.003	CALB	.005	.003
10	.003	.003	.003	.003	.002	.003	.002	.002	.003	.003	.003	.003	.003	.003	.003	.003	.002	.002	.002	.002	.002	.003	CALB	.005	.003
11	.003	.003	.002	.002	.002	.003	.003	.003	.003	.003	.003	.003	.002	.003	.003	.003	.003	.002	.003	.002	.003	.003	CALB	.006	.003
12	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.006	.003
13	.003	.003	.003	.002	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.002	.002	.003	.003	.003	.003	.002	CALB	.007	.003
14	.003	.003	.002	.002	.003	.002	.003	.003	CALB	CALB	.004	.003	.003	.003	.003	.002	.003	.002	.002	.002	.003	.003	CALB	.007	.003
15	.003	.003	.003	.003	.002	.003	.003	.003	.003	.002	.002	.002	.002	.003	.003	.002	.002	.002	.002	.002	.002	.002	CALB	.008	.003
16	.003	.003	.003	.003	.003	.002	.002	.003	.003	.003	.003	.002	.002	.002	.003	.003	.003	.002	.002	.003	.002	.003	CALB	.010	.003
17	.005	.004	.004	.003	.003	.003	.004	.003	.003	.002	.003	.003	.002	.002	.002	.002	.002	.003	.003	.002	.002	.003	CALB	.015	.003
18	.005	.004	.004	.004	.004	.003	.004	.003	.003	.003	.003	.002	.003	.002	.003	.003	.002	.003	.002	.003	.003	.003	CALB	.016	.004
19	.005	.004	.003	.003	.003	.003	.003	.003	CALB	.008	.003	.002	.002	.003	.002	.003	.003	.002	.002	.003	.002	.002	CALB	.007	.003
20	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.003	.002	.002	.002	.002	.002	.002	.002	.003	CALB	.012	.003
21	.004	.003	.003	.003	.003	.003	.003	.003	.002				(007	.005	.004)	.003	.003	.003	.003	.002	.003	.003	CALB	.007	.004
22	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.003	.002	.002	.003	.003	.003	MALF	.006	.003
23	.003	.003	.003	.003	.002	.002	.002	.003	.002	.003	.002	.002	.002	.002	.003	.002	.002	.003	.003	.002	.002	.002	CALB	.009	.003
24	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.002	.002	.002	.002	CALB	.005	.003
25	.002	.002	.002	.002	.002	.002	.002	.002	.003	.003	.003	.002	.003	.003	.003	.003	.002	.002	.002	.003	.002	.003	CALB	.006	.003
26	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.006	.003
27	.003	.003	.003	.003	.004	.003	.004	.003	.003	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.006	.003
28	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.004	.003	.003	.003	.003	.003	.003	.002	CALB	.006	.003
29	.003	.003	.002	.002	.002	.002	.003	.003	.002	.003	.002	.003	.002	.002	.003	.002	.002	.002	.002	.002	.002	.002	CALB	.006	.002
30	.003	.003	.002	.002	.002	.002	.002	.003	.003	.002	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.007	.003
NO	30	30	30	30	30	30	30	30	28	28	29	29	30	29	30	30	30	30	30	30	30	30		30	683
MEAN	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.002	.002	.002	.003		.007	.003
MAX	.005	.004	.004	.004	.004	.003	.004	.003	.003	.008	.004	.003	.007	.005	.004	.003	.003	.003	.003	.003	.003	.003		.016	.016

'MALF' - MACHINE MALFUNCTION 'WTHR' - BAD WEATHER 'VAND' - VANDALISM 'COLL' - COLLECTION ERROR
'LAB ' - LAB ERROR 'QUAL' - QUALITY ASSURANCE 'CALB' - CALIBRATION 'WAIV' - MONITORING WAIVED
'*** ' - NOT ENOUGH READINGS ' ' - NUL VALUE

3hr = .005

STATE: FLORIDA (10) AQDHS-II A QUALITY DATA REPORT DISPLAY N (9999 PA

AQCR: 000 AGENCY(J): PRIVATE
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED
AREA: 3420 PARM(42401): SULFUR DIOXIDE
SITE: 017 UNITS(07): PARTS PER MILLION
YEAR: 1930 MONTH(10): OCTOBER
LOCALE: FLORIDA CELERY EXCHANGE BELLE GLADE

LECT METH: INSTRUMENTAL
ANALYSIS METH: PULSED FLUORSCENCE
SAMPLING INTR: 01 HOURS
SAROAD KEY: 10/3420/017/J/01
MINIMUM DETEC: 00000+

SLAMS/NAMS(0):
RPT AGNCY/SMSA: 0000
UTM ZONE: 17
UTM EASTING: 000535
TIME ZONE(07): EASTERN

PRIMARY
FEDERAL STANDARD

SECONDARY
SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.003	.003	.003	.003	.003	.003	.002	.002	.002	.003	.002	.002	CALB	.005	.003
02	.003	.003	.002	.002	.003	.002	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.003	.002	.002	.003	.003	.003	CALB	.006	.003
03	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.002	.003	.002	.003	.002	.003	CALB	.008	.003
04	.004	.003	.003	.003	.003	.003	.003	.004	.003	.003	.003	.003	.003	.003	.003	.002	.003	.003	.003	.003	.003	.003	CALB	.009	.003
05	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.003	.003	.003	.003	.002	.003	CALB	.007	.003
06	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.002	.003	CALB	.006	.003
07	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.003	.002	.002	.002	.002	.002	.003	.002	.002	.002	CALB	.006	.002
08	.003	.003	.002	.002	.002	.002	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.003	.002	.002	.002	.002	CALB	.008	.003
09	.003	.003	.003	.002	.002	.002	.002	.003	.003	.002	.002	.002	.002	.003	.003	.003	.002	.003	.002	.002	.002	.002	CALB	.007	.003
10	.003	.003	.003	.003	.003	.003	.003	CALB									.001	.001	.001	.000	.000	.000	CALB	.005	.002
11	.001	.001	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.004	.000
12	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.000	.000	.000	.000	.000	.000	.001	.000	.001	CALB	.003	.001
13	.001	.001	.001	.001	.001	.001	.001	.000	.001	.000	.001	.000	.000	.000	.000	.000	.000	.000	.001	.001	.001	.000	CALB	.002	.001
14	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.000	.000	.000	.001	.000	.000	.000	.000	CALB	.003	.001
15	.001	.001	.000	.000	.000	.001	.001	.001	.001	.001	.001	.001	.000	.000	.000	.000	.001	.000	.000	.000	.000	.001	CALB	.002	.001
16	.001	.000	.001	.000	.001	.001	.000	.000	.001	.001	.001	.001	.001	.002	.002	.001	.002	.000	.000	.000	.000	.000	CALB	.003	.001
17	.001	.001	.000	.001	.001	.001	.001	.000	.000	.000	.001	.001	.000	.000	.000	.000	.000	.000	.000	.001	.000	.001	CALB	.002	.001
18	.000	.000	.000	.000	.000	.000	.000	.001	.001	.000	.001	.000	.000	.000	.000	.000	.000	.000	.001	.000	.000	.000	CALB	.003	.000
19	.000	.001	.000	.000	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.003	.001
20	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.003	.001
21	.001	.001	.001	.001	.001	.000	.001	.001	.001	.000	.001	.001	.001	.001	.001	.000	.000	.000	.001	.000	.001	.001	CALB	.003	.001
22	.000	.001	.001	.001	.001	.000	.001	.001	.001	.001	.001	.001	.000	.001	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.003	.001
23	.001	.001	.001	.001	.001	.002	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.004	.001
24	.002	.001	.001	.001	.001	.001	.001	.002	.001	.002	.003	.004	.004	.002	.002	.001	.001	.001	.001	.001	.001	.001	CALB	.004	.002
25	.001	.001	.001	.001	.001	.001	.001	.001	.001	.002	.002	.002	.001	.001	.001	.001	.001	.001	.001	.002	.002	.002	CALB	.003	.001
26	.002	.002	.001	.001	.001	.002	WTHR	WTHR	.002	.001	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.003	.001
27	.001	.001	.002	WTHR	WTHR	WTHR	WTHR	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.000	CALB	.002	.001
28	.001	.000	.000	.000	.000	.000	.000	.000	.001	.000	.001	.001	.001	.001	.001	.001	.000	.001	.000	.001	.001	.000	CALB	.003	.001
29	.001	.001	.001	.001	.001	.001	.000	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.002	.001	.001	.001	CALB	.003	.001
30	.001	.001	.001	.001	.001	.001	.001	.002	.002	.002	.002	.002	.001	.002	.002	.001	.001	.001	.002	.002	.002	.001	CALB	.004	.002
31	.002	.002	.002	.001	.001	.001	.002	.002	.001	.001	.002	.002	.002	.002	.002	.001	.002	.002	.002	.001	.001	.002	CALB	.005	.002
NO	31	31	31	30	30	30	29	29	30	30	30	30	30	30	30	30	31	31	31	31	31	31		31	698
MEAN	.002	.002	.001	.001	.001	.001	.002	.002	.002	.001	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001		.004	.002
MAX	.004	.003	.003	.003	.003	.003	.003	.004	.003	.003	.003	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003		.009	.009

'MALF' - MACHINE MALFUNCTION 'WTHR' - BAD WEATHER 'VAND' - VANDALISM 'COLL' - COLLECTION ERROR
'LAB ' - LAB ERROR 'QUAL' - QUALITY ASSURANCE 'CALB' - CALIBRATION 'WAIV' - MONITORING WAIVED
'*** ' - NOT ENOUGH READINGS ' ' - NUL VALUE

3hr - .004

BEST AVAILABLE COPY

AQCR: 000 AGENCY(J): PRIVATE
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED
AREA: 3420 PARM(42401): SULFUR DIOXIDE
SITE: 017 UNITS(07): PARTS PER MILLION
YEAR: 1990 MONTH(11): NOVEMBER
LOCALE: FLORIDA CELERY EXCHANGE BELLE GLADE

COLLECT METH: INSTRUMENTAL
ANALYSIS METH: PULSED FLUORSCENCE
SAMPLING INTR: 01 HOURS
SAROAD KEY: 10/3420/017/J/01
MINIMUM DETEC: 00000+

SLAMS/NAMS(0):
RPT AGNCY/SMSA: 0000
UTM ZONE: 17
UTM EASTING: 000535
TIME ZONE(07): EASTERN

PRIMARY
FEDERAL STANDARD

SECONDARY
SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01	.002	.002	.001	.001	.001	.001	.001	.001	.002	.001	.001	.002	.001	.001	.002	.002	.002	.001	.001	.002	.002	.002	CALB	.006	.002
02	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.013	.003	.003	.003	.003	.002	.002	.002	.003	.003	.003	.003	CALB	.006	.003
03	.003	.003	.003	.003	.002	.002	.002	.003	.002	.003	.002	.002	.002	.002	.002	.003	.002	.002	.002	.002	.002	.002	CALB	.006	.002
04	.003	.002	.002	.001	.002	.002	.002	.001	.000	MALF	MALF	MALF	MALF	.000	.002	.002	.003	.003	.003	.002	.002	.003	CALB	.006	.002
05	.003	.002	.002	.002	.001	.000	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	.002
06	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	
07	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF													
08																									
09																									
10														MALF											
11																									
12																									
13																									
14																									
15																									
16																									
17																									
18																									
19																									
20		MALF																							
21																									
22																									
23																									
24			MALF										MALF												
25																									
26																									
27					MALF																				
28																									
29																									
30	MALF																.006	.004	.003	.003	.002	.002	CALB	.004	.003
NO	5	5	5	5	5	5	4	4	4	2	3	3	3	4	4	4	5	5	5	5	5	5		5	100
MEAN	.003	.002	.002	.002	.002	.001	.002	.002	.002	.002	.005	.002	.002	.002	.002	.002	.003	.002	.002	.002	.002	.002		.006	.002
MAX	.003	.003	.003	.003	.002	.002	.002	.003	.002	.003	.013	.003	.003	.003	.003	.003	.006	.004	.003	.003	.003	.003		.006	.013

'MALF' - MACHINE MALFUNCTION
'LAB ' - LAB ERROR
'*** ' - NOT ENOUGH READINGS
'WTHR' - BAD WEATHER
'QUAL' - QUALITY ASSURANCE
' ' - NUL VALUE
'VAND' - VANDALISM
'CALB' - CALIBRATION
'COLL' - COLLECTION ERROR
'WAIV' - MONITORING WAIVED

STATE: FLORIDA (10) AQDHS-II A[illegible]ALITY DATA REPORT DISPLAY N (9993 PA[illegible]

AQCR: 000 AGENCY(J): PRIVATE
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED
AREA: 3420 PARM(42401): SULFUR DIOXIDE
SITE: 017 UNITS(07): PARTS PER MILLION
YEAR: 1990 MONTH(12): DECEMBER
LOCALE: FLORIDA CELERY EXCHANGE BELLE GLADE

[illegible]ECT METH: INSTRUMENTAL
ANALYSIS METH: PULSED FLUORSCENCE
SAMPLING INTR: 01 HOURS
SAROAD KEY: 10/3420/017/J/01
MINIMUM DETEC: 00000+

SLAMS/NAMS(0):
RPT AGNCY/SMSA: 0000
UTM ZONE: 17
UTM EASTING: 000535
TIME ZONE(07): EASTERN

PRIMARY
FEDERAL STANDARD

SECONDARY
SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01	.002	.001-	.001-	.001-	.001-	.001-	.000	.000	.001-	.001	.000	.000	.000	.001-	.000	.000	.001	.000	.001	.001	.001	.001	CALB	.003	.000
02	.000	.001-	.001-	.001-	.002-	.002-	.002-	.001-	.001-	.001-	.002-	.001-	.001-	.001-	.001-	.002-	.000	.001	.001	.001	.001	.001	CALB	.004	.000
03	.001	.001	.001-	.000	.001-	.003-	.002-	.002-	.003-	.002-	.002-	.003-	.003-	.004-	.003-	.003-	.002-	.002-	.003-	.001-	.000	.001-	CALB	.006	.001
04	.002	.000	.001	.000	.000	.002-	.002-	.000	.000	.001-	.002-	.003-	.003-	.003-	.003-	.003-	.003-	.003-	.002-	.002-	.002-	.002-	CALB	.005	.001
05	.000	.000	.001-	.002-	.002-	.004-	.005-	.004-	.005-	.004-	.002-	.002-	.003-	.004-	.005-	.003-	.003-	.003-	.003-	.003-	.003-	.004-	CALB	.001-	.003
06	.005-	.005-	.005-	.007-	.006-	WTHR	WTHR	.006-	.006-	.005-	.005-	.004-	.004-	.003-	.005-	.003-	.004-	.004-	.004-	.003-	.003-	.003-	CALB	.001-	.004
07	.004-	.006-	.006-	.007-	.007-	.008-	.006-	.006-	.006-	.005-	.004-	.005-	.006-	.006-	.005-	.004-	.004-	.005-	.004-	.003-	.004-	.003-	CALB	.004	.005
08	.004-	.002-	.000	.001-	.001-	.002-	.003-	.002-	.004-	.006-	.007-	.006-	.004-	.003-	.003-	.003-	.003-	.004-	.005-	.006-	.007-	.007-	CALB	.005-	.004
09	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	.008-	.007-	.006-	.003-	.005-	.006-	.005-	.006-	.007-	.007-	.008-	.005-	.003-	CALB	WTHR	.007
10	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	.008-	.005-	.004-	.005-	.007-	.007-	.008-	.008-	.007-	.007-	.007-	.008-	.010-	CALB	WTHR	.007
11	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	.010-	CALB	CALB	CALB									WTHR	CALB	WTHR	.010
12	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR														CALB		
13						WTHR	WTHR	WTHR															CALB		
14																.002	.002	.003	.002	.003	.002	.003	CALB	.005	.003
15	.003	.002	.002	.002	.002	.001	.002	.002	.002	.002	.002	.001	.001	.002	.002	.002	.002	.002	.003	.003	.004	.002	CALB	.004	.002
16	.003	.003	.002	.002	.002	.003	.002	.002	.002	.003	.001	.001	.001	.001	.001	.001	.001	.001	.001	.002	.003	.003	CALB	.007	.002
17	.003	.002	.002	.002	.002	.001	.001	.002	.002	.002	.001	.001	.001	CALB	CALB	.013	.003	.002	.003	.004	.004	.003	CALB	.009	.003
18	.004	.003	.002	.002	.002	.001	.002	.002	.002	.003	.001	.001	.000	.001	.001	.001	.001	.001	.001	.002	.003	.004	CALB	.012	.002
19	.006	.002	.002	.002	.002	.002	.002	.002	CALB	CALB	CALB	CALB	.002	.001	.001-	.001-	.000	.000	.000	.002	.002	.002	CALB	.012	.002
20	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	.093	COLL	COLL	COLL	COLL	COLL	COLL	COLL	.093
21	.002	.000	.000	.001-	.000	.001-	.001-	.001	.000	.002-	.002-	.003-	.002-	.002-	.003-	.002-	.001-	.001-	.002-	.001-	.001-	.000	CALB	.011	.000
22	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	
23	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	
24	.002	.001	.001	.001-	.001-	.001-	.002-	.001-	.002-	.002-	.003-	.003-	.003-	.003-	.003-	.003-	.003-	.002-	.002-	.002-	.001-	.002-	CALB	.010	.001
25	.001-	.001-	.002-	.002-	.002-	.002-	.001-	.001-	.002-	.003-	.003-	.003-	.003-	.003-	.003-	.003-	.004-	.004-	.004-	.003-	.003-	.003-	CALB	.003	.002
26	.001-	.002-	.002-	.002-	.002-	.004-	.004-	.002-	.003-	.003-	.004-	.004-	.004-	.004-	.004-	.003-	.003-	.002-	.003-	.003-	.003-	.002-	CALB	.007	.002
27	.000	.001-	.003-	.003-	.004-	.005-	.003-	.003-	.004-	.005-	.004-	.004-	.004-	.005-	.005-	.005-	.004-	.004-	.004-	.003-	.004-	.003-	CALB	.007	.003
28	.002-	.002-	.002-	.003-	.003-	.003-	.004-	.003-	.004-	.004-	.005-	.005-	.005-	.005-	.004-	.004-	.004-	.004-	.003-	.003-	.002-	.002-	CALB	.012	.003
29	.001-	.001-	.002-	.001-	.003-	.003-	.003-	.002-	.004-	.004-	.003-	.004-	.004-	.004-	.004-	.004-	.004-	.004-	.003-	.003-	.003-	.003-	CALB	.012	.002
30	.001	.001-	.001-	.003-	.003-	.003-	.003-	.002-	.003-	.004-	.004-	.004-	.004-	.005-	.004-	.003-	.003-	.004-	.004-	.004-	.003-	.004-	CALB	.010	.003
31	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	COLL	
NO	21	21	21	21	21	20	20	21	20	23	22	22	23	22	22	24	25	24	24	24	24	24		22	511
MEAN	.001	.000	.001-	.001-	.001-	.002-	.002-	.001-	.002-	.003-	.003-	.003-	.003-	.003-	.003-	.002-	.002	.002-	.002-	.002-	.002-	.002-		.006	.001-
MAX	.006	.003	.002	.002	.002	.003	.002	.002	.002	.003	.002	.001	.002	.002	.002	.013	.093	.003	.003	.004	.004	.004		.012	.093

'MALF' - MACHINE MALFUNCTION 'WTHR' - BAD WEATHER 'VAND' - VANDALISM 'COLL' - COLLECTION ERROR
'LAB ' - LAB ERROR 'QUAL' - QUALITY ASSURANCE 'CALB' - CALIBRATION 'WAIV' - MONITORING WAIVED
'*** ' - NOT ENOUGH READINGS ' ' - NUL VALUE

3hr - .006

STATE: FLORIDA (10) AQDHS-II AIR QUALITY DATA REPORT DISPLAY N (9999 PAGE 14

AQCR: 000 AGENCY(J): PRIVATE
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED
AREA: 3420 PARM(42401): SULFUR DIOXIDE
SITE: 017 UNITS(07): PARTS PER MILLION
YEAR: 1991 MONTH(01): JANUARY
LOCALE: FLORIDA CELERY EXCHANGE BELLE GLADE

COLLECT METH: INSTRUMENTAL
ANALYSIS METH: PULSED FLUORESCENCE
SAMPLING INTR: 01 HOURS
SAROAD KEY: 10/3420/017/J/01
MINIMUM DETEC: 00000+

SLAMS/NAMS(0):
RPT AGNCY/SMSA: 0000
UTM ZONE: 17
UTM EASTING: 000535
TIME ZONE(07): EASTERN

PRIMARY
FEDERAL STANDARD

SECONDARY
SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.007	.000
02	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.003	.000
03	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.008	.000
04	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	CALB	.000	.000	.000	.000	.000	.000	CALB	.000	.000
05	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
06	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
07	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
08	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	MALF	MALF	MALF	.000	.000	.000	.000	.000	CALB	.000	.000
09	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
10	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
11	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
12	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
13	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
14	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
15	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
16	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
17	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
18	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
19	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
20	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
21	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	CALB	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
22	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
23	.000	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
24	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
25	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
26	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
27	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
28	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
29	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
30	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
31	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
NO	31	30	30	30	30	30	30	30	30	31	31	31	31	30	27	29	30	31	31	31	31	31	3	31	700
MEAN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.000
MAX	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.008	.008

'MALF' - MACHINE MALFUNCTION 'WTHR' - BAD WEATHER 'VAND' - VANDALISM 'COLL' - COLLECTION ERROR
'LAB ' - LAB ERROR 'QUAL' - QUALITY ASSURANCE 'CALB' - CALIBRATION 'WAIV' - MONITORING WAIVED
'*** ' - NOT ENOUGH READINGS ' ' - NUL VALUE

3hr - 000

STATE: FLORIDA (10) AQDHS-1 QUALITY DATA REPORT DISPLAY N (9999 P

AQCR: 000 AGENCY(J): PRIVATE
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED
AREA: 3420 PARM(42401): SULFUR DIOXIDE
SITE: 017 UNITS(07): PARTS PER MILLION
YEAR: 1991 MONTH(02): FEBRUARY
LOCALE: FLORIDA CELERY EXCHANGE BELLE GLADE

COLLECT METH: INSTRUMENTAL
ANALYSIS METH: PULSED FLUORSCENCE
SAMPLING INTR: 01 HOURS
SAROAD KEY: 10/3420/017/J/01
MINIMUM DETEC: 00000+

SLAMS/NAMS(0):
RPT AGNCY/SMSA: 0000
UTM ZONE: 17
UTM EASTING: 000535
TIME ZONE(07): EASTERN

PRIMARY
FEDERAL STANDARD

SECONDARY
SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
02	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
03	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
04	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	CALB	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
05	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
06	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
07	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	MALF	.000	.000
08	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
09	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
10	.000	.000	.000	WTHR	WTHR	WTHR	WTHR	WTHR	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
11	.000	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	WTHR	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
12	.000	.000	.000	.000	.000	.000	.000	WTHR	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
13	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
14	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	CALB	CALB									.000
15												.008	.003	.001	.002	.001	.001	.001	.001	.000	.001	.001	CALB	.003	.002
16	.002	.003	.003	.003	.002	.002	.002	.001	.003	.003	.002	.002	.001	.002	.002	.002	.002	.001	.002	.002	.002	WTHR	CALB	WTHR	.002
17	.002	WTHR	WTHR	WTHR	.002	WTHR	WTHR	.003	.003	.002	.001	.001	.001	.001	.001	.001	.000	.000	.000	.000	.001	.001	CALB	.002	.001
18	.001	.002	.002	.002	.002	.001	.001	.001	.001	.001	.001	.001	.002	.001	.001	.001	.001	.001	.001	.001	.000	.001	CALB	.002	.001
19	.001	.002	.001	.001	.001	.001	.001	.003	.002	.001	.002	.001	.001	.001	CALB	(.014	.003	.003)	.002	.002	.001	.001	CALB	.000	.002
20	.001	.001	.001	.001	.001	.001	.001	.002	.001	.001	.002	.002	.003	.002	.003	.003	.002	.003	.002	.001	.002	.001	CALB	.005	.002
21	.003	.003	.003	.002	.002	.002	.003	.003	.003	.003	.003	.002	.003	.002	.002	.003	.003	.003	.003	.001	.002	.002	CALB	.006	.003
22	.003	.002	.002	.002	.001	.001	.001	.001	.002	.002	.002	.002	.002	.002	.002	.003	.002	.003	.003	.002	.002	.002	CALB	.008	.002
23	.004	.004	.003	.002	.002	.002	.002	.002	.002	.002	.002	.003	.003	.003	.003	.003	.003	.003	.002	.002	.002	.002	CALB	.009	.003
24	.004	.003	.002	.002	.002	.002	.002	.003	.001	.002	.002	.003	.003	.003	.003	.003	.003	.002	.002	.002	.002	.002	CALB	.007	.003
25	.003	.003	.003	.002	.002	.002	.002	.002	.002	.002	.001	.002	.002	.002	WTHR	.002	.002	.002	.002	.002	.002	.002	CALB	.006	.002
26	.004	.003	.003	.002	.002	.001	.001	.002	.002	.001	.001	.001	.002	.001	.002	.002	.002	.002	.001	.001	.001	.001	CALB	.004	.002
27	.002	.002	.002	.002	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.002	.002	.001	.001	.000	.000	.000	CALB	.003	.001
28	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.006	.001
NO	27	25	25	24	25	24	24	24	26	27	27	28	28	26	24	27	27	27	27	27	27	26		26	598
MEAN	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.002	.001	.001	.001	.001	.001	.001		.002	.001
MAX	.004	.004	.003	.003	.002	.002	.003	.003	.003	.003	.003	.008	.003	.003	.003	.014	.003	.003	.003	.002	.002	.002		.009	.014

'MALF' - MACHINE MALFUNCTION 'WTHR' - BAD WEATHER 'VAND' - VANDALISM 'COLL' - COLLECTION ERROR
'LAB ' - LAB ERROR 'QUAL' - QUALITY ASSURANCE 'CALB' - CALIBRATION 'WAIV' - MONITORING WAIVED
'*** ' - NOT ENOUGH READINGS ' ' - NUL VALUE

3hr = .007

BEST AVAILABLE COPY

STATE: FLORIDA (10) AQDHS-II AIR QUALITY DATA REPORT DISPLAY N (9999 PAGE 16

AQCR: 000 AGENCY(J): PRIVATE
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED
AREA: 3420 PARM(42401): SULFUR DIOXIDE
SITE: 017 UNITS(07): PARTS PER MILLION
YEAR: 1991 MONTH(03): MARCH
LOCALE: FLORIDA CELERY EXCHANGE BELLE GLADE

COLLECT METH: INSTRUMENTAL
ANALYSIS METH: PULSED FLUORSCENCE
SAMPLING INTR: 01 HOURS
SAROAD KEY: 10/3420/017/J/01
MINIMUM DETEC: 00000+

SLAMS/NAMS(0):
RPT AGNCY/SMSA: 0000
UTM ZONE: 17
UTM EASTING: 000535
TIME ZONE(07): EASTERN

FEDERAL STANDARD PRIMARY SECONDARY SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01	.003	.001	.001	.001	.000	.000	.001	.000	.000	.001	.001	.002	.002	.002	WTHR	.002	.002	.002	.002	.002	.002	.002	CALB	.011	.002
02	.004	.003	.002	.002	.002	.002	.002	.002	.001	.001	.002	.002	WTHR	WTHR	WTHR	.002	.002	.002	.002	.001	.002	.001	CALB	.011	.002
03	.003	.003	.003	.003	.003	.002	.003	.003	.002	.002	.002	.003	.003	MALF	MALF	.002	.000	.001	.002	.002	.002	.001	CALB	.009	.003
04	.004	.002	.002	.002	.002	.001	.001	.001	.001	.001	.002	.001	.001	CALB	CALB	.016	.004	.002	.002	.001	.001	.001	CALB	.004	.002
05	.001	.001	.001	.002	.002	.001	.001	.002	.002	.001	.000	.000	.001	.001	.002	.001	.001	.001	.002	.002	.002	.002	CALB	.005	.001
06	.002	.002	.002	.002	.002	.001	.002	.002	.003	.002	.002	.002	.002	.001	.002	.001	.001	.001	.001	.000	.000	.001	CALB	.004	.002
07	.002	.002	.002	.002	.001	.001	.001	.002	.001	.001	.001	.002	.002	.002	WTHR	.002	.001	.002	.002	.002	.001	.000	CALB	.005	.002
08	.000	.001	.000	.001	.001	.000	.001	.001	.001	.001	.001	.002	WTHR	.001	.002	.001	.002	.003	.001	.002	.002	.002	CALB	.008	.002
09	.003	.002	.001	.002	.001	.002	.002	.001	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.002	.001	.001	CALB	.008	.002
10	.003	.002	.001	.002	.002	.002	.002	.002	.002	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.003	CALB	.002	.001
11	.002	.001	.001	.002	.001	.000	.002	.002	.002	.001	.000	.001	.002	.001	.001	.000	.001	.000	.000	.001	.001	.001	CALB	.002	.001
12	.002	.002	.001	.001	.001	.002	.001	.003	.002	.001	.002	.002	.002	.002	.002	.003	.002	.002	.002	.001	.000	.001	CALB	.001	.002
13	.000	.000	.001	.001	.001	.001	.002	.002	.001	.002	.002	.002	.002	.003	.003	.003	.003	.003	.002	.002	.002	.002	CALB	.007	.002
14	.003	.002	.002	.002	.001	.001	.001	.001	.002	.002	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	CALB	.010	.003
15	.004	.002	.002	.002	.002	.001	.002	.002	.001	.001	.002	.002	.003	.003	CALB	CALB	.006	.005	.004	.004	.003	.002	CALB	.005	.003
16	.002	.002	.002	.001	.001	.002	.001	.001	.002	.002	.003	.002	.003	.003	.003	.003	.003	.002	.002	.002	.002	.002	CALB	.005	.002
17	.003	.003	.002	.002	.002	.002	.002	.003	.003	.003	.004	.003	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	CALB	.015	.004
18	.006	.005	.005	.004	.004	.003	.004	.004	.004	.004	.004	WTHR	.004	.004	.005	.004	.004	.004	.004	.004	.005	.005	CALB	.018	.005
19	.003	.007	.005	.005	.004	.003	.003	.003	CALB	CALB	.016	.007	.005	.006	.005	.005	.005	.004	.004	.003	.003	.003	CALB	.005	.005
20	.004	.004	WTHR	WTHR	WTHR	WTHR	WTHR	.005	.004	.003	.003	.004	.004	.003	.004	.003	.002	.002	.002	.001	.001	.001	CALB	.004	.003
21	.003	.002	.003	.002	.002	.003	.003	.004	.003	.002	.003	.002	.002	.003	.003	.003	.003	.002	.002	.001	.001	.001	CALB	.002	.003
22	.002	.002	.002	.002	.002	.002	.003	.003	.002	.002	.003	.003	.003	.003	.003	.003	.003	.003	.004	.002	.001	.001	CALB	.005	.003
23	.002	.001	.001	.001	.001	.001	.002	.001	.002	.002	.003	.002	.003	.003	.003	.003	.003	.004	.003	.003	.003	.001	CALB	.005	.003
24	.002	.001	.002	.002	.001	.001	.001	.000	.002	.002	.004	.004	.004	.005	.004	.004	.004	.004	.003	.003	.003	.002	CALB	.007	.003
25	.001	.001	.001	.002	.001	.002	.002	.002	.002	.003	.003	.003	.004	.004	CALB	.017	.005	.005	.003	.002	.003	.002	CALB	.007	.003
26	.002	.000	.000	.000	.000	.000	.000	.001	.001	.001	.002	.003	.002	.002	.002	.002	.003	.003	.002	.002	.001	.001	CALB	.003	.002
27	.001	.001	.000	.001	.001	.001	.002	.002	.001	.002	.002	.003	.003	.002	.002	.002	.003	.003	.002	.001	.001	.000	CALB	.006	.002
28	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001				.005	.004	.003	.003	.002	.003	.002	.002	.002	CALB	.007	.002
29	.001	.000	.001	.001	.000	.000	.000	.001	.001	.002	.002	.002	.002	.002	.003	.002	.003	.003	.003	.003	.002	.002	CALB	.008	.002
30	.003	.002	.001	.002	.001	.002	.002	.002	.002	.002	.003	.003	.003	.003	.003	.003	.003	.004	.003	.003	.003	.003	CALB	.011	.003
31	.007	.004	.004	.002	.002	.001	.001	.002	.002	.002	.002	.002	.003	.002	.002	.003	.002	.003	.002	.002	.002	.002	CALB	.003	.002
NO	31	31	30	30	30	30	30	31	30	30	30	29	28	28	24	30	31	31	31	31	31	31		31	685
MEAN	.003	.002	.002	.002	.002	.001	.002	.002	.002	.002	.003	.002	.003	.003	.003	.003	.003	.003	.002	.002	.002	.002		.007	.002
MAX	.008	.007	.005	.005	.004	.003	.004	.005	.004	.004	.016	.007	.005	.006	.005	.017	.006	.005	.004	.004	.005	.005		.018	.016

'MALF' - MACHINE MALFUNCTION 'WTHR' - BAD WEATHER 'VAND' - VANDALISM 'COLL' - COLLECTION ERROR
'LAB ' - LAB ERROR 'QUAL' - QUALITY ASSURANCE 'CALB' - CALIBRATION 'WAIV' - MONITORING WAIVED
'*** ' - NOT ENOUGH READINGS ' ' - NUL VALUE

3hr - .009

BEST AVAILABLE COPY

/ATE: FLORIDA (10) · AQDHS-11 AIR … TY DATA REPORT · DISPLAY N (9959 · PAGE 18

AQCR: 000 AGENCY(J): PRIVATE
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED
AREA: 3420 PARM(42401): SULFUR DIOXIDE
SITE: 017 UNITS(07): PARTS PER MILLION
YEAR: 1991 MONTH(05): MAY
LOCALE: FLORIDA CELERY EXCHANGE . BELLE GLADE

COLLECT METH: INSTRUMENTAL
ANALYSIS METH: PULSED FLUORSCENCE
SAMPLING INTR: 01 HOURS
BAROAD KEY: 10/3420/017/J/01
MINIMUM DETEC: 00000+

SLAMS/NAMS(O):
RPT AGNCY/SMSA: 0000
UTM ZONE: 17
UTM EASTING: 000535
TIME ZONE(07): EASTERN

PRIMARY
FEDERAL STANDARD

SECONDARY
SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01	.003	.001	.000	.000	.000	.000	.000	.000	.001	.001	.002	.002	.002	.003	.002	.001	.002	.002	.002	.001	.001	.000	CALB	.007	.001
02	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.001	.001	.001	.001	.001	.001	.002	.002	.002	.002	CALB	.007	.001
03	.001	.000	.000	.000	.000	.000	.000	.000	.001	.001	.000	.001	.001	.001	.001	.001	.001	.001	.002	.001	.001	.000	CALB	.006	.001
04	.001	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.000	.000	CALB	.004	.001
05	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.002	.001	.002	.001	.002	.001	.001	.001	.001	.000	.000	.000	CALB	.004	.001
06	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.001	.002	(.003	.004	.003)	.002	.002	.002	.002	.001	.001	.000	CALB	.005	.001
07	.001	.001	.001	.000	.000	.000	.000	.000	.000	.001	.001	.002	.002	.001	.001	.001	.002	.001	.001	.001	.000	.000	CALB	.004	.001
08	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.001	.001	.002	.001	.001	.002	.001	.002	.000	.000	.000	CALB	.000	.001
09	.000	.000	.000	.000	.000	.000	.000	.000	.000			.002	.002	.002	.001	.001	.001	.001	.001	.000	.000	.001	CALB	.000	.001
10	.000	.000	.000	.000	.000	.000	.000	.001	.001	.001	.001	.001	.001	.002	.001	.001	.001	.002	.001	.001	.001	.000	CALB	.000	.001
11	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.001	.002	.001	.001	.001	.002	.002	.000	.000	.000	CALB	.000	.001
12	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.001	.001	.001	.001	.000	.002	.001	.000	.000	.000	CALB	.000	.000
13	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.002	.002	.001	.001	.002	.001	.001	.000	.000	.000	.000	.000	CALB	.000	.000
14	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.001	.001	.002	.001	.001	.001	.002	.000	.000	.000	CALB	.000	.000
15	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.001	.001	.001	.000	.001	.000	.000	.000	.000	.000	CALB	.000	.000
16	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.001	.001	.001	.001	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
17	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.002	.001	.001	.001	.001	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
18	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.001	.001	.000	.001	.001	.001	.001	.001	.001	.000	.000	.000	CALB	.000	.000
19	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.001	.001	.001	.001	.002	.002	.001	.002	.000	.000	.000	CALB	.000	.001
20	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.001	.001	.000	.001	.000	CALB	.000	.000
21	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.001	.000	.000	.001	.001	.001	.001	.001	.000	.000	CALB	.000	.000
22	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.001	.001	.001	.001	.001	.000	.000	.000	CALB	.000	.000
23	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.001	.001	.000	.001	.000	.001	.001	.001	.001	.000	.000	.001	CALB	.000	.000
24	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.001	.001	.002	.002	.001	.001	.001	.001	.001	.001	.000	.000	CALB	.000	.001
25	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.002	.001	.002	.001	.001	.002	.001	.002	.001	.000	.000	.001	CALB	.000	.001
26	.001	.000	.000	.000	.000	.000	.000	.000	.001	.001	.001	.002	.001	.001	.001	.001	.001	.001	.002	.001	.001	.000	CALB	.000	.001
27	.001	.000	.000	.000	.000	.000	.000	.001	.001	.002	.001	.001	.001	.002	.001	.001	.001	.001	.001	.000	.000	.000	CALB	.000	.001
28	.000	.000	.000	.000	.000	.000	.000	.000	.001	.002	.001	.001	.001	.001	.002	.001	.001	.001	.001	.000	.000	.000	CALB	.000	.001
29	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.001	.002	.001	.002	.002	.002	.001	.002	.005	.003	.001	.000	CALB	.000	.001
30																									
31	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.002	.001	.002	.002	.001	.002	.001	.001	.000	.000	.000	.000	CALB	.000	.001
NO	30	30	30	30	30	30	30	30	30	29	29	30	29	30	30	30	30	30	30	30	30	30		20	667
MEAN	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.000	.000		.001	.001
MAX	.003	.001	.001	.000	.000	.000	.000	.001	.001	.002	.002	.002	.003	.004	.003	.002	.002	.002	.005	.003	.002	.002		.007	.007

'MALF' - MACHINE MALFUNCTION 'WTHR' - BAD WEATHER 'VAND' - VANDALISM 'COLL' - COLLECTION ERROR
'LAB ' - LAB ERROR 'QUAL' - QUALITY ASSURANCE 'CALB' - CALIBRATION 'WAIV' - MONITORING WAIVED
'*** ' - NOT ENOUGH READINGS '   ' - NUL VALUE

3hr-2 .003

STATE: FLORIDA (10) AQDHS-II QUALITY DATA REPORT DISPLAY N (9999 P 7

AQCR: 000 AGENCY(J): PRIVATE LLECT METH: INSTRUMENTAL SLAMS/NAMS(0):
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED ANALYSIS METH: PULSED FLUORSCENCE RPT AGNCY/SMSA: 0000
AREA: 3420 PARM(42401): SULFUR DIOXIDE SAMPLING INTR: 01 HOURS UTM ZONE: 17
SITE: 017 UNITS(07): PARTS PER MILLION SAROAD KEY: 10/3420/017/J/01 UTM EASTING: 000535
YEAR: 1991 MONTH(04): APRIL MINIMUM DETEC: 00000+ TIME ZONE(07): EASTERN
LOCALE: FLORIDA CELERY EXCHANGE BELLE GLADE

PRIMARY SECONDARY
FEDERAL STANDARD SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01	.003	.002	.003	.002	.003	.002	.002	.003	.003	.001	.001	.002	.002	.002	.002	.002	.003	.002	.001	.001	.001	.002	CALB	.007	.002
02	.003	.002	.002	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.002	.001	.001	.000	.001	.001	.001	CALB	.005	.002
03	.002	.002	.002	.001	.002	.002	.002	.002	.001	.001	.001	.002	.001	.002	.002	.002	.002	.002	.002	.001	.001	.001	CALB	.006	.002
04	.001	.000	.000	.001	.000	.000	.000	.001	.001	.002	.001	.002	.001	.001	.002	.002	.002	.002	.002	.001	.002	.001	CALB	.010	.002
05	.003	.003	.002	.002	.001	.001	.001	.001	.001	.002	.002	.002	.002	.002	.002	.003	.003	.003	.002	.002	.003	.002	CALB	.013	.003
06	.006	.004	.003	.003	.002	.001	.002	.002	.003	.003	.003	.003	.003	.003	.002	.003	.003	.003	.003	.002	.003	.002	CALB	.012	.003
07	.004	.003	.002	.002	.002	.001	.002	.002	.003	.002	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.001	.002	CALB	.009	.003
08	.003	.001	.001	.001	.001	.000	.001	.001	.002	.002	.002	.002	.002	.003	.003	.003	.003	.003	.003	.002	.001	.001	CALB	.009	.002
09	.003	.002	.001	.001	.000	.000	.000	.001	.002	.003	.003	.004	.003	.002	.003	.005	.005	.005	.004	.003	.002	.001	CALB	.008	.003
10	.002	.001	.001	.000	.001	.001	.002	.001	.002	.002	.002	.004	.003	.003	.003	.004	.003	.003	.003	.003	.002	.001	CALB	.007	.002
11	.002	.002	.002	.002	.001	.002	.002	.002	.003	.003	.003	.003	.003	.003	.002	.003	.003	.003	.003	.002	.003	.002	CALB	.008	.003
12	.003	.002	.002	.001	.001	.001	.001	CALB	CALB	CALB	CALB	CALB	CALB	CALB	~~.014~~	.001	.000	.000	.000	.000	.000	.000	CALB	.004	.002
13	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.004	.000
14	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.006	.000
15	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.007	.000
16	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.001	.000	.000	.000	.000	.000	.000	.000	CALB	.008	.000
17	.002	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.007	.000
18	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.008	.000
19	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.008	.000
20	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.008	.000
21	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	CALB	.005	.000
22	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.000	.000	.000	.000	.001	.002	.001	.001	.001	.001	.001	.000	CALB	.006	.001
23	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.000	.001	.000	.000	.000	.000	CALB	.006	.000
24	.002	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.002	.001	.001	.001	.001	.002	.001	.001	.000	.000	.001	CALB	.014	.001
25	.004	.003	.001	.002	.000	.001	.000	.000	.000	.001	.001	.001	.001	.002	.002	.001	.000	.000	.000	.000	.000	.000	CALB	.012	.001
26	.002	.002	.001	.000	.000	.000	.000	.000	CALB	CALB	.003	.002	.002	.003	.003	.003	.002	.002	.002	.001	.001	.000	CALB	.008	.002
27	.002	.001	.001	.001	.000	.000	.001	.001	.002	.001	.002	.002	.002	.002	.002	.002	.003	.003	.003	.001	.001	.001	CALB	.003	.002
28	.003	.002	.002	.000	.000	.000	.000	.001	.001	.002	.002	.001	.002	.002	.002	.002	.002	.002	.002	.002	.001	.001	CALB	.011	.002
29	.002	.002	.001	.001	.001	.001	.001	.001	.003	.004	.006	.004	.003	.003	.003	.003	.003	.003	.004	.002	.002	.001	CALB	.007	.003
30	.002	.002	.002	.001	.001	.000	.001	.001	.001	.002	.002	.001	.001	.002	.002	.002	.002	.002	.002	.002	.001	.001	CALB	.008	.002
NO	30	30	30	30	30	30	30	29	28	28	29	29	29	29	30	30	30	30	30	30	30	30		30	681
MEAN	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.002	.002	.002	.002	.001	.001	.001	.001		.008	.001
MAX	.006	.004	.003	.003	.003	.002	.002	.003	.003	.004	.006	.004	.003	.003	.014	.005	.005	.005	.004	.003	.003	.002		.014	.014

'MALF' - MACHINE MALFUNCTION 'WTHR' - BAD WEATHER 'VAND' - VANDALISM 'COLL' - COLLECTION ERROR
'LAB ' - LAB ERROR 'QUAL' - QUALITY ASSURANCE 'CALB' - CALIBRATION 'WAIV' - MONITORING WAIVED
'*** ' - NOT ENOUGH READINGS ' ' - NUL VALUE

3hr-.005

BEST AVAILABLE COPY

STATE: FLORIDA (10) | AQDHS-II [illegible] DATA REPORT | DISPLAY N (9339 PAG[illegible]9

ADCR: 000 AGENCY(J): PRIVATE
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED
AREA: 3420 PARM(42401): SULFUR DIOXIDE
SITE: 017 UNITS(07): PARTS PER MILLION
YEAR: 1991 MONTH(06): JUNE
LOCALE: FLORIDA CELERY EXCHANGE BELLE GLADE

[illegible]LLECT METH: INSTRUMENTAL
[illegible]NALYSIS METH: PULSED FLUORSCENCE
SAMPLING INTR: 01 HOURS
SAROAD KEY: 10/3420/017/J/01
MINIMUM DETEC: 00000+

SLAMS/NAMS(0):
RPT AGNCY/SMSA: 0000
UTM ZONE: 17
UTM EASTING: 000535
TIME ZONE(07): EASTERN

PRIMARY FEDERAL STANDARD | SECONDARY SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01	.000	.000	.000	.000	.000	.000	.000	.000	.001	.002	.002	.001	.002	.002	.003	.002	.003	.003	.002	.001	.003	.000	CALB	.000	.001
02	.000	.000	.000	.000	.000	.000	.000	.000	.001	.002	.001	.003	.002	.001	.002	.002	.001	.000	.001	.000	.000	.000	CALB	.000	.001
03	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.001	.001	.001	.002	.002	.002	.002	.002	.001	.000	.000	CALB	.000	.001
04	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.001	.001	.001	.002	.002	[illegible]	.001	.002	.002	.001	.001	.001	CALB	.000	.001
05	.000	.001	.000	.000	.000	.000	.000	.000	CALB	~~.015~~	.002	.002	.002	.002	.001	.001	.001	.001	.002	.000	.000	.001	CALB	.003	.002
06	.000	.000	.000	.000	.000	.000	.000	.000	CALB	CALB	.003	.003	CALB	CALB	CALB	.003	.003	.002	.001	.000	.000	.000	CALB	.003	.001
07	.000	.001	.000	.000	.001	.001	.001	.001	.002	.002	.004	.003	.003	.003	.004	.003	.003	.003	.002	.001	.001	.001	CALB	.002	.002
08	.001	.001	.000	.000	.000	.001	.001	.002	.003	.003	.003	.003	.003	.003	.003	.002	.002	.003	.002	.002	.002	.002	CALB	.004	.002
09	.002	.002	.001	.001	.002	.002	.001	.002	.003	.003	.004	.003	.004	.003	.004	.003	.003	.004	.003	.002	.002	.001	CALB	.002	.002
10	.001	.001	.001	.001	.000	.001	.000	.001	.003	.003	.003	.003	.003	.004	.004	.003	.003	.004	.004	.003	.003	.001	CALB	.001	.002
11	.000	.000	.000	.000	.000	.000	.000	.003	.004	.004	.003	.004	.004	.004	.004	.003	.004	.003	.004	.003	.002	.002	CALB	.003	.002
12	.002	.001	.002	.001	.000	.001	.001	.002	.003	.004	.004	.004	.004	.003	.004	.003	.004	.004	.005	.004	.003	.003	CALB	.003	.003
13	.002	.001	.002	.002	.003	.002	.002	CALB	CALB	CALB	CALB	CALB	CALB												.002
14									CALB	CALB	CALB	CALB	CALB	.006	.005	[illegible]	.004	.004	.004	.003	.003	.003	CALB	.004	.004
15	.003	.002	.001	.001	.001	.001	.001	.002	.004	.004	.004	.004	.004	.004	.004	.003	.003	.004	.003	.003	.003	.003	CALB	.005	.003
16																									
17																									
18																									
19	.002	.002	.002	.002	.001	.001	.002	.003	.007	.004	.004	.004	.004	.003	.003	[illegible]	.002	.003	.003	.003	.002	.002	.002	.002	.003
20	.002	.002	.001	.001	.001	.001	.002	.002	.003	.003	.004	.003	.002	.003											.002
21	MALF	.004	.003	.003	.003	.002	.002	.001	.001	.001	.001	.001	.001	MALF	.003	[illegible]	.002	.002	.003	.001	.001	.002	.001	.001	.002
22	.001	.001	.001	.001	.001	.001	.001	.002	.002	.003	.003	.003	.003	.003	.003	[illegible]	.002	.001	.002	.001	.002	.001	.001	.001	.002
23	.001	.001	.001	.001	.001	.001	.001	.002	.002	.003	.003	.003	.003	.003	.003	.003	.001	.002	.002	.001	.001	.001	.001	.001	.002
24	.001	.002	.001	.001	.001	.001	.001	.001	.002	.002	.004	.003	.003	.002	.002	[illegible]	.002	.003	.002	.002	.002	.002	.001	.001	.002
25	.001	.002	.001	.001	.001	.001	.001	.003	CALB	CALB	CALB	CALB	CALB	CALB	CALB	[illegible]	.004	.004	.004	.004	.003	.003	.002	.002	.002
26	.003	.003	.003	.002	.002	.002	.003	.004	.004	.005	.004	.005	.005	.005	.008	[illegible]	.009	.008	.009	.008	.007	.007	.006	.005	.005
27	.006	.004	.003	.003	.003	.003	.003	.004	.005	.005	.005	.005	.005	.005	.005	[illegible]	.006	.005	.005	.004	.004	.005	.004	.004	.004
28	.004	.004	.004	.004	.004	.004	.004	.005	.003	.005	.005	.005	.005	.005	.005	[illegible]	.004	.004	.004	.003	.004	.004	.004	.004	.004
29	.004	.003	.004	.004	.004	.003	.004	.004	.004	.005	.003	.005	.004	.004	.004	.004	.004	.004	.004	.004	.003	.003	.003	.003	.004
30	.004	.004	.004	.004	.004	.003	.003	.004	.004	.005	.006	.005	.005	.004	.004	[illegible]	.004	.005	.005	.004	.003	.003	.003	.004	.004
NO	25	26	26	26	26	26	26	25	22	23	24	24	23	23	23	[illegible]	25	25	25	25	25	25	11	25	579
MEAN	.002	.002	.001	.001	.001	.001	.001	.002	.003	.004	.003	.003	.003	.003	.004	.003	.003	.003	.003	.002	.002	.002	.003	.002	.002
MAX	.006	.004	.004	.004	.004	.004	.004	.005	.007	.015	.006	.005	.005	.006	.008	.005	.009	.008	.009	.008	.007	.007	.006	.006	.015

'MALF' - MACHINE MALFUNCTION | 'WTHR' - BAD WEATHER | 'VAND' - VANDALISM | 'COLL' - COLLECTION ERROR
'LAB ' - LAB ERROR | 'QUAL' - QUALITY ASSURANCE | 'CALB' - CALIBRATION | 'WAIV' - MONITORING WAIVED
'*** ' - NOT ENOUGH READINGS | ' ' - NUL VALUE

3hr ~ .009

BEST AVAILABLE COPY

ATE: FLORIDA (10) AQDHS-II AIR QU / DATA REPORT DISPLAY N (9999 PAGE 20

AQCR: 000 AGENCY(J): PRIVATE
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED
AREA: 3420 PARM(42401): SULFUR DIOXIDE
SITE: 017 UNITS(07): PARTS PER MILLION
YEAR: 1991 MONTH(07): JULY
LOCALE: FLORIDA CELERY EXCHANGE BELLE GLADE

COLLECT METH: INSTRUMENTAL
ANALYSIS METH: PULSED FLUORSCENCE
SAMPLING INTR: 01 HOURS
SAROAD KEY: 10/3420/017/J/01
MINIMUM DETEC: 00000+

SLAMS/NAMS(0):
RPT AGNCY/SMSA: 0000
UTM ZONE: 17
UTM EASTING: 000535
TIME ZONE(07): EASTERN

PRIMARY SECONDARY
FEDERAL STANDARD SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01																									
02																									
03																									
04																									
05																									
06																									
07																									
08																									
09																									
10																									
11																									
12																									
13																									
14																									
15																									
16																									
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									
25									CALB	CALB	CALB	CALB													
26									WTHR														CALB		
27										WTHR													CALB		
28											WTHR												CALB		
29																							CALB		
30																							CALB		
31																							CALB		
NO																									0
MEAN																									.000
MAX																									.999

'MALF' - MACHINE MALFUNCTION 'WTHR' - BAD WEATHER 'VAND' - VANDALISM 'COLL' - COLLECTION ERROR
'LAB ' - LAB ERROR 'QUAL' - QUALITY ASSURANCE 'CALB' - CALIBRATION 'WAIV' - MONITORING WAIVED
'*** ' - NOT ENOUGH READINGS ' ' - NUL VALUE

STATE: FLORIDA (10) AUDHS-II ([illegible] QUALITY DATA REPORT DISPLAY N (5939 PA[illegible]

AQCR: 000 AGENCY(J): PRIVATE
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED
AREA: 3420 PARM(42401): SULFUR DIOXIDE
SITE: 017 UNITS(07): PARTS PER MILLION
YEAR: 1991 MONTH(08): AUGUST
LOCALE: FLORIDA CELERY EXCHANGE BELLE GLADE

[illegible]LECT METH: INSTRUMENTAL
ANALYSIS METH: PULSED FLUORSCENCE
SAMPLING INTR: 01 HOURS
SAROAD KEY: 10/3420/017/J/01
MINIMUM DETEC: 00000+

SLAMS/NAMS(0):
RPT AGNCY/SMSA: 0000
UTM ZONE: 17
UTM EASTING: 000535
TIME ZONE(07): EASTERN

PRIMARY
FEDERAL STANDARD

SECONDARY
SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01										WTHR	WTHR	WTHR											CALB		
02																							CALB		
03																							CALB		
04																							CALB		
05																							CALB		
06																							CALB		
07																	.001	.002	.002	.001	.002	.001	.001	.002	.002
08	.001	.001	.002	.002	.001	.002	.001	.001	.002	.002	.002	.002	.001	.001	.002	.001	.001	.002	.001	.001	.001	.001	.001	.000	.001
09	.000	.001	.000	.001	.000	.000	.000	.001	.001	.002	.002	.002	.002	.002	.001	.002	.002	.002	.002	.001	.001	.000	CALB	.000	.001
10	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.002	.002	.002	.002	.002	.000	.000	.001	.001	.001	.001	.001	CALB	.001	.001
11	.000	.000	.001	.000	.001	.000	.000	.001	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.001	.001	.001	CALB	.000	.001
12	.001	.001	.001	.000	.000	.001	.000	.001	.002	.002	.002	.002	.001	.002	.001	.002	.001	.003	.002	.001	.000	.000	CALB	.000	.001
13	.000	.000	.000	.000	.000	.000	.000	.001	.002	.002	.001	.000	.001	.001	.001	.002	.003	.004	.003	.002	.001	.002	CALB	.000	.001
14	.000	.001	.000	.000	.000	.000	.000	.000	.001	.003	.002	.002	.002	.002	.001	.001	.001	.001	.002	.001	.000	.000	CALB	.000	.001
15	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.001	.001	.001	.000	.000	.001	.002	.002	.001	.000	.000	.000	CALB	.000	.000
16	.000	.000	.000	.000	.000	.000	.000	.000	.003	.005	.005	.004	.004	.003	.003	.003	.002	.003	.003	.002	.002	.001	CALB	.000	.002
17	.001	.000	.001	.000	.002	.001	.000	.001	.001	.002	.002	.002	.003	.003	.002	.002	.001	.002	.002	.002	.001	.002	CALB	.001	.001
18	.001	.001	.000	.001	.001	.000	.001	.001	.002	.002	.002	.003	.002	.002	.002	.001	.001	.001	.001	.000	.001	.000	CALB	.000	.001
19	.000	.000	.000	.000	.000	.000	.000	.000	.001	.002	.003	.001	.002	.002	.001	.001	.002	.002	.002	.001	.001	.001	CALB	.001	.001
20	.000	.001	.000	.000	.000	.000	.000	.001	.001	.001	.002	.001	.001	.002	.002	.002	.002	.002	.001	.000	.001	.000	CALB	.000	.001
21	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.001	.002	.001	.001	.001	.001	.001	.001	.000	.000	.000	CALB	.000	.000
22	.000	.000	.000	.000	.000	.000	.000	.000	.000	.002	.001	.001	.001	.001	.001	.000	.000	.000	.000	.000	.000	.000	CALB	.000	.000
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
NO	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	16	16	16	16	16	16	2	16	354
MEAN	.000	.000	.000	.000	.000	.000	.000	.001	.001	.002	.002	.002	.002	.002	.001	.001	.001	.002	.002	.001	.001	.001	.001	.000	.001
MAX	.001	.001	.002	.002	.002	.002	.001	.001	.003	.005	.005	.004	.004	.003	.003	.003	.003	.004	.003	.002	.002	.002	.001	.002	.005

'MALF' - MACHINE MALFUNCTION 'WTHR' - BAD WEATHER 'VAND' - VANDALISM 'COLL' - COLLECTION ERROR
'LAB ' - LAB ERROR 'QUAL' - QUALITY ASSURANCE 'CALB' - CALIBRATION 'WAIV' - MONITORING WAIVED
'*** ' - NOT ENOUGH READINGS ' ' - NUL VALUE

3hr-.005

STATE: FLORIDA (10) AQDHS-II AIR QUALITY DATA REPORT DISPLAY N (9999 PAGE 22

AQCR: 000 AGENCY(J): PRIVATE
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED
AREA: 3420 PARM(42401): SULFUR DIOXIDE
SITE: 017 UNITS(07): PARTS PER MILLION
YEAR: 1991 MONTH(09): SEPTEMBER
LOCALE: FLORIDA CELERY EXCHANGE BELLE GLADE

COLLECT METH: INSTRUMENTAL
ANALYSIS METH: PULSED FLUORSCENCE
SAMPLING INTR: 01 HOURS
SAROAD KEY: 10/3420/017/J/01
MINIMUM DETEC: 00000+

SLAMS/NAMS(0):
RPT AGNCY/SMSA: 0000
UTM ZONE: 17
UTM EASTING: 000535
TIME ZONE(07): EASTERN

PRIMARY SECONDARY
FEDERAL STANDARD SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01																									
02																									
03																									
04																									
05																									
06																									
07																									
08																									
09																									
10																									
11																									
12																									
13																									
14																									
15																									
16																									
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
NO																									0
MEAN																									.000
MAX																									.999-

'MALF' - MACHINE MALFUNCTION 'WTHR' - BAD WEATHER 'VAND' - VANDALISM 'COLL' - COLLECTION ERROR
'LAB ' - LAB ERROR 'QUAL' - QUALITY ASSURANCE 'CALB' - CALIBRATION 'WAIV' - MONITORING WAIVED
'*** ' - NOT ENOUGH READINGS ' ' - NUL VALUE

STATE: FLORIDA (10) AQDHS-11 A UALITY DATA REPORT DISPLAY N (9999 PAGE

ADCR: 000 AGENCY(J): PRIVATE
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED
AREA: 3420 PARM(42401): SULFUR DIOXIDE
SITE: 017 UNITS(07): PARTS PER MILLION
YEAR: 1991 MONTH(10): OCTOBER
LOCALE: FLORIDA CELERY EXCHANGE BELLE GLADE

ECT METH: INSTRUMENTAL
ANALYSIS METH: PULSED FLUORSCENCE
SAMPLING INTR: 01 HOURS
SAROAD KEY: 10/3420/017/J/01
MINIMUM DETEC: 00000+

SLAMS/NAMS(0):
RPT AGNCY/SMSA: 0000
UTM ZONE: 17
UTM EASTING: 000535
TIME ZONE(07): EASTERN

PRIMARY
FEDERAL STANDARD

SECONDARY
SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01																									
02																									
03																									
04																									
05																									
06																									
07	MALF	MALF																							
08																									
09																									
10																									
11																									
12																									
13																									
14																									
15			MALF																						
16			MALF																						
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									
25																									
26																									
27															MALF										
28																									
29																									
30																									
31															MALF										
NO																									0
MEAN																									.000
MAX																									.999-

'MALF' - MACHINE MALFUNCTION 'WTHR' - BAD WEATHER 'VAND' - VANDALISM 'COLL' - COLLECTION ERROR
'LAB ' - LAB ERROR 'QUAL' - QUALITY ASSURANCE 'CALB' - CALIBRATION 'WAIV' - MONITORING WAIVED
'*** ' - NOT ENOUGH READINGS ' ' - NUL VALUE

AQCR: 000 AGENCY(J): PRIVATE
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED
AREA: 3420 PARM(42401): SULFUR DIOXIDE
SITE: 017 UNITS(07): PARTS PER MILLION
YEAR: 1991 MONTH(11): NOVEMBER
LOCALE: FLORIDA CELERY EXCHANGE BELLE GLADE

COLLECT METH: INSTRUMENTAL
ANALYSIS METH: PULSED FLUORSCENCE
SAMPLING INTR: 01 HOURS
SAROAD KEY: 10/3420/017/J/01
MINIMUM DETEC: 00000+

SLAMS/NAMS(0):
RPT AGNCY/SMSA: 0000
UTM ZONE: 17
UTM EASTING: 000535
TIME ZONE(07): EASTERN

PRIMARY
FEDERAL STANDARD

SECONDARY
SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01															MALF										
02																									
03																									
04																									
05																									
06																									
07																MALF									
08																									
09																									
10																									
11						MALF																			
12																									
13															MALF										
14																									
15																									
16																									
17																									
18																									
19												MALF													
20								MALF																	
21																									
22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30	MALF																								
NO																									0
MEAN																									.000
MAX																									.939-

'MALF' - MACHINE MALFUNCTION 'WTHR' - BAD WEATHER 'VAND' - VANDALISM 'COLL' - COLLECTION ERROR
'LAB ' - LAB ERROR 'QUAL' - QUALITY ASSURANCE 'CALB' - CALIBRATION 'WAIV' - MONITORING WAIVED
'*** ' - NOT ENOUGH READINGS ' ' - NUL VALUE

References

1. HRS Palm Beach County Public Health Unit, "Annual Air Monitoring Report, 1990, 1991.

2. Florida Department of Environmental Regulation, "AllSUM Reports", 1989, 1990, 1991.

ATTACHMENT J

Application to Operate/Construct Air Pollution Sources

BEST AVAILABLE COPY

Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

AC 26-238006
PSD-FL-208

Carol M. Browner, Secretary

$7500 pd.
9-17-93
Recpt.#180874

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Bagasse/Oil-Fired Boiler [X] New[1] [ ] Existing[1]

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

COMPANY NAME: U. S. Sugar Corporation, Clewiston Mill COUNTY: Hendry

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Boiler No. 7

SOURCE LOCATION: Street W. C. Owens Avenue and Clewiston Street City Clewiston

UTM: East 506.1 North 2956.9

Latitude 26 ° 44 ' 05 "N Longitude 80 ° 56 ' 20 "W

APPLICANT NAME AND TITLE: Murray T. Brinson, Vice President, Sugar Processing

APPLICANT ADDRESS: P.O. Drawer 1207, Clewiston, Florida 33440

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of U.S. Sugar Corporation

I certify that the statements made in this application for a Construction 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: Murray T. Brinson

Murray T. Brinson, Vice President, Sugar Process
Name and Title (Please Type)

Date: 9-16-93 Telephone No. 813/983-8121

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, th

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

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 Peter J. Kroll

Peter Kroll
Name (Please Type)

ICF Kaiser Engineers, Inc.
Company Name (Please Type)

4 Gateway Center; Pittsburgh, PA 15222-1207
Mailing Address (Please Type)

Florida Registration No. PE0046447 Date: Feb. 26, 1993 Telephone No. 412/497-2024

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 PSD Report

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

Start of Construction February 1994* Completion of Construction January 1995*

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.)

Spray Impingement Scrubber: $570,000

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

See PSD Report for permits for existing boilers

*Assumes permit to construct issed in January 1994

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 52

if power plant, hrs/yr ____; if seasonal, describe: ____

F. 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? No

   a. If yes, has "offset" been applied? ____

   b. If yes, has "Lowest Achievable Emission Rate" been applied? ____

   c. If yes, list non-attainment pollutants. ____

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) requirement 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? Yes

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? No

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? No

   a. If yes, for what pollutants? ____

   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

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

See PSD Report for Source Applicability

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

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

Not Applicable

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% WT		

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

1. Total Process Input Rate (lbs/hr): 738 MM Btu/hr on bagasse or bagasse/oil
255 MM Btu/hr maximum from oil

2. Product Weight (lbs/hr): 350,000 lb/hr Steam

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lb/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lb/hr	Actual T/yr			lb/hr	T/yr	
Particulates	111	313	0.2 lb/10^6 Btu	147.6	1,440	4,346	D
Sulfur Dioxide	123	435			667	1,136	D
Nitrogen Oxides	192	721			192	721	D
Carbon Monoxide	6,644	16,575			6,644	16,575	D
Vol. Org. Comps.	157	413			157	413	D

1 See Section V, Item 2.

2 Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 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).

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

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (Iff applicable.)	Basis for Efficiency (Section V Item 5)
Spray Impingement Scrubber Joy Turbulaire	Particulate	90+%	See PSD Report	See PSD Report
Type D. Size 260 or equivalent, two in parallel	SO_2 from bagasse	75%	N/A	"

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
Bagasse		92.3 ton/hr (wet)	738
No. 6 Fuel Oil		1,700 gal/hr	255

* Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis: See PSD Report

Percent Sulfur:__________ Percent Ash:__________

Density:__________ lbs/gal Typical Percent Nitrogen:__________

Heat Capacity:__________ BTU/lb __________ BTU/gal

Other Fuel Contaminants (which may cause air pollution):__________

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

Annual Average Not Applicable Maximum Not Applicable

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

Water from Scrubbers used to sluice cane juice mud. Scrubber water discharges to holding ponds.

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

Stack Height: 225 ft. Stack Diameter: 8.63 ft.

Flow Rate: See PSD Report ACFM ______ DSCFM Gas Exit Temperature: 153 °F.

Water Vapor Content: 15-30 (vol %) % Velocity: See PSD Report FPS

SECTION IV: INCINERATOR INFORMATION

Not Applicable

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.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste ______

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

Approximate Number of Hours of Operation per day ______ day/wk ______ wks/yr. ______

Manufacturer ______

Date Constructed ______ Model No. ______

	Volume (ft)^3	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
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: ______________

____

____

____

____

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

____

____

____

____

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS **See PSD Report**

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]

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, design pressure drop, 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 8 1/2" 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 8 1/2" 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 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

9. The appropriate application fee in accordance with Rule 17-4.05. 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?

[X] Yes [ ] No **For oil firing**

Contaminant	Rate of Concentration
Particulate	0.1 lb/MM Btu
SO_2	0.5 lb/MM Btu or low-sulfur oil
NO_x	0.3 - 0.4 lb/MM Btu or low-nitrogen oil

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy.)

[X] Yes [ ] No **For oil firing**

Contaminant	Rate of Concentration
Particulate	0.1 lb/MM Btu
SO_2	0.5% sulfur oil (very low sulfur oil)
NO_x	Low-NO_x burners

C. What emission levels do you propose as best available control technology?

Contaminant	Rate of Concentration
Particulate - bagasse / oil	0.15 lb/MM Btu / 0.1 lb/MM Btu
Sulfur dioxide - bagasse / oil	0.1667 lb/MM Btu / 0.5% S oil
NOx-bagasse/oil	0.26 lb/MM Btu / 0.3% N oil
Other pollutants	Maximum emission rate shown in Section III.C

D. Describe the existing control and treatment technology (if any). See PSD Report

1. Control Device/System:
2. Operating
3. Efficiency:*
4. Capital Costs:

* Explain method of determining.

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft.

b. Diameter: ft.

c. Flow Rate: ACFM

d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary). **See PSD Report**

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

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:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

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:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

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: **See PSD Report**

1. Control Device:
2. Efficiency:[1]
3. Capital Cost:
4. Useful Life:
5. Operating Cost:
6. Energy:[2]
7. Maintenance Cost:
8. Manufacturer:
9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1]Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data

1. FSCL no. sites 11 TSP 1 ( ) SO^2* ______ Wind spd/dir

Period of Monitoring 1 / 1 / 89 to 12 / 30 / 91
month day year month day year

Other data recorded ______

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [X] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[X] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

1. 5 Year(s) of data from 1 / 1 / 85 to 12 / 31/ 89
month day year month day year

2. Surface data obtained from (location)_____

3. Upper air (mixing height) data obtained from (location)_____

4. Stability wind rose (STAR) data obtained from (location)_____

C. Computer Models Used

1. Industrial Source Complex 2 Modified? If yes, attach description.

2. _____ 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	See PSD Report	grams/sec
SO^2	See PSD Report	grams/sec

E. Emission Data Used in Modeling See PSD Report

Attach list of emission sources. Emission data required is source name, description of 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

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 PSD Report

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 attached supportive information.

ATTACHMENT K

List of Dispersion Modeling Input Files

U.S. SUGAR DISPERSION MODELING INPUT DISK DIRECTORY

1.0 Meteorological Data

Meteorological data used in the ISCST2 model to determine air quality impacts consisted of a concurrent 5-year period (from 1985 through 1989) of hourly surface-weather observations and twice-daily upper-air soundings from the National Weather Service (NWS) station at West Palm Beach. The surface observations included wind direction, wind speed, temperature, cloud cover, and cloud ceiling.

Sequential hourly data bases were computed for each year by using EPA's randomized meteorological (RAMMET) preprocessor program. RAMMET estimates atmospheric stability from wind speed, cloud cover, and cloud ceiling values, and estimates mixing heights using the Holzworth approach. RAMMET also randomizes the observed wind directions, which are rounded to the nearest tenth degree by the NWS, in an effort to account for expected variablity in the actual wind field.

Mixing height data files

- 12844-85.DAT
- 12844-86.DAT
- 12844-87.DAT
- 12844-88.DAT
- 12844-89.DAT

Surface weather data files

- S85.DAT
- S86.DAT
- S87.DAT
- S88.DAT
- S89.DAT

2.0 Significant Impact Analysis

As discussed in Section 6.9.1, modeling was conducted to define the significant impact area for CO, NO_2, PM10 and SO_2 for the years 1985-1989, and the input data files are as follows:

CO 1-hour/8-hour

- SIG2CO.D85
- SIG2CO.D86
- SIG2CO.D87
- SIG2CO.D88
- SIG2CO.D89

NO_2 Annual

- SIG2NOAN.D85
- SIG2NOAN.D86
- SIG2NOAN.D87
- SIG2NOAN.D88
- SIG2NOAN.D89

PM10 24-hour
- SIG2PM24.D85
- SIG2PM24.D86
- SIG2PM24.D87
- SIG2PM24.D88
- SIG2PM24.D89

PM10 Annual
- SIG2PMAN.D85
- SIG2PMAN.D86
- SIG2PMAN.D87
- SIG2PMAN.D88
- SIG2PMAN.D89

SO_2 3-hour
- SIG2SO03.D85
- SIG2SO03.D86
- SIG2SO03.D87
- SIG2SO03.D88
- SIG2SO03.D89

SO_2 24-hour
- SIG2SO24.D85
- SIG2SO24.D86
- SIG2SO24.D87
- SIG2SO24.D88
- SIG2SO24.D89

SO_2 Annual
- SIG2SOAN.D85
- SIG2SOAN.D86
- SIG2SOAN.D87
- SIG2SOAN.D88
- SIG2SOAN.D89

3.0 PSD Class I Analysis

As discussed in Section 6.9.4, modeling was conducted to define the impact on Class I areas for NO_2, PM10 and SO_2 for the years 1985-1989, and the input data files are as follows:

3.1 Crop Season

NO_2 Annual
- CPS2NO.D85
- CPS2NO.D86
- CPS2NO.D87

- CPS2NO.D88
- CPS2NO.D89

PM10 24-hour
- CPS2PM24.D85
- CPS2PM24.D86
- CPS2PM24.D87
- CPS2PM24.D88
- CPS2PM24.D89

PM10 Annual
- CPS2PMAN.D85
- CPS2PMAN.D86
- CPS2PMAN.D87
- CPS2PMAN.D88
- CPS2PMAN.D89

SO_2 3-hour
- CPS2SO03.D85
- CPS2SO03.D86
- CPS2SO03.D87
- CPS2SO03.D88
- CPS2SO03.D89

SO_2 24-hour
- CPS2SO24.D85
- CPS2SO24.D86
- CPS2SO24.D87
- CPS2SO24.D88
- CPS2SO24.D89

SO_2 Annual
- CPS2SOAN.D85
- CPS2SOAN.D86
- CPS2SOAN.D87
- CPS2SOAN.D88
- CPS2SOAN.D89

3.2 Off-season

Note that the annual impact modeling was done under "crop season" above, so the off-season modeling runs were only for short-term impacts.

PM10 24-hour
- OPS2PM24.D85
- OPS2PM24.D86
- OPS2PM24.D87

- OPS2PM24.D88
- OPS2PM24.D89

SO_2 3-hour
- OPS2SO03.D85
- OPS2SO03.D86
- OPS2SO03.D87
- OPS2SO03.D88
- OPS2SO03.D89

SO_2 24-hour
- OPS2SO24.D85
- OPS2SO24.D86
- OPS2SO24.D87
- OPS2SO24.D88
- OPS2SO24.D89

4.0 Preconstruction Monitoring Runs

As discussed in Section 4, modeling was conducted to demonstrate that CO and NO_2 does not exceed the established *de minimus* ambient impacts, and the input data files for the years 1985-1989 are as follows:

CO: Crop Season
- CPC2CO.D85
- CPC2CO.D86
- CPC2CO.D87
- CPC2CO.D88
- CPC2CO.D89

CO: Off-season
- OPC2CO.D85
- OPC2CO.D86
- OPC2CO.D87
- OPC2CO.D88
- OPC2CO.D89

NO
- CPC2NO.D85
- CPC2NO.D86
- CPC2NO.D87
- CPC2NO.D88
- CPC2NO.D89

5.0 AAQS and PSD Class II Impact Analysis Runs

As discussed in Section 6.9.2, modeling was conducted to define the impact on AAQS for CO, NO_2, PM10, SO_2, and air toxics for the years 1985-1989. The same input data files were also used for PSD Class II impact analysis for NO_2, PM10/PM(TSP) and SO_2, as discussed in Section 6.9.3. The input files are as follows:

5.1 Crop Season

CO 1-hour/8-hour
- CRF2CO.D85
- CRF2CO.D86
- CRF2CO.D87
- CRF2CO.D88
- CRF2CO.D89

NO_2 Annual
- CRF2NO.D85
- CRF2NO.D86
- CRF2NO.D87
- CRF2NO.D88
- CRF2NO.D89

PM10 24-hour
- CRF2PM24.D85
- CRF2PM24.D86
- CRF2PM24.D87
- CRF2PM24.D88
- CRF2PM24.D89

PM10 Annual
- CRF2PMAN.D85
- CRF2PMAN.D86
- CRF2PMAN.D87
- CRF2PMAN.D88
- CRF2PMAN.D89

SO_2 3-hour
- CRF2SO03.D85
- CRF2SO03.D86
- CRF2SO03.D87
- CRF2SO03.D88
- CRF2SO03.D89

SO_2 24-hour
- CRF2SO24.D85
- CRF2SO24.D86

- CRF2SO24.D87
- CRF2SO24.D88
- CRF2SO24.D89

SO_2 Annual
- CRF2SOAN.D85
- CRF2SOAN.D86
- CRF2SOAN.D87
- CRF2SOAN.D88
- CRF2SOAN.D89

Toxics 8-hour
- CRF2TX08.D85
- CRF2TX08.D86
- CRF2TX08.D87
- CRF2TX08.D88
- CRF2TX08.D89

Toxics 24-hour
- CRF2TX24.D85
- CRF2TX24.D86
- CRF2TX24.D87
- CRF2TX24.D88
- CRF2TX24.D89

Toxics Annual
- CRF2TXAN.D85
- CRF2TXAN.D86
- CRF2TXAN.D87
- CRF2TXAN.D88
- CRF2TXAN.D89

5.2 Off-season

CO 1-hour/8-hour
- ORF2CO.D85
- ORF2CO.D86
- ORF2CO.D87
- ORF2CO.D88
- ORF2CO.D89

PM10 24-hour
- ORF2PM24.D85
- ORF2PM24.D86
- ORF2PM24.D87
- ORF2PM24.D88
- ORF2PM24.D89

SO_2 3-hour
- ORF2SO03.D85
- ORF2SO03.D86
- ORF2SO03.D87
- ORF2SO03.D88
- ORF2SO03.D89

SO_2 24-hour
- ORF2SO24.D85
- ORF2SO24.D86
- ORF2SO24.D87
- ORF2SO24.D88
- ORF2SO24.D89

Toxics 8-hour
- ORF2TX08.D85
- ORF2TX08.D86
- ORF2TX08.D87
- ORF2TX08.D88
- ORF2TX08.D89

Toxics 24-hour
- ORF2TX24.D85
- ORF2TX24.D86
- ORF2TX24.D87
- ORF2TX24.D88
- ORF2TX24.D89

6.0 VOC/Ozone Impact Analysis Runs

As discussed in Section 6.9.6, modeling was conducted to define the impact of VOC emissions during the off-season (the high ozone season) for the years 1985-1989, and the input data files are as follows:

- ORF2VOC.D85
- ORF2VOC.D86
- ORF2VOC.D87
- ORF2VOC.D88
- ORF2VOC.D89

ATTACHMENT L

List of Dispersion Modeling Output Files

1.0 Significant Impact Analysis

As discussed in Section 6.9.1, modeling was conducted to define the significant impact area for CO, NO_2, PM10 and SO_2 for the years 1985-1989, and the output files are as follows:

CO 1-hour/8-hour
- SIG2CO.L85
- SIG2CO.L86
- SIG2CO.L87
- SIG2CO.L88
- SIG2CO.L89

NO_2 Annual
- SIG2NOAN.L85
- SIG2NOAN.L86
- SIG2NOAN.L87
- SIG2NOAN.L88
- SIG2NOAN.L89

PM10 24-hour
- SIG2PM24.L85
- SIG2PM24.L86
- SIG2PM24.L87
- SIG2PM24.L88
- SIG2PM24.L89

PM10 Annual
- SIG2PMAN.L85
- SIG2PMAN.L86
- SIG2PMAN.L87
- SIG2PMAN.L88
- SIG2PMAN.L89

SO_2 3-hour
- SIG2SO03.L85
- SIG2SO03.L86
- SIG2SO03.L87
- SIG2SO03.L88
- SIG2SO03.L89

SO_2 24-hour
- SIG2SO24.L85
- SIG2SO24.L86
- SIG2SO24.L87
- SIG2SO24.L88
- SIG2SO24.L89

SO_2 Annual
- SIG2SOAN.L85
- SIG2SOAN.L86
- SIG2SOAN.L87
- SIG2SOAN.L88
- SIG2SOAN.L89

2.0 PSD Class I Analysis

As discussed in Section 6.9.4, modeling was conducted to define the impact on Class I areas for NO_2, PM10 and SO_2 for the years 1985-1989, and the output files are as follows:

2.1 Crop Season

NO_2 Annual
- CPS2NO.L85
- CPS2NO.L86
- CPS2NO.L87
- CPS2NO.L88
- CPS2NO.L89

PM10 24-hour
- CPS2PM24.L85
- CPS2PM24.L86
- CPS2PM24.L87
- CPS2PM24.L88
- CPS2PM24.L89

PM10 Annual
- CPS2PMAN.L85
- CPS2PMAN.L86
- CPS2PMAN.L87
- CPS2PMAN.L88
- CPS2PMAN.L89

SO_2 3-hour
- CPS2SO03.L85
- CPS2SO03.L86
- CPS2SO03.L87
- CPS2SO03.L88
- CPS2SO03.L89

SO_2 24-hour
- CPS2SO24.L85
- CPS2SO24.L86
- CPS2SO24.L87

- CPS2SO24.L88
- CPS2SO24.L89

SO_2 Annual
- CPS2SOAN.L85
- CPS2SOAN.L86
- CPS2SOAN.L87
- CPS2SOAN.L88
- CPS2SOAN.L89

2.2 Off-season

Note that the annual impact modeling was done under "crop season" above, so the off-season modeling runs were only for short-term impacts.

PM10 24-hour
- OPS2PM24.L85
- OPS2PM24.L86
- OPS2PM24.L87
- OPS2PM24.L88
- OPS2PM24.L89

SO_2 3-hour
- OPS2SO03.L85
- OPS2SO03.L86
- OPS2SO03.L87
- OPS2SO03.L88
- OPS2SO03.L89

SO_2 24-hour
- OPS2SO24.L85
- OPS2SO24.L86
- OPS2SO24.L87
- OPS2SO24.L88
- OPS2SO24.L89

3.0 Preconstruction Monitoring Runs

As discussed in Section 4, modeling was conducted to demonstrate that CO and NO_2 does not exceed the established *de minimus* ambient impacts, and the output files for the years 1985-1989 are as follows:

CO: Crop Season
- CPC2CO.L85
- CPC2CO.L86
- CPC2CO.L87
- CPC2CO.L88

- CPC2CO.L89

CO: Off-season
- OPC2CO.L85
- OPC2CO.L86
- OPC2CO.L87
- OPC2CO.L88
- OPC2CO.L89

NO
- CPC2NO.L85
- CPC2NO.L86
- CPC2NO.L87
- CPC2NO.L88
- CPC2NO.L89

4.0 AAQS and PSD Class II Impact Analysis Runs

As discussed in Section 6.9.2, modeling was conducted to define the impact on AAQS for CO, NO_2, PM10, SO_2, and air toxics for the years 1985-1989. The same input data files were also used for PSD Class II impact analysis for NO_2, PM10/PM(TSP) and SO_2, as discussed in Section 6.9.3. The output files are as follows:

4.1 Crop Season

CO 1-hour/8-hour
- CRF2CO.L85
- CRF2CO.L86
- CRF2CO.L87
- CRF2CO.L88
- CRF2CO.L89

NO_2 Annual
- CRF2NO.L85
- CRF2NO.L86
- CRF2NO.L87
- CRF2NO.L88
- CRF2NO.L89

PM10 24-hour
- CRF2PM24.L85
- CRF2PM24.L86
- CRF2PM24.L87
- CRF2PM24.L88
- CRF2PM24.L89

PM10 Annual
- CRF2PMAN.L85
- CRF2PMAN.L86
- CRF2PMAN.L87
- CRF2PMAN.L88
- CRF2PMAN.L89

SO_2 3-hour
- CRF2SO03.L85
- CRF2SO03.L86
- CRF2SO03.L87
- CRF2SO03.L88
- CRF2SO03.L89

SO_2 24-hour
- CRF2SO24.L85
- CRF2SO24.L86
- CRF2SO24.L87
- CRF2SO24.L88
- CRF2SO24.L89

SO_2 Annual
- CRF2SOAN.L85
- CRF2SOAN.L86
- CRF2SOAN.L87
- CRF2SOAN.L88
- CRF2SOAN.L89

Toxics 8-hour
- CRF2TX08.L85
- CRF2TX08.L86
- CRF2TX08.L87
- CRF2TX08.L88
- CRF2TX08.L89

Toxics 24-hour
- CRF2TX24.L85
- CRF2TX24.L86
- CRF2TX24.L87
- CRF2TX24.L88
- CRF2TX24.L89

Toxics Annual
- CRF2TXAN.L85
- CRF2TXAN.L86
- CRF2TXAN.L87
- CRF2TXAN.L88

- CRF2TXAN.L89

4.2 Off-season

CO 1-hour/8-hour
- ORF2CO.L85
- ORF2CO.L86
- ORF2CO.L87
- ORF2CO.L88
- ORF2CO.L89

PM10 24-hour
- ORF2PM24.L85
- ORF2PM24.L86
- ORF2PM24.L87
- ORF2PM24.L88
- ORF2PM24.L89

SO_2 3-hour
- ORF2SO03.L85
- ORF2SO03.L86
- ORF2SO03.L87
- ORF2SO03.L88
- ORF2SO03.L89

SO_2 24-hour
- ORF2SO24.L85
- ORF2SO24.L86
- ORF2SO24.L87
- ORF2SO24.L88
- ORF2SO24.L89

Toxics 8-hour
- ORF2TX08.L85
- ORF2TX08.L86
- ORF2TX08.L87
- ORF2TX08.L88
- ORF2TX08.L89

Toxics 24-hour
- ORF2TX24.L85
- ORF2TX24.L86
- ORF2TX24.L87
- ORF2TX24.L88
- ORF2TX24.L89

5.0 VOC/Ozone Impact Analysis Runs

As discussed in Section 6.9.6, modeling was conducted to define the impact of VOC emissions during the off-season (the high ozone season) for the years 1985-1989, and the output files are as follows:

- ORF2VOC.L85
- ORF2VOC.L86
- ORF2VOC.L87
- ORF2VOC.L88
- ORF2VOC.L89

ATTACHMENT M

GEP Stack Height Calculation Output

GEP Table
ICF Kaiser Engineers

Input Data

Date:	6-8-1993
Model:	ISCST2
Wake Area Section Option:	Maximum of all directions within sector.
Wake Area Shape Option:	Building edge moved 2L upwind & 5L downwind.
Combine Structures:	Combine buildings and tanks within one "L" crosswind and 5.00 "L" upwind-downwind of each other.
Number of Buildings:	27
Number of Tanks:	6
Number of Stacks:	16
Plant Rotation Angle:	.000°

Building No. 1 Name: cblr Height: 75.00 (FT)		
Corner	**East (FT)**	**North (FT)**
1	45.00	-13.00
2	111.00	-13.00
3	111.00	-91.00
4	45.00	-91.00
5	45.00	-13.00

Building No. 2 Name: ablr Height: 66.00 (FT)		
Corner	**East (FT)**	**North (FT)**
1	177.00	15.00
2	292.00	15.00
3	292.00	-88.00
4	177.00	-88.00
5	177.00	15.00

Building No. 3 Name: bblr Height: 56.00 (FT)		
Corner	**East (FT)**	**North (FT)**
1	45.00	-13.00
2	111.00	-13.00
3	111.00	23.00
4	177.00	23.00
5	177.00	15.00
6	292.00	15.00
7	292.00	-88.00
8	177.00	-88.00
9	177.00	-95.00
10	111.00	-95.00
11	111.00	-91.00
12	45.00	-91.00
13	45.00	13.00

Building No. 4 Name: dblr Height: 51.00 (FT)		
Corner	**East (FT)**	**North (FT)**
1	-23.00	-13.00
2	111.00	-13.00
3	111.00	23.00
4	177.00	23.00
5	177.00	15.00
6	292.00	15.00
7	292.00	-88.00
8	177.00	-88.00
9	177.00	-95.00

Building No. 4 Name: dblr Height: 51.00 (FT)		
Corner	**East (FT)**	**North (FT)**
10	111.00	-95.00
11	111.00	-91.00
12	-23.00	-91.00
13	-23.00	-13.00

Building No. 5 Name: hse Height: 34.00 (FT)		
Corner	**East (FT)**	**North (FT)**
1	-23.00	-13.00
2	111.00	-13.00
3	111.00	23.00
4	177.00	23.00
5	177.00	15.00
6	292.00	15.00
7	292.00	-23.00
8	411.00	-23.00
9	411.00	-79.00
10	372.00	-79.00
11	372.00	-88.00
12	333.00	-88.00
13	333.00	-69.00
14	292.00	-69.00
15	292.00	-88.00
16	177.00	-88.00
17	177.00	-95.00
18	111.00	-95.00

Building No. 5 Name: hse Height: 34.00 (FT)		
Corner	East (FT)	North (FT)
19	111.00	-91.00
20	-23.00	-91.00
21	-23.00	-13.00

Building No. 6 Name: aplt Height: 51.00 (FT)		
Corner	East (FT)	North (FT)
1	-8.00	153.00
2	45.00	153.00
3	45.00	98.00
4	-8.00	98.00
5	-8.00	153.00

Building No. 7 Name: bplt Height: 34.83 (FT)		
Corner	East (FT)	North (FT)
1	-8.00	153.00
2	45.00	153.00
3	45.00	40.00
4	-8.00	40.00
5	-8.00	153.00

Building No. 8 Name: cplt Height: 22.00 (FT)		
Corner	**East (FT)**	**North (FT)**
1	-8.00	153.00
2	45.00	153.00
3	45.00	-91.00
4	-23.00	91.00
5	-23.00	40.00
6	-8.00	40.00
7	-8.00	153.00

Building No. 9 Name: carpenter Height: 24.00 (FT)		
Corner	**East (FT)**	**North (FT)**
1	74.00	159.00
2	138.00	159.00
3	138.00	103.00
4	74.00	103.00
5	74.00	159.00

Building No. 10 Name: office Height: 15.00 (FT)		
Corner	**East (FT)**	**North (FT)**
1	427.00	23.00
2	486.00	23.00
3	486.00	-57.00
4	427.00	-57.00
5	427.00	23.00

Building No. 11 Name: whse Height: 46.00 (FT)		
Corner	**East (FT)**	**North (FT)**
1	-605.00	212.00
2	-78.00	212.00
3	-78.00	107.00
4	-605.00	107.00
5	-605.00	212.00

Buildin No. 12 Name: ship Height: 24.00 (FT)		
Corner	**East (FT)**	**North (FT)**
1	-605.00	212.00
2	-78.00	212.00
3	-78.00	107.00
4	-180.00	107.00
5	-180.00	74.00
6	-342.00	74.00
7	-342.00	107.00
8	-605.00	107.00
9	-605.00	212.00

Building No. 13 Name: unkn Height: 21.00 (FT)		
Corner	**East (FT)**	**North (FT)**
1	-176.00	-4.00
2	-126.00	-4.00
3	-126.00	-45.00
4	-176.00	-45.00
5	-176.00	-4.00

Building No. 14 Name: locomotive Height: 20.00 (FT)		
Corner	**East (FT)**	**North (FT)**
1	-61.00	-351.00
2	49.00	-351.00
3	49.00	-394.00
4	-61.00	-394.00
5	-61.00	-351.00

Building No. 15 Name: shop Height: 39.00 (FT)		
Corner	**East (FT)**	**North (FT)**
1	-164.00	-276.00
2	20.00	-276.00
3	20.00	-235.00
4	145.00	-235.00
5	145.00	-341.00
6	-164.00	-341.00
7	-164.00	-276.00

Building No. 16 Name: m-17 Height: 37.00 (FT)		
Corner	**East (FT)**	**North (FT)**
1	-20.00	-119.00
2	133.00	-119.00
3	133.00	-176.00
4	83.00	-176.00
5	83.00	-190.00
6	-20.00	-190.00
7	-20.00	-119.00

Building No. 17 Name: emill Height: 90.00 (FT)		
Corner	**East (FT)**	**North (FT)**
1	303.00	-176.00
2	458.00	-176.00
3	458.00	-357.00
4	393.00	-357.0
5	393.00	-335.00
6	389.00	-335.00
7	389.00	-313.00
8	303.00	-313.00
9	303.00	-176.00

Building No. 18 Name: fmill Height: 85.00 (FT)		
Corner	East (FT)	North (FT)
1	315.00	-198.00
2	458.00	-198.00
3	458.00	-219.00
4	315.00	-219.00
5	315.00	-198.00

Building No. 19 Name: amill Height: 66.75 (FT)		
Corner	East (FT)	North (FT)
1	155.00	-194.00
2	236.00	-194.00
3	236.00	-372.00
4	155.00	-372.00
5	155.00	-194.00

Building No. 20 Name: imill Height: 66.67 (FT)		
Corner	East (FT)	North (FT)
1	303.00	-176.00
2	458.00	-176.00
3	458.00	-170.00
4	514.00	-170.00
5	514.00	-223.00
6	458.00	-223.00
7	458.00	-357.00

Building No. 20 Name: imill Height: 66.67 (FT)		
Corner	East (FT)	North (FT)
8	393.00	-357.00
9	393.00	-335.00
10	389.00	-355.00
11	389.00	-313.00
12	303.00	-313.00
13	303.00	-176.00

Building No. 21 Name: bmill Height: 51.00 (FT)		
Corner	East (FT)	North (FT)
1	155.00	-194.00
2	236.00	-194.00
3	236.00	-129.00
4	303.00	-129.00
5	303.00	-176.00
6	458.00	-176.00
7	458.00	-170.00
8	514.00	-170.00
9	514.00	-223.00
10	458.00	-223.00
11	548.00	-357.00
12	393.00	-357.00
13	393.00	-335.00
14	389.00	-335.00
15	389.00	-313.00
16	303.00	-313.00

Building No. 21 Name: bmill Height: 51.00 (FT)		
Corner	**East (FT)**	**North (FT)**
17	303.00	-372.00
18	155.00	-372.00
19	155.00	-194.00

Building No. 22 Name: gmill Height: 43.00 (FT)		
Corner	**East (FT)**	**North (FT)**
1	155.00	-194.00
2	236.00	-194.00
3	236.00	-129.00
4	303.00	-129.00
5	303.00	-176.00
6	458.00	-176.00
7	458.00	-170.00
8	514.00	-170.00
9	514.00	-223.00
10	458.00	-223.00
11	458.00	-357.00
12	393.00	-357.00
13	393.00	-366.00
14	303.00	-366.00
15	303.00	-372.00
16	155.00	-372.00
17	155.00	-194.00

Building No. 23 Name: hmill Height: 35.00 (FT)		
Corner	East (FT)	North (FT)
1	155.00	-194.00
2	236.00	-194.00
3	236.00	-129.00
4	303.00	-129.00
5	303.00	-176.00
6	405.00	-176.00
7	405.00	-129.00
8	458.00	-129.00
9	458.00	-170.00
10	514.00	170.00
11	514.00	223.00
12	458.00	223.00
13	458.00	376.00
14	399.00	376.00
15	399.00	357.00
16	393.00	357.00
17	393.00	366.00
18	303.00	366.00
19	303.00	372.00
20	155.00	372.00
21	155.00	194.00

Building No. 24 Name: dmill Height: 34.00 (FT)		
Corner	East (FT)	North (FT)
1	155.00	194.00
2	236.00	194.00
3	236.00	129.00
4	303.00	129.00
5	303.00	176.00
6	458.00	176.00
7	458.00	170.00
8	514.00	170.00
9	514.00	223.00
10	458.00	223.00
11	458.00	376.00
12	399.00	376.00
13	399.00	357.00
14	393.00	357.00
15	393.00	366.00
16	303.00	366.00
17	303.00	372.00
18	155.00	372.00
19	155.00	194.00

Building No. 25 Name: emill Height: 24.00 (FT)		
Corner	East (FT)	North (FT)
1	155.00	-194.00
2	236.00	-194.00
3	236.00	-129.00

Building No. 25 Name: emill Height: 24.00 (FT)		
Corner	**East (FT)**	**North (FT)**
4	458.00	-129.00
5	458.00	-170.00
6	514.00	-170.00
7	514.00	-223.00
8	458.00	-223.00
9	458.00	-376.00
10	399.00	-376.00
11	399.00	-357.00
12	393.00	-357.00
13	393.00	-366.00
14	303.00	-366.00
15	303.00	-372.00
16	155.00	-372.00
17	155.00	-194.00

Building No. 26 Name: pwr-mill Height: 56.00 (FT)		
Corner	**East (FT)**	**North (FT)**
1	333.00	-88.00
2	405.00	-88.00
3	405.00	-129.00
4	333.00	-129.00
5	333.00	-88.00

Building No. 27 Name: cane dump Height: 24.00 (FT)		
Corner	**East (FT)**	**North (FT)**
1	274.00	432.00
2	378.00	432.00
3	378.00	479.00
4	274.00	479.00
5	274.00	432.00

Tank Parameters					
Tank No.	**Tank Name**	**Height (FT)**	**Diameter (FT)**	**Center Location**	
				East (FT)	**Norht (FT)**
1	w condens	30.00	53.00	221.00	128.00
2	e condens	30.00	53.00	358.00	128.00
3	fuel oil	30.00	52.00	-139.00	-163.00
4	w molasses	30.00	106.00	-444.00	-199.00
5	c molasses	32.00	91.00	-348.00	-260.00
6	e molasses	30.00	106.00	-236.00	-282.00

Stack Parameters			
Stack No.	**Height (FT)**	**Location**	
		East (FT)	**North (FT)**
1	75.00	273.00	.00
2	75.80	233.00	.00
3	90.00	183.00	25.00
4	150.00	77.00	.00
5	68.50	155.00	25.00
6	68.50	117.00	25.00

Stack Parameters			
Stack No.	Height (FT)	Location	
		East (FT)	North (FT)
7	150.00	.00	.00
8	150.00	136.00	25.00
9	110.00	273.00	.00
10	150.00	273.00	.00
11	110.00	233.00	.00
12	150.00	233.00	.00
13	130.00	183.00	25.00
14	150.00	183.00	25.00
15	213.25	.00	.00
16	213.25	136.00	25.00

GEP Table ICF Kaiser International STACK ID 1						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
1	15.00	166.875	emill	amill	66.750	334.863
2	25.00	166.875	emill	amill	66.750.	343.498
3	28.00	166.875	emill	amill	66.750	344.057
4	35.00	166.875	emill	amill	66.750	341.696
5	50.00	187.500	cblr		75.000	102.175
6	55.00	187.500	cblr		75.000	101.750
7	65.00	187.500	cblr		75.000	98.585
8	75.00	187.500	cblr		75.000	92.424
9	89.00	187.500	cblr	emill	75.000	351.156

GEP Table ICF Kaiser International STACK ID 1						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
10	95.00	187.500	cblr	emill	75.000	318.113
11	105.00	165.000	ablr	emill	66.000	333.184
12	118.00	165.000	ablr	amill	66.000	406.018
13	125.00	165.000	ablr	amill	66.000	395.592
14	135.00	165.000	ablr	amill	66.000	370.524
15	145.00	165.000	ablr	amill	66.000	334.198
16	165.00	165.000	ablr	imill	66.000	304.293
17	168.00	225.000	emill		90.000	180.097
18	184.00	225.000	emill		90.000	167.248
19	195.00	165.000	ablr	imill	66.000	387.115
20	205.00	165.000	ablr	imill	66.000	411.886
21	215.00	165.000	ablr	imill	66.000	443.552
22	225.00	165.000	ablr	emill	66.000	461.741
23	233.00	165.000	ablr	emill	66.000	466.202
24	235.00	165.000	ablr	emill	66.000	465.900
25	245.00	165.000	ablr	emill	66.000	455.902
26	255.00	165.000	ablr	emill	66.000	432.053
27	265.00	165.000	ablr	emill	66.000	395.076
28	275.00	165.000	ablr	emill	66.000	361.782
29	285.00	165.000	ablr	emill	66.000	333.184
30	305.00	225.000	emill		90.000	201.128
31	315.00	225.000	emill		90.000	206.475
32	319.000	225.000	emill		90.000	206.860
33	325.000	225.000	emill		90.000	205.549

GEP Table ICF Kaiser International STACK ID 1						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
34	335.000	225.000	emill		90.000	198.377
35	345.000	225.000	emill		90.000	185.177
36	364.00	225.000	emill		90.000	167.248

GEP Table ICF Kaiser International STACK ID 2						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
1	15.00	166.875	emill	amill	66.750	334.863
2	25.00	166.875	emill	amill	66.750.	343.498
3	28.00	166.875	emill	amill	66.750	344.057
4	45.00	187.500	cblr		75.000	101.823
5	50.00	187.500	cblr		75.000	102.175
6	55.00	187.500	cblr		75.000	101.750
7	65.00	187.500	cblr		75.000	98.585
8	75.00	187.500	cblr		75.000	92.424
9	89.00	187.500	cblr	emill	75.000	351.156
10	95.00	187.500	cblr	emill	75.000	318.113
11	105.00	165.000	ablr	emill	66.000	333.184
12	118.00	165.000	ablr	amill	66.000	406.018
13	125.00	165.000	ablr	amill	66.000	395.592

GEP Table ICF Kaiser International STACK ID 2						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
14	135.00	165.000	ablr	amill	66.000	370.524
15	145.00	165.000	ablr	amill	66.000	334.198
16	165.00	165.000	ablr	imill	66.000	304.293
17	175.00	165.000	ablr	imill	66.000	328.571
18	185.00	165.000	ablr	imill	66.000	356.460
19	195.00	165.000	ablr	imill	66.000	387.115
20	205.00	165.000	ablr	imill	66.000	411.886
21	215.00	165.000	ablr	imill	66.000	443.552
22	223.00	187.500	cblr		75.000	101.465
23	235.00	187.500	cblr		75.000	101.750
24	235.00	187.500	cblr		75.000	101.750
25	245.00	187.500	cblr		75.000	98.585
26	255.00	187.500	cblr		75.000	92.424
27	270.00	187.500	cblr	emill	75.000	344.001
28	275.00	187.500	cblr	emill	75.000	318.114
29	285.00	165.000	ablr	emill	66.000	333.184
30	305.00	225.000	emill		90.000	201.128
31	315.00	225.000	emill		90.000	206.475
32	319.000	225.000	emill		90.000	206.860
33	325.000	225.000	emill		90.000	205.549
34	335.000	225.000	emill		90.000	198.377
35	345.000	225.000	emill		90.000	185.177
36	355.00	225.000	emill		90.000	166.351

GEP Table ICF Kaiser International STACK ID 3						
Sector No.	**Critical Flow Vector (deg)**	**GEP Stack Height (FT)**	**Controlling Structures**			
			Name-1	**Name-2**	**Height (FT)**	**Projected Width (FT)**
1	15.00	166.875	emill	amill	66.750	334.863
2	25.00	187.500	cblr		75.000	92.781
3	35.00	187.500	cblr		75.000	98.803
4	45.00	187.500	cblr		75.000	101.823
5	50.00	187.500	cblr		75.000	102.175
6	55.00	187.500	cblr		75.000	101.750
7	65.00	187.500	cblr		75.000	98.585
8	75.00	187.500	cblr		75.000	92.424
9	89.00	187.500	cblr	emill	75.000	351.156
10	95.00	165.000	ablr	emill	66.000	361.782
11	105.00	165.000	ablr	emill	66.000	333.184
12	118.00	165.000	ablr	amill	66.000	406.018
13	125.00	165.000	ablr	amill	66.000	395.592
14	135.00	165.000	ablr	amill	66.000	370.524
15	145.00	165.000	ablr	amill	66.000	334.198
16	165.00	165.000	ablr	imill	66.000	304.293
17	175.00	165.000	ablr	imill	66.000	328.571
18	185.00	165.000	ablr	imill	66.000	356.460
19	195.00	165.000	ablr	imill	66.000	387.115
20	205.00	187.000	cblr		75.000	92.780
21	215.00	187.500	cblr		75.000	98.803
22	225.00	187.500	cblr		75.000	101.823
23	230.00	187.500	cblr		75.000	102.175
24	235.00	187.500	cblr		75.000	101.750

GEP Table ICF Kaiser International STACK ID 3						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
25	245.00	187.500	cblr		75.000	98.585
26	255.00	187.500	cblr		75.000	92.424
27	269.00	187.500	cblr	emill	75.000	351.157
28	275.00	165.000	ablr	emill	66.000	361.782
29	285.00	165.000	ablr	emill	66.000	333.184
30	305.00	225.000	emill		90.000	201.128
31	315.00	225.000	emill		90.000	206.475
32	319.000	225.000	emill		90.000	206.860
33	325.000	225.000	emill		90.000	205.549
34	335.000	225.000	emill		90.000	198.377
35	345.000	225.000	emill		90.000	185.177
36	355.00	166.875	emill	amill	66.750	318.930

GEP Table ICF Kaiser International STACK ID 4						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
1	15.00	187.500	cblr		75.000	83.939
2	25.00	187.500	cblr		75.000	92.781
3	35.00	187.500	cblr		75.000	98.803
4	45.00	187.500	cblr		75.000	101.823

GEP Table ICF Kaiser International STACK ID 4						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
5	50.00	187.500	cblr		75.000	102.175
6	55.00	187.500	cblr		75.000	101.750
7	65.00	187.500	cblr		75.000	98.585
8	75.00	187.500	cblr		75.000	92.424
9	89.00	187.500	cblr	emill	75.000	351.156
10	95.00	187.500	cblr	emill	75.000	318.113
11	105.00	187.500	cblr	emill	75.000	259.292
12	125.00	187.500	cblr	emill	75.000	201.128
13	135.00	187.500	cblr	emill	75.000	231.930
14	145.00	187.500	cblr	emill	75.000	289.555
15	155.00	187.500	cblr	emill	75.000	338.382
16	162.00	187.500	cblr	emill	75.000	366.519
17	165.00	187.500	cblr		75.000	83.939
18	175.00	183.821	cblr		75.000	72.547
19	195.00	187.500	cblr		75.000	83.939
20	205.00	187.000	cblr		75.000	92.780
21	215.00	187.500	cblr		75.000	98.803
22	225.00	187.500	cblr		75.000	101.823
23	230.00	187.500	cblr		75.000	102.175
24	235.00	187.500	cblr		75.000	101.750
25	245.00	187.500	cblr		75.000	98.585
26	255.00	187.500	cblr		75.000	92.424
27	269.00	187.500	cblr	emill	75.000	351.157
28	275.00	187.500	cblr	emill	75.000	318.114

Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
29	285.00	225.000	emill		90.000	192.316
30	305.00	225.000	emill		90.000	201.128
31	315.00	225.000	emill		90.000	206.475
32	319.000	225.000	emill		90.000	206.860
33	325.000	225.000	emill		90.000	205.549
34	335.000	187.500	cblr	amill	75.000	366.519
35	345.000	187.500	cblr		75.000	83.939
36	355.00	183.821	cblr		75.000	72.547

GEP Table
ICF Kaiser International

STACK ID 4

Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
1	15.00	187.500	cblr		75.000	83.939
2	25.00	187.500	cblr		75.000	92.781
3	35.00	187.500	cblr		75.000	98.803
4	45.00	187.500	cblr		75.000	101.823
5	50.00	187.500	cblr		75.000	102.175
6	55.00	187.500	cblr		75.000	101.750
7	65.00	187.500	cblr		75.000	98.585
8	75.00	187.500	cblr		75.000	92.424

GEP Table
ICF Kaiser International

STACK ID 5

GEP Table ICF Kaiser International STACK ID 5						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
9	89.00	187.500	cblr	emill	75.000	351.156
10	95.00	165.000	ablr	emill	66.000	361.782
11	105.00	165.000	ablr	emill	66.000	333.184
12	118.00	165.000	ablr	amill	66.000	406.018
13	125.00	165.000	ablr	amill	66.000	395.592
14	135.00	165.000	ablr	amill	66.000	370.524
15	145.00	165.000	ablr	amill	66.000	334.198
16	165.00	165.000	ablr	imill	66.000	304.293
17	175.00	165.000	ablr	imill	66.000	328.571
18	185.00	183.820	cblr		75.000	72.547
19	195.00	187.500	cblr		75.000	83.939
20	205.00	187.000	cblr		75.000	92.780
21	215.00	187.500	cblr		75.000	98.803
22	225.00	187.500	cblr		75.000	101.823
23	230.00	187.500	cblr		75.000	102.175
24	235.00	187.500	cblr		75.000	101.750
25	245.00	187.500	cblr		75.000	98.585
26	255.00	187.500	cblr		75.000	92.424
27	269.00	187.500	cblr	emill	75.000	351.157
28	275.00	165.000	ablr	emill	66.000	361.782
29	285.00	165.000	ablr	emill	66.000	333.184
30	305.00	225.000	emill		90.000	201.128
31	315.00	225.000	emill		90.000	206.475
32	319.000	225.000	emill		90.000	206.860

GEP Table ICF Kaiser International STACK ID 5						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
33	325.000	225.000	emill		90.000	205.549
34	335.000	225.000	emill		90.000	198.377
35	345.000	166.875	emill	amill	66.750	343.405
36	365.00	183.820	cblr		75.000	72.547

GEP Table ICF Kaiser International STACK ID 6						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
1	15.00	187.500	cblr		75.000	83.939
2	25.00	187.500	cblr		75.000	92.781
3	35.00	187.500	cblr		75.000	98.803
4	45.00	187.500	cblr		75.000	101.823
5	50.00	187.500	cblr		75.000	102.175
6	55.00	187.500	cblr		75.000	101.750
7	65.00	187.500	cblr		75.000	98.585
8	75.00	187.500	cblr		75.000	92.424
9	89.00	187.500	cblr	emill	75.000	351.156
10	95.00	165.000	ablr	emill	66.000	361.782
11	112.00	187.500	cblr	emill	75.000	213.313
12	115.00	187.500	cblr	emill	75.000	192.592

GEP Table ICF Kaiser International STACK ID 6						
Sector No.	**Critical Flow Vector (deg)**	**GEP Stack Height (FT)**	**Controlling Structures**			
			Name-1	**Name-2**	**Height (FT)**	**Projected Width (FT)**
13	130.00	187.500	cblr		75.000	102.175
14	135.00	187.500	cblr		75.000	101.823
15	145.00	187.500	cblr		75.000	98.803
16	155.00	187.500	cblr		75.000	92.781
17	165.00	187.500	cblr		75.000	83.939
18	175.00	183.820	cblr		75.000	72.547
19	195.00	187.500	cblr		75.000	83.939
20	205.00	187.000	cblr		75.000	92.780
21	215.00	187.500	cblr		75.000	98.803
22	225.00	187.500	cblr		75.000	101.823
23	230.00	187.500	cblr		75.000	102.175
24	235.00	187.500	cblr		75.000	101.750
25	245.00	187.500	cblr		75.000	98.585
26	255.00	187.500	cblr		75.000	92.424
27	269.00	187.500	cblr	emill	75.000	351.157
28	275.00	165.000	ablr	emill	66.000	361.782
29	294.00	225.000	emill		90.000	191.790
30	305.00	225.000	emill		90.000	201.128
31	315.00	225.000	emill		90.000	206.475
32	319.000	225.000	emill		90.000	206.860
33	325.000	225.000	emill		90.000	205.549
34	335.000	225.000	emill		90.000	198.377
35	345.000	187.500	cblr		75.000	83.939

GEP Table ICF Kaiser International STACK ID 6						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
36	355.00	183.821	cblr		75.000	72.547

GEP Table ICF Kaiser International STACK ID 7						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
1	15.00	127.500	dblr	imill	51.000	573.054
2	25.00	127.500	dblr	bmill	51.000	581.315
3	35.00	127.500	dblr	emill	51.000	591.322
4	36.00	127.500	dblr	bmill	51.000	591.335
5	53.00	187.500	cblr		75.000	102.013
6	55.00	187.500	cblr		75.000	101.750
7	65.00	187.500	cblr		75.000	98.585
8	75.00	187.500	cblr		75.000	92.424
9	89.00	187.500	cblr	emill	75.000	351.156
10	95.00	187.500	cblr	emill	75.000	318.113
11	105.00	187.500	cblr	emill	75.000	259.292
12	125.00	187.500	cblr	emill	75.000	201.128
13	135.00	187.500	cblr	emill	75.000	231.930
14	145.00	187.500	cblr	emill	75.000	289.555
15	155.00	187.500	cblr	emill	75.000	338.382

GEP Table ICF Kaiser International STACK ID 7						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
16	162.00	187.500	cblr	emill	75.000	366.519
17	165.00	187.500	cblr		75.000	83.939
18	185.00	127.500	dblr	imill	51.000	533.259
19	195.00	127.500	dblr	imill	51.000	573.054
20	205.00	127.500	dblr	bmill	51.000	581.314
21	215.00	127.500	dblr	emill	51.000	591.322
22	216.00	127.500	dblr	bmill	51.000	591.335
23	233.00	127.500	cblr		75.000	102.013
24	235.00	127.500	cblr		75.000	101.750
25	245.00	127.500	cblr		75.000	98.585
26	255.00	127.500	cblr		75.000	92.424
27	269.00	127.500	cblr	emill	75.000	351.157
28	275.00	127.500	cblr	emill	75.000	318.114
29	294.00	225.000	emill		90.000	191.790
30	305.00	225.000	emill		90.000	201.128
31	315.00	225.000	emill		90.000	206.475
32	319.00	225.000	emill		90.000	206.860
33	335.00	187.500	cblr	emill	75.000	338.381
34	342.00	187.500	cblr	emill	75.000	366.519
35	345.00	187.500	cblr		75.000	83.939
36	365.00	127.500	dblr	bmill	51.000	553.258

GEP Table ICF Kaiser International STACK ID 8						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
1	15.00	187.500	cblr		75.000	83.939
2	25.00	187.500	cblr		75.000	92.781
3	35.00	187.500	cblr		75.000	98.803
4	45.00	187.500	cblr		75.000	101.823
5	50.00	187.500	cblr		75.000	102.175
6	55.00	187.500	cblr		75.000	101.750
7	65.00	187.500	cblr		75.000	98.585
8	75.00	187.500	cblr		75.000	92.424
9	89.00	187.500	cblr	emill	75.000	351.156
10	95.00	187.500	ablr	emill	66.000	361.782
11	105.00	165.000	ablr	emill	66.000	333.184
12	118.00	165.000	ablr	amill	66.000	406.018
13	125.00	165.000	ablr	amill	66.000	395.592
14	135.00	165.000	ablr	amill	66.000	370.524
15	145.00	165.000	cblr	amill	66.000	334.198
16	158.00	187.500	cblr		75.000	90.414
17	165.00	187.500	cblr		75.000	83.939
18	175.00	183.821	cblr		75.000	72.547
19	195.00	187.500	cblr		75.000	83.939
20	205.00	187.500	cblr		75.000	92.780
21	215.00	187.500	cblr		75.000	98.803
22	225.00	187.500	cblr		75.000	101.823
23	230.00	187.500	cblr		75.000	102.175
24	235.00	187.500	cblr		75.000	101.750

GEP Table ICF Kaiser International STACK ID 8						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
25	245.00	187.500	cblr		75.000	98.585
26	255.00	187.500	cblr		75.000	92.424
27	269.00	187.500	cblr	emill	75.000	351.157
28	275.00	165.000	ablr	emill	66.000	361.782
29	285.00	165.000	ablr	emill	66.000	333.184
30	305.00	225.000	emill		90.000	201.128
31	315.00	225.000	emill		90.000	206.475
32	319.00	225.000	emill		90.000	206.860
33	325.00	225.000	emill		90.000	205.549
34	335.00	225.000	emill		90.000	198.377
35	345.00	187.500	cblr		75.000	83.939
36	355.00	183.821	cblr		75.000	72.547

GEP Table ICF Kaiser International STACK ID 9						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
1	15.00	166.875	emill	amill	66.750	334.863
2	25.00	166.875	emill	amill	66.750	343.498
3	28.00	166.875	emill	amill	66.750	344.057
4	35.00	166.875	emill	amill	66.750	341.696

GEP Table ICF Kaiser International STACK ID 9						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
5	50.00	187.500	cblr		75.000	102.175
6	55.00	187.500	cblr		75.000	101.750
7	65.00	187.500	cblr		75.000	98.585
8	75.00	187.500	cblr		75.000	92.424
9	89.00	187.500	cblr	emill	75.000	351.156
10	95.00	187.500	cblr	emill	75.000	318.113
11	105.00	165.000	ablr	emill	66.000	333.184
12	118.00	165.000	ablr	amill	66.000	406.018
13	125.00	165.000	ablr	amill	66.000	395.592
14	135.00	165.000	ablr	amill	66.000	370.524
15	145.00	165.000	ablr	amill	66.000	334.198
16	165.00	165.000	ablr	imill	66.000	304.293
17	168.00	225.000	emill		90.000	180.097
18	184.00	225.000	emill		90.000	167.248
19	1945.00	165.000	ablr	imill	66.000	387.115
20	205.00	165.000	ablr	imill	66.000	411.886
21	215.00	165.000	ablr	imill	66.000	443.552
22	225.00	165.000	ablr	emill	66.000	461.741
23	233.00	165.000	ablr	emill	66.000	466.202
24	235.00	165.000	ablr	emill	66.000	465.900
25	245.00	165.000	ablr	emill	66.000	455.902
26	255.00	165.000	ablr	emill	66.000	432.053
27	265.00	165.000	ablr	emill	66.000	305.076
28	275.00	165.000	ablr	emill	66.000	361.782

GEP Table ICF Kaiser International STACK ID 9						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
29	285.00	165.000	ablr	emill	66.000	333.184
30	305.00	225.000	emill		90.000	201.128
31	315.00	225.000	emill		90.000	206.475
32	319.00	225.000	emill		90.000	206.860
33	325.00	225.000	emill		90.000	205.549
34	335.00	225.000	emill		90.000	198.377
35	345.00	225.000	emill		90.000	185.177
36	364.00	225.000	emill		90.000	167.248

GEP Table ICF Kaiser International STACK ID 10						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
1	15.00	166.875	emill	amill	66.750	334.863
2	25.00	166.875	emill	amill	66.750	343.498
3	28.00	166.875	emill	amill	66.750	344.057
4	35.00	166.875	emill	amill	66.750	341.696
5	50.00	187.500	cblr		75.000	102.175
6	55.00	187.500	cblr		75.000	101.750
7	65.00	187.500	cblr		75.000	98.585
8	75.00	187.500	cblr		75.000	92.424

GEP Table ICF Kaiser International STACK ID 10						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
9	89.00	187.500	cblr	emill	75.000	351.156
10	95.00	187.500	cblr	emill	75.000	318.113
11	105.00	165.000	ablr	emill	66.000	333.184
12	118.00	165.000	ablr	amill	66.000	406.018
13	125.00	165.000	ablr	amill	66.000	395.592
14	135.00	165.000	ablr	amill	66.000	370.524
15	145.00	165.000	ablr	amill	66.000	334.198
16	165.00	165.000	ablr	imill	66.000	304.293
17	168.00	225.000	emill		90.000	180.097
18	184.00	225.000	emill		90.000	167.248
19	195.00	165.000	ablr	imill	66.000	387.115
20	205.00	165.000	ablr	imill	66.000	411.886
21	215.00	165.000	ablr	imill	66.000	443.552
22	225.00	165.000	ablr	emill	66.000	461.741
23	233.00	165.000	ablr	emill	66.000	466.202
24	235.00	165.000	ablr	emill	66.000	465.900
25	245.00	165.000	ablr	emill	66.000	455.902
26	255.00	165.000	ablr	emill	66.000	432.053
27	265.00	165.000	ablr	emill	66.000	395.076
28	275.00	165.000	ablr	emill	66.000	361.782
29	285.00	165.000	ablr	emill	66.000	333.184
30	305.00	225.000	emill		90.000	201.128
31	345.00	225.000	emill		90.000	206.475
32	319.00	225.000	emill		90.000	206.860

GEP Table ICF Kaiser International STACK ID 10						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
33	325.00	225.000	emill		90.000	205.549
34	335.00	225.000	emill		90.000	198.377
35	345.00	225.000	emill		90.000	185.177
36	365.00	225.000	emill		90.000	167.248

GEP Table ICF Kaiser International STACK ID 11						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
1	15.00	166.875	emill	amill	66.750	334.863
2	25.00	166.875	emill	amill	66.750	343.498
3	28.00	187.500	emill	amill	66.750	344.057
4	45.00	187.500	cblr		75.000	101.823
5	50.00	187.500	cblr		75.000	102.175
6	55.00	187.500	cblr		75.000	101.750
7	65.00	187.500	cblr		75.000	98.585
8	75.00	187.500	cblr	emill	75.000	92.424
9	89.00	187.500	cblr	emill	75.000	351.156
10	95.00	187.500	ablr	emill	75.000	318.113
11	105.00	165.000	ablr	emill	66.000	333.184
12	118.00	165.000	ablr	amill	66.000	406.018

GEP Table ICF Kaiser International STACK ID 11						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
13	125.00	165.000	ablr	amill	66.000	395.592
14	135.00	165.000	ablr	amill	66.000	370.524
15	145.00	165.000	ablr	amill	66.000	334.198
16	165.00	165.000	ablr	imill	66.000	304.293
17	175.00	165.000	ablr	imill	66.000	328.571
18	185.00	165.000	ablr	imill	66.000	356.460
19	195.00	165.000	ablr	imill	66.000	387.115
20	205.00	165.000	ablr	imill	66.000	411.886
21	215.00	165.000	ablr	imill	66.000	443.552
22	223.00	187.500	cblr		75.000	101.465
23	235.00	187.500	cblr		75.000	101.750
24	235.00	187.500	cblr		75.000	101.750
25	245.00	187.500	cblr		75.000	98.585
26	255.000	187.500	cblr		75.000	92.424
27	270.00	187.500	cblr	emill	75.000	344.001
28	275.00	187.500	cblr	emill	75.000	318.114
29	285.00	165.000	ablr	emill	66.000	333.184
30	305.00	225.000	emill		90.000	201.128
31	315.00	225.000	emill		90.000	206.475
32	319.00	225.000	emill		90.000	206.860
33	325.00	225.000	emill		90.000	205.549

GEP Table ICF Kaiser International STACK ID 11						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
34	335.00	225.000	emill		90.000	198.377
35	345.00	225.000	emill		90.000	185.177
36	355.00	225.000	emill		90.000	166.351

GEP Table ICF Kaiser International STACK ID 12						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
1	15.00	166.875	emill	amill	66.750	334.863
2	25.00	166.875	emill	amill	66.750	343.498
3	28.00	166.875	emill	amill	66.750	344.057
4	45.00	187.500	cblr		75.000	101.823
5	50.00	187.500	cblr		75.000	102.175
6	55.00	187.500	cblr		75.000	101.750
7	65.00	187.500	cblr		75.000	98.585
8	75.00	187.500	cblr		75.000	92.424
9	89.00	187.500	cblr	emill	75.000	351.156
10	95.00	187.500	cblr	emill	75.000	318.113
11	105.00	165.000	ablr	emill	66.000	333.184
12	118.00	165.000	ablr	amill	66.000	406.018
13	125.00	165.000	ablr	amill	66.000	395.592

GEP Table ICF Kaiser International STACK ID 12						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
14	135.00	165.000	ablr	amill	66.000	370.524
15	145.00	165.000	ablr	amill	66.000	334.198
16	165.00	165.000	ablr	imill	66.000	304.293
17	175.00	165.000	ablr	imill	66.000	328.571
18	185.00	165.000	ablr	imill	66.000	356.460
19	195.00	165.000	ablr	imill	66.000	387.115
20	205.00	165.000	ablr	imill	66.000	411.886
21	215.00	165.000	ablr	imill	66.000	443.552
22	223.00	187.500	cblr		75.000	101.465
23	235.00	187.500	cblr		75.000	101.750
24	235.00	187.500	cblr		75.000	101.750
25	245.00	187.500	cblr		75.000	98.585
26	255.00	187.500	cblr		75.000	92.424
27	270.00	187.500	cblr	emill	75.000	344.001
28	275.00	187.500	cblr	emill	75.000	318.114
29	285.00	165.000	ablr	emill	66.000	333.184
30	305.00	225.000	emill		90.000	201.128
31	315.00	225.000	emill		90.000	206.475
32	319.00	225.000	emill		90.000	206.860
33	325.00	225.000	emill		90.000	205.549
34	335.00	225.000	emill		90.000	198.377
35	345.00	225.000	emill		90.000	185.177
36	355.00	225.00	emill		90.000	166.351

GEP Table ICF Kaiser International STACK ID 13						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
1	15.00	166.875	emill	amill	66.750	334.863
2	25.00	187.500	cblr		75.000	92.781
3	35.00	187.500	cblr		75.000	98.803
4	45.00	187.500	cblr		75.000	101.823
5	50.00	187.500	cblr		75.000	102.175
6	55.00	187.500	cblr		75.000	101.750
7	65.00	187.500	cblr		75.000	98.585
8	75.00	187.500	cblr		75.000	92.424
9	89.00	187.500	cblr		75.000	351.156
10	95.00	165.000	cblr	emill	66.000	361.782
11	105.00	165.000	ablr	emill	66.000	333.184
12	118.00	165.000	ablr	emill	66.000	406.018
13	125.00	165.000	ablr	amill	66.000	395.592
14	135.00	165.000	ablr	amill	66.000	370.524
15	145.00	165.000	ablr	amill	66.000	334.198
16	165.00	165.000	ablr	imill	66.000	304.293
17	175.00	165.000	ablr	imill	66.000	328.571
18	185.00	165.000	ablr	imill	66.000	356.460
19	195.00	165.000	ablr	imill	66.000	387.115
20	205.00	187.500	cblr		75.000	92.780
21	215.00	187.500	cblr		75.000	98.803
22	225.00	187.500	cblr		75.000	101.823
23	230.00	187.500	cblr		75.000	102.175
24	235.00	187.500	cblr		75.000	101.750

GEP Table ICF Kaiser International STACK ID 13						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
25	245.00	187.500	cblr		75.000	98.585
26	255.00	187.500	cblr		75.000	92.424
27	269.00	187.500	cblr	emill	75.000	351.157
28	275.00	165.000	ablr	emill	66.000	361.782
29	285.00	165.000	ablr	emill	66.000	33.184
30	305.00	225.000	emill		90.000	201.128
31	315.00	225.000	emill		90.000	206.475
32	319.00	225.000	emill		90.000	206.860
33	325.00	225.000	emill		90.000	205.549
34	335.00	225.000	emill		90.000	198.377
35	345.00	225.000	emill		90.000	185.177
36	355.00	166.875	emill	amill	66.750	318.930

GEP Table ICF Kaiser International STACK ID 14						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
1	15.00	166.875	emill	amill	66.750	334.863
2	25.00	187.500	cblr		75.000	92.781
3	35.00	187.500	cblr		75.000	98.803
4	45.00	187.500	cblr		75.000	101.823

GEP Table ICF Kaiser International STACK ID 14						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
5	50.00	187.500	cblr		75.000	102.175
6	55.00	187.500	cblr		75.000	101.750
7	65.00	187.500	cblr		75.000	98.585
8	75.00	187.500	cblr		75.000	92.424
9	89.00	187.500	cblr	emill	75.000	351.156
10	95.00	165.000	ablr	emill	66.000	361.782
11	105.00	165.000	ablr	emill	66.000	333.184
12	118.00	165.000	ablr	amill	66.000	406.018
13	125.00	165.000	ablr	amill	66.000	395.592
14	135.00	165.000	ablr	amill	66.000	370.524
15	145.00	165.000	ablr	amill	66.000	334.198
16	165.00	165.000	ablr	imill	66.000	304.293
17	175.00	165.000	ablr	imill	66.000	328.571
18	185.00	165.000	ablr	imill	66.000	356.460
19	195.00	165.000	ablr	imill	66.000	387.115
20	205.00	187.500	cblr		75.000	92.780
21	215.00	187.500	cblr		75.000	98.803
22	225.00	187.500	cblr		75.000	101.823
23	230.00	187.500	cblr		75.000	102.175
24	235.00	187.500	cblr		75.000	01.750
25	245.00	187.500	cblr		75.000	98.585
26	255.00	187.500	cblr		75.000	92.424
27	269.00	187.500	cblr	emill	75.000	351.157
28	275.00	165.000	ablr	emill	66.000	361.782

GEP Table ICF Kaiser International STACK ID 14						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
29	285.00	165.000	ablr	emill	66.000	333.184
30	305.00	225.000	emill		90.000	201.128
31	315.00	225.000	emill		90.000	206.475
32	319.00	225.000	emill		90.000	206.860
33	325.00	225.000	emill		90.000	205.549
34	335.00	225.000	emill		90.000	198.377
35	345.00	225.000	emill		90.000	185.177
36	355.00	166.875	emill	amill	66.750	318.930

GEP Table ICF Kaiser International STACK ID 15						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
1	15.00	127.500	dblr	imill	51.000	573.054
2	25.00	127.500	dblr	bmill	51.000	581.315
3	35.00	127.500	dblr	emill	51.000	591.322
4	36.00	127.500	dblr	bmill	51.000	591.335
5	53.00	187.500	cblr		75.000	102.013
6	55.00	187.500	cblr		75.000	101.750
7	65.00	187.500	cblr		75.000	98.585
8	75.00	187.500	cblr		75.000	92.424

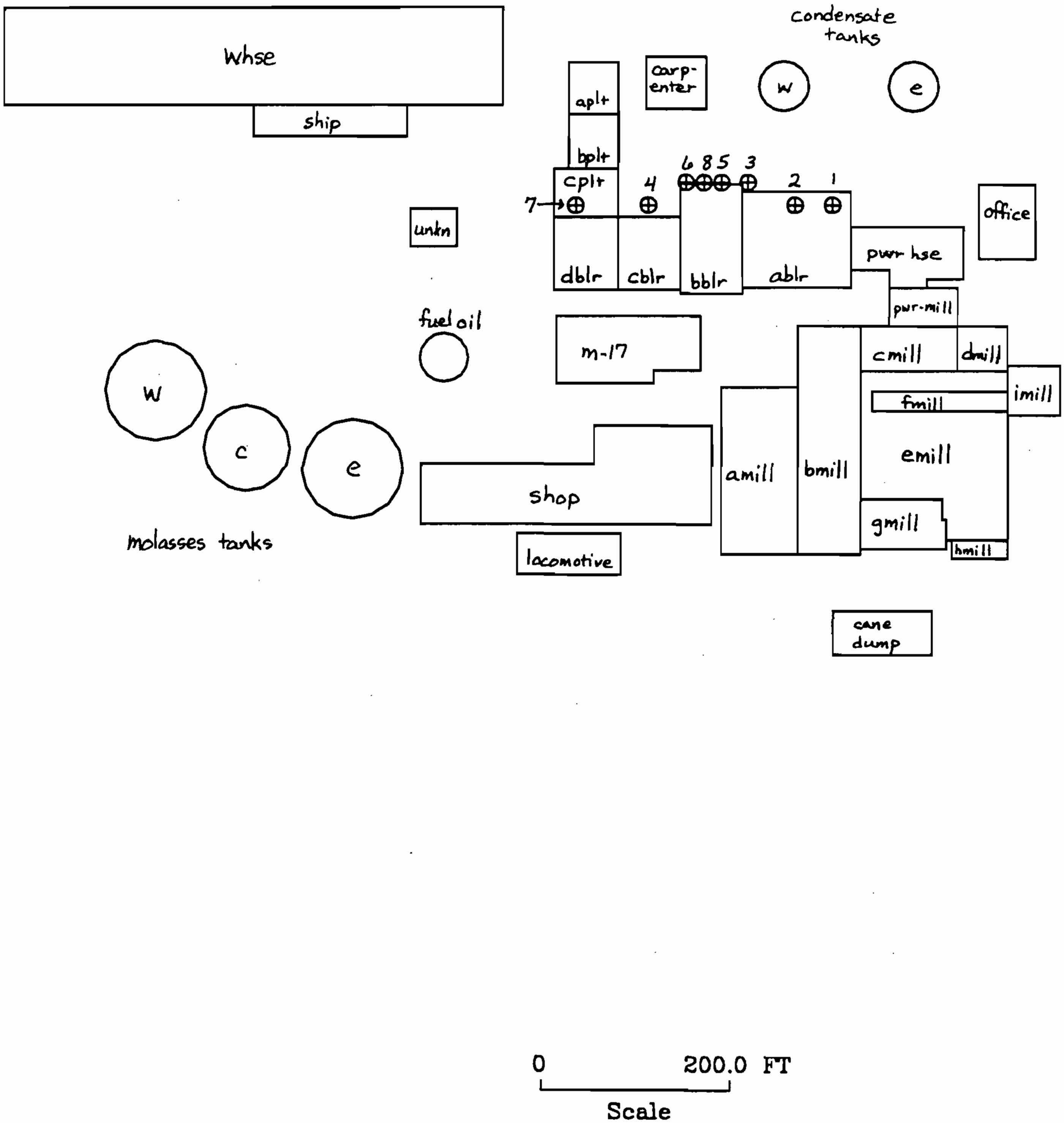
GEP Table ICF Kaiser International STACK ID 15						
Sector No.	**Critical Flow Vector (deg)**	**GEP Stack Height (FT)**	**Controlling Structures**			
			Name-1	**Name-2**	**Height (FT)**	**Projected Width (FT)**
9	89.00	187.500	cblr	emill	75.000	351.156
10	95.00	187.500	cblr	emill	75.000	318.113
11	105.00	187.500	cblr	emill	75.000	259.292
12	125.00	187.500	cblr	emill	75.000	201.128
13	135.00	187.500	cblr	emill	75.000	231.930
14	145.00	187.500	cblr	emill	75.000	289.555
15	155.00	187.500	cblr	emill	75.000	338.382
16	162.00	187.500	cblr	emill	75.000	366.519
17	165.00	187.500	cblr		75.000	83.939
18	185.00	127.500	dblr	imill	51.000	553.259
19	195.00	127.500	dblr	imill	51.000	573.054
20	205.00	127.500	dblr	bmill	51.000	581.314
21	215.00	127.500	dblr	emill	51.000	591.322
22	216.00	127.500	dblr	bmill	51.000	591.335
23	233.00	187.500	cblr		75.000	102.013
24	235.00	187.500	cblr		75.000	101.750
25	245.00	187.500	cblr		75.000	98.585
26	255.00	187.500	cblr		75.000	92.424
27	269.00	187.500	cblr	emill	75.000	351.157
28	275.00	187.500	emill	emill	75.000	318.114
29	294.00	225.000	emill		90.000	191.790
30	305.00	225.000	emill		90.000	201.128
31	315.00	225.000	emill		90.000	206.475
32	319.00	225.000	emill		90.000	206.860

GEP Table ICF Kaiser International STACK ID 15						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
33	335.00	187.500	cblr	emill	75.000	338.381
34	342.00	187.500	cblr	emill	75.000	366.519
35	345.00	187.500	cblr		75.000	83.939
36	365.00	127.500	dblr	bmill	51.000	553.258

GEP Table ICF Kaiser International STACK ID 16						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
1	15.00	187.500	cblr		75.000	83.939
2	25.00	187.500	cblr		75.000	92.781
3	35.00	187.500	cblr		75.000	98.803
4	45.00	187.500	cblr		75.000	101.823
5	50.00	187.500	cblr		75.000	102.175
6	55.00	187.500	cblr		75.000	101.750
7	65.00	187.500	cblr		75.000	98.585
8	75.00	187.500	cblr		75.000	92.424
9	89.00	187.500	cblr	emill	75.000	351.156
10	95.00	165.00	ablr	emill	66.000	361.782
11	105.00	165.00	ablr	emill	66.000	333.184
12	118.00	165.00	ablr	amill	66.000	406.018

GEP Table ICF Kaiser International STACK ID 16						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
13	125.00	165.00	ablr	amill	66.000	395.592
14	135.00	165.00	ablr	amill	66.000	370.524
15	145.00	165.00	ablr	amill	66.000	334.198
16	158.00	187.500	cblr		75.000	90.414
17	165.00	187.500	cblr		75.000	83.939
18	175.00	187.500	cblr		75.000	72.547
19	195.00	187.500	cblr		75.000	83.939
20	205.00	187.500	cblr		75.000	92.780
21	215.00	187.500	cblr		75.000	98.803
22	225.00	187.500	cblr		75.000	101.823
23	230.00	187.500	cblr		75.000	102.175
24	235.00	187.500	cblr		75.000	101.750
25	245.00	187.500	cblr		75.000	98.585
26	255.00	187.500	cblr		75.000	92.424
27	269.00	187.500	cblr	emill	75.000	351.157
28	275.00	165.000	ablr	emill	66.000	361.782
29	285.00	165.000	ablr	emill	66.000	333.184
30	305.00	225.000	emill		90.000	201.128
31	315.00	225.000	emill		90.000	206.475
32	319.00	225.000	emill		90.000	206.860
33	325.00	225.000	emill		90.000	205.549
34	335.00	225.000	emill		90.000	198.377
35	345.00	187.500	cblr		75.000	83.939

GEP Table ICF Kaiser International STACK ID 16						
Sector No.	Critical Flow Vector (deg)	GEP Stack Height (FT)	Controlling Structures			
			Name-1	Name-2	Height (FT)	Projected Width (FT)
36	355.00	183.821	cblr		75.000	72.547

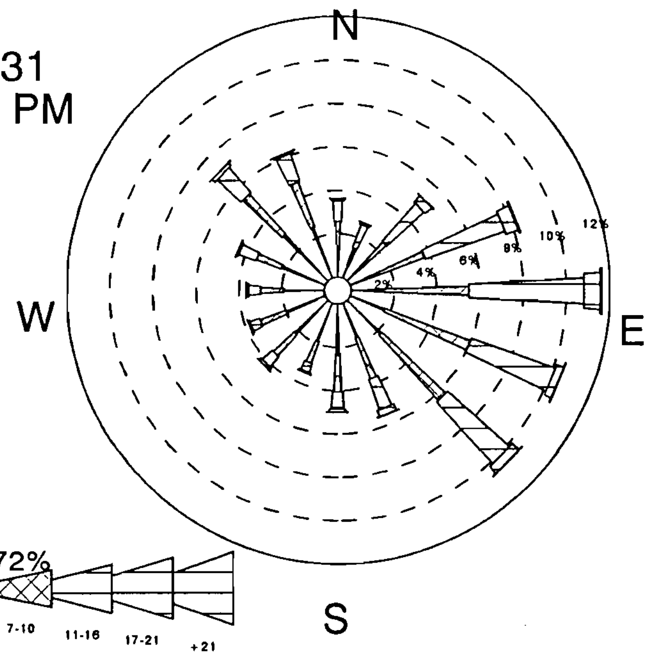


whse
ship
condensate tanks
carp-enter
w
e
aplt
bplt
cplt
7
4
6 8 5
3
2
1
office
unkn
dblr
cblr
bblr
ablr
pwr hse
pwr-mill
fuel oil
m-17
cmill
dmill
imill
fmill
emill
w
c
e
molasses tanks
shop
amill
bmill
gmill
hmill
locomotive
cane dump
0
200.0 FT
Scale

ATTACHMENT N

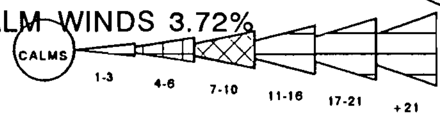
Wind Roses

Jan - Dec ; 1984 - 1989
January 1
December 31
Midnight-11 PM

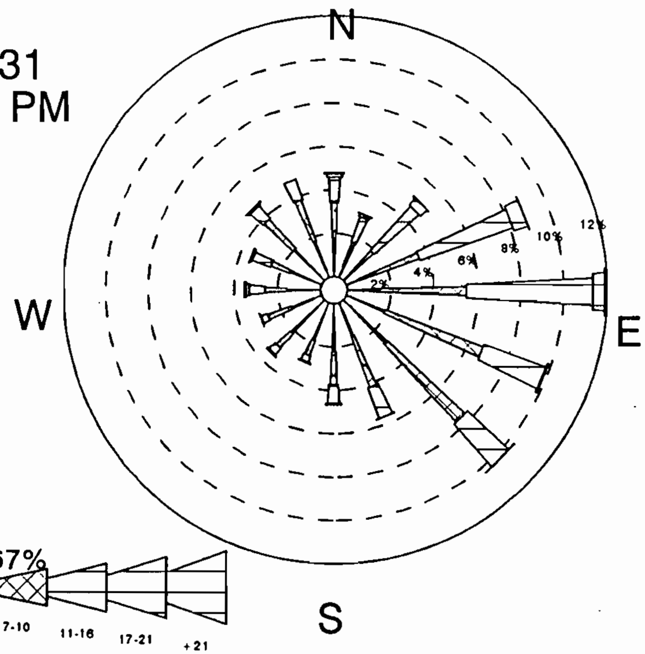


NOTE: Frequencies indicate direction from which the wind is blowing.

CALM WINDS 3.72%

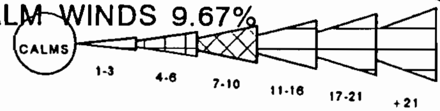


Jan. - Dec., 1984
January 1
December 31
Midnight-11 PM

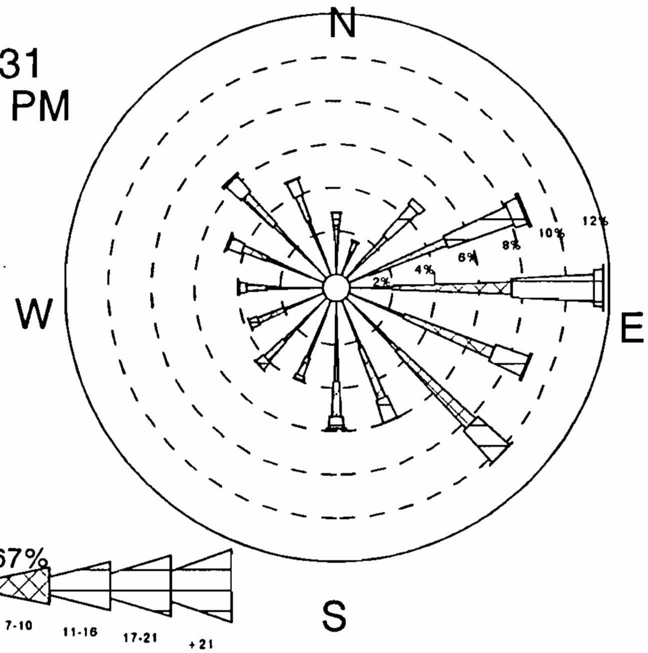


NOTE: Frequencies indicate direction from which the wind is blowing.

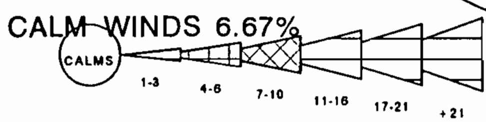
CALM WINDS 9.67%



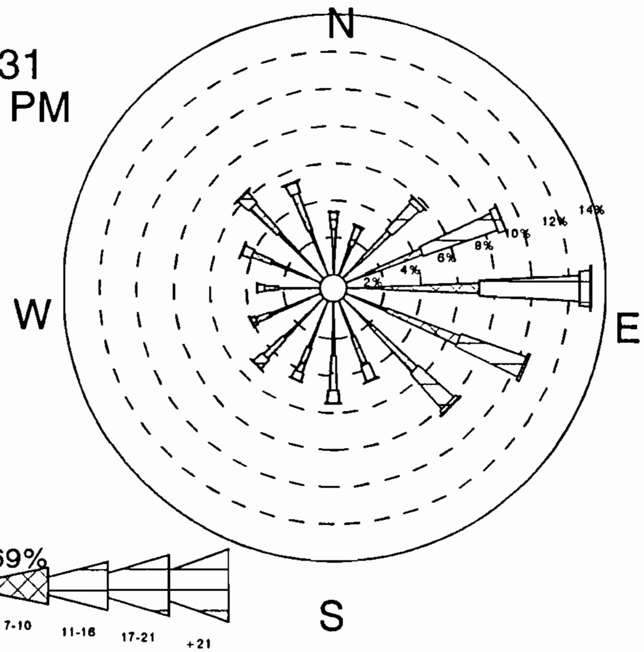
Jan - Dec ; 1985
January 1
December 31
Midnight-11 PM



NOTE: Frequencies indicate direction from which the wind is blowing.

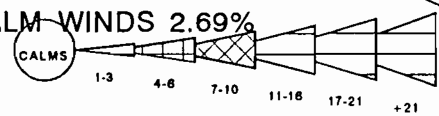


Jan - Dec ; 1986
January 1
December 31
Midnight-11 PM

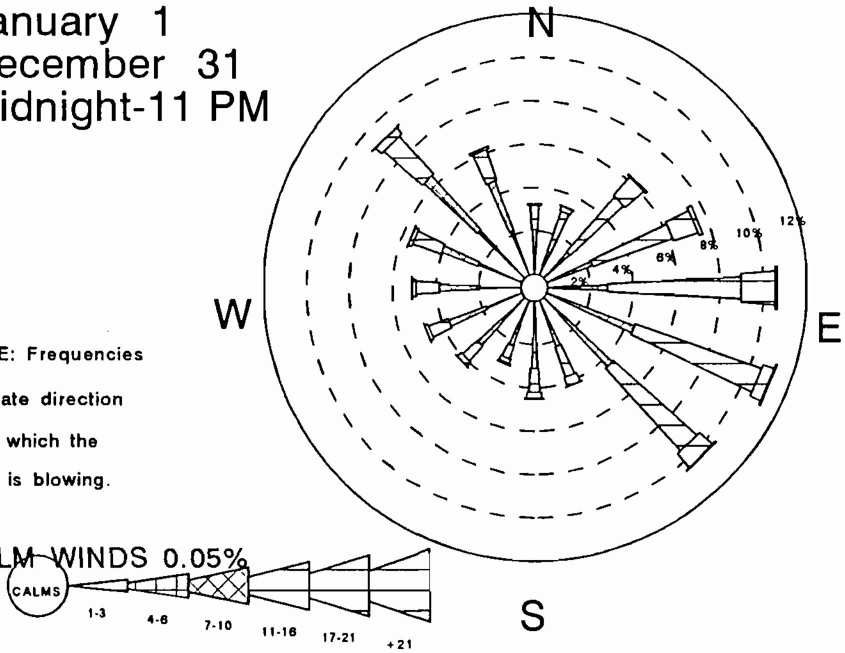


NOTE: Frequencies indicate direction from which the wind is blowing.

CALM WINDS 2.69%



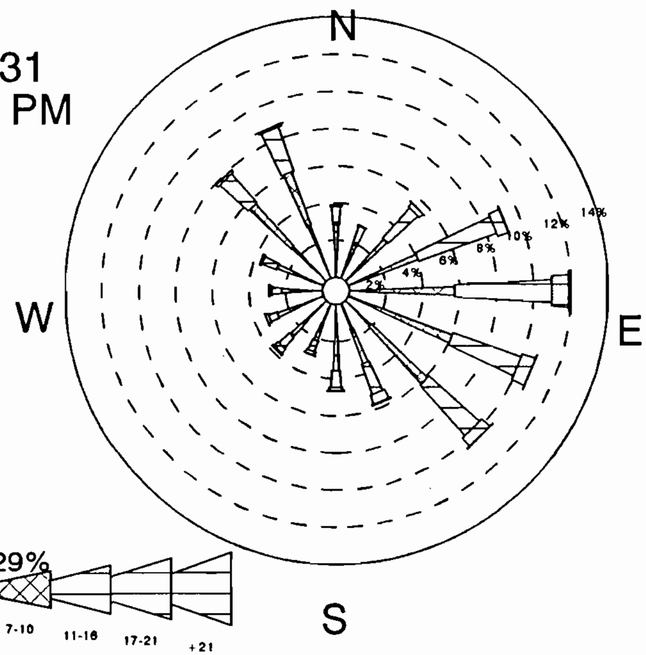
Jan - Dec ; 1987
January 1
December 31
Midnight-11 PM



NOTE: Frequencies indicate direction from which the wind is blowing.

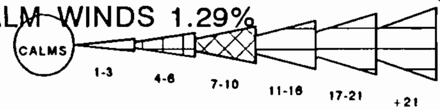
CALM WINDS 0.05%

Jan - Dec ; 1988
January 1
December 31
Midnight-11 PM

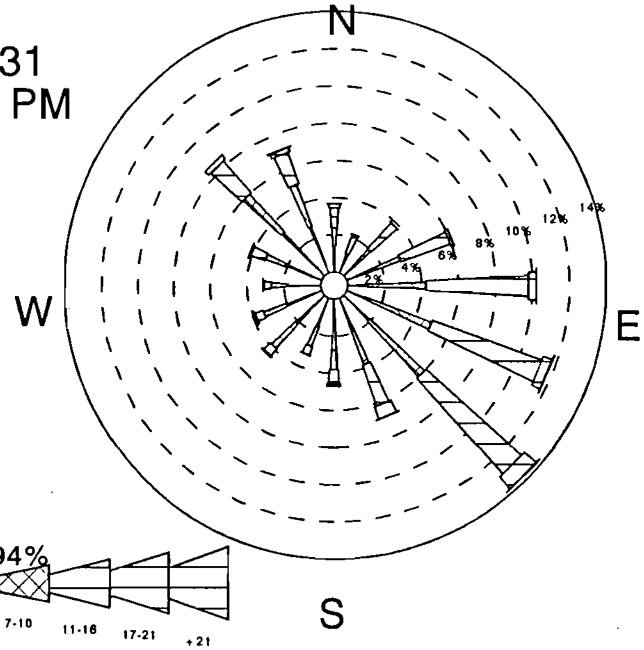


NOTE: Frequencies indicate direction from which the wind is blowing.

CALM WINDS 1.29%

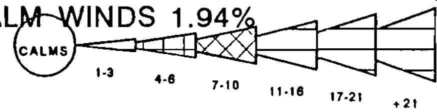


Jan - Dec ; 1989
January 1
December 31
Midnight-11 PM

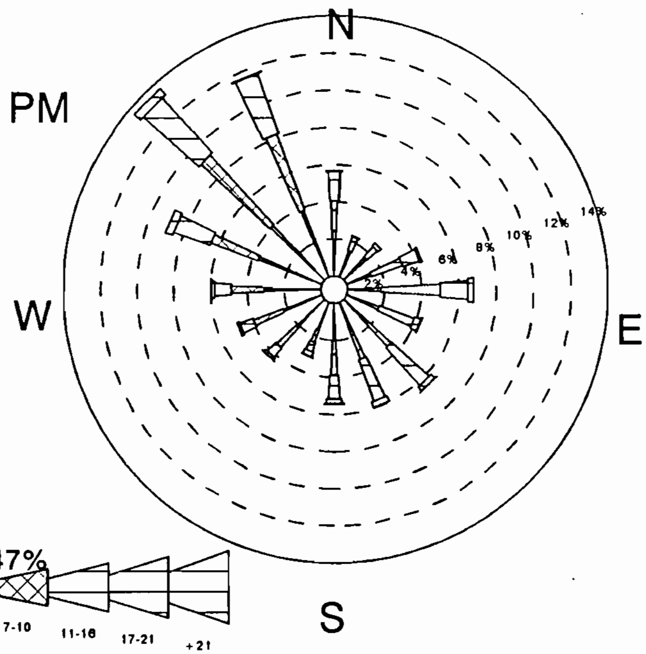


NOTE: Frequencies indicate direction from which the wind is blowing.

CALM WINDS 1.94%

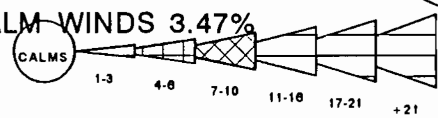


January, 1984 - 1989
January 1
January 31
Midnight-11 PM

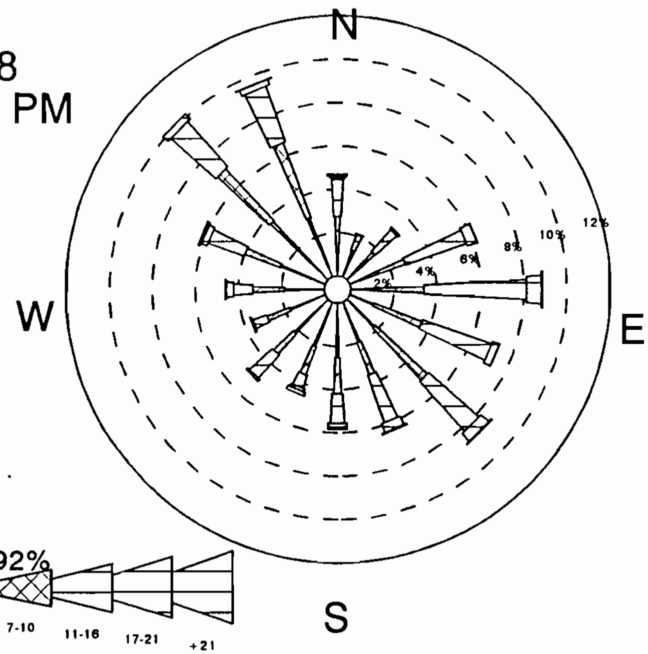


NOTE: Frequencies indicate direction from which the wind is blowing.

CALM WINDS 3.47%

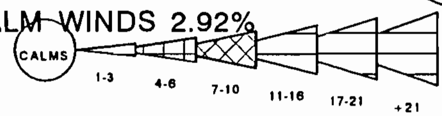


February, 1984 - 1989
February 1
February 28
Midnight-11 PM

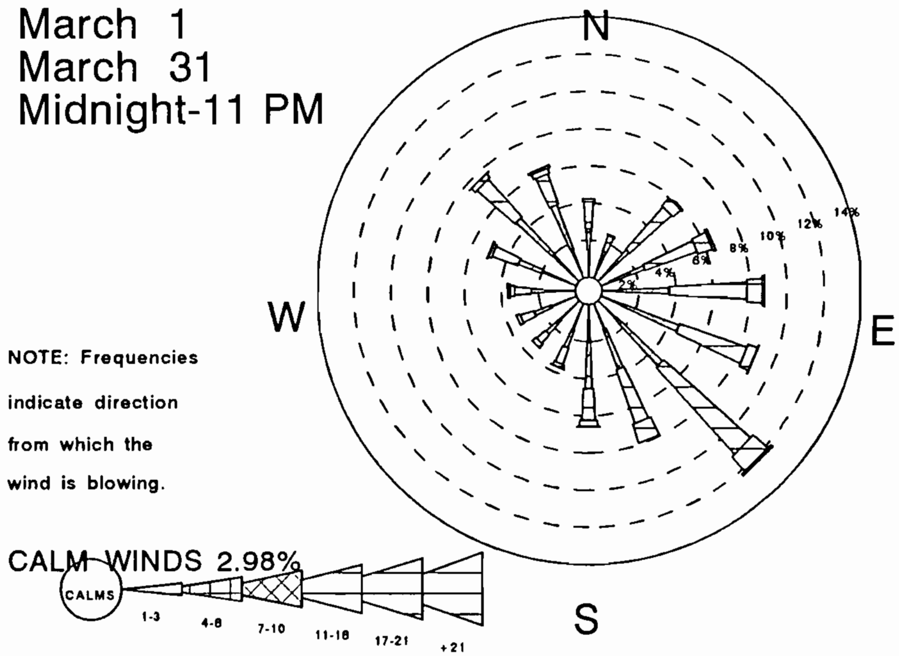


NOTE: Frequencies indicate direction from which the wind is blowing.

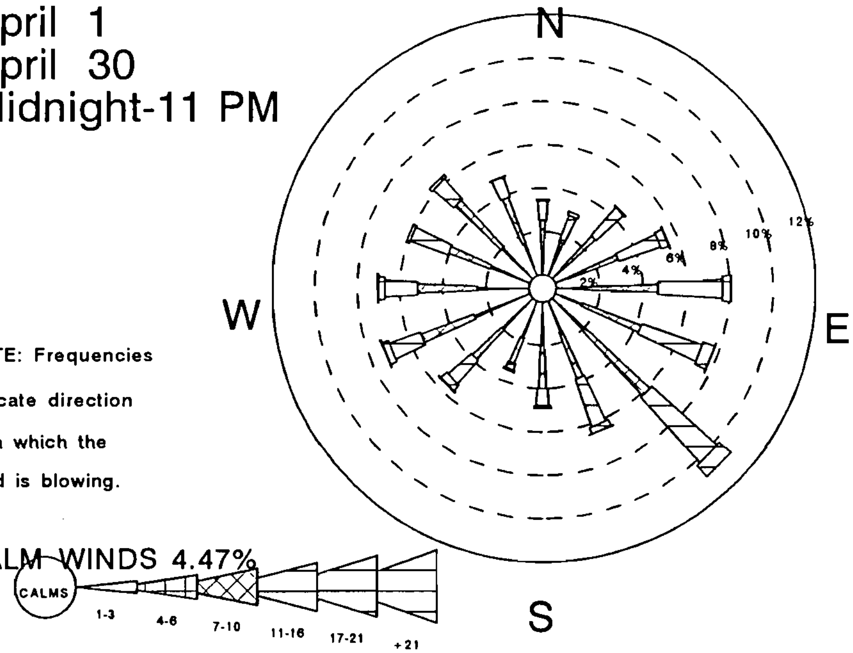
CALM WINDS 2.92%



March, 1984 - 1989
March 1
March 31
Midnight-11 PM



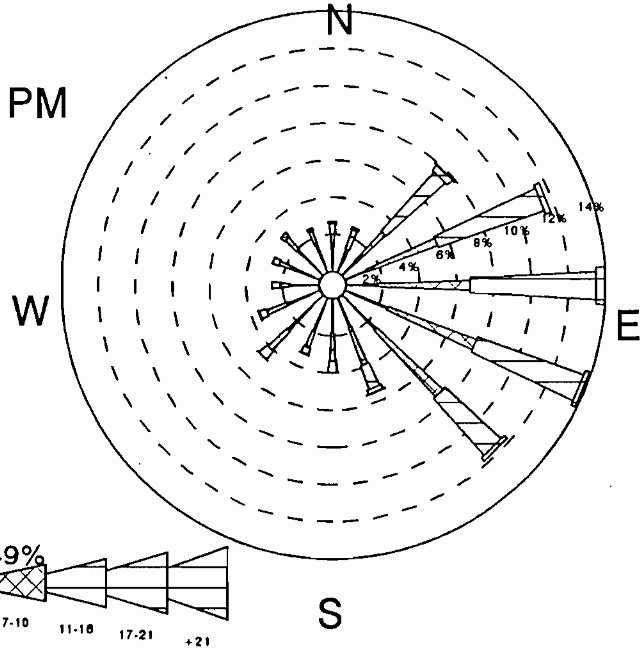
April, 1984 - 1989
April 1
April 30
Midnight-11 PM



NOTE: Frequencies indicate direction from which the wind is blowing.

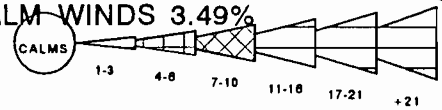
CALM WINDS 4.47%

May, 1984 - 1989
May 1
May 31
Midnight-11 PM

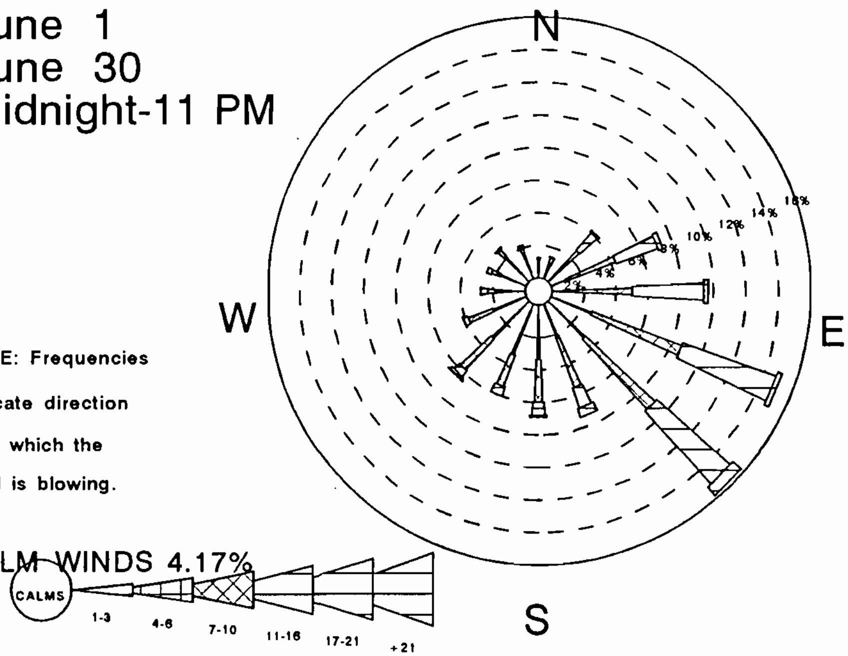


NOTE: Frequencies indicate direction from which the wind is blowing.

CALM WINDS 3.49%



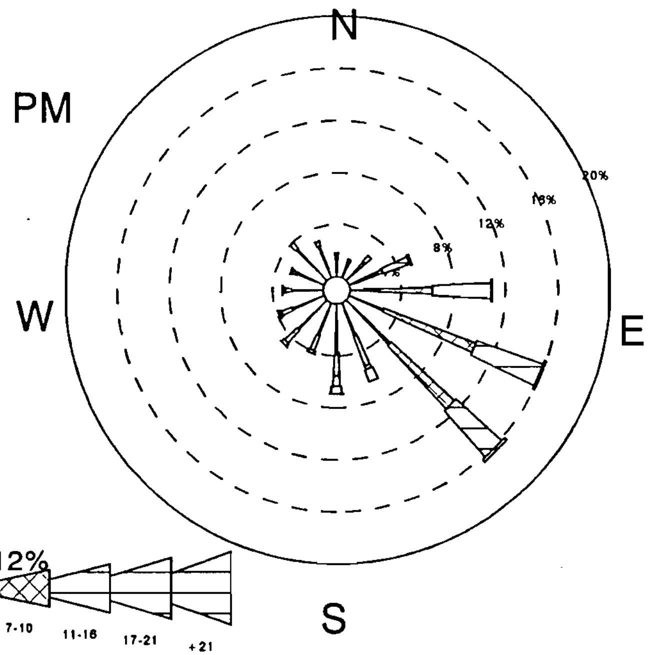
June, 1984 - 1989
June 1
June 30
Midnight-11 PM



NOTE: Frequencies indicate direction from which the wind is blowing.

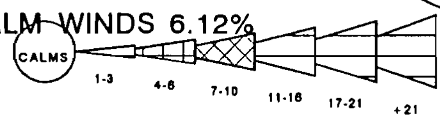
CALM WINDS 4.17%

July, 1984 - 1989
July 1
July 31
Midnight-11 PM

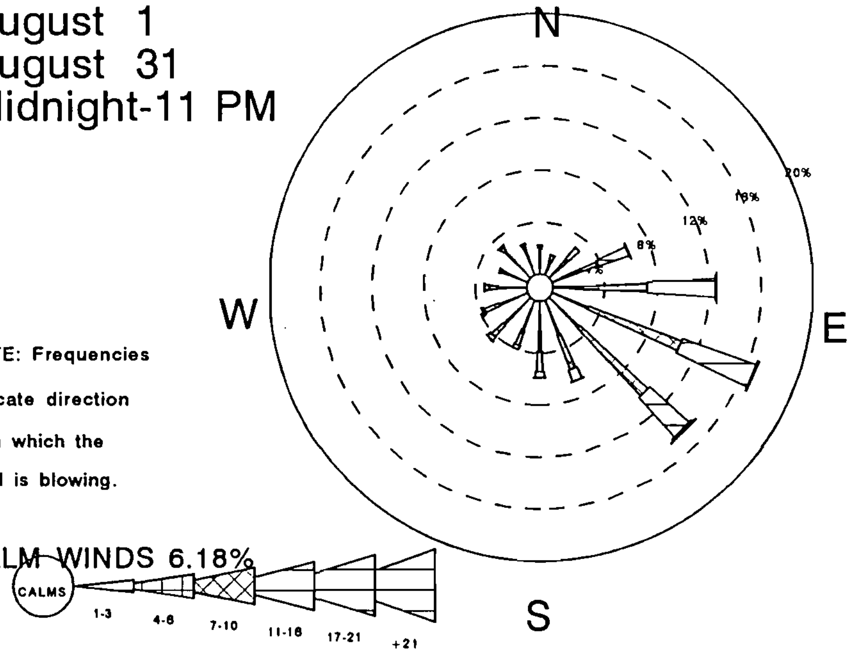


NOTE: Frequencies indicate direction from which the wind is blowing.

CALM WINDS 6.12%



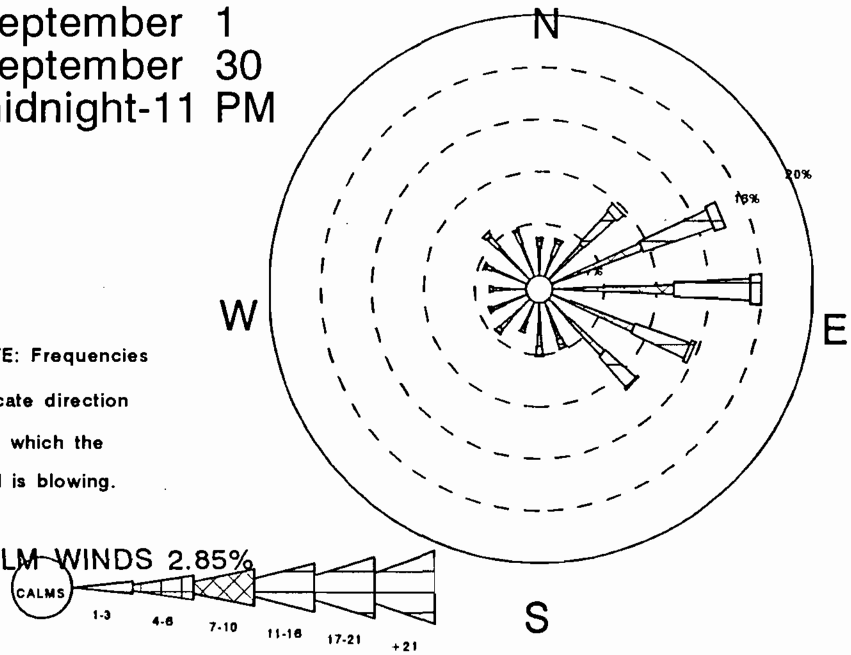
August, 1984 - 1989
August 1
August 31
Midnight-11 PM



NOTE: Frequencies indicate direction from which the wind is blowing.

CALM WINDS 6.18%

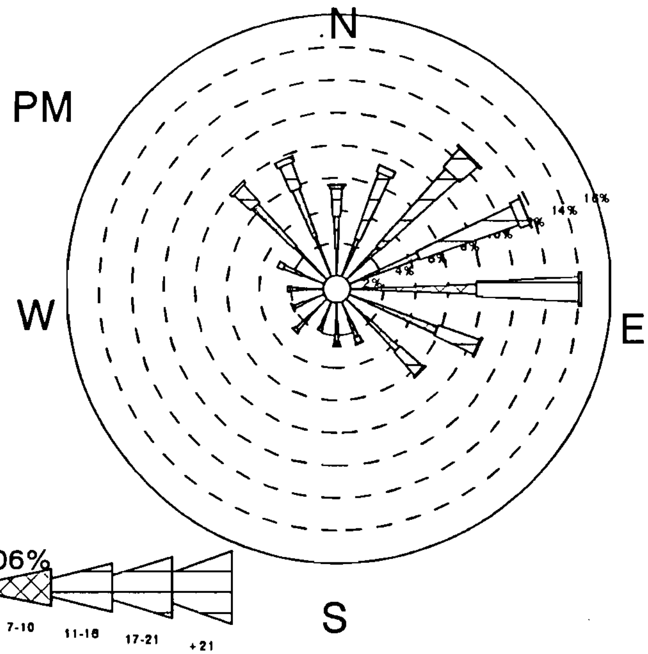
September, 1984 - 1989
September 1
September 30
Midnight-11 PM



NOTE: Frequencies indicate direction from which the wind is blowing.

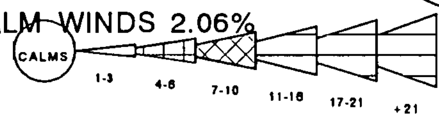
CALM WINDS 2.85%

October, 1984 - 1989
October 1
October 31
Midnight-11 PM

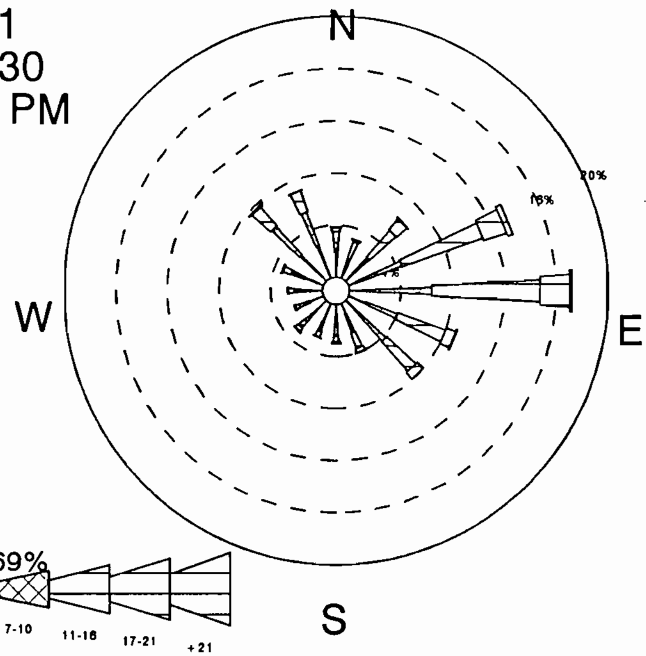


NOTE: Frequencies indicate direction from which the wind is blowing.

CALM WINDS 2.06%

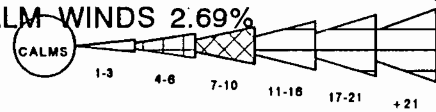


November, 1984 - 1989
November 1
November 30
Midnight-11 PM

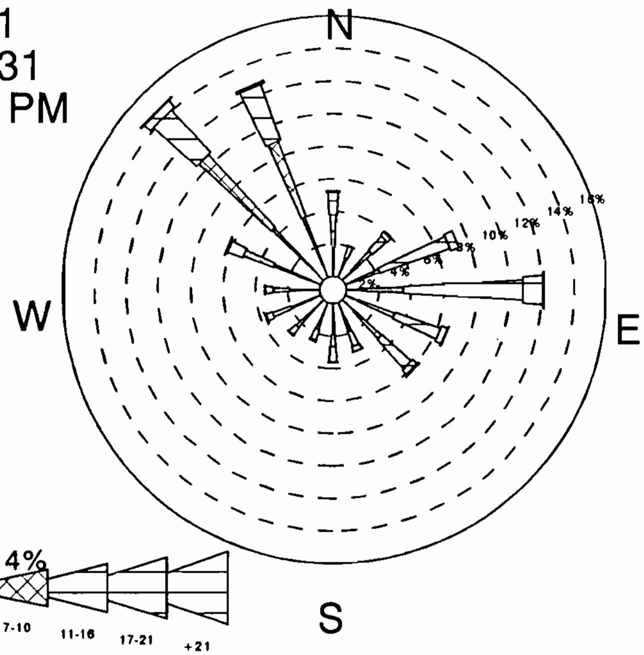


NOTE: Frequencies indicate direction from which the wind is blowing.

CALM WINDS 2.69%

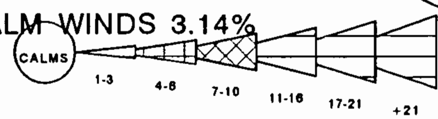


December, 1984 - 198
December 1
December 31
Midnight-11 PM



NOTE: Frequencies indicate direction from which the wind is blowing.

CALM WINDS 3.14%



ATTACHMENT O

Diskettes of Dispersion Modeling Input Files

Directions for Input/Output Diskettes[1]

1. Create a directory on the hard drive for both Input and Output

   C:\MKDIR "INPUT" (press enter)
   C:\MKDIR "OUTPUT" (press enter)

2. Load diskette files you wish to use into either the Input or Output directory. At the directory prompt type the file name and press enter.

   C:\INPUT\>"File Name" (press enter)

3. These files are self extracting, once you press enter the files will begin to decompress. Make sure you have enough room on your hard drive. If at any point you wish to terminate the process press Ctrl + C.

[1] These diskettes are formatted for MS-DOS computers.

ATTACHMENT P

Diskettes of Dispersion Modeling Output Files

Directions for Input/Output Diskettes[1]

1. Create a directory on the hard drive for both Input and Output

   C:\MKDIR "INPUT" (press enter)
   C:\MKDIR "OUTPUT" (press enter)

2. Load diskette files you wish to use into either the Input or Output directory. At the directory prompt type the file name and press enter.

   C:\INPUT\>"File Name" (press enter)

3. These files are self extracting, once you press enter the files will begin to decompress. Make sure you have enough room on your hard drive. If at any point you wish to terminate the process press Ctrl + C.

[1] These diskettes are formatted for MS-DOS computers.

Table 6-13
Predicted Short-Term Crop Season Impacts
for the PSD Class I Increment Analysis

Pollutant	**Averaging Time**	**Year**	**Predicted Impact ($\mu g/m^3$)**	**Allowable Increment ($\mu g/m^3$)**
SO_2	3-Hour	1985	9.05	25
		1986	12.2	
		1987	8.91	
		1988	8.80	
		1989	9.91	
	24-Hour	1985	2.53	5
		1986	2.83	
		1987	2.53	
		1988	2.55	
		1989	2.64	
TSP/PM10[1]	24-Hour	1985	2.60	10/8
		1986	2.45	
		1987	1.89	
		1988	2.12	
		1989	2.09	

Note:

1 Reported TSP/PM10 impacts are the maximum predicted impacts. PM10 increments become effective June 1994.

Table 6-14
Predicted Short-Term Off-Season Impacts
for the PSD Class I Increment Analysis

Pollutant	**Averaging Time**	**Year**	**Predicted Impact ($\mu g/m^3$)**	**Allowable Increment ($\mu g/m^3$)**
SO_2	3-Hour	1985	14.1	25
		1986	13.9	
		1987	12.5	
		1988	12.1	
		1989	11.9	
	24-Hour	1985	3.41	5
		1986	2.50	
		1987	2.57	
		1988	3.58	
		1989	2.43	
TSP/PM10[1]	24-Hour	1985	2.88	10/8
		1986	3.44	
		1987	1.63	
		1988	1.69	
		1989	1.94	

Note:

1 Reported TSP/PM10 impacts are the maximum predicted impacts. PM10 increments become effective June 1994.

Table 6-15
Predicted Annual Impacts
for the PSD Class I Increment Analysis

Pollutant	**Averaging Time**	**Year**	**Predicted Impact ($\mu g/m^3$)**	**Allowable Increment ($\mu g/m^3$)**
SO_2	Annual	1985	0.291	2
		1986	0.309	
		1987	0.275	
		1988	0.312	
		1989	0.238	
TSP/PM10[1]	Annual	Maximum	0.0335	5/4
		HSH	0.0326	
		HTH	0.0309	
		H4H	0.0301	
		H5H	0.0297	
		H6H	0.0292	
NO_2	Annual	1985	0.140	2.5
		1986	0.139	
		1987	0.133	
		1988	0.172	
		1989	0.169	

Note:

1 Reported TSP/PM10 impacts are maximum through highest-sixth-highest (H6H) impacts for the 1984-1989 period. PM10 increments become effective June 1994.

Table 6-16
Maximum Impacts of Toxic Pollutants for Clewiston Facility (total all boilers)

Pollutant	Concentration (µg/m³)					
	8-Hour		24-Hour		Annual	
	Impact	NTL	Impact	NTL	Impact	NTL
Antimony	0.0022	5	0.0010	1.2	0.000033	3.0
Arsenic	0.0018	2	0.00082	0.48	0.000027	0.000230
Barium	0.0062	5	0.0029	1.2	0.000096	50
Beryllium	0.00039	0.02	0.00018	0.0048	0.000006	0.00042
Bromine	0.00065	6.6	0.00030	1.58	-	-
Cadmium	0.0015	0.5	0.00068	0.12	0.000023	0.00056
Chromium metals	0.0020	5	0.00091	1.2	0.000030	1000
Chromium $^{+6}$	0.00020	0.5	0.000091	0.12	0.000006	0.000083
Cobalt	0.011	0.5	0.0051	0.12	-	-
Copper	0.026	10	0.012	2.4	-	-
Fluoride	0.011	25	0.0052	6	-	
Formaldehyde	0.038	12	0.018	2.88	0.000580	0.077
Hydrogen Chloride	0.059	75	0.028	18	0.000910	7.0
Manganese	0.0024	50	0.0011	12	0.000037	-
Mercury	0.00030	10	0.00014	2.4	0.000005	03
Molybdenum	0.0045	50	0.0021	12	-	-
Nickel	0.12	0.5	0.055	0.12	0.001800	0.0042
Phosphorus	0.0054	1	0.0025	0.24	-	-
Selenium	0.0035	2	0.0016	0.48	-	-
Tin	0.031	1	0.014	0.24	-	-
Zinc	0.0062	10	0.0029	2.4	-	-

Notes:

1. NTL = no-threat level.
2. Maximum concentrations determined with ISCST2 model and West Palm Beach meteorological data for 1985 to 1989.

Source: FDEP Air Toxics Working List, V3.0

Table 6-17
Comparison of Predicted Off-Season NMHC Impacts
Against THC Ambient Air Quality Data

Year	Highest Monitored THC Concentration ($\mu g/m^3$)	Highest Predicted NMHC Concentration ($\mu g/m^3$)
1974	3206	--
1975	3403	--
1976	3076	--
1977	3272	--
1978	--	--
1979	4973	--
1980	5104	--
1981	4057	--
1982	--	--
1983	--	--
1984	--	--
1985	--	14.3
1986	--	19.6
1987	--	14.4
1988	--	12.8
1989	--	16.1

Note: averaging time = 1 hour

7.1 IMPACTS ON SOILS AND VEGETATION

7.1.1 General

The U.S. Sugar Clewiston mill is less than 5 km southwest of Lake Okeechobee and approximately 100 km north of the Everglades National Park (ENP). The major crops grown in the vicinity of the site are sugar cane, vegetables, and some pasture grasses. Maximum annual concentrations of criteria pollutants are predicted to occur approximately 100 km from the source (see Table 6-6).

As described in the air quality impact analysis (Section 6.0), the maximum predicted PM, SO_2, NO_x and CO concentrations in the vicinity of the site as a result of the proposed project are predicted to be well below the associated AAQS. The AAQS are designed to protect both the public health (primary standards) and welfare (secondary standards), including effects upon soils and vegetation. Therefore no detrimental effects on soils or vegetation should occur in this area.

As discussed in Section 6.0, the impact of the proposed project is well below the allowable PSD Class I increments. Therefore there should be no significant ecological effects of the proposed project on the ENP.

7.1.2 Impacts on Vegetation

<u>7.1.2.1 Sulfur Dioxide</u>

The predicted maximum increase in annual concentrations of SO_2 due to the proposed boiler No. 7 is less than 26 $\mu g/m^3$. Sulfur is a plant nutrient which is normally taken up as sulfate ions by the roots. When sulfur dioxide in the atmosphere enters the foliage through pores in the leaves, it reacts with water in the leaf interior to form sulfite ions. Sulfite ions are highly toxic, and they interact with enzymes, compete with normal metabolites, and interfere with a variety of cellular functions (Horsman and Welburn, 1976). However, sulfite is oxidized to sulfate ions within the leaf. These sulfate ions can then be used by the plant as a nutrient. Small amounts of sulfite can be oxidized in the plant before they induce harmful effects.

SO_2 at elevated levels in the ambient air has long been known to cause injury to plants. Acute SO_2 injury usually develops within a few hours or days of exposure. Symptoms include marginal, flecked, and/or intercostal necrotic areas that initially appear water-soaked and dullish green. This type of injury generally occurs to younger leaves. Chronic injury usually is evident by signs of chlorosis, bronzing, premature senescence, reduced growth, and possible tissue necrosis (EPA, 1982).

Many studies have been conducted to determine the effects of high-concentration, short-term SO_2 exposure on vegetation. Sensitive plants include ragweed, legumes, blackberry, southern pine, and red and black oak. These species are potentially injured by 3-hour exposure to SO_2 concentrations ranging from 790-1,570 $\mu g/m^3$. Intermediate plants include locust and sweetgum; these species can be injured by 3-hour exposure to SO_2 concentrations ranging from 1,570-2,100 $\mu g/m^3$. Resistant species, which are not injured at concentrations below 2,100 ug/m^3 for 3 hours, include white oak and dogwood (EPA, 1982). A study of native Floridian vegetation species (Woltz and Howe, 1991) demonstrated that pine, cypress, oak, and mangrove exposed to 1,300 ug/m^3 SO_2 for 8 hours were not visibly damaged.

A recent study (Granat and Hallgren, 1992) considered the effects of low-concentration, long-term exposure of SO_2 on a pine forest by exposing the trees to 14-20 ug/m^3 of SO_2 over a long period. No adverse effects were reported; this study verified previous findings that forests have the capacity to take up wet-deposited sulfur compounds at low concentrations over long periods. Taylor and Bell (1988) evaluated exposure of grasses to SO_2 and reported similar results of no adverse effects at low concentrations over long periods.

No information is available on the sensitivity of sugar cane to SO_2. There has been no discernible damage to cane surrounding the present facilities. Table 7-1 presents concentrations of SO_2 known to adversely affect grasses which have been tested. Concentrations of SO_2 which affect sweet corn and tomatoes are also provided in Table 7-1, since these crops are grown in the region. Orchard grass exhibited reduced growth at concentrations approximating the predicted annual average, but all other species were adversely affected at SO_2 doses much higher than those predicted.

7.1.2.2 Nitrogen Oxides

The predicted maximum increase in annual concentrations of NO_x due to the proposed boiler No. 7 is less than 20 $\mu g/m^3$. No information is available on the sensitivity of sugar cane to NO_x; however, Ashenden (1979) reported no effect on orchard grass after exposure to 127 $\mu g/m^3$ NO_2 for 20 weeks. Taylor and Bell (1988) evaluated exposure of grasses to NO_x and reported similar results of no adverse effects at low concentrations over long periods.

Fumigation of plants of five species: the kidney bean, tomato, radish, sunflower, and spinach with greater than 10,000 ug/m^3 of NO_2 in daylight caused no injury, while some injuries to leaves in darkness was reported for the kidney bean (Shimazaki et al., 1992). NO_2 was absorbed by the plant leaves in the dark. The level of accumulated NO_2^- was decreased by light much more rapidly in spinach leaves than in those of the kidney bean, with much less injury to spinach leaves than to those of the kidney bean leaves.

Table 7-1

Lowest Doses of SO_2 Reported to Affect Growth of Sweet Corn, Tomato, and Some Grasses

Species	**Lowest SO_2 Dose Known to Affect Species, ($\mu g/m^3$)**	**Reference**
Rye Grass	367 for 131 days reduced growth	Ayazloo and Bell, 1981
Orchard Grass	37-62 for 72 days reduced growth	Crittenden and Read, 1979
Oats	1,048 for 3 hours four times during life cycle reduced growth	Heck and Dunning, 1978
Sweet Corn	812 for 7 days causes chlorosis, but no yield effects	Mandl et al., 1975
Tomato	1,258 for 5 hours on each of 57 days reduced growth	Kohut et al., 1982

The above concentrations are much greater than that expected from the proposed facility, and thus no adverse impacts on vegetation from NO_x are expected.

7.1.2.3 Particulate Matter

Predicted maximum increase in the annual average concentration of PM due to the proposed boiler No. 7 is 15 $\mu g/m^3$. Plants are adversely affected by particulate matter only at grossly high concentrations that result in surface depositions of 1 to 4 g/m^2/day (Lerman and Darley, 1975). Surface deposition from the predicted maximum levels of particulates would be a small fraction of the levels known to impact plant growth and will have no significant effect on vegetation in the region of the site. The wet scrubbers controlling particulate matter emissions at the Clewiston mill will effectively capture a large portion of the PM in the exhaust gas streams of the boilers.

7.1.2.4 Carbon Monoxide

A thorough search of the Hazardous Substances Database (EPA 1993b) yielded no information on the potential impacts of carbon monoxide on soils and vegetation.

7.1.3 Impacts on Soils

Soils are primarily organic peat-type and mucks. Mucks near the rim of Lake Okeechobee are organic soils mixed with silt and clay; they contain microelements which the peats lack and are highly valued for agriculture. Sandy soils also occur in the region.

The potential and hypothesized effects of atmospheric deposition of SO_2 and NO_x include:

- Increased soil acidification
- Alteration in cation exchange
- Loss of base cations
- Mobilization of trace metals

The potential sensitivity of specific soils to atmospheric inputs is related to two factors. First, the physical ability of a soil to conduct water vertically through the soil profile is important in influencing the interaction with deposition. Second, the ability of the soil to resist chemical changes, as measured in terms of pH and soil cation exchange capacity (CEC), is important in determining how a soil responds to atmospheric inputs.

Organic soils can adsorb SO_2, sulfates, and NO_x with little change in pH. Deposition of these gases can increase the acidity of sandy soils; however, the low concentrations resulting from the proposed source will have a negligible effect on soil pH. Soils in this area that are utilized for agriculture are commonly amended with lime, thus any tendency towards lower pH would be neutralized. Area crops may benefit from the additional sulfur and nitrogen in the soil.

The relatively low sensitivity of the soils to acid inputs coupled with the extremely low ground-level concentrations of contaminants projected for the facility emissions precludes any significant impact on soils.

7.2 IMPACTS ON VISIBILITY

The visibility analysis required by PSD regulations under Additional Impact Analysis is distinct from that required for Class I areas. This visibility impairment analysis is concerned with impacts that occur within the significant impact area of the proposed project.

A Level-1 visibility screening analysis was performed to determine the potential adverse visibility effects using the approach suggested in the Workbook for Plume Visual Impact Screening and Analysis (EPA, 1988c). The Level-1 screening analysis is designed to provide a conservative estimate of plume visual impacts (i.e., impacts higher than expected). The EPA model, VISCREEN, was used for this analysis. Model input and output results are presented in Table 7-2. The total PM, NO_x, and sulfuric acid mist emissions from the proposed facility, as presented in Section 3.4, were used as input to the model. As indicated, the maximum visibility impacts caused by the facility do not exceed the screening criteria. As a result, there is no significant impact upon visibility predicted in the significant impact area or for the ENP Class I area.

7.3 IMPACTS DUE TO ASSOCIATED POPULATION GROWTH

There will be a small number of temporary construction workers during construction. There will be no new permanent employees at the Clewiston Mill associated with the operation of boiler No. 7. With no associated industrial, commercial, or residential growth, there will thus be no growth-related air pollution impacts in the area due to the project.

Table 7-2
Visual Effects Screening Analysis for
Source: USSC-Clewiston, Boiler 7
Class I Area: Everglades National Park

*** Level-1 Screening ***

Input Emissions for

Particulates	13.95	G /S
NOx (as NO2)	24.19	G /S
Primary NO2	.00	G /S
Soot	.00	G /S
Primary SO4	.50	G /S

**** Default Particle Characteristics Assumed

Transport Scenario Specifications:

Background Ozone:	.04 ppm
Background Visual Range:	40.00 km
Source-Observer Distance:	102.00 km
Min. Source-Class I Distance:	102.00 km
Max. Source-Class I Distance:	175.00 km
Plume-Source-Observer Angle:	11.25 degrees
Stability:	6
Wind Speed:	1.00 m/s

R E S U L T S

Asterisks (*) indicate plume impacts that exceed screening criteria

Maximum Visual Impacts INSIDE Class I Area
Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	84.	102.0	84.	2.00	.306	.05	.003
SKY	140.	84.	102.0	84.	2.00	.061	.05	-.003
TERRAIN	10.	84.	102.0	84.	2.00	.070	.05	.001
TERRAIN	140.	84.	102.0	84.	2.00	.018	.05	.001

Maximum Visual Impacts OUTSIDE Class I Area
Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	65.	95.2	104..	2.00	.325	.05	.003
SKY	140.	65.	95.2	104.	2.00	.063	.05	-.003
TERRAIN	10.	55.	91.3	114.	2.00	.092	.05	.001
TERRAIN	140.	55.	91.3	114.	2.00	.024	.05	.001

Presented in this section are proposed permit conditions for the Clewiston Mill boiler No. 7. These proposed conditions reflect typical conditions issued in FDEP construction permits for industrial boilers. It is requested that FDEP consider these proposed conditions in issuing the air construction and operating permits for the facility.

Construction Details

1. Construction of the proposed boiler No. 7 shall reasonably conform to the plans described in the application.

2. The boiler shall be of the spreader-stoker, vibrating-grate type.

3. The boiler stack shall have a minimum height of 225 feet. The stack sampling facilities for each stack shall comply with F.A.C. Rule 17-297.345.

4. The boiler shall be equipped with instruments to measure fuel oil flowrate, steam production, steam pressure, and steam temperature.

5. The boiler shall be equipped with a wet impingement scrubber designed for at least 75% removal of SO_2 from bagasse combustion. The scrubber shall be built to Joy Manufacturing Company's specification for their Turbulaire Type D, Size 260 spray impingement scrubber. The unit shall be equipped with instruments to measure the gas pressure drop, and to continuously record the scrubber water pressure and volumetric flowrate.

Operational and Emission Restrictions

6. The proposed steam generating unit shall be operated in accordance with the capabilities and specifications described in the application. Boiler No. 7 steam production, steam pressure, steam temperature, heat input and bagasse feedrate shall not exceed the following:

Steam Press., psig	Steam Temp., F°	Averaging Time[1]	Steam Production, lb/hr	Heat Input, MM Btu/hr	Bagasse Feedrate, lbs/hr-wet
600	750	Maximum	385,000	812	203,060
		6 hours	350,000	738	184,600

[1] Maximum is a 1-hour average

7. Heat input from residual oil shall not exceed 255 million (MM) Btu per hour (which is approximately equivalent to 1,700 gallons per hour of oil and 175,000 pounds per hour of steam). The boiler shall be operated so that not more than two burners with two oil guns each (total of four oil guns) can be used with a total maximum capacity not to exceed the permitted oil input.

8. Based on a maximum heat input to the boiler of 738 MM Btu/hr for bagasse and 255 MM Btu/hr for fuel oil, stack emissions shall not exceed those shown in the following Table 8-1

9. During any 12-month period, the maximum quantity of residual oil burned in boiler No. 7 shall not exceed 3,000,000 gallons. The consumption of oil shall not exceed 10% of the total heat input to the boiler in any calendar year.

10. During any 24-hour period, not more than 40,800 gallons of fuel oil shall be burned in all stationary fuel-oil-burning equipment at the plant. All permits to operate other oil-burning equipment at this plant are revised to include this limitation.

11. During any 3-hour period, not more than 6,300 gallons of fuel oil shall be burned in all stationary fuel-oil-burning equipment at the plant. Excess fuel oil burning resulting from startup, shutdown, or malfunction of any source shall be permitted, provided that best operational practices to minimize emissions are adhered to and that the duration of excess emissions shall be minimized. All permits to operate other oil-burning equipment at this plant are revised to include this limitation.

12. All stationary fuel-oil-burning equipment at the plant shall be equipped with integrating fuel oil flow meters or continuous recorders to measure the amount of fuel oil consumed by the equipment. Oil meter readings on all oil-consuming equipment shall be read and logged at least once every three hours, unless oil consumption for the equipment is recorded continuously, and these records shall be kept for at least five years for Department inspection. Each meter shall be calibrated annually by a method approved by the Department.

Table 8-1

Proposed Emission Limits (lb/MM Btu) for Boiler No. 7

Pollutant	Bagasse	No. 6 Oil
Particulate (TSP)	0.15	0.1
Particulate (PM10)	0.15	0.1
Sulfur Dioxide[1]	0.167	0.5
Nitrogen Oxides[1]	0.26	0.3-0.4[2]
Carbon Monoxide	9.0[3]	0.066
Volatile Organic Compounds	0.21	0.004
Lead	--	56E-06
Mercury	--	6.4E-06
Beryllium	--	8.4E-06
Fluorides	--	12.6E-06
Sulfuric Acid Mist	0.0167	0.05

Notes:

[1] Compliance based on use of very-low-sulfur fuel oil and on 24-hour rolling average per 40 CFR 60, Subpart Db.

[2] Compliance based on use of low-nitrogen fuel oil and on 24-hour rolling average per 40 CFR 60, Subpart Db.

[3] 9.0 lb/MM Btu during crop season, 7.74 lb/MM Btu during off-season.

13. The permittee shall maintain a daily log of fuel oil amount, heating value, and equivalent SO_2 emission rate (in lb/MM Btu). The SO_2 emission rate shall be determined from the sulfur content of the fuel oil, based on certified analysis from the fuel oil vendor. These daily logs shall be kept for a least two years.

14. During boiler No. 7 operation, the existing boilers No. 5 and 6 shall be shut down. Boilers No. 5 and 6 may be operated only when boiler No. 7 is not operating. During operation, boilers No. 5 and 6 must meet all requirements in their current operating permits.

Compliance Requirements

15. Performance Tests. Within 180 operating days after initial startup, the permittee shall conduct performance tests for particulates, SO_2, NO_x, and visible emissions. The performance tests shall be conducted in accordance with the provisions of 40 CFR 60.45b and 60.46b. All compliance tests shall be conducted while the boiler is operating within 10% of maximum capacity. Such tests shall be conducted once per year commencing before February 15th. Results shall be submitted to the Department within 45 days after testing. The South Florida District office shall be notified 15 days prior to any compliance test to allow witnessing.

    Compliance with emission limitations stated in Condition No. 8 above shall be demonstrated using EPA Methods, as contained in 40 CFR Part 60 (Standards of Performance for New Stationary Sources), or 40 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants), or any other method as approved by the Department, in accordance with F.A.C. Rule 17-297. A test protocol shall be submitted for approval to the Bureau of Air Regulation at least 90 days prior to testing.

    Stack testing for particulates only shall be performed once every year.

16. Scrubber performance. During the first 160 days of operation following the issuance of the construction permit, one reading every 8 hours of the gas pressure drop shall be taken and logged for each day that boiler No. 7 operates. If any reading is 25% below the average pressure drop recorded during the compliance test, the Department may require a compliance test at the lower pressure drop and may also require the installation of an instrument to continuously measure and record the gas pressure drop.

    Readings every 24 hours of the pH of the scrubber water shall be taken and logged for each day during which bagasse is burned in boiler No. 7 during its first 160 days of operation following issuance of the construction permit. The Department shall be notified if chemicals are used to adjust pH. If any pH value falls more than 10% below the pH that existed during the compliance test for sulfur dioxide, the Department may require the installation of an instrument to continuously measure and record scrubber water pH.

During compliance testing, the scrubber parameters shall be measured and recorded at 15-minute intervals. Records of the measurements required by this condition shall be obtained for the first 160 days of operation of boiler No. 7 after issuance of the construction permit and copies of the records transmitted to the South Florida District and Bureau of Air Quality Management at the end of the season(s).

After review of the 160 days of data, the Bureau of Air Quality Management and the South Florida District will establish the scrubber parameters to be monitored and the frequency of monitoring. These requirements shall become a condition to any permit to operate issued to boiler No. 7. The records required by the permit to operate shall be kept for five years for agency inspection.

17. Particulate matter emissions from boiler No. 7 shall not exceed 0.150 lb/million Btu heat input for bagasse fuel or 0.10 lb/million Btu heat input for residual fuel oil. In event that both fuels are burned concurrently, the allowable particulate matter emissions shall be prorated from the allowable standards for each fuel by their respective heat inputs. Compliance with the particulate matter standards shall be determined by EPA Reference Methods 1, 2, 3, 4 and 5 as described in 40 CFR 60, Appendix A. The compliance test results shall be calculated by assuming the thermal efficiency of boiler No. 7 is 55%, or any new method subsequently adopted by Department rule. For informational purposes only, the particulate matter emission rate shall also be calculated by utilizing the short-form ASME boiler-efficiency test results (once every five years). Scrubber parameters listed in Condition No. 16 shall be recorded every 15 minutes or continuously during the compliance test.

18. Visible emissions from boiler No. 7 shall not exceed 20% opacity except that 40% opacity is allowed for 2 minutes during any hour. Compliance with the standard shall be determined by DEP Method 9 as described in Chapter 17-2, F.A.C. The particulate matter emissions and visible emissions shall be determined concurrently. Under circumstances when this is not feasible, the company shall obtain prior approval from the South Florida District to conduct the tests at separate times. In such circumstances, the tests shall be conducted as close to each other as is feasible.

19. Residual fuel oil burned in this boiler shall contain no more than 2.50% sulfur and shall be replaced during the season in which it is burned with fuel oil containing no more than 0.50% sulfur. Compliance with this condition shall be determined from certified analyses of the replacement oil by ASTM Method D-129, D-1552, D-2622 or D-4294. Records of the

quantity and analysis of fuel oil consumed in boiler No. 7 and invoices for the oil purchases shall be kept for a minimum of five years for regulatory agency inspection.

20. Sulfur dioxide emissions from boiler No. 7, while it is burning 100% bagasse fuel, shall not exceed 0.166 lb/million Btu heat input as determined by EPA Method 6 as described in 40 CFR 60, Appendix A. The compliance test results shall be calculated by assuming the thermal efficiency of boiler No. 7 is 55%, or any new method subsequently adopted by Department rule. The Department will re-evaluate this sulfur dioxide standard, without penalty to the applicant, if technical data is submitted to the Department prior to the expiration of this permit that confirms that emissions from bagasse are different under the two operational modes (bagasse only versus bagasse/oil combination). For informational purposes only, the sulfur dioxide emission rate shall also be calculated by utilizing the short-form ASME boiler-efficiency test results (once every five years). Scrubber parameters listed in Condition No. 16 shall be recorded every 15 minutes or continuously during the compliance test.

Sulfur dioxide emissions from boiler No. 7, while it is burning a mixture of oil and bagasse, shall not exceed 710 lb/hr.

21. Nitrogen oxides emissions, expressed as NO_2, shall not exceed 192.4 lb/hr (maximum) and 180.7 lb/hr (6-hour average) as determined by EPA Reference Method 7 described in 40 CFR 60, Appendix A. After the initial compliance test, the permittee may substitute an Operation and Maintenance plan that is approved by the Department that optimizes the NO_x emissions for the compliance tests specified in this specific condition, if the initial Method 7 test shows compliance.

22. Carbon monoxide and volatile organic compounds emissions shall be maintained at the lowest possible level through the implementation of an Operation and Maintenance plan that is approved by the Department. Emissions of carbon monoxide shall not exceed 9.0 lb/million Btu as determined by EPA Method 10. Emissions of volatile organic compounds shall not exceed 1.7 lb/ton of wet bagasse as determined by EPA Method 25. These test methods are described in 40 CFR 60, Appendix A. Compliance testing for these pollutants will not be required if the visible emissions from boiler No. 7 are below 20% opacity.

23. Visible emissions from the bagasse handling systems shall not exceed 10% opacity over any 6 minute period as measured by EPA Reference Method 9, provided, however, that this visible emissions limit shall not apply during periods of high winds (wind speed of 18 miles per hour or greater) if reasonable precautions (covered conveyors, windbreaks, and minimum drop-point height) to control fugitive emissions have been taken. The permittee shall

maintain a meteorological instrument to record the wind speed at the plant which shall be located at its Research Center, about one mile "south" of the Clewiston mill.

24. Compliance with all emission standards for boiler No. 7, except particulate matter and visible emissions, may be based on emission factors established by previous EPA reference method tests on similar boilers at the Clewiston mill.

25. Thermal efficiency. A test shall be made on boiler No. 7 to determine its actual thermal efficiency in accordance with the ASME short-form procedure each time the operating permit for this boiler is renewed. The test shall be done while the tubes are clean and within 14 days of the compliance test. A current report on the thermal efficiency test must be included with the application to operate this boiler.

Reporting Requirements

26. Fuel usage, fuel analysis data, and sulfur dioxide emission calculations for fuel oil combustion shall be reported to the Department's South District Office on a quarterly basis commencing with the start of full-time operation in accordance with 40 CFR, Part 60, Sections 60.7 and 60.49b.

27. An annual operation report (FDEP Form 17-1.202(6)) shall be submitted by March 1st of each year.

Ashendon, T.W. 1979. The Effects of Long-Term Exposures to SO_2 and NO_2 Pollution on the Growth of *Dactylis glomerata L.* and *Poa pratensis L.* Environmental Pollution, 18:249-258.

Auer, A.H., 1978. Correlation of Land Use and Cover with Meteorological Anomalies. J. Applied Meteorology, Vol 17.

Briggs, G. A., 1969. Plume Rise, USAEC Critical Review Series, TID-25075, National Technical Information Service, Springfield, Virginia.

Briggs, G.A., 1971. Some Recent Analyses of Plume Rise Observations, In: Proceedings of the Second International Clean Air Congress, Academic Press, New York.

Briggs, G.A., 1972. Discussion on Chimney Plumes in Neutral and Stable Surroundings. Atoms. Environ. 6:507-510.

Briggs, G.A., 1975. Plume rise predictions. In: Lectures on Air Pollution and Environmental Impact Analysis, American Meteorological Society, Boston, Massachusetts.

Granat, L and Hallgren, J. 1992. Relationship Between Estimated Dry Deposition and Throughfall in a Coniferous Forest Exposed to Controlled Levels of SO_2 and NO_2 Environmental Pollution 75: 237-242.

Holzworth, G.C., 1972. Mixing Heights, Wind Speeds and Potential for Urban Air Pollution Throughout the Contiguous United States. Pub. No. AP-101. U.S. Environmental Protection Agency.

Horsman, D.C. and A.R. Wellburn. 1976. Guide to Metabolic and Biochemical Effects of Air Pollutants on Higher Plants. In: Effects of Air Pollution on Plants. T.A. Mansfield, ed., Cambridge University Press, Cambridge, England. pp. 185-199.

Huber, A.H. and W. H. Snyder, 1976. Building Wake Effects on Short Stack Effluents. Preprint Volume for the Third Symposium on Atmospheric Diffusion and Air Quality, American Meteorological Society, Boston, Massachusetts.

Huber, A.H., 1977. Incorporating Building/Terrain Wake Effects on Stack Effluents. Preprint volume for the Joint Conference on Applications of Air Pollution Meteorology, American Meteorological Society, Boston, Massachusetts.

Lerman, S.L., and Darley, E.F., 1975. Particulates. In: Responses of Plants to Air Pollution. pp. 141-158. J.B. Mudd and T.T. Kozlowski, editors. Academic Press, Inc., New York.

Pasquill, F., 1976. Atmospheric Dispersion Parameters in Gaussian Plume Modeling, Part II. Possible Requirements for Changes in the Turner Workbook Values. EPA Report No. EPA 600/4/76-030b. U.S. Environmental Protection Agency, Research Triangle Park, North Carolina.

Schulman, L.L. and S.R. Hanna, 1986. Evaluation of Downwash Modifications to the Industrial Source Complex Model. Journal of Air Pollution Control Association 36 (3), 258-264.

Schulman, L.L. and J.S. Scire, 1980. Buoyant Line and Point Source (BLP) Dispersion Model User's Guide. Document P-7304B, Environmental Research and Technology, Inc., Concord, Massachusetts

Shimazaki, K., YU, S., Sakaki, T., and Tanaka, K. 1992. Difference Between Spinach and Kidney Bean Plants in Terms of Sensitivity to Fumigation with NO_2. Plant Cell Physiology. 33: 267-273.

Taylor, H.J., and Bell, J.N.B. 1988. Studies on the Tolerance to SO_2 of Grass Populations in Polluted Areas. Investigations into the Development of Tolerance to SO_2 and NO_2 in Combination and NO_2 Alone. New Phytology. 110: 327-338.

U.S. Environmental Protection Agency (EPA). 1981. Emissions Assessment of Conventional Stationary Combustion Systems: Volume V, Industrial Combustion Sources. Prepared by TRW, Inc. EPA 600/7-81-003. Washington, DC.

U.S. EPA. 1982. Air Quality Criteria for Particulate Matter and Sulfur Oxides. Vol. 3.

U.S. EPA. 1985. Guideline for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations) Revised). Research Triangle Park, NC. EPA-450/4-80-023.

U.S. EPA. 1987a. Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD). Research Triangle Park, NC. EPA-450/4-87-007.

U.S. EPA. 1987b. Guideline on Air Quality Models, Supplement A (Revised). EPA-450/2-78-027.

U.S. EPA. 1988a. Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources (Supplement B, p. 3.1-2) AP-42. Research Triangle Park, NC.

U.S. EPA. 1988b. EPA's User's Network for Applied Modeling of Air Pollution (UNAMAP), Version 6, Change 3, January 4, 1988. Research Triangle Park, North Carolina.

U.S. EPA. 1988c. Workbook for Plume Visual Impact Screening and Analysis. Office of Air Quality. EPA-450/4-83-015. Washington, DC.

U.S. EPA. 1989. Estimating Air Toxics Emission from Coal and Oil Combustion Sources. QAQPS, Research Triangle Park, North Carolina. EPA-450/2-89-001.

U.S. EPA. 1990a. New Source Review Workshop Manual. Research Triangle Park, North Carolina.

U.S. EPA. 1990b. OAQPS Control Cost Manual (4th Ed.) OAQPS, Research Triangle Park, North Carolina. EPA-450/3-90-006.

U.S. EPA. 1992. User's Guide for the Industrial Source Complex (ISC2) Dispersion Models. Office of Air Quality Planning and Standards. EPA-450/4-92-008. Research Triangle Park, North Carolina.

U.S. EPA. 1993a. BACT/LAER Clearinghouse-BACT/LAER Information System (BLIS). EPA National Computer Center. Research Triangle Park, North Carolina.

U.S. EPA. 1993b. Hazardous Substances Toxnet Database (on-line computerized database).

Woltz, S.S. and T.K. Howe. 1981. Effects of Coal Burning Emissions on Florida Agriculture. In: The Impact of Increased Coal Use in Florida. Interdisciplinary Center of Aeronomy and (other) Atmospheric Sciences. University of Florida, Gainesville, FL.

ATTACHMENT A

Fuel Analysis Information

BEST AVAILABLE COPY

STANDARD LABORATORIES, INC.
CRESSON, PA 16630

DATE: 2-25-93
SAMPLE NO. 196540

7193
ENTROPY ENVIRO. INC.
PO BOX 12291
RES TRIANGLE PK NC 27709

SAMPLE ID: EEI-FUEL-1A U.S. SUGAR
CLEWISTON, FL

PERATING CO.:
AMPLED BY: JDK
INE:
OCATION:

ATE SAMPLED: 2/22/93
DATE RECEIVED: 2/23/93
EATHER:
ROSS WEIGHT:

THER ID: P.O. 3270-11462 SAMPLE MATRIX: SOLID FUEL

CERTIFICATE OF ANALYSIS

	ASTM METHOD	AS RECEIVED	DRY BASIS	
MOISTURE	D2961 D3302 D3173	50.53%	XXX	
VOLATILE MATTER	D3175	41.60%	84.09%	
FIXED CARBON	D3172	6.51%	13.15%	
ASH	D3174	1.36%	2.76%	
SULFUR	D3177 METHOD A	.07%	.13%	
CARBON	D3178	23.48%	47.47%	
HYDROGEN	D3178	2.93%	5.93%	
NITROGEN	D3179	.19%	.39%	
OXYGEN	D3176	21.44%	43.32%	
TU/LB	D2015 D1989	3750	7580	
AF BTU/LB				7795
LBS OF SO2 PER MILLION BTU			.34	
LBS OF SULFUR PER MILLION BTU			.172	

APPROVED BY

APPROVED BY

PAGE 1 OF 1
246

BLACK SEAL ANALYSIS

BEST AVAILABLE COPY

Thom. DGW, OGB, Lab, TJG

624
604

RILEY | RILEY STOKER CORPORATION

POST OFFICE BOX 547, WORCESTER, MASS. 01613
An Ashland Technology Company

FUELS LABORATORY

TEST REPORT

Laboratory No. 35,611 Sample of Bagasse Date Rec'd 1/9/86

Received From U.S. Sugar Corp. Clewiston, FL

Sample Data Bagasse Sample #2-28 taken during compliance testing #2 Blr 1/2/86

Contract No. 641-61018 Field Sample By

Air Drying Loss %					
Proximate Analysis	**As Rec'd**	**Dry**	**Ultimate Analysis**	**As Rec'd**	**Dry**
Moisture	52.6 %	------	Moisture	%	--------
Volatile	40.56%	85.56 %	Carbon	%	48.1 %
Ash	1.04%	2.20 %	Hydrogen	%	6.4 %
Fixed Carbon	5.80%	12.24 %	Nitrogen	%	0.35 %
	100.0 %	100.0 %	Oxygen (diff)	%	42.90 %
British Thermal Units	3,702	7,810	Sulfur	%	0.05 %
Fusibility of Ash			Ash	%	2.20 %
Initial Deformation		F		100.0 %	100.0 %
Softening		F	Free Swelling Index		
Fluid		F	Grindability Index		

Date 1/29/86 Tom Gallagher

FORM 214

BEST AVAILABLE COPY

Thom. DGW, OGB, Lab, TJG

624
604

FEB
RECEIVED
Clewiston
Sugar House

RILEY | RILEY STOKER CORPORATION

POST OFFICE BOX 547, WORCESTER, MASS. 01613
An Ashland Technology Company

FUELS LABORATORY

TEST REPORT

Laboratory No. 35,611 Sample of Bagasse Date Rec'd 1/9/86

Received From U.S. Sugar Corp. Clewiston, FL

Sample Data Bagasse Sample #2-28 taken during compliance testing
#2 Blr 1/2/86

Contract No. 641-61018 Field Sample By

Air Drying Loss		%			
Proximate Analysis	As Rec'd	Dry	Ultimate Analysis	As Rec'd	Dry
Moisture	52.6 %	------	Moisture	%	--------
Volatile	40.56%	85.56 %	Carbon	%	48.1 %
Ash	1.04%	2.20 %	Hydrogen	%	6.4 %
Fixed Carbon	5.80%	12.24 %	Nitrogen	%	0.35 %
	100.0 %	100.0 %	Oxygen (diff)	%	42.90 %
British Thermal Units	3,702	7,810	Sulfur	%	0.05 %
Fusibility of Ash			Ash	%	2.20 %
Initial Deformation		F		100.0 %	100.0 %
Softening		F	Free Swelling Index		
Fluid		F	Grindability Index		

Date 1/29/86 Tom Gallagher

FORM 214

RILEY
RILEY STOKER CORPORATION
POST OFFICE BOX 547, WORCESTER, MASS. 01613
An Ashland Technology Company

FUELS LABORATORY

TEST REPORT

Laboratory No. 35,612 Sample of Bagasse Date Rec'd 1/9/86

Received From U. S. Sugar Corp. Clewiston, FL

Sample Data Bagasse Sample #3 - 85 taken during compliance testing
#3 Blr 1/3/86

Contract No. 641-61018 Field Sample By

Air Drying Loss		%			
Proximate Analysis	As Rec'd	Dry	Ultimate Analysis	As Rec'd	Dry
Moisture	52.8 %	------	Moisture	%	--------
Volatile	40.19%	85.15 %	Carbon	%	48.1 %
Ash	1.11%	2.36 %	Hydrogen	%	6.1 %
Fixed Carbon	5.90%	12.49 %	Nitrogen	%	0.36 %
	100.0 %	100.0 %	Oxygen (diff)	%	43.02 %
British Thermal Units	3,783	8,015	Sulfur	%	0.06 %
Fusibility of Ash			Ash	%	2.36 %
Initial Deformation		F		100.0 %	100.0 %
Softening		F	Free Swelling Index		
Fluid		F	Grindability Index		

Date 1/29/86 Tom Gallagher

FORM 214

RILEY
RILEY STOKER CORPORATION
POST OFFICE BOX 547, WORCESTER, MASS. 01613
An Ashland Technology Company Ashland

FUELS LABORATORY

TEST REPORT

Laboratory No. 35,612 Sample of Bagasse Date Rec'd 1/9/86

Received From U. S. Sugar Corp. Clewiston, FL

Sample Data Bagasse Sample #3 - 85 taken during compliance testing
#3 Blr 1/3/86

Contract No. 641-61018 Field Sample By

Air Drying Loss		%			
Proximate Analysis	**As Rec'd**	**Dry**	**Ultimate Analysis**	**As Rec'd**	**Dry**
Moisture	52.8 %	------	Moisture	%	--------
Volatile	40.19%	85.15 %	Carbon	%	48.1 %
Ash	1.11%	2.36 %	Hydrogen	%	6.1 %
Fixed Carbon	5.90%	12.49 %	Nitrogen	%	0.36 %
	100.0 %	100.0 %	Oxygen (diff)	%	43.02 %
British Thermal Units	3,783	8,015	Sulfur	%	0.06 %
Fusibility of Ash			Ash	%	2.36 %
Initial Deformation		F		100.0 %	100.0 %
Softening		F	Free Swelling Index		
Fluid		F	Grindability Index		

Date 1/29/86 Tom Gallagher

FORM 214

Thom, DGW, OGB, Lab, TJG

BEST AVAILABLE COPY

RILEY | RILEY STOKER CORPORATION

POST OFFICE BOX 547, WORCESTER, MASS. 01613
An Ashland Technology Company Ashland

FUELS LABORATORY

TEST REPORT

Copy: 61
68
PB
624

Laboratory No. 35,644 Sample of Bagasse Date Rec'd 1/23/86

Received From U.S. Sugar Corp., Clewiston, FL

Sample Data Bagasse Sample #1 Blr. 4-85 1/14/86 Compliance Testing-
Bryant Sugar House

Contract No. 641-61018 Field Sample By

Air Drying Loss %

Proximate Analysis	As Rec'd	Dry	Ultimate Analysis	As Rec'd	Dry
Moisture	51.1 %	------	Moisture	%	--------
Volatile	41.24 %	84.33 %	Carbon	%	47.9 %
Ash	1.42 %	2.90 %	Hydrogen	%	5.9 %
Fixed Carbon	6.24 %	12.77 %	Nitrogen	%	0.35 %
	100.0 %	100.0 %	Oxygen (diff)	%	42.83%
British Thermal Units	3981	8140	Sulfur	%	0.12%
Fusibility of Ash			Ash	%	2.90%
Initial Deformation		F		100.0 %	100.0 %
Softening		F	Free Swelling Index		
Fluid		F	Grindability Index		

Date February 5, 1986

T. J. Gallagher

FORM 214

Thom, DGW, OGB, Lab, TJG

BEST AVAILABLE COPY

RILEY | RILEY STOKER CORPORATION

POST OFFICE BOX 547, WORCESTER, MASS. 01613

An Ashland Technology Company

Copy: 61 / 68 / PB / 624

FUELS LABORATORY

TEST REPORT

Laboratory No. 35,644 Sample of Bagasse Date Rec'd 1/23/86

Received From U.S. Sugar Corp., Clewiston, FL

Sample Data Bagasse Sample #1 Blr. 4-85 1/14/86 Compliance Testing-Bryant Sugar House

Contract No. 641-61018 Field Sample By

Air Drying Loss %

Proximate Analysis	As Rec'd	Dry	Ultimate Analysis	As Rec'd	Dry
Moisture	51.1 %	------	Moisture	%	--------
Volatile	41.24 %	84.33 %	Carbon	%	47.9 %
Ash	1.42 %	2.90 %	Hydrogen	%	5.9 %
Fixed Carbon	6.24 %	12.77 %	Nitrogen	%	0.35 %
	100.0 %	100.0 %	Oxygen (diff)	%	42.83 %
British Thermal Units	3981	8140	Sulfur	%	0.12 %
Fusibility of Ash			Ash	%	2.90 %
Initial Deformation		F		100.0 %	100.0 %
Softening		F	Free Swelling Index		
Fluid		F	Grindability Index		

Date February 5, 1986 T. J. Gallagher

FORM 214

BEST AVAILABLE COPY

RILEY ... CORPORATION

POST OFFICE BOX 547, WORCESTER, MASS. 01613

An Ashland Technology Company

FEB 1986
RECEIVED
CLEWISTON
SUGAR HOUSE

FUELS LABORATORY

TEST REPORT

Laboratory No. 35,645 Sample of Bagasse Date Rec'd 1-23-86

Received From U.S. Sugar Corp., Clewiston, Florida

Sample Data Bagasse Sample #2 Blr. 5-85 1/15/86 Compliance Testing - Bryant Sugar House

Contract No. 641-61018 Field Sample By

Air Drying Loss		%			
Proximate Analysis	As Rec'd	Dry	Ultimate Analysis	As Rec'd	Dry
Moisture	52.8 %	------	Moisture	%	--------
Volatile	40.13%	85.01 %	Carbon	%	49.1 %
Ash	0.70%	1.49 %	Hydrogen	%	6.1 %
Fixed Carbon	6.37%	13.50 %	Nitrogen	%	0.38%
	100.0 %	100.0 %	Oxygen (diff.)	%	42.86%
British Thermal Units	3915	8295	Sulfur	%	0.07%
Fusibility of Ash			Ash	%	1.49%
Initial Deformation		F		100.0 %	100.0 %
Softening		F	Free Swelling Index		
Fluid		F	Grindability Index		

Date February 5, 1986

T. J. Gallagher

FORM 214

BEST AVAILABLE COPY

RILEY | RILEY STOKER CORPORATION

POST OFFICE BOX 547, WORCESTER, MASS. 01613

An Ashland Technology Company

FEB 1986 RECEIVED CLEWISTON SUGAR HOUSE

FUELS LABORATORY

TEST REPORT

Laboratory No. 35,645 Sample of Bagasse Date Rec'd 1-23-86

Received From U.S. Sugar Corp., Clewiston, Florida

Sample Data Bagasse Sample #2 Blr. 5-85 1/15/86 Compliance Testing - Bryant Sugar House

Contract No. 641-61018 Field Sample By

Air Drying Loss		%			
Proximate Analysis	As Rec'd	Dry	Ultimate Analysis	As Rec'd	Dry
Moisture	52.8 %	------	Moisture	%	--------
Volatile	40.13%	85.01 %	Carbon	%	49.1 %
Ash	0.70%	1.49 %	Hydrogen	%	6.1 %
Fixed Carbon	6.37%	13.50 %	Nitrogen	%	0.38%
	100.0 %	100.0 %	Oxygen (diff.)	%	42.86%
British Thermal Units	3915	8295	Sulfur	%	0.07%
Fusibility of Ash			Ash	%	1.49%
Initial Deformation		F		100.0 %	100.0 %
Softening		F	Free Swelling Index		
Fluid		F	Grindability Index		

Date February 5, 1986 T. J. Gallagher

FORM 214

FEB 1986
RECEIVED
CLEWISTON
SUGAR HOUSE

RILEY | RILEY STOKER CORPORATION

POST OFFICE BOX 547, WORCESTER, MASS. 01613

An Ashland Technology Company Ashland

FUELS LABORATORY

TEST REPORT

Laboratory No. 35,646 Sample of Bagasse Date Rec'd 1/23/86

Received From U.S. Sugar Corp. Clewiston, Florida

Sample Data Bagasse Sample #3 Blr. 6-85 1/16/86 Compliance Testing - Bryant Sugar House

Contract No. 641-61018 Field Sample By

Air Drying Loss		%			
Proximate Analysis	As Rec'd	Dry	Ultimate Analysis	As Rec'd	Dry
Moisture	51.7 %	------	Moisture	%	--------
Volatile	41.71%	86.35 %	Carbon	%	48.9 %
Ash	0.69%	1.43 %	Hydrogen	%	6.1 %
Fixed Carbon	5.90%	12.22 %	Nitrogen	%	0.35 %
	100.0 %	100.0 %	Oxygen (diff.)	%	43.15 %
British Thermal Units	3,920	8,115	Sulfur	%	0.07 %
Fusibility of Ash			Ash	%	1.43 %
Initial Deformation		F		100.0 %	100.0 %
Softening		F	Free Swelling Index		
Fluid		F	Grindability Index		

Date February 5, 1986 T.J. Gallagher

FORM 214

RILEY | RILEY STOKER CORPORATION
POST OFFICE BOX 547, WORCESTER, MASS. 01613
An Ashland Technology Company Ashland

FUELS LABORATORY

TEST REPORT

Laboratory No. 35,646 Sample of Bagasse Date Rec'd 1/23/86

Received From U.S. Sugar Corp. Clewiston, Florida

Sample Data Bagasse Sample #3 Blr. 6-85 1/16/86 Compliance Testing - Bryant Sugar House

Contract No. 641-61018 Field Sample By

Air Drying Loss		%			
Proximate Analysis	As Rec'd	Dry	Ultimate Analysis	As Rec'd	Dry
Moisture	51.7 %	-----	Moisture	%	--------
Volatile	41.71%	86.35 %	Carbon	%	48.9 %
Ash	0.69%	1.43 %	Hydrogen	%	6.1 %
Fixed Carbon	5.90%	12.22 %	Nitrogen	%	0.35 %
	100.0 %	100.0 %	Oxygen (diff.)	%	43.15 %
British Thermal Units	3,920	8,115	Sulfur	%	0.07 %
Fusibility of Ash			Ash	%	1.43 %
Initial Deformation		F		100.0 %	100.0 %
Softening		F	Free Swelling Index		
Fluid		F	Grindability Index		

Date February 5, 1986 T.J. Gallagher

FORM 214

/ Umm, DGW, OGB, Lab, TJG

BEST AVAILABLE COPY

RILEY STOKER CORPORATION

POST OFFICE BOX 547, WORCESTER, MASS. 01613

An Ashland Technology Company

MAR 1986 RECEIVED CLEWISTON SUGAR HOUSE

FUELS LABORATORY

TEST REPORT

Laboratory No. 35 1656 Sample of Bagasse Date Rec'd 01-31-86

Received From U.S. Sugar Corporation, Clewiston, Florida

Sample Data Bagasse Sample #1 Boiler 7-85 01-25-86 Compliance Testing

Contract No. 641-61018 Field Sample By

Air Drying Loss %

Proximate Analysis	As Rec'd	Dry	Ultimate Analysis	As Rec'd	Dry
Moisture	50.6 %	------	Moisture	%	--------
Volatile	42.91%	86.86%	Carbon	%	48.0 %
Ash	0.80%	1.61%	Hydrogen	%	5.6 %
Fixed Carbon	5.69%	11.53%	Nitrogen	%	0.33 %
	100.0 %	100.0 %	Oxygen (diff.)	%	44.43 %
British Thermal Units	4,122	8,345	Sulfur	%	0.03 %
Fusibility of Ash			Ash	%	1.61 %
Initial Deformation		F		100.0 %	100.0 %
Softening		F	Free Swelling Index		
Fluid		F	Grindability Index		

Date February 27, 1986 T. J. Gallagher

FORM 214

/ Thom, DGW, OGB, Lab, TJG

BEST AVAILABLE COPY

RILEY | CORPORATION

POST OFFICE BOX 547, WORCESTER, MASS. 01613

An Ashland Technology Company

MAR 1986 RECEIVED CLEWISTON SUGAR HOUSE

FUELS LABORATORY

TEST REPORT

Laboratory No. 351656 Sample of Bagasse Date Rec'd 01-31-86

Received From U.S. Sugar Corporation, Clewiston, Florida

Sample Data Bagasse Sample #1 Boiler 7-85 01-25-86 Compliance Testing

Contract No. 641-61018 Field Sample By

Air Drying Loss		%			
Proximate Analysis	**As Rec'd**	**Dry**	**Ultimate Analysis**	**As Rec'd**	**Dry**
Moisture	50.6 %	------	Moisture	%	--------
Volatile	42.91%	86.86%	Carbon	%	48.0 %
Ash	0.80%	1.61%	Hydrogen	%	5.6 %
Fixed Carbon	5.69%	11.53%	Nitrogen	%	0.33 %
	100.0 %	100.0 %	Oxygen (diff.)	%	44.43 %
British Thermal Units	4,122	8,345	Sulfur	%	0.03 %
Fusibility of Ash			Ash	%	1.61 %
Initial Deformation		F		100.0 %	100.0 %
Softening		F	Free Swelling Index		
Fluid		F	Grindability Index		

Date February 27, 1986 T. J. Gallagher

FORM 814

CORPORATION
POST OFFICE BOX 547, WORCESTER, MASS. 01613
An Ashland Technology Company

FUELS LABORATORY

TEST REPORT

Laboratory No. 35,657 Sample of Bagasse Date Rec'd 1-31-86

Received From U.S. Sugar Corporation, Clewiston, Florida

Sample Data Bagasse Sample #6 Boiler 8-85 1-27-86 Compliance Testing

Contract No. 641-61018 Field Sample By

Air Drying Loss		%			
Proximate Analysis	As Rec'd	Dry	Ultimate Analysis	As Rec'd	Dry
Moisture	52.8 %	------	Moisture	%	--------
Volatile	40.79 %	86.43%	Carbon	%	47.9 %
Ash	0.71 %	1.50%	Hydrogen	%	5.8 %
Fixed Carbon	5.70 %	12.07%	Nitrogen	%	0.39 %
	100.0 %	100.0 %	Oxygen (diff.)	%	44.35 %
British Thermal Units	3,851	8,160	Sulfur	%	0.06 %
Fusibility of Ash			Ash	%	1.50 %
Initial Deformation		F		100.0 %	100.0 %
Softening		F	Free Swelling Index		
Fluid		F	Grindability Index		

Date February 27, 1986 T. J. Gallagher

FORM 214

CORPORATION
POST OFFICE BOX 547, WORCESTER, MASS. 01613
An Ashland Technology Company

FUELS LABORATORY

TEST REPORT

Laboratory No. 35,657 Sample of Bagasse Date Rec'd 1-31-86

Received From U.S. Sugar Corporation, Clewiston, Florida

Sample Data Bagasse Sample #6 Boiler 8-85 1-27-86 Compliance Testing

Contract No. 641-61018 Field Sample By

Air Drying Loss		%			
Proximate Analysis	As Rec'd	Dry	Ultimate Analysis	As Rec'd	Dry
Moisture	52.8 %	------	Moisture	%	-------
Volatile	40.79 %	86.43%	Carbon	%	47.9 %
Ash	0.71 %	1.50%	Hydrogen	%	5.8 %
Fixed Carbon	5.70 %	12.07%	Nitrogen	%	0.39 %
	100.0 %	100.0 %	Oxygen (diff.)	%	44.35 %
British Thermal Units	3,851	8,160	Sulfur	%	0.06 %
Fusibility of Ash			Ash	%	1.50 %
Initial Deformation		F		100.0 %	100.0 %
Softening		F	Free Swelling Index		
Fluid		F	Grindability Index		

Date February 27, 1986 T. J. Gallagher

FORM 214

Copy: PB 62 68

BEST AVAILABLE COPY

CORPORATION
POST OFFICE BOX 547, WORCESTER, MASS. 01613
An Ashland Technology Company

FUELS LABORATORY

TEST REPORT

Laboratory No. 35,684 Sample of Bagasse Date Rec'd 02-06-86

Received From U. S. Sugar Corporation, Clewiston, Florida

Sample Data Bagasse Sample #5 Boiler 2-4-86 9-85 Compliance Testing of Clewiston Sugar House

Contract No. 641-61018 Field Sample By

Air Drying Loss %

Proximate Analysis	As Rec'd	Dry	Ultimate Analysis	As Rec'd	Dry
Moisture	51.9 %	------	Moisture	%	--------
Volatile	41.37 %	86.00 %	Carbon	%	48.1 %
Ash	1.37 %	2.84 %	Hydrogen	%	6.0 %
Fixed Carbon	~~53.6~~ 5.36 %	11.16 %	Nitrogen	%	0.32 %
	100.0 %	100.0 %	Oxygen (diff.)	%	42.71 %
British Thermal Units	3,761	7,820	Sulfur	%	0.03 %
Fusibility of Ash			Ash	%	2.84 %
Initial Deformation		F		100.0 %	100.0 %
Softening		F	Free Swelling Index		
Fluid		F	Grindability Index		

Date February 27, 1986 T. J. Gallagher

FORM 214

[illegible], [illegible], [illegible], Lab, [illegible]

Copy: PB 62/68

BEST AVAILABLE COPY

RILEY | CORPORATION

POST OFFICE BOX 547, WORCESTER, MASS. 01613

An Ashland Technology Company

FUELS LABORATORY

TEST REPORT

Laboratory No. 35,684 Sample of Bagasse Date Rec'd 02-06-86

Received From U. S. Sugar Corporation, Clewiston, Florida

Sample Data Bagasse Sample #5 Boiler 2-4-86 9-85 Compliance Testing of Clewiston Sugar House

Contract No. 641-61018 Field Sample By

Air Drying Loss		%			
Proximate Analysis	**As Rec'd**	**Dry**	**Ultimate Analysis**	**As Rec'd**	**Dry**
Moisture	51.9 %	------	Moisture	%	--------
Volatile	41.37 %	86.00 %	Carbon	%	48.1 %
Ash	1.37 %	2.84 %	Hydrogen	%	6.0 %
Fixed Carbon	~~53.6~~ 5.36 %	11.16 %	Nitrogen	%	0.32 %
	100.0 %	100.0 %	Oxygen (diff.)	%	42.71 %
British Thermal Units	3,761	7,820	Sulfur	%	0.03 %
Fusibility of Ash			Ash	%	2.84 %
Initial Deformation		F		100.0 %	100.0 %
Softening		F	Free Swelling Index		
Fluid		F	Grindability Index		

Date February 27, 1986 T. J. Gallagher

FORM 214

1. Sugar Cane League (Ed Barber)
hom DGW OGB Lab TJG

RILEY — RILEY STOKER CORPORATION
POST OFFICE BOX 547, WORCESTER, MASS. 01613
An Ashland Technology Company

Copy: 6[illegible] 68 P[illegible]

FUELS LABORATORY

TEST REPORT

Laboratory No. 35,686 Sample of Bagasse Date Rec'd 2/18/86

Received From U.S. Sugar, Clewiston, FL

Sample Data Bagasse Sample 10-85 2/15/86 Compliance Testing of #5 Blr. - Bryant Sugar House

Contract No. 641-61018 Field Sample By

Air Drying Loss		%			
Proximate Analysis	As Rec'd	Dry	Ultimate Analysis	As Rec'd	Dry
Moisture	48.8 %	-----	Moisture	%	-------
Volatile	45.02 %	87.92 %	Carbon	%	49.0 %
Ash	0.44 %	0.85 %	Hydrogen	%	6.4 %
Fixed Carbon	5.74 %	11.23 %	Nitrogen	%	0.33 %
	100.0 %	100.0 %	Oxygen (diff.)	%	43.06 %
British Thermal Units	4,219	8,240	Sulfur	%	0.36 %
Fusibility of Ash			Ash	%	0.85 %
Initial Deformation		F		100.0 %	100.0 %
Softening		F	Free Swelling Index		
Fluid		F	Grindability Index		

Date 3/7/86 Tom Gallagher

FORM 214

1. Sugar Cane League (Ed Barber)✓
hom DGW OGB Lab TJG —✓

RILEY | RILEY STOKER CORPORATION
POST OFFICE BOX 547, WORCESTER, MASS. 01613
An Ashland Technology Company

Copy: 6[illegible]
68
PB

FUELS LABORATORY

TEST REPORT

Laboratory No. 35,686 Sample of Bagasse Date Rec'd 2/18/86

Received From U.S. Sugar, Clewiston, FL

Sample Data Bagasse Sample 10-85 2/15/86 Compliance Testing of #5 Blr. - Bryant Sugar House

Contract No. 641-61018 Field Sample By

Air Drying Loss %

Proximate Analysis	As Rec'd	Dry	Ultimate Analysis	As Rec'd	Dry
Moisture	48.8 %	-----	Moisture	%	--------
Volatile	45.02 %	87.92 %	Carbon	%	49.0 %
Ash	0.44 %	0.85 %	Hydrogen	%	6.4 %
Fixed Carbon	5.74 %	11.23 %	Nitrogen	%	0.33 %
	100.0 %	100.0 %	Oxygen (diff.)	%	43.06 %
British Thermal Units	4,219	8,240	Sulfur	%	0.36 %
			Ash	%	0.85 %
				100.0 %	100.0 %
			Free Swelling Index		
			Grindability Index		

Fusibility of Ash

Initial Deformation	F
Softening	F
Fluid	F

Date 3/7/86 Tom Gallagher

FORM 214

Belcher

OCTOBER 29, 1982

ANALYSIS OF BUNKER C TANK #201 AT
PORT EVERGLADES FOR WEST PALM BEACH

API GRAVITY, @ 60° F.	10.5
SULPHUR	2.36%
FLASH POINT, ° F	+200
POUR POINT, ° F	+35
BS&W	0.2%
VISCOSITY, CTS@50 ° C	429
VANADIUM, PPM	380
BTU'S PER GALLON	148,805
BTU'S PER POUND	17,970

Carl Bloomberg

CARL BLOOMBERG
Area Manager

BELCHER OIL COMPANY, PO BOX 8296, 1733 HILL AVENUE, MANGONIA PARK,
WEST PALM BEACH, FLORIDA 33407 PHONE(305) 848-1495

ATTACHMENT B

Specifications for Proposed Boiler No. 7

PREDICTED PERFORMANCE DATA SHEET 1

Fuel Fired		BAGASSE
Steam Output	lbs./Hr	350,000
Steam Pressure at Superheater Outlet	PSIG	600
Steam Temperature at Superheater Outlet	F	750
Steam Pressure Drop through Superheater	PSIG	50
Feedwater Temperature	F	240
Efficiency	%	62.21
Fuel as Fired	Lbs/Hr	150,410
H2O in Fuel as Fired	%Wt	51.0
Heat Release (Furnace)	BTU/Cu.Ft./Hr	20,000
Heat Release (Stoker)	BTU/Sq.Ft./Hr	900,000
CO2/Excess Air Leaving	%	15.4/35
Gas Temperature Leaving Boiler	F	750
Temperature Leaving Economizer	F	500
Gas Temperature Leaving Air Heater	F	330
Air Temperature Entering Air Heater	F	80
Air Temperature Leaving Air Heater	F	353
Water Temperature Leaving Economizer	F	390
Water Pressure Drop through Economizer	PSIG	10
Weight of Combustion Air	Lbs/Hr	523,018
Volume of Air	CFM	118,600
Density of Air	Lbs/Cu.Ft	0.0735
Weight of Gas	Lbs/Hr	731,001
Volume of Gas	CFM	266,595
Density of Gas	Lbs/Cu.ft	0.0457

Air Pressure Losses:

Stoker	"WG	3.00
Air Heater	"WG	8.50
Ducts	"WG	1.00
	Total	12.50

PREDICTED PERFORMANCE DATA SHEET 2

Draft Losses:

Furnace	"WG 0.15
Boiler & Superheater	"WG 2.00
Economizer	"WG 2.00
Air Heater	"WG 2.50
Ducts	"WG N/A
Air Pollution Equipment	"WG N/A
Total	----

HEAT BALANCE

Losses:

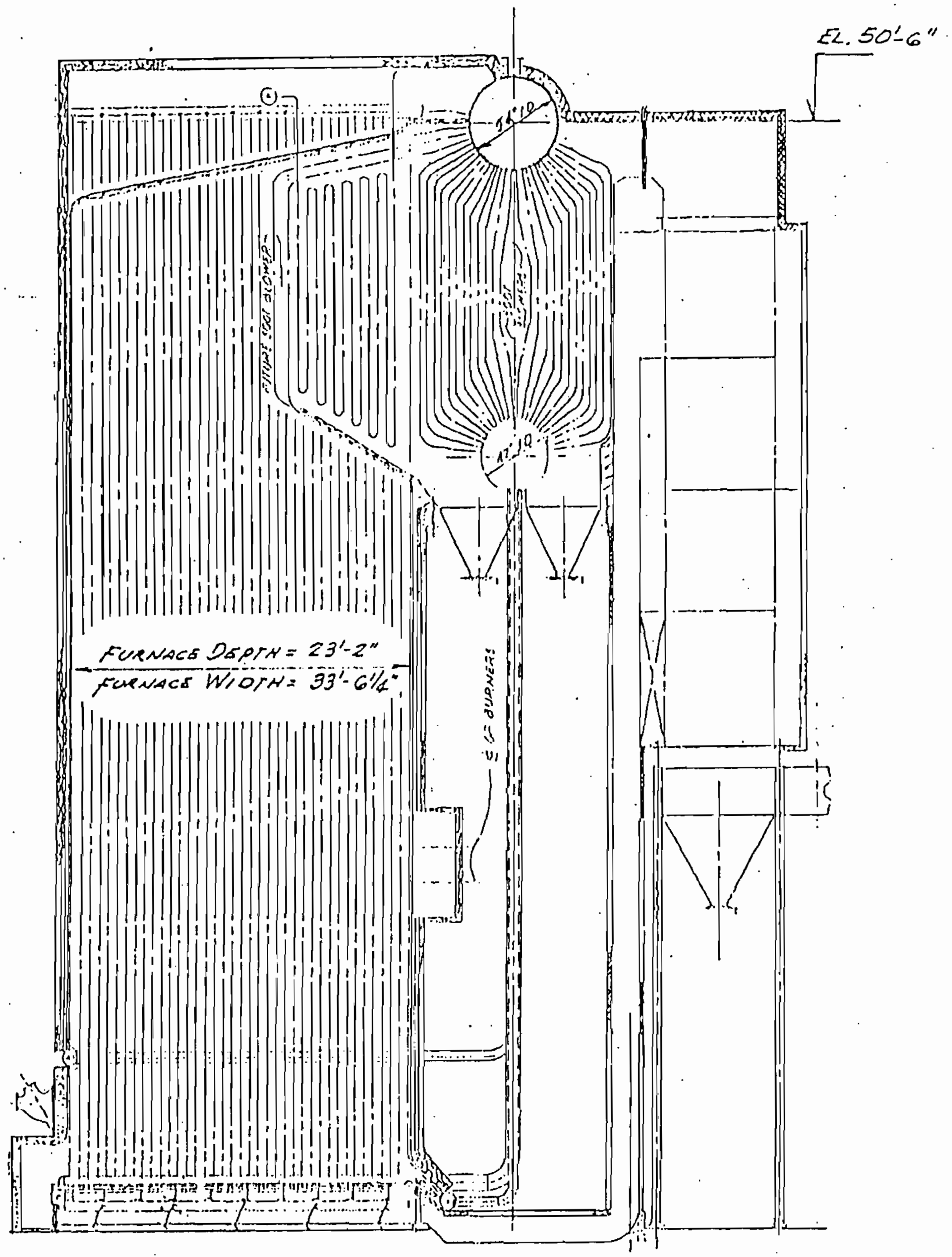
Dry Gas	% 8.55
Hydrogen & Moisture in Fuel	% 25.20
Moisture in Air	% 0.21
Unburned Combustible	% 2.00
Radiation	% 0.33
Unaccounted for Losses and Manufacturer's Tolerance	% 1.50
Total	% 37.79
EFFICIENCY	% 62.21

FUEL

The fuel characteristics shall not be less favorable than indicated by the following analysis:

BAGASSE

Carbon	22.68
Hydrogen	2.76
Oxygen	19.51
Nitrogen	0.19
Sulphur	---
Ash	0.86
Moisture	54.00
Total:	100.00
HHV (dry)	8,300 BTU/LBS
HHV (as Fired)	3,818 BTU/LBS



CLEWISTON SUGAR HOUSE

PROPOSED BOILER No 7

DATE: JUL. 22/93

SK. No. CL 9367

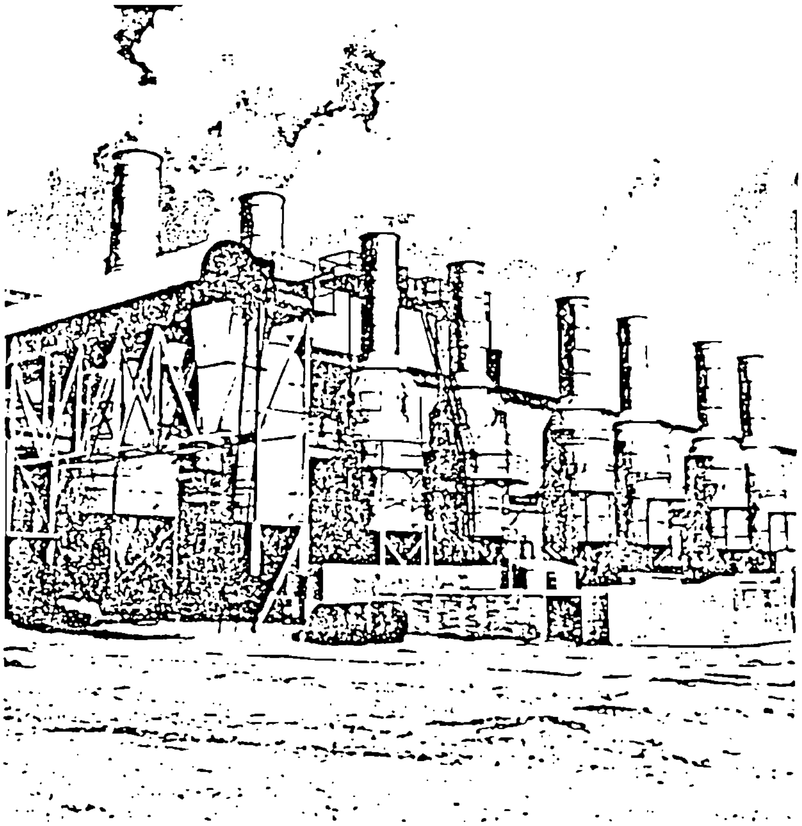
ATTACHMENT C

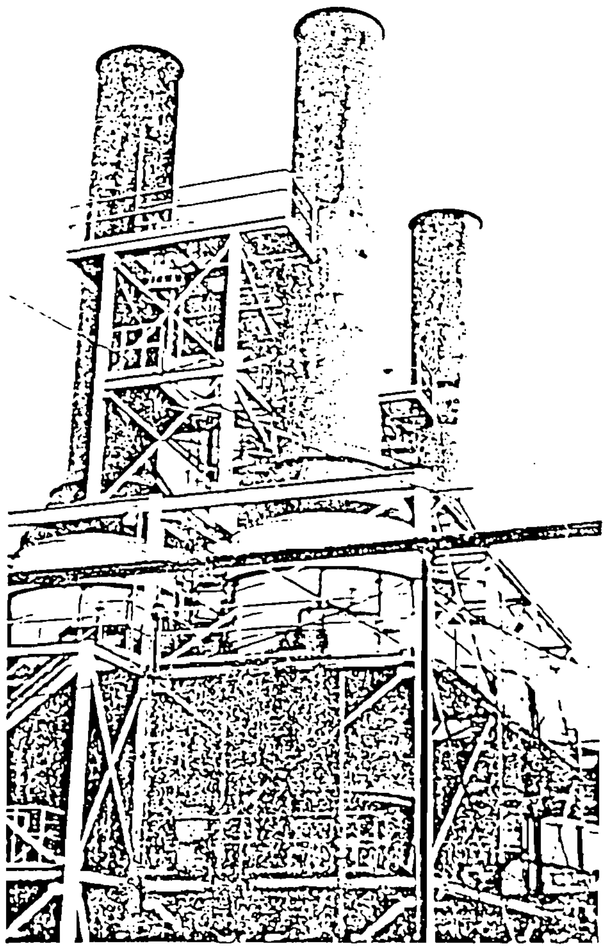
Boiler No. 7 Spray Impingement Scrubber Design Details

Best Available Copy

Type "D" Turbulaire® Scrubber

High efficiency / low energy / non-plugging / for large volumes.





Type "D" Turbulaire® Scrubbers are used where dust particle sizing and process conditions require low energy inputs (Scrubber pressure drops less than 14 inches of water). These energy requirements are below the range in which the collecting mechanisms of conventional venturi scrubbers begin to take full effect. Hence, our Type "D" units often match the performance of venturi scrubbers while saving 20 to 50 percent in operating horsepower.

The Type "D" model has a vertical flow design which requires a minimum of floor space. The cylindrical configuration improves rigidity with light gage "unitized" construction.

BEST AVAILABLE COPY

How It works

A patented peripheral gas nozzle (U.S. patent 3726513) combines a low energy venturi effect with collection by impingement on the liquid bath. This combination provides optimum energy utilization at low pressure drop.

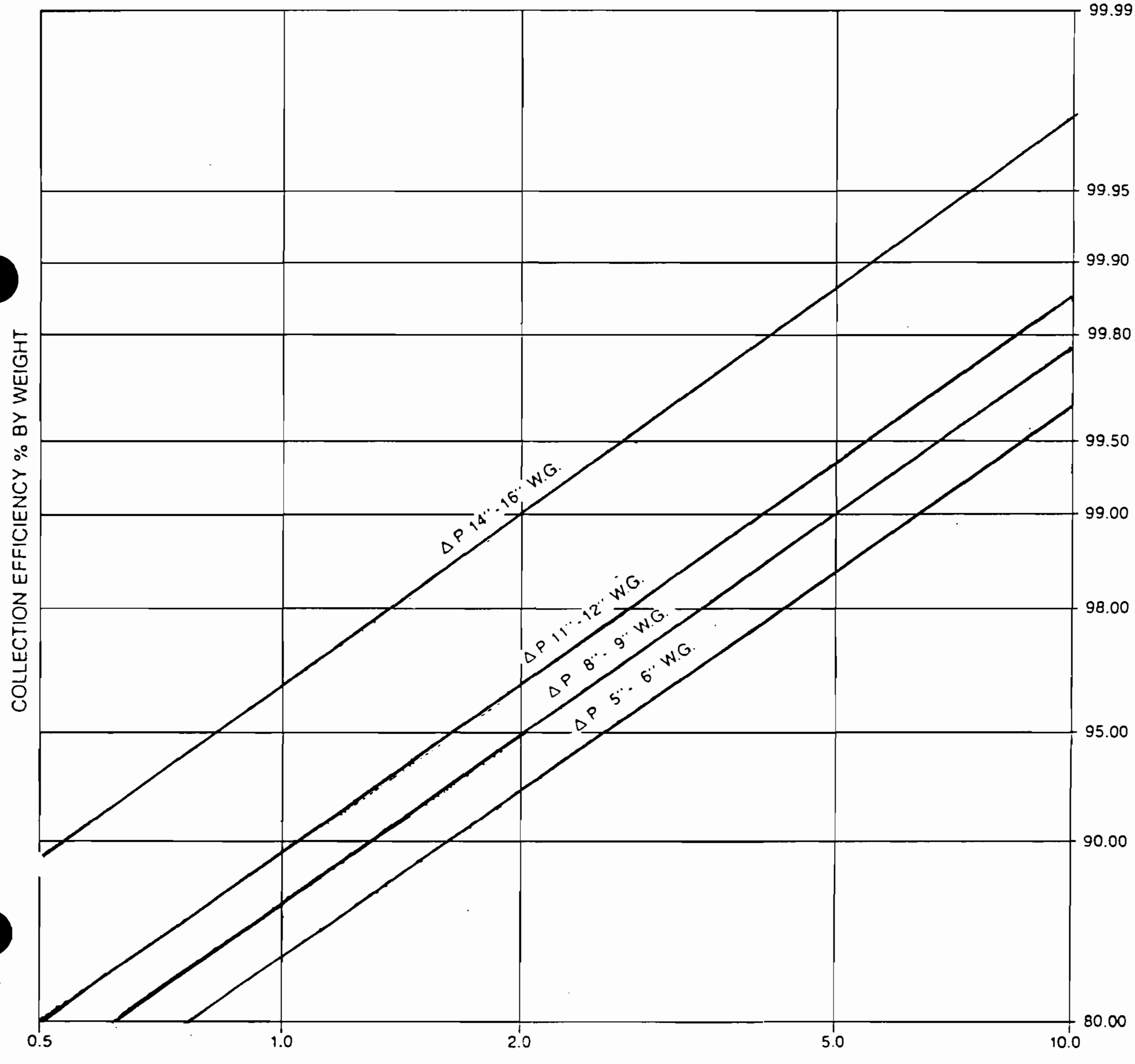
In order to accommodate changes in process conditions or more stringent emission codes, the unit is designed to allow for variations in pressure drop by means of a simple internal adjustment of the peripheral gas nozzle.

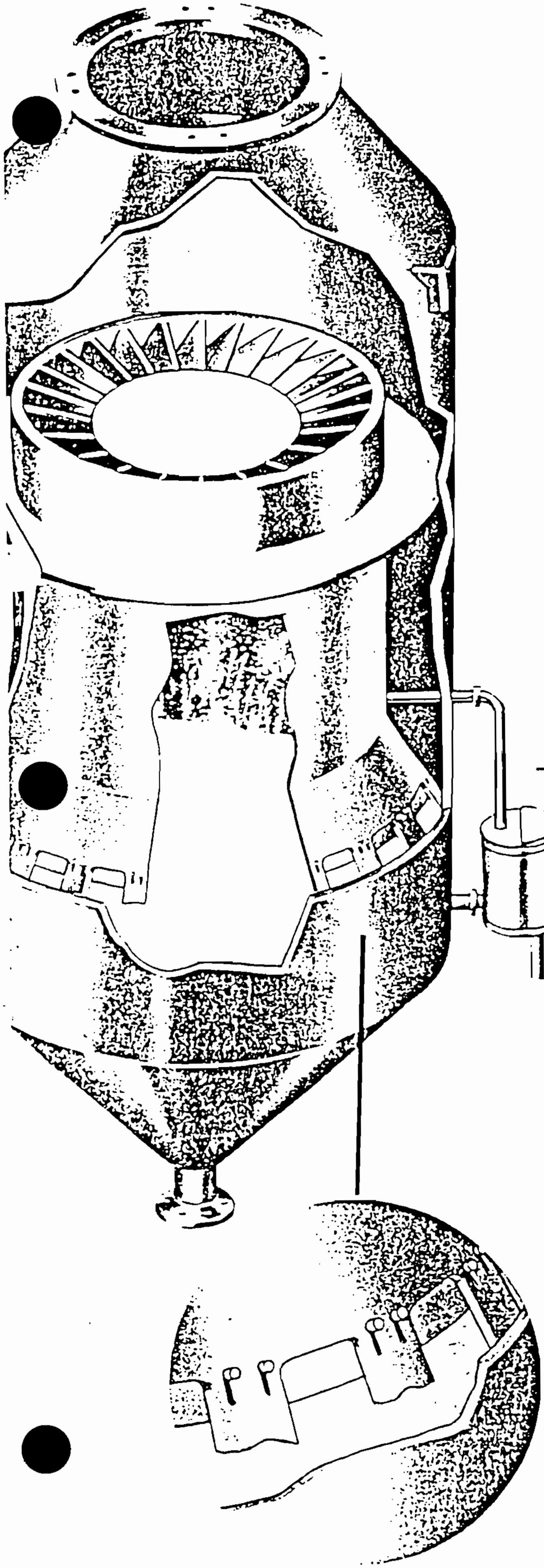
Slurries are kept in suspension in the sump by the action of the gases being scrubbed. Mist elimination is accomplished with the centrifugal action of a set of swirl vanes, and the droplets once separated from the gas stream are returned by gravity into the sump.

Water needs are kept to a minimum by the unit's ability to recirculate the heavily concentrated slurries often containing as much as 5.0% solids by weight. The top gas outlet configuration makes stack connection simple; the flanged slurry drain can be connected to settling tanks or piped for disposal with ease.

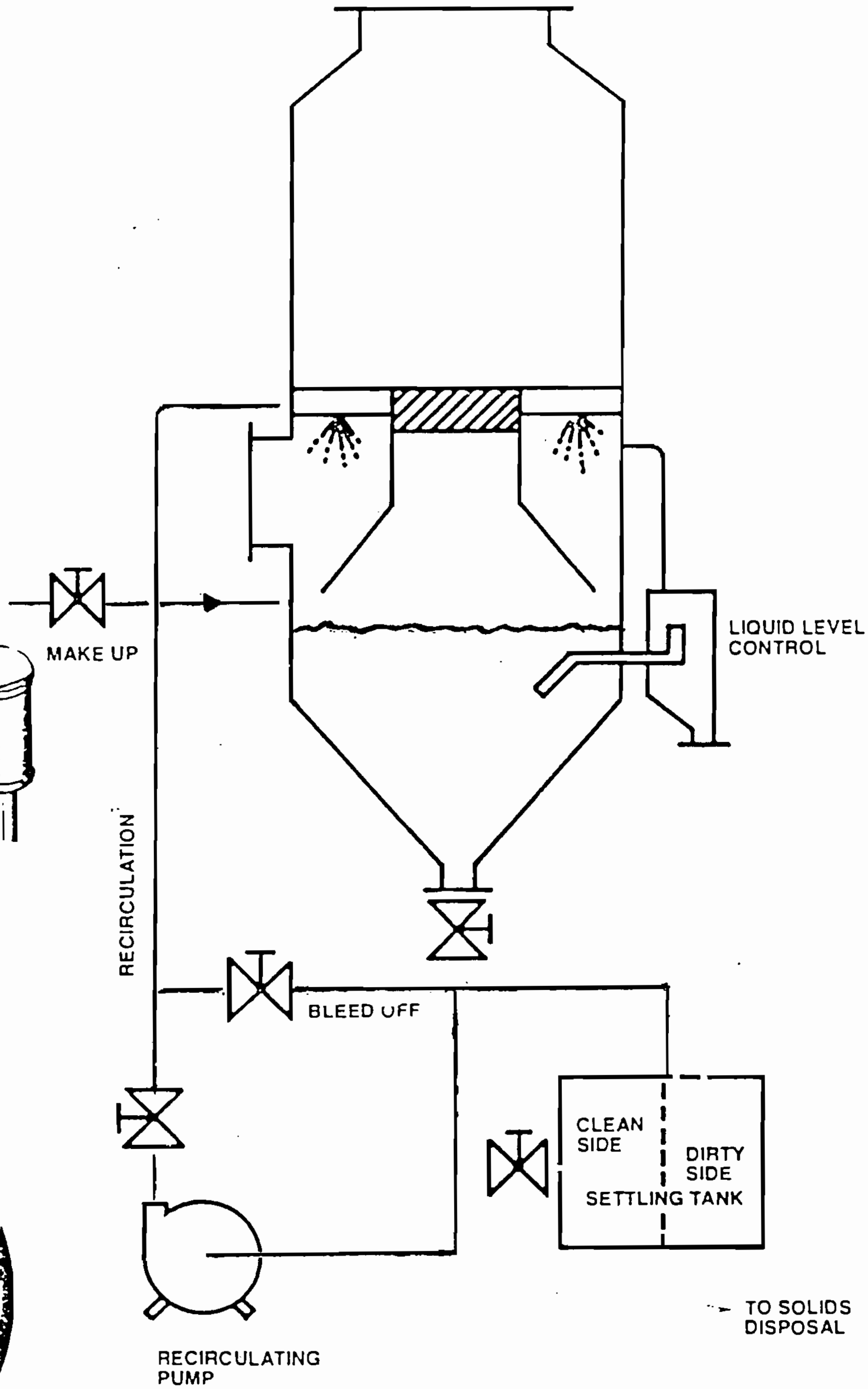
The Type "D" is simple, rugged, with no moving parts and excellent non-plugging characteristics, and it can be made of a variety of corrosion-resistant metals as well as lightweight, low cost fiberglass reinforced polyester (FRP).

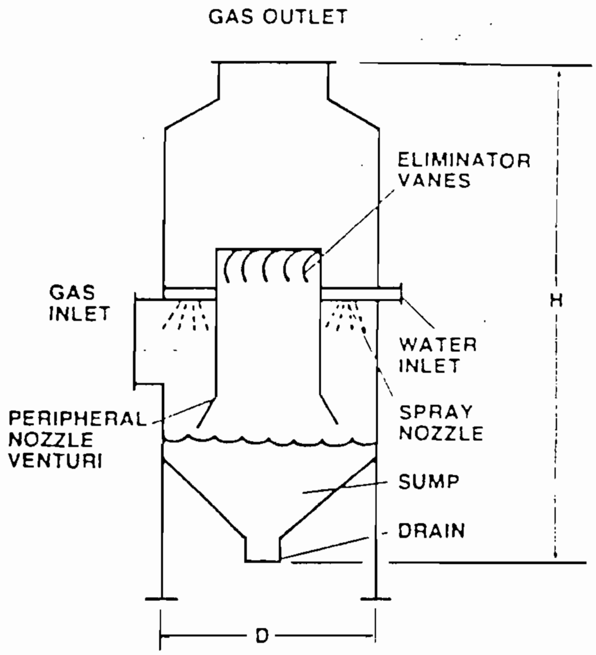
COLLECTION EFFICIENCY VS PARTICLE SIZE





Type "D" Process Flow Diagram





AVAILABLE OPTIONS

Support Assembly (Drain flange 2'-6" to grade)
Discharge valve, Cast iron or Rubber lined
Automatic water supply control
Manometer and Fittings
Pump and Motor
Fan and Motor

EQUIPMENT SIZING

SCRUBBER SIZE	DESIGN ACFM OUTLET	DRAIN SIZE (IN)	SUMP CAPACITY (GAL)	DIAMETER D	HEIGHT H	INLET DIAMETER	OUTLET DIAMETER
4	6,900	3	157	4'-0"	10'-3"	1'-7"	2'-9"
4.5	8,700	3	208	4'-6"	11'-1"	1'-9"	3'-1"
5	10,700	3	269	5'-0"	12'-1"	2'-0"	3'-5"
5.5	13,000	3	340	5'-6"	13'-0"	2'-2"	3'-9"
6	15,500	3	423	6'-0"	13'-11"	2'-4"	4'-1"
6.5	18,200	3	517	6'-6"	14'-11"	2'-7"	4'-5"
7	21,100	3	624	7'-0"	15'-10"	2'-9"	4'-9"
7.5	24,300	4	744	7'-6"	16'-8"	2'-11"	5'-1"
8	27,600	4	877	8'-0"	17'-8"	3'-2"	5'-5"
8.5	31,100	4	1,026	8'-6"	18'-8"	3'-4"	5'-9"
9	34,900	4	1,189	9'-0"	19'-7"	3'-6"	6'-1"
9.5	38,900	4	1,370	9'-6"	20'-5"	3'-9"	6'-5"
10	43,100	4	1,566	10'-0"	21'-4"	3'-11"	6'-9"
10.5	47,600	4	1,781	10'-6"	22'-4"	4'-1"	7'-1"
11	52,200	6	2,014	11'-0"	23'-2"	4'-4"	7'-6"
11.5	57,100	6	2,266	11'-6"	24'-1"	4'-6"	7'-10"
12	62,200	6	2,537	12'-0"	25'-0"	4'-8"	8'-2"
12.5	67,400	6	2,830	12'-6"	26'-0"	4'-11"	8'-6"
13	72,900	6	3,144	13'-0"	26'-10"	5'-1"	8'-10"

EQUIPMENT SPECIFICATIONS

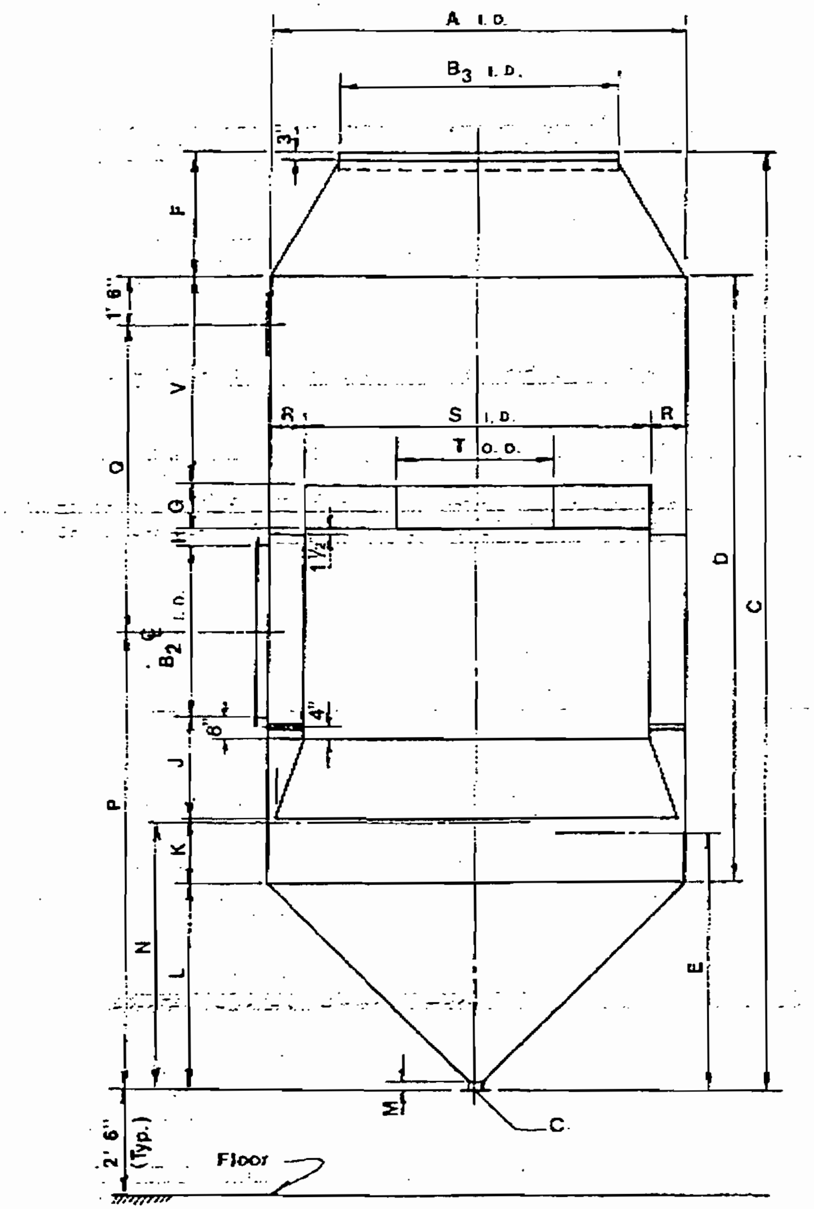
Scrubber of cylindrical shape shall be of the high efficiency inertial-orifice type with radial inlet. The gas to be cleaned passes through a peripheral nozzle and is jetted in a near vertical direction and at high velocity into a static liquid bath, the level of which is maintained slightly below the bottom of the gas nozzle by means of an adjustable weir. Weir box shall be equipped with a gas-lock release mechanism. After leaving liquid bath, gases shall pass through a centrifugal type spray eliminator and exit the scrubber through the top vertical discharge.

World-Wide Response : Ability

WESTERN PRECIPITATION DIVISION

JOY™

Joy Industrial Equipment Company
P O Box 2744 Terminal Annex
Los Angeles California 90051
(213) 240-2300



SIZE	C.F.M.	A	B_2	B_3	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V
20	21,000	7'-0"	2'-9"	6'-0"	16'-11½"	11'-1"	8'-5½"	2'-2"	9"	4"	7'-9"	12"	3'-8½"	4"	4'-8"	8'-10"	4'-5½	9"	5'-6"	3'-10"	3"	3'-6"
24	26,000	8'-0"	3'-0"	5'-5"	18'-11"	12'-3"	4'-10"	2'-6"	10"	4"	3'-1"	12"	4'-2"	4"	5'-1½	9'-4"	5'-2"	10½"	6'-3"	4'-3"	4"	4'-0"
28	31,000	8'-6"	3'-4"	5'-10"	19'-11"	12'-11"	5'-1"	2'-7"	11"	4"	3'-1"	12"	4'-5"	4"	5'-4½	10'-3"	5'-8"	10½"	6'-9"	4'-8"	4"	4'-3"
32	37,000	9'-6"	3'-8"	6'-5"	22'-8"	14'-10"	6'-1"	2'-8"	12"	5"	3'-6"	18"	4'-11"	4"	5'-6½	11'-9"	6'-6"	12½"	7'-5"	5'-1"	4"	4'-9"
40	46,000	10'-6"	4'-1"	7'-1"	24'-9"	16'-2"	6'-7"	3'-2"	12"	5"	3'-10"	18"	5'-5"	4"	6'-7½	12'-9½	7'-4½	14"	8'-2"	5'-8"	4"	5'-3"
48	56,000	11'-6"	4'-6"	7'-10"	26'-8"	17'-5"	7'-0"	3'-5"	14"	5"	4'-1"	18"	5'-10"	4"	7'-3½	13'-8"	8'-1"	15"	9'-0"	6'-9"	6"	5'-9"
56	62,000	12'-0"	4'-9"	8'-2"	28'-5"	18'-8"	7'-9"	3'-6"	15"	6"	4'-2"	24"	6'-1"	4"	8'-0½	14'-7½	8'-7½"	15½"	9'-5"	6'-7"	6"	6'-0"
64	67,000	12'-6"	4'-8"	9'-6"	29'-6"	19'-5"	8'-0"	3'-9"	15"	5"	4'-6"	24"	6'-4"	4"	8'-3½	15'-3½	8'-11½	17"	9'-3"	6'-10"	6"	6'-3"
72	72,000	13'-0"	5'-0"	8'-9"	30'-3"	19'-9"	8'-3"	3'-11"	15"	6"	4'-6"	24"	6'-7"	4"	8'-6½	15'-7"	9'-3"	17"	10'-2"	7'-2"	6"	6'-6"
Sp 90	94,000	14'-0"	5'-9"	15'-0"	32'-6"	21'-6"		2'-10"	15"		5'-1½"	28"	7'-0"	4"		15'-6½		16½	11'-7"	8'-2"	6"	7'-0"
100	100,000	16'-0"	5'-0"	10'-6"	37'-5"	24'-2"	9'-9"	5'-2"	20"	5"	5'-0"	24"	8'-1"	6"	10'-0½	19'-1"	11'-8"	20½"	11'-11"	8'-5"	6"	8'-0"
150	150,000	19'-0"	7'-0"	12'-8"	42'-11"	27'-7"	11'-3"	5'-9"	23"	6"	6'-8"	24"	9'-7"	6"	11'-6½	21'-9"	13'-11"	26½"	14'-7"	10'-4"	6"	9'-6"
200	200,000	22'-0"	8'-6"	14'-7"	51'-0"	33'-3"	13'-9"	6'-8"	27"	9"	7'-9"	36"	11'-1"	6"	14'-0½	26'-1"	16'-9"	31"	15'-10"	11'-11"	6"	11'-0"
250	250,000	25'-6"	9'-6"	16'-4"	56'-1"	36'-5"	15'-0"	7'-6"	30"	9"	8'-5"	36"	12'-6"	4"	15'-5½	25'-6"	18'-9"	34"	18'-10"	13'-6"	6"	12'-3"
Sp 175	175,000	20'-6"	5'x8'6"	12'-6½	47'-0"	30'-5"	12'-6"	6'-9"	25"	7½	7'-2"	30"	10'-6"	4"	13'-9½	25'-11"	15'-4"	28¼	15'-8½	11'-3"	6"	9'-3"

(15'-9")

UNITED STATES SUGAR CORP

SUGAR HOUSES ENG DEPT.

TURBULAIRE SCRUBBERS

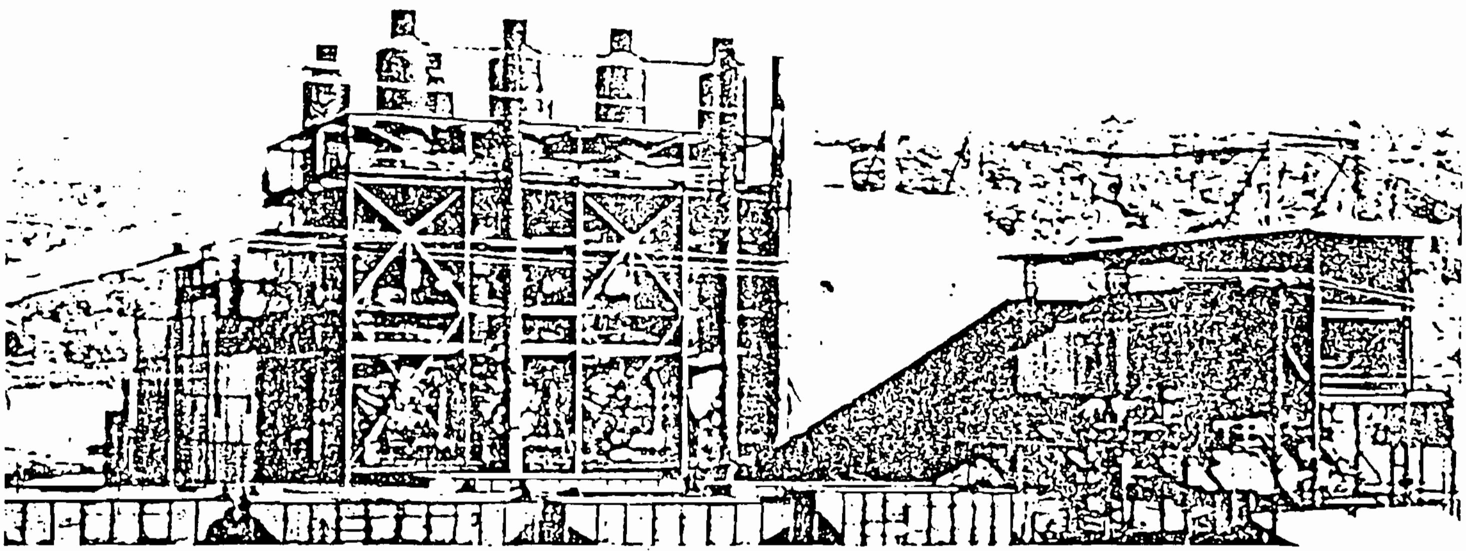
DATE: DEC. 13/91

BEST AVAILABLE COPY

Proven performance in a wide range of [illegible]

Because we have pioneered the air pollution control field since 1907, we have within arm's reach more answers to your pollution control problems than anyone else. So no matter how peculiar your air pollution problem, our engineers will evaluate many workable solutions—and before they're through, they'll narrow all of the alternatives to the one solution that's best for your particular case.

"Turbulaire" scrubbers have been used successfully to control emissions from many industrial process operations, including combustion, chemical, mining, metallurgical, etc.



Some "Turbulaire" features

Scrubbing slurry processing expenses (clarifiers, pumps, etc.) are kept down by making every drop count. Special sump designs maintain high turbulence within the scrubbing liquid. The high turbulence permits higher slurry concentrations reducing the possibilities of solid build-up or system stoppage. (Most of our units operate at liquid to gas ratios of less than 3GPM/1,000 ACFM.) Therefore less processing equipment is required.

Simple, compact designs save valuable in-plant space and make minimum operating and maintenance demands.

"Turbulaire" scrubbers are often used in conjunction with other collection equipment. Flexibility in space needs and efficiency make "Turbulaire" scrubbers excellent add-on units, especially for already tight plant layouts.

Each "Turbulaire" scrubber model can be adapted to meet virtually any corrosion problem. For example, units can be made of mild or stainless steel, FRP, or with corrosion resistant plastics, rubber, lead or acid brick liners.

[illegible]

WP™ scrubbers have solved air pollution control problems in a wide variety of industries. If your particular application is included on our list below, chances are that we can help you.

ASPHALT
- Kiln (Batch Process)
- Kiln (Continuous Mix)

COAL
- Dryers
- Pulverizers
- Handling, Transfer Points
- Underground Ventilation

COMBUSTION PROCESSES
- Bagasse Boilers
- Bark and Wood Boilers
- Bagasse Residue Boilers
- Coal-fired Boilers
- Kraft Recovery Boilers
- Incinerators
- Oil-fired Boilers

FERTILIZERS
- Ammoniators
- Coolers
- Dryers
- Evaporators
- Prill Towers
- Product Handling and Ventilation
- Reactors and Granulators

INORGANIC CHEMICALS
- Coolers and Dryers
- Pyrites Roasting
- Sulphuric Acid Mist

IRON AND STEEL
- Blast Furnaces
- Coke Ovens
- Cupolas
- Crushing and Handling
- Electric Furnaces
- Foundry Clean-up
- Open Hearth Furnaces
- Taconite Nodulizing Furnaces
- Sintering Systems
- Ventilation Systems

[illegible]
- Ore Crushing and Handling
- Mine Ventilation
- Screening and Sizing

NON-FERROUS METALS
- Alumina Calcining
- Antimony Smelters
- Bauxite Dryers
- Chromium Smelters
- Copper Smelters
- Gold, Mercury Smelters
- Lead Smelters
- Magnesium Smelters
- Molybdenum Smelters
- Nickel Smelters
- Vanadium, Uranium Smelters
- Zinc Smelters

NON-METALLIC MINERALS
(Cement, Lime, Rock Products [illegible])
- Calciners
- Clean-up and Ventilation
- Clinker Coolers
- Dryers
- Kilns
- Preheaters
- Pulverizers

ORGANIC CHEMICALS
- Carbon Black
- Food, Glue, etc.
- Insecticides
- Paint and Resins
- Pharmaceuticals

[illegible]
- Plastics
- Sewage Sludge Dryers

PETROCHEMICALS
- Catalytic Cracking Regenerators
- Catalytic Cracking Reactors
- Fluidized Coke
- Shale Oil

PULP AND PAPER
- Kraft Recovery Boilers
- Magnesia Red Liquor Acid Recovery
- Magnesia Red Liquor—Dry Dust Collection
- Magnesium Oxide from Bi-Sulfite Recovery
- Dissolving Tank Ventilation
- Slaker Tank Ventilation

INSTALLATION, OPERATING, AND MAINTENANCE INSTRUCTIONS

FOR

TURBULAIRE® SCRUBBER

TYPE D

J O Y M A N U F A C T U R I N G C O M P A N Y
Western Precipitation Division
1000 W. Ninth St.
Los Angeles, California 90015

CONTENTS

FIGURES

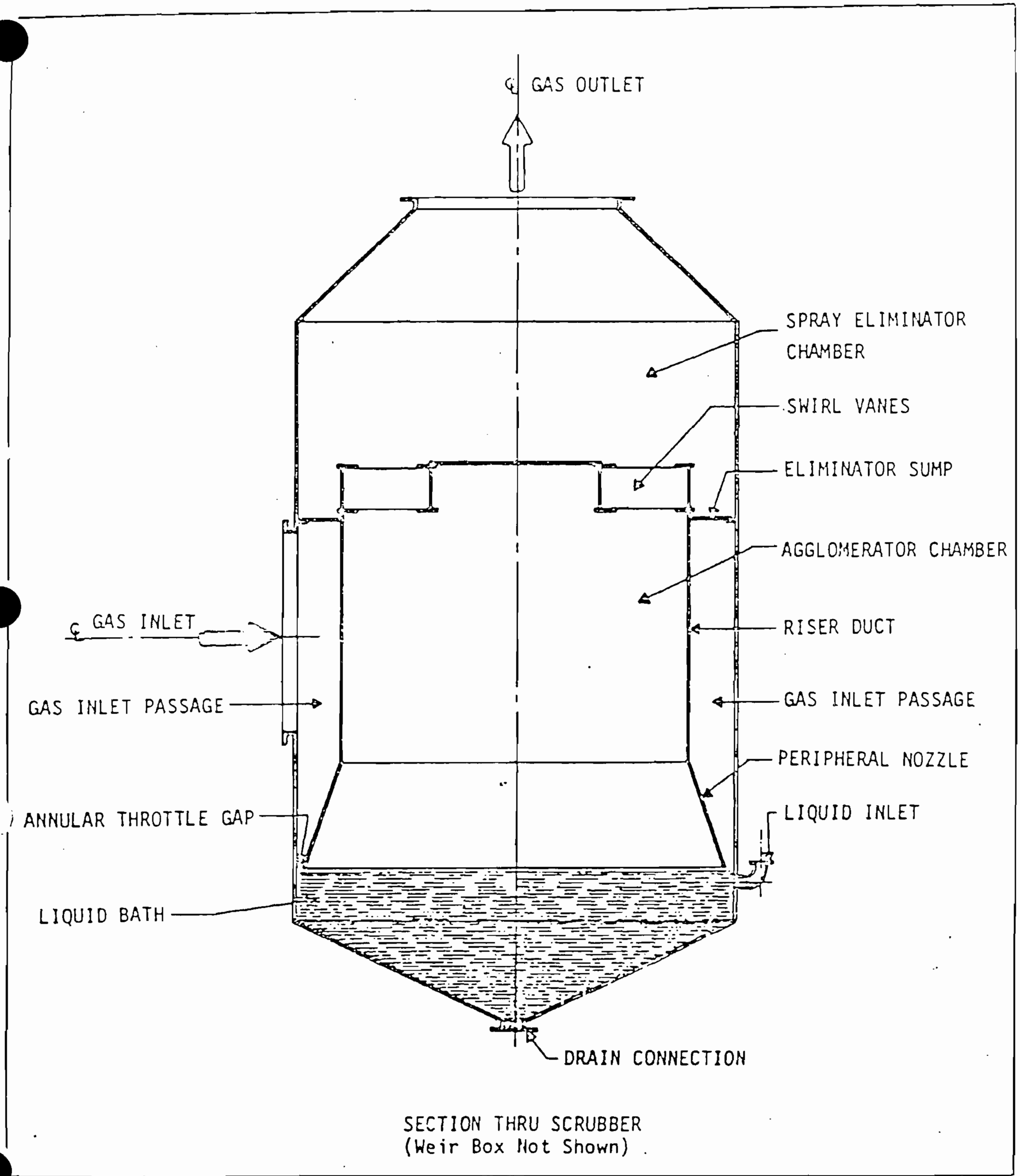


Figure 1. Turbulaire® Scrubber, Type D-B, Sizes 20 thru 64

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

1 D B MS R 32

Size

Shell Lining if specified

Shell Material

Hopper Type

Design Type

Number of Units

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 materia of construction may be: mild steel lined with rubber, lead or coated with epox 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 the desired level.

   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.

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 operatin 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 throug 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 calcula 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. <u>Introduce liquid sprays ahead of the scrubber inlet to humidify the gases entering the scrubber</u>. 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. <u>Increase the inlet liquid rate</u>. This will also bring the temperature of the gas down to saturation quickly. However, as the liquid rate is increas 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.

BEST AVAILABLE COPY

ATTACHMENT TO QUESTION 20

WESTERN PRECIPITATION DIVISION
JOY MANUFACTURING COMPANY
[illegible] BOULEVARD
LOS ANGELES, CALIFORNIA 90054
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,

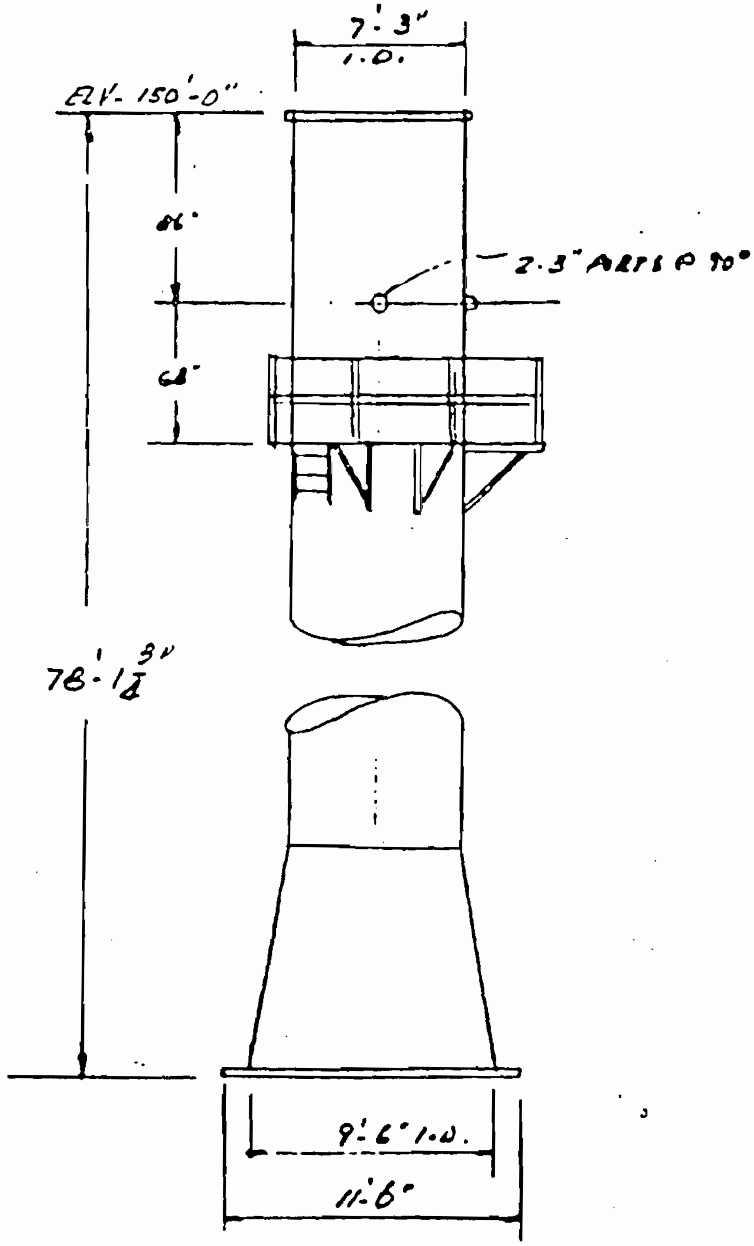
Allen H. Jones
Vice President, Standard Products

AHJ:js

Encl. EPA Train, Method 5.

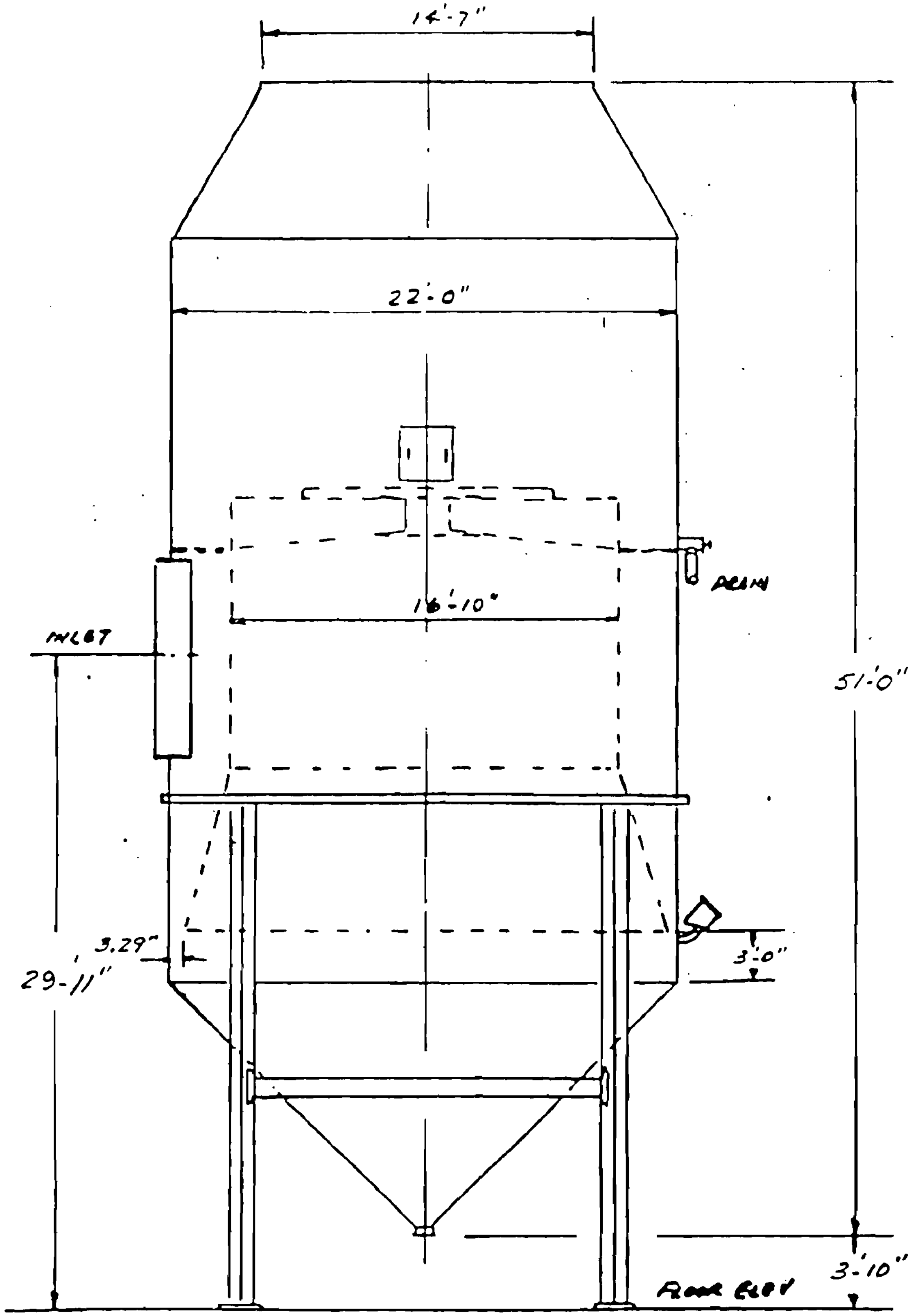
cc: F. Arroyo - Arroyo Process Equipment
cc: L. Newton - Western Precipitation
cc: R. Fernandez - Western Precipitation

STACK BOILER No 4



SCRUBBER BOILER NO 4

SRE D-200



ATTACHMENT D

Compilation of Emission Tests Performed on Bagasse Boilers

Attachment D

Analysis of SO_2 Emission from Bagasse
Boilers Equipped with Spray Impingement Scrubbers

Measurements of SO_2 emissions from bagasse-burning boilers has been performed at the U.S. Sugar Bryant mill, at the Sugar Cane Growers Cooperative (SCGC) mill, and at the Osceola Farms mill. The results of these tests are summarized in Table D-1. All tests were conducted using EPA and/or FDER source test methods. The U.S. Sugar Bryant and Osceola Farms tests were conducted while burning 100-percent bagasse. However, the SCGC tests were conducted while burning approximately 50×10^6 Btu/hr of oil (approximately 330 gallons per hour). The heat inputs shown in Table D-1 for SCGC boiler No. 8 reflect only the heat input due to bagasse. The oil usage, and associated SO_2 produced, has been ignored in developing the SO_2 removal efficiency for this boiler; therefore, the results are extremely conservative. Nevertheless, the SCGC tests show an overall SO_2 removal efficiency of the system of 97.7% and greater. The test results for U.S. Sugar Bryant and Osceola Farms, which were based on conservative assumptions for the sulfur content of bagasse, also reflect overall removals of greater than 98%.

The only concurrent test data for scrubber inlet and outlet were obtained at U.S. Sugar Bryant and SCGC. The data show better than 90% removal of SO_2 within the scrubber itself. The data also reflect an estimated 60%-90% loss of theoretical SO_2 before reaching the scrubber. This is probably a result of SO_2 absorption in the bottom ash and fly ash produced in the boiler.

The data presented in the analysis substantiate that an assumed 75% SO_2 removal in the bagasse boiler/spray impingement scrubber system when burning bagasse is a very conservative assumption. The data from SCGC boiler No. 8 show that assuming no SO_2 removal when burning small quantities of oil in conjunction with bagasse is also a very conservative assumption.

Table D-1

Summary of SO_2 Source Tests and SO_2 Removal Efficiencies, Florida Sugar Industry

Date	Mill/ Boiler	Steam Load (lb/hr)	Heat Input* (10^6 Btu/hr)	Bagasse Rate† (lb/hr,dry)	Sulfur Content (% dry)	Theoretical SO_2 (lb/hr)	Measured Scrubber Inlet SO_2 (lb/hr)	Measured Scrubber Outlet SO_2 (lb/hr)	Scrubber SO_2 Efficiency (%)	Overall SO_2 Efficiency (%)
U.S. Sugar Bryant										
12/17/79	2	142,000	337.6	42,200	0.15	126.6	-	<2.5	-	>98.0
12/18/79	2	151,000	359.8	44,975	0.15	134.9	-	<2.5	-	>98.0
12/18/79	2	144,000	342.8	42,850	0.15	128.6	-	<2.5	-	>98.0
4/1/87	5	250,909	564.7	70,588	0.15	211.7	1.91	0.23	87.9	99.9
4/1/87	5	249,041	560.5	70,062	0.15	210.2	3.07	0.20	93.4	99.9
4/1/87	5	249,600	561	70,125	0.15	210.4	4.00	0.38	90.5	99.8
U.S. Sugar Clewiston										
12/23/85	4	262,500	504.6	63,075	0.15	189.2	-	1.26	-	99.3
12/23/85	4	266,000	505.7	63,212	0.15	189.6	-	0.83	-	99.5
12/23/85	4	251,408	478.5	59,812	0.15	179.4	-	0.83	-	99.5
U.S. Sugar Clewiston										
1/20/87	4	251,363	537.2	67,150	0.15	201.5	-	1.19	-	99.4
1/20/87	4	246,400	526.4	65,800	0.15	197.4	-	1.59	-	99.2
1/20/87	4	254,545	544.2	68,025	0.15	204.0	-	1.19	-	99.4
Sugar Cane Growers Corp.										
2/4/83	8	246,429	415.1	51,888	0.1	103.8	45.0	1.7	96.2	98.4
2/4/83	8	243,250	405.3	50,663	0.1	101.3	36.7	1.9	94.8	98.1
2/4/83	8	254,211	427.5	53,438	0.1	106.9	35.4	2.5	92.9	97.7
Osceola Farms (Average of 3 Tests)										
12/22/82	6	135,000	280.0	35,000	0.1	70.0	-	0.07	-	99.9

Table D-2
Summary of NO_x Emission Tests Performed on Bagasse Boilers in Florida

Unit	Boiler Type	Date	Steam Rate (lb/hr)	Heat Input Rate (MMBtu/hr)	Bagasse Burning Rate[a] (TPH wet)	NO_x Emissions lb/hr	NO_x Emissions lb/MMBtu	NO_x Emissions lb/ton,wet
Atlantic Sugar Association								
Boiler 3	Horseshoe	03/19/80	92,868	160.2	22.25	27.7	0.17	1.24
Boiler 4	Horseshoe	03/18/80	91,833	158.4	22.00	31.8	0.20	1.45
Boiler 5	Traveling Grate	03/21/83	108,000	201	27.92	25.9	0.13	0.93
Boiler 5	Traveling Grate	03/21/83	98,000	183	25.42	15.7	0.09	0.62
Boiler 5	Traveling Grate	03/21/83	108,000	201	25.42	28.1	0.14	1.01
Boiler 5	Traveling Grate	03/21/83	107,000	200	27.78	32.0	0.16	1.15
Boiler 5	Traveling Grate	03/21/83	107,000	199	27.64	29.9	0.15	1.08
Boiler 5	Traveling Grate	02/20/87	NA	NA	NA	9.7	NA	NA
Boiler 5	Traveling Grate	02/20/87	NA	NA	NA	7.7	NA	NA
Boiler 5	Traveling Grate	02/20/87	NA	NA	NA	6.4	NA	NA
Boiler 5	Traveling Grate	02/28/88	NA	NA	NA	27.7	NA	NA
Boiler 5	Traveling Grate	01/11/89	119,500	219.9	30.54	18.3	0.08	0.60
Okeelanta								
Boiler 10	Horseshoe	04/10/80	97,667	168.5	23.40	17.7	0.11	0.76
Osceola Farms								
Boiler 6	Traveling Grate	12/09/86	150,000	290	40.28	16.8	0.06	0.42
Boiler 6	Traveling Grate	12/09/86	150,000	290	40.28	7.9	0.03	0.20
Boiler 6	Traveling Grate	12/09/86	150,000	290	40.28	12.8	0.04	0.32
Sugar Cane Growers Cooperative[b]								
Boiler 1	Traveling Grate	03/20/80	81,176	118.5	16.46	38.7	0.33	2.35
Boiler 2	Traveling Grate	03/20/80	94,500	137.9	19.15	37.3	0.26	1.84
Boiler 8	Traveling Grate	02/04/83	246,429	414	57.50	43.1	0.10	0.75
Boiler 8	Traveling Grate	02/04/83	243,250	406	56.39	29.2	0.07	0.52
Boiler 8	Traveling Grate	02/04/83	254,211	425	59.03	32.3	0.08	0.55
Boiler 8	Traveling Grate	01/27/89	248,000	425.2	39.81[c]	117.9	0.28	2.96
Boiler 8	Traveling Grate	01/27/89	251,408	431.0	40.36[c]	118.8	0.28	2.94
Boiler 8	Traveling Grate	01/27/89	249,375	427.5	40.03[c]	117.7	0.28	2.94
U.S. Sugar - Bryant								
Boiler 2	Vibrating Grate	02/26/80	155,000	267.4	37.14	14.9	0.06	0.40
Boiler 5	Vibrating Grate	02/03/89	253,253	566.2	80.95[d]	85.0	0.15	1.05
Boiler 5	Vibrating Grate	02/03/89	247,612	554.2	79.55[d]	71.6	0.13	0.90
Boiler 5	Vibrating Grate	02/03/89	253,881	568.2	81.33[d]	79.7	0.14	0.98
U.S. Sugar - Clewiston								
Boiler 1	Vibrating Grate	02/28/80	215,000	370.9	51.51	26.9	0.07	0.52
Boiler 4	Traveling Grate	12/23/85	262,500	561.4	76.2[d]	92.9	0.17	1.10
Boiler 4	Traveling Grate	12/23/85	266,000	562.7	76.3[d]	70.4	0.13	0.83
Boiler 4	Traveling Grate	12/23/85	251,407	532.3	72.4[d]	58.2	0.11	0.73

Note:
lb/hr = pounds per hour.
lb/MMBtu = pounds per million British thermal units.
lb/ton = pounds per ton.
MMBtu/hr = million British thermal units per hour.
NA = not available.
TPH = tons per hour.

[a] Assumed 3,600 Btu/lb average heat content for wet bagasse.
[b] Heat input and NO_x emissions due to oil burning excluded.
[c] Combination of residue/oil firing; oil firing constituted less than 7 percent of total heat input. Average heating value of wet residue assumed to be 5,340 Btu/lb.
[d] Based on actual reported data.

Table D-3
Summary of VOC Emission Tests Performed on Bagasse Boilers in Florida

Unit	Boiler Type	Date	Steam Rate (lb/hr)	Heat Input Rate (MMBtu/hr)	Bagasse Burning Rate[a] (TPH wet)	VOC Emissions lb/hr	lb/MMBtu	lb/ton,wet
Atlantic Sugar								
Boiler 5	Traveling Grate	03/21/83	108,000	201	27.92	14.3	0.07	0.51
Boiler 5	Traveling Grate	03/21/83	98,000	183	25.42	14.6	0.08	0.57
Boiler 5	Traveling Grate	03/21/83	108,000	201	27.92	14.5	0.07	0.52
Boiler 5	Traveling Grate	02/20/87	NA	NA	NA	20.0	NA	NA
Boiler 5	Traveling Grate	02/28/88	NA	NA	NA	34.3	NA	NA
Boiler 5	Traveling Grate	01/11/89	119,500	219.9	30.54	25.2	0.12	0.82
Osceola Farms								
Boiler 6	Traveling Grate	12/18/86	160,000	310	43.06	79.0	0.25	1.83
Boiler 6	Traveling Grate	12/18/86	160,000	310	43.06	49.0	0.16	1.14
Sugar Cane Growers Cooperative								
Boiler 8	Traveling Grate	02/04/83	246,429	414	57.50	13.9	0.03	0.24
Boiler 8	Traveling Grate	02/04/83	243,250	406	56.39	26.8	0.07	0.48
Boiler 8	Traveling Grate	02/04/83	254,211	425	59.03	88.1	0.21	1.49
Boiler 8[b]	Traveling Grate	01/06/89	NA	425.2	39.81	35.8	0.08	0.90
						5.41[c]	0.01	0.14
Boiler 8[b]	Traveling Grate	01/06/89	NA	431.0	40.36	36.2	0.08	0.90
						12.7[c]	0.03	0.32
Boiler 8[b]	Traveling Grate	01/06/89	NA	427.5	40.03	111.4	0.26	2.78
						21.5[c]	0.05	0.54
U.S. Sugar - Bryant								
Boiler 5	Vibrating Grate	02/03/89	253,253	566.2	80.95[d]	102.8	0.18	1.27
Boiler 5	Vibrating Grate	02/03/89	253,881	568.2	81.33[d]	116.3	0.20	1.43
U.S. Sugar - Clewiston								
Boiler 4	Traveling Grate	12/23/85	262,500	561.4	76.2[d]	104.4	0.19	1.37
Boiler 4	Traveling Grate	12/23/85	266,000	562.7	76.3[d]	71.0	0.13	0.93
Boiler 4	Traveling Grate	12/23/85	251,407	532.3	72.4[d]	120.2	0.23	1.66

Note:
lb/hr = pounds per hour.
lb/MMBtu = pounds per million British thermal units.
lb/ton = pounds per ton.
MMBtu/hr = million British thermal units per hour.
NA = not available.
TPH = tons per hour.

[a] Calculated from reported heat input rate, assumed 3,600 Btu/lb average heat content for wet bagasse. Average heat value for wet residue is 5,340 Btu/lb.
[b] Residue was used as fuel source. Average heat value for wet residue is 5,340 Btu/lb.
[c] Sample analyzed by another analytical laboratory.
[d] Based on actual reported data.

COMPILATION OF PARTICULATE EMISSION TESTS
CLEWISTON BOILER NO. 1

TEST NO	DATE	STEAM PRODUCTION #/HR	HEAT INPUT MMBTU/HR. BAGASSE	OIL	PARTICULATE EMISSION ACTUAL #/MMBTU	AVG.	ALLOWABLE #/MMBTU	ACTUAL #/HR.	ALLOWABLE #/HR.	GAS FLOW ACFM
1	11-16-76	186,600	367.1	0	0.17		0.30	60.89	110.13	–
2	11-16-76	179,000	352.1	0	0.16	0.17	0.30	57.81	105.63	–
3	11-16-76	179,200	318.3	35.1	0.17		0.29	59.30	99.00	–
4	2-09-78	206,100	408.6	O	0.13		0.30	53.65	122.58	–
5	2-13-78	197,200	378.3	10.4	0.15	0.15	0.29	58.75	114.53	–
6	2-13-78	218,000	425.7	0	0.15		0.30	64.57	127.71	–
7	1-05-79	213,100	412.9	0	0.15		0.30	61.65	123.86	–
8	1-05-79	205,200	395.0	0	0.17	0.16	0.30	66.41	118.50	–
9	1-05-79	209,300	394.4	0	0.17		0.30	69.47	119.82	–
10	12-03-79	210,201	404.3	0	0.17		0.30	70.09	121.29	–
11	12-03-79	222,928	405.2	0	0.19	0.20	0.30	77.69	121.60	–
12	12-03-79	225,000	409.1	0	0.23		0.30	92.12	122.73	–
13	12-20-80	223,228	432.3	0	0.18		0.30	77.53	129.69	135,805
14	12-20-80	221,564	422.4	0	0.16	0.16	0.30	66.00	126.71	129,154
15	12-20-80	223,977	427.2	0	0.16		0.30	68.19	128.16	140,192
16	11-19-81	210,750	393.6	0	0.25		0.30	99.52	118.07	139,301
17	11-20-81	218,893	421.6	0	0.16	0.22	0.30	69.21	126.48	146,264
18	11-20-81	220,730	428.5	0	0.25		0.30	106.92	128.56	137,885
19	11-15-82	236,250	462.3	0	0.22		0.30	91.90	138.68	147,022
20	11-15-82	220,798	393.9	0	0.21	0.21	0.30	86.79	118.17	141,764
21	11-15-82	210,375	412.7	0	0.19		0.30	78.93	123.80	145,712
22	12-22-83	201,903	413.5	0	0.18		0.30	76.44	124.05	133,652
23	12-22-83	207,000	422.1	0	0.18	0.17	0.30	77.37	126.63	129,763
24	12-22-83	210,551	431.2	0	0.15		0.30	64.34	129.36	129,225
25	11-30-84	212,143	412.0	0	0.18		0.30	74.84	124.21	168,111
26	11-30-84	211,091	411.6	0	0.30	0.24	0.30	121.50	123.49	170,740
27	11-30-84	217,277	425.4	0	0.25		0.30	106.14	127.63	171,840

Table D-4

COMPILATION OF PARTICULATE EMISSION TESTS
CLEWISTON BOILER NO. 1
PAGE 2

TEST NO	DATE		STEAM PRODUCTION #/HR	HEAT INPUT MMBTU/HR. BAGASSE	OIL	PARTICULATE EMISSION ACTUAL #/MMBTU	AVG.	ALLOWABLE #/MMBTU	ACTUAL #/HR.	ALLOWABLE #/HR.	GAS FLOW ACFM
28	1-25-86		215,317	395.5	0	0.15		0.25	61.10	98.87	144,337
29	1-25-86		215,649	398.1	0	0.15	0.15	0.25	61.55	99.52	133,979
30	1-25-86		214,934	399.9	0	0.17		0.25	69.50	99.98	142,089
31	2-10-87		195,652	386.4	0	0.23		0.25	89.11	96.61	158,292
32	2-10-87		202,500	40.3	0	0.19	0.20	0.25	76.36	100.06	164,288
33	2-10-87		201,575	398.4	0	0.19		0.25	75.10	99.61	164,036
34	1-07-88		200,724	417.1	0	0.24		0.25	100.42	104.29	168,399
35	1-07-88		194,610	406.3	0	0.26	0.24	0.25	103.95	101.57	166,690
36	1-07-88		200,676	418.9	0	0.24		0.25	102.14	104.19	159,909
37	3-06-89		198,643	415.2	0	0.22		0.25	90.88	103.80	165,045
38	3-06-89		197,609	413.0	0	0.22	0.21	0.25	92.31	103.26	169,635
39	3-06-89		201,522	421.4	0	0.19		0.25	80.37	105.36	173,269
40	1-16-90		220,743	424.4	0	0.21		0.25	87.79	106.11	173,985
41	1-16-90	(250PSIG)	216,711	418.4	0	0.27	0.25	0.25	113.52	104.59	189,662
42	1-16-90		215,671	414.0	0	0.27		0.25	111.58	103.50	179,650
43	02-12-91		192,466	406.6	0	0.15		0.25	62.81	101.67	182,607
44	02-12-91		189,000	398.9	0	0.17	0.17	0.25	68.39	99.74	184,820
45	02-12-91		190,479	402.3	0	0.17		0.25	69.09	100.59	184,235
46	01-24-92		201,575	0	0	0.28		0.25	116.50	105.32	187,267
47	01-24-92		198,851	0	0	0.16	0.20	0.25	66.88	103.94	184,771
48	01-24-92		198,851	0	0	0.16		0.25	67.16	103.88	184,488
49	01-19-93		196,927	0	0	0.11		0.25	44.00	102.71	173,619
50	01-19-93		200,118	0	0	0.15	0.15	0.25	63.82	104.25	178,157
51	01-19-93		196,027	0	0	0.20		0.25	82.46	101.77	184,676

File: \123\WYSIWYG\BLRS\C2COMP.

COMPILATION OF PARTICULATE EMISSION TESTS
CLEWISTON BOILER NO. 2

TEST NO	DATE	STEAM PRODUCTION #/HR	HEAT INPUT MMBTU/HR. BAGASSE	HEAT INPUT MMBTU/HR. OIL	PARTICULATE EMISSION ACTUAL #/MMBTU	AVG.	ALLOWABLE #/MMBTU	ACTUAL #/HR.	ALLOWABLE #/HR.	GAS FLOW ACFM
1	11-10-75	175,000	314.2	33.3	0.15		0.28	52.10	97.60	–
2	11-10-75	175,000	303.4	50.8	0.15	0.16	0.27	51.80	96.10	–
3	11-10-75	175,000	315.9	49.3	0.17		0.27	63.80	99.70	–
4	01-04-77	185,780	343.6	50.0	0.20		0.27	79.61	108.08	–
5	01-04-77	186,876			0.16	0.18	0.29	62.04	109.29	–
6	01-05-77	174,558	328.9	14.9	0.17		0.29	59.03	100.16	–
7	02-08-78	198,200	361.0	0	0.12		0.30	44.42	108.30	–
8	02-08-78	206,300	379.5	0	0.13	0.14	0.30	48.29	113.85	–
9	02-08-78	211,000	388.8	0	0.18		0.30	70.07	116.64	–
10	01-15-79	209,400	401.6	0	0.21		0.30	85.48	120.48	–
11	01-15-79	215,100	410.4	0	0.13	0.19	0.30	52.94	123.12	–
12	01-15-79	183,800	351.1	0	0.23		0.30	82.28	105.32	–
13	12-04-79	203,450	370.0	0	0.20		0.30	73.19	111.00	–
14	12-04-79	201,159	376.5	0	0.20	0.19	0.30	76.08	112.95	–
15	12-04-79	207,360	377.0	0	0.17		0.30	65.79	113.11	–
16	12-22-80	199,452	361.2	0	0.15		0.30	53.26	108.36	137,360
17	12-22-80	204,750	371.6	0	0.12	0.15	0.30	43.76	111.49	142,915
18	12-22-80	203,067	368.3	0	0.19		0.30	69.28	110.48	141,986
19	02-11-82	208,319	369.0	62.8	0.14		0.30	62.04	116.98	158,489
20	02-11-82	204,750	380.6	42.8	0.16	0.13	0.30	66.06	118.44	155,621
21	02-11-82	212,318	384.3	40.5	0.10		0.30	41.05	119.33	152,127
22	11-17-82	203,097	416.2	0	0.17		0.30	78.79	124.86	153,869
23	11-17-82	204,750	423.2	0	0.13	0.16	0.30	58.76	126.96	153,891
24	11-17-82	214,817	453.2	0	0.17		0.30	75.54	135.96	149,671

Table D-5

COMPILATION OF PARTICULATE EMISSION TESTS
CLEWISTON BOILER NO. 2
PAGE 2

TEST NO	DATE	STEAM PRODUCTION #/HR	HEAT INPUT MMBTU/HR. BAGASSE	OIL	PARTICULATE EMISSION ACTUAL #/MMBTU	AVG.	ALLOWABLE #/MMBTU	ACTUAL #/HR.	ALLOWABLE #/HR.	GAS FLOW ACFM
25	12-08-83	194,735	382.3	17.9	0.17		0.30	69.97	116.49	165,119
26	12-08-83	195,395	372.8	24.9	0.15	0.16	0.30	59.27	114.33	163,295
27	12-08-83	200,046	410.2	0	0.17		0.30	70.79	123.05	159,011
28	11-29-84	224,196	483.4	0	0.16		0.30	78.97	145.01	162,999
29	11-29-84	222,936	480.3	0	0.15	0.15	0.30	72.27	144.28	160,237
30	11-29-84	225,000	486.9	0	0.13		0.30	63.48	146.08	159,752
31	1-02-86	196,364	412.4	0	0.18		0.25	73.14	103.10	153,895
32	1-02-86	192,857	404.0	0	0.12	0.14	0.25	47.82	101.00	154,388
33	1-02-86	196,200	410.6	0	0.13		0.25	53.58	102.66	153,529
34	2-11-87	208,125	438.3	0	0.16		0.25	68.17	109.58	156,718
35	2-11-87	206,352	432.0	0	0.17	0.16	0.25	72.83	108.01	167,179
36	2-11-87	205,875	432.1	0	0.17		0.25	73.29	108.02	166,957
37	1-19-88	198,851	416.0	0	0.16		0.25	68.25	104.01	166,243
38	1-19-88	201,575	422.0	0	0.21	0.18	0.25	88.82	105.49	167,981
39	1-19-88	200,724	420.0	0	0.17		0.25	72.06	104.99	168,364
40	2-02-89	205,200	433.6	0	0.25		0.25	108.31	108.40	172,375
41	2-02-89	204,188	430.4	0	0.25	0.24	0.25	107.59	107.59	178,598
42	2-02-89	203,425	429.0	0	0.23		0.25	107.26	107.26	175,767
43	2-21-90	198,750	418.6	0	0.22		0.25	92.85	104.64	170,425
44	2-21-90	196,027	412.8	0	0.17	0.20	0.25	70.27	103.21	167,399
45	2-21-90	198,851	418.8	0	0.22		0.25	92.28	104.70	180,474
46	02-13-91	178,459	372.5	0	0.15		0.25	58.16	94.13	164,521
47	02-13-91	176,250	371.8	0	0.17	0.15	0.25	63.26	92.96	167,653
48	02-13-91	180,608	381.0	0	0.13		0.25	48.04	95.26	166,836
49	01-22-92	185,844	388.7	0	0.24		0.25	92.75	97.19	196,325
50	01-22-92	180,608	377.8	0	0.17	0.23	0.25	64.79	94.45	186,342
51	01-22-92	184,932	386.8	0	0.28		0.25	107.77	96.72	193,803
52	01-20-93	210,822	444.6	0	0.15		0.25	66.38	112.42	205,336
53	01-20-93	810,822	448.3	0	0.21		0.25	92.98	112.08	201,173
54	01-20-93	211,875	449.6	0	0.10	0.15	0.25	43.90	112.4	195,927

File: \123\WYSIWYG\BLRS\C3COMP.

COMPILATION OF PARTICULATE EMMISION TESTS
CLEWISTON BOILER NO. 3

		STEAM	HEAT INPUT		PARTICULATE EMISSION					
		PRODUCTION	MMBTU/HR.		ACTUAL		ALLOWABLE	ACTUAL	ALLOWABLE	GAS FLOW
TEST NO	DATE	#/HR	BAGASSE	OIL	#/MMBTU	AVG	#/MMBTU	#/HR.	#/HR.	ACFM
1	11-12-75	100,000	146.2	47.4	0.11		0.25	44.44	48.60	–
2	11-12-75	100,000	123.5	77.5	0.13	0.18	0.22	60.27	44.80	–
3	11-12-75	100,000	135.1	61.7	0.31		0.24	129.12	46.70	–
										–
4	11-19-76	87,600	145.3	24.7	0.14		0.27	53.28	46.06	–
5	11-19-76	88,200	146.6	25.6	0.16	0.15	0.27	57.61	46.54	–
6	11-19-76	81,000	130.7	21.2	0.16		0.27	58.05	41.33	–
										–
7	02-14-78	82,600	160.5	0	0.12		0.30	40.61	48.16	–
8	02-14-78	82,500	160.5	0	0.15	0.14	0.30	49.69	48.18	–
9	02-14-78	81,800	155.2	2.5	0.15		0.30	50.54	46.81	–
										–
10	12-18-78	111,800	125.8	102.8	0.11		0.21	52.38	48.02	–
										–
11	12-19-78	107,500	168.5	42.2	0.10	0.12	0.26	38.46	54.77	–
12	12-19-78	105,600	148.4	63.5	0.14		0.24	58.33	50.87	–
										–
										–
13	12-12-79	90,426	186.4	0	0.26		0.30	86.67	55.92	–
14	12-12-79	91,969	189.4	0	0.26	0.25	0.30	86.67	56.83	–
15	12-12-79	93,462	183.8	8.9	0.23		0.30	76.67	56.03	–
16	12-23-80	107,693	203.1	18.9	0.13		0.28	45.50	28.50	81,798
17	12-23-80	107,432	206.8	14.6	0.12	0.12	0.28	41.70	26.46	83,018
18	12-23-80	107,156	199.2	21.7	0.12		0.27	45.22	27.97	78,292
19	11-23-81	110,455	205.9	5.6	0.22		0.30	75.32	62.34	89,348
20	11-23-81	109,929	190.6	2.0	0.22	0.20	0.30	72.99	57.39	77,278
21	11-23-81	117,149	201.4	3.9	0.17		0.30	58.21	60.81	87,779
22	11-16-82	117,900	246.9	0	0.16		0.30	53.33	74.06	95,944
23	11-17-82	125,337	268.1	0	0.16	0.16	0.30	53.33	80.44	104,168
24	11-17-82	128,483	275.0	0	0.17		0.30	56.67	82.50	101,931
25	12-07-83	117,900	242.4	0	0.30		0.30	86.67	72.73	107,309
26	12-07-83	118,241	241.4	0	0.26	0.26	0.30	100.00	72.43	113,525
27	12-07-83		231.3	0	0.21		0.30	70.00	69.40	112,269

Table D-6

COMPILATION OF PARTICULATE EMISSION TESTS
CLEWISTON BOILER NO. 3
PAGE 2

TEST NO	DATE	STEAM PRODUCTION #/HR	HEAT INPUT MMBTU/HR. BAGASSE	OIL	PARTICULATE EMISSION ACTUAL #/MBTU	AVG	ALLOWABLE #/MBTU	% OF ALLOWABLE	ALLOWABLE #/HR.	GAS FLOW ACFM
28	12-17-84	113,400	228.3	0	0.28		0.30	93.33	63.50	109,238
29	12-17-84	112,500	225.9	0	0.20	0.24	0.30	66.67	67.77	107,451
30	12-17-84	111,375	223.1	0	0.24		0.30	80.00	66.92	113,415
31	1-03-86	119,118	235.8	0	0.23		0.30	76.66	70.75	121,223
32	1-03-86	110,455	218.4	0	0.28	0.24	0.30	93.33	65.51	126,221
33	1-03-86	109,227	215.2	0	0.21		0.30	70.00	64.56	119,736
34	1-21-87	109,227	176.0	44.7	0.17		0.30	56.66	57.27	119,429
35	1-21-87	105,652	170.6	42.8	0.24	0.19	0.30	80.00	55.47	112,151
36	1-21-87	103,970	171.8	37.8	0.17		0.30	56.66	55.31	118,161
37	12-10-87	117,269	198.7	37.7	0.23		0.30	76.66	63.37	113,892
38	12-10-87	114,646	194.3	36.8	0.18	0.21	0.30	60.00	61.97	99,406
39	12-10-87	110,455	182.2	40.5	0.24		0.30	80.00	58.70	97,161
40	1-17-89	116,735	227.0	12.4	0.15		0.29	51.70	69.35	116,433
41	1-17-89	118,887	227.7	15.8	0.16	0.15	0.29	55.20	69.89	114,950
42	1-17-89	117,139	226.3	13.0	0.16		0.29	55.20	69.19	109,140
43	1-02-90	116,735	239.8	0	0.23		0.30	76.70	71.95	119,099
44	1-02-90	130,567	270.4	0	0.25	0.23	0.30	83.30	81.12	127,292
45	1-02-90	128,647	256.7	10.3	0.23		0.29	79.30	78.04	117,712
46	02-20-91	112,696	226.4	0	0.15		0.30	50.66	67.92	134,630
47	02-20-91	110,779	222.6	0	0.12	0.15	0.30	38.66	66.79	133,140
48	02-20-91	107,206	215.5	0	0.17		0.30	56.33	64.64	133,620
49	02-19-92	104,478	194.7	16.3	0.15		0.30	49.00	60.05	124,899
50	02-19-92	111,224	207.7	16.8	0.10		0.30	33.00	63.09	124,364
51	02-19-92	108,000	197.7	20.4	0.14	0.13	0.30	48.33	61.37	123,814
52	01-21-93	112,243	206.5	22.5	0.19		0.28	67.50	64.19	127,617
53	01-21-93	112,696	204.9	24.9	0.09		0.28	32.37	63.96	125,088
54	01-21-93	111,971	203.5	24.7	0.18	0.15	0.28	66.19	63.51	132,374

File: \123\WYSIWYG\BLRS\C4COMP.

COMPILATION OF PARTICULATE EMISSION TESTS
CLEWISTON BOILER NO. 4

TEST NO	DATE	STEAM PRODUCTION #/HR	HEAT INPUT MMBTU/HR. BAGASSE	HEAT INPUT MMBTU/HR. OIL	PARTICULATE EMISSION ACTUAL #/MMBTU	AVG.	ALLOWABLE #/MMBTU	ACTUAL #/HR.	ALLOWABLE #/HR.	GAS FLOW ACFM
1	12-23-85	262,500	561.4	0	0.13		0.15	71.36	84.21	186,739
2	12-23-85	266,000	562.7	0	0.15	0.147	0.15	84.76	84.40	186,530
3	12-23-85	251,409	532.3	0	0.17		0.15	87.86	79.85	186,374
4	1-20-87	251,364	537.2	0	0.15		0.15	82.13	80.58	212,001
5	1-20-87	246,400	526.4	0	0.14	0.142	0.15	73.60	78.95	209,316
6	1-20-87	254,546	544.2	0	0.13		0.15	73.12	81.63	209,766
7	1-25-88	303,692	674.4	0	0.13		0.15	88.47	101.15	204,143
8	1-25-88	315,000	699.5	0	0.10	0.109	0.15	70.28	104.92	203,496
9	1-25-88	316,615	702.8	0	0.10		0.15	68.45	105.42	208,462
10	12-21-88	305,735	610.2	0	0.12		0.15	81.91	100.61	203,422
11	12-21-88	311,719	621.8	0	0.06	0.087	0.15	39.35	102.64	200,799
12	12-21-88	300,462	598.5	0	0.09		0.15	52.01	98.69	203,406
13	2-20-90	308,636	691.7	0	0.13		0.15	91.04	103.75	203,201
14	2-20-90	306,667	690.3	0	0.13	0.122	0.15	89.94	103.55	202,555
15	2-20-90	310,299	698.8	0	0.10		0.15	72.10	104.82	200,211
16	02-22-91	300,000	647.8	0	0.13		0.15	85.03	97.20	211,660
17	02-22-91	298,148	644.1	0	0.12	0.131	0.15	80.01	96.62	216,320
18	02-22-91	293,382	634.2	0	0.14		0.15	87.04	95.13	213,370
19	01-09-92	302,055	630.0	0	0.09		0.15	58.43	94.50	213,561
20	01-09-92	295,135	615.8	0	0.13		0.15	79.01	92.38	214,997
21	01-09-92	305,000	642.0	0	0.07	0.096	0.15	42.44	96.30	214,248
22	02-04-93	295,135	552.4	0	0.10		0.15	64.26	95.29	227,708
23	02-04-93	286,622	535.9	0	0.12		0.15	76.61	92.46	228,300
24	02-04-93	294,000	551.2	0	0.14	0.122	0.15	89.27	95.09	228,846

Table D-7

COMPILATION OF PARTICULATE EMISSION TESTS
CLEWISTON BOILER NO. 5

TEST NO	DATE	STEAM PRODUCTION #/HR	HEAT INPUT MMBTU/HR. BAGASSE	HEAT INPUT MMBTU/HR. OIL	PARTICULATE EMISSION ACTUAL #/MMBTU	AVG	ALLOWABLE #/MMBTU	ACTUAL #/HR.	ALLOWABLE #/HR.	GAS FLOW ACFM
1	01-04-78	60,000	119.6	0	0.24		0.30	29.15	35.88	–
2	01-04-78	59,016	118.2	0	0.26	0.25	0.30	29.45	35.46	–
3	01-04-78	54,104	108.2	0	0.27		0.30	28.88	32.46	–
4	12-05-79	65,000	122.1	0	0.25		0.30	30.00	36.63	–
5	12-05-79	65,000	122.2	0	0.23	0.27	0.30	28.59	36.66	–
6	12-05-79	60,000	112.9	0	0.33		0.30	36.97	33.87	–
7	01-13-81	64,565	124.6	0	0.28		0.30	34.29	37.38	63,836
8	01-13-81	70,667	136.0	0	0.18	0.24	0.30	24.90	40.81	63,620
9	01-13-81	66,353	128.0	0	0.26		0.30	32.92	38.40	61,850
10	11-24-81	61,177	122.1	0	0.25		0.30	30.16	36.63	54,677
11	11-24-81	65,934	131.6	0	0.29	0.24	0.30	37.90	39.48	55,780
12	11-24-81	65,161	129.7	0	0.20		0.30	25.57	38.92	56,671
13	11-18-82	51,724	102.4	0	0.21		0.30	21.22	30.72	58,290
14	11-18-82	60,000	117.7	0	0.15	0.18	0.30	18.08	35.30	56,200
15	11-18-82	54,838	108.8	0	0.17		0.30	18.99	32.64	57,640
16	11-23-83	48,268	92.4	0	0.34		0.30	31.42	27.71	59,540
17	11-23-83	63,600	122.3	0	0.26	0.28	0.30	31.71	36.68	59,814
18	11-23-83	64,941	125.2	0	0.24		0.30	29.94	37.55	60,239
19	12-19-84	60,000	116.7	0	0.15		0.30	17.84	35.02	53,794
20	12-19-84	53,933	105.1	0	0.21	0.19	0.30	22.38	31.53	49,834
21	12-19-84	60,000	117.2	0	0.21		0.30	24.84	35.15	51,565
22	02-04-86	62,535	118.6	0	0.15		0.30	17.48	35.58	59,205
23	02-04-86	61,000	116.3	0	0.20	0.17	0.30	22.96	34.89	58,977
24	02-04-86	61,904	123.1	0	0.18		0.30	21.61	36.92	60,318
25	1-22/23-87	43,200	81.1	0	0.21		0.30	17.04	24.33	49,106
26	1-22/23-87	49,846	93.8	0	0.10	0.15	0.30	9.35	28.15	50,396
27	1-22/23-87	50,400	91.2	0	0.14		0.30	12.48	27.36	50,071
28	1-22-88	60,869	114.2	0	0.21		0.30	23.72	34.26	56,629
29	1-22-88	59,130	110.4	0	0.20	0.19	0.30	22.10	33.11	56,806
30	1-22-88	66,563	124.2	0	0.18		0.30	22.22	37.27	57,473

Table D-8

COMPILATION OF PARTICULATE EMISSION TESTS
CLEWISTON BOILER NO. 5
PAGE 2

TEST NO	DATE	STEAM PRODUCTION #/HR	HEAT INPUT MMBTU/HR. BAGASSE	OIL	PARTICULATE EMISSION ACTUAL #/MMBTU	AVG	ALLOWABLE #/MMBTU	ACTUAL #/HR.	ALLOWABLE #/HR.	GAS FLOW ACFM
31	1-26-89	68,955	128.7	0	0.20		0.30	25.51	38.60	52,786
32	1-26-89	71,250	133.0	0	0.23	0.20	0.30	30.64	39.91	51,525
33	1-26-89	64,390	120.3	0	0.17		0.30	20.11	36.09	50,606
34	1-18-90	68,824	129.1	0	0.27		0.30	35.21	38.72	52,341
35	1-18-90	68,182	128.1	0	0.27	0.26	0.30	34.75	38.43	50,271
36	1-18-90	69,863	131.3	0	0.26		0.30	34.43	39.38	53,743
37	02-21-91	63,582	113.9	0	0.13		0.30	14.96	34.19	46,840
38	02-21-91	64,412	121.2	0	0.28	0.19	0.30	33.86	36.36	47,470
39	02-21-91	66,667	126.2	0	0.16		0.30	20.70	37.85	46,270
40	01-30-92	60,000	112.7	0	0.18		0.30	20.21	33.81	47,372
41	01-30-92	66,857	123.6	0	0.18		0.30	22.43	37.09	45,228
42	01-30-92	65,400	122.8	0	0.15	0.17	0.30	17.94	36.85	44,654
43	03-12-93	66,117	123.9	0	0.10		0.30	12.67	37.17	49,083
44	03-12-93	67,887	127.0	0	0.15		0.30	19.08	38.11	50,344
45	03-12-93	62,054	116.0	0	0.17	0.14	0.30	19.41	34.81	47,642

File: \123\WYSIWYG\BLRS\C6COMP.

COMPILATION OF PARTICULATE EMISSION TESTS
CLEWISTON BOILER NO. 6

TEST NO	DATE	STEAM PRODUCTION #/HR	HEAT INPUT MMBTU/HR. BAGASSE	HEAT INPUT MMBTU/HR. OIL	PARTICULATE EMISSION ACTUAL #/MMBTU	AVG	ALLOWABLE #/MMBTU	ACTUAL #/HR.	ALLOWABLE #/HR.	GAS FLOW ACFM
1	02-19-76	57,400	118.7	0	0.16		0.30	19.50	35.60	–
2	02-19-76	57,000	117.7	0	0.18	0.16	0.30	20.80	35.30	–
3	02-20-76	60,000	124.0	0	0.14		0.30	17.50	37.20	–
4	01-13-77	50,026	100.1	0	0.26		0.30	26.25	30.03	–
5	01-13-77	49,773	99.5	0	0.29	0.27	0.30	28.54	29.85	–
6	01-13-77	51,906	103.1	0	0.26		0.30	26.97	30.93	–
7	01-05-78	59,381	118.7	0	0.22		0.30	25.73	35.61	–
8	01-05-78	59,558	119.1	0	0.25	0.26	0.30	29.81	35.73	–
9	01-05-78	60,000	119.1	0	0.30		0.30	36.26	35.97	–
10	03-13-79	61,026	116.6	0	0.33		0.30	38.09	34.98	–
11	03-13-79	60,000	111.9	0	0.29	0.28	0.30	32.23	33.56	–
12	03-13-79	62,376	116.3	0	0.24		0.30	27.48	34.89	–
13	12-13-79	55,579	104.4	0	0.33		0.30	33.94	31.33	–
14	12-13-79	55,385	104.0	0	0.26	0.30	0.30	27.25	31.20	–
15	12-13-79	49,756	93.5	0	0.31		0.30	29.04	28.05	–
16	01-03-81	60,571	113.4	0	0.26		0.30	29.57	34.02	64,344
17	01-03-81	66,976	126.5	0	0.24	0.29	0.30	30.71	37.96	60,370
18	01-03-81	63,750	119.9	0	0.37		0.30	43.95	35.98	65,866
19	11-24-81	54,495	107.6	0	0.21		0.30	22.99	32.27	45,666
20	11-24-81	53,395	105.9	0	0.26	0.22	0.30	27.23	31.76	44,806
21	11-24-81	65,106	129.0	0	0.19		0.30	24.80	38.70	49,757
22	01-15-83	60,674	118.1	0	0.18		0.30	21.66	35.42	60,403
23	01-15-83	70,588	138.1	0	0.21	0.22	0.30	28.73	41.44	61,294
24	01-15-83	68,764	134.5	0	0.26		0.30	35.08	40.35	61,177
25	11-22-83	43,421	83.9	0	0.28		0.30	23.50	25.17	54,968
26	11-22-83	71,087	136.9	0	0.22	0.25	0.30	30.93	41.07	62,853
27	11-22-83	69,756	134.9	0	0.25		0.30	33.94	40.46	64,901
28	12-20-84	60,000	113.5	0	0.20		0.30	23.00	34.05	56,610
29	12-20-84	57,857	112.3	0	0.24	0.22	0.30	26.40	33.70	59,158
30	12-20-84	58,652	116.4	0	0.21		0.30	24.87	34.91	56,314

Table D-9

COMPILATION OF PARTICULATE EMISSION TESTS
CLEWISTON BOILER NO. 6

TEST NO	DATE	STEAM PRODUCTION #/HR	HEAT INPUT MMBTU/HR. BAGASSE	HEAT INPUT MMBTU/HR. OIL	PARTICULATE EMISSION ACTUAL #/MMBTU	AVG	ALLOWABLE #/MMBTU	ACTUAL #/HR.	ALLOWABLE #/HR.	GAS FLOW ACFM
31	1-27-86	61,622	117.5	0	0.28		0.30	32.76	35.25	57,835
32	1-27-86	61,818	116.7	0	0.24	0.30	0.30	27.73	35.02	58,994
33	1-27-86	63,750	121.5	0	0.17		0.30	20.13	36.46	55,682
34	1-19-87	51,750	98.0	0	0.21		0.30	20.29	39.40	66,771
35	1-19-87	53,169	100.7	0	0.23	0.23	0.30	22.83	30.22	65,876
36	1-19-87	51,273	97.0	0	0.25		0.30	24.25	29.09	66,337
37	2-09-88	57,273	106.7	0	0.16		0.30	16.61	32.00	62,519
38	2-09-88	56,308	104.8	0	0.14	0.14	0.30	14.78	31.44	66,580
39	2-09-88	53,539	99.8	0	0.14		0.30	13.98	29.93	68,702
40	1-30-89	67,273	132.7	0	0.15		0.30	20.28	39.76	53,641
41	1-30-89	72,000	135.4	0	0.11	0.11	0.30	14.75	40.63	51,814
42	1-30-89	73,333	138.7	0	0.09		0.30	12.53	41.61	49,964
43	1-12-90	73,044	137.2	0	0.25		0.30	34.32	41.16	54,498
44	1-12-90	78,261	146.6	0	0.29	0.26	0.30	42.14	43.97	54,969
45	1-12-90	73,044	137.5	0	0.25		0.30	34.90	41.24	49,545
46	03-04-91	62,903	120.8	0	0.13		0.30	15.56	36.25	57,290
47	03-04-91	68,710	129.9	0	0.20	0.17	0.30	25.43	38.99	53,280
48	03-04-91	68,710	129.9	0	0.19		0.30	24.74	38.98	53,440
49	02-05-92	71,879	134.9	0	0.17		0.30	22.42	40.49	47,753
50	02-05-92	71,014	134.1	0	0.15		0.30	20.54	40.54	48,645
51	02-05-92	70,402	132.5	0	0.14	0.15	0.30	18.65	39.76	48,990
52	02-03-93	59,833	113.7	0	0.20		0.30	22.65	33.35	59,226
53	02-03-93	58,753	111.2	0	0.17		0.30	19.71	34.04	57,973
54	02-03-93	59,708	113.5	0	0.17	0.18	0.30	22.06	38.00	57,277

COMPILATION OF PARTICULATE EMISSION TESTS
BRYANT BOILER NO. 5

TEST NO.	DATE	STEAM PRODUCTION #/HR	HEAT INPUT #/MMBTU BAGASSE	HEAT INPUT #/MMBTU OIL	PARTICULATE EMISSION ACTUAL #/MMBTU	AVG.	ALLOWABLE #/MMBTU	ACTUAL #/HR.	ALLOWABLE #/HR.	GAS FLOW ACFM
1	2-29-80	169,068	0	0	0.15		0.15	58.30	36.58	–
2	2-29-80	155,405	0	0	0.13	0.14	0.15	44.29	51.75	–
3	2-29-80	165,789	0	0	0.14		0.15	51.43	55.34	–
4	3-06-81	169,898	387.6	0	0.10		0.15	38.03	58.14	180,907
5	3-06-81	167,368	381.0	0	0.09	0.09	0.15	34.34	57.14	170,213
6	3-06-81	172,959	393.4	0	0.09		0.15	35.35	59.01	177,161
7	2-15-82	202,000	459.3	0	0.11		0.15	50.59	68.90	165,783
8	2-15-82	190,116	430.6	0	0.15	0.14	0.15	68.21	64.59	103,560
9	2-15-82	193,125	434.9	0	0.17		0.15	72.59	65.24	165,557
10	3-04-83	187,037	409.5	0	0.15		0.15	60.78	61.43	166,329
11	3-04-83	185,625	404.8	0	0.14	0.15	0.15	58.48	60.72	103,412
12	3-04-83	185,625	404.8	0	0.17		0.15	68.39	60.72	170,018
13	1-13-84	190,741	420.4	0	0.15		0.15	62.01	63.05	166,458
14	1-13-84	187,037	413.3	0	0.16	0.15	0.15	66.09	62.00	167,523
15	1-13-84	188,415	416.1	0	0.14		0.15	60.01	62.41	170,801
16	1-11-85	206,250	454.0	0	0.14		0.15	62.63	68.11	185,019
17	1-11-85	198,750	439.5	0	0.14		0.15	61.12	65.92	194,434
18	1-11-85	198,837	439.7	0	0.14	0.14	0.15	59.88	65.95	196,284
19	2-15-86	226,087	509.2	0	0.15		0.15	77.07	76.38	226,742
20	2-15-86	227,119	510.5	0	0.14	0.14	0.15	69.09	76.57	227,992
21	2-15-86	226,119	511.2	0	0.14		0.15	72.92	76.67	232,377
22	2-05-87	240,000	534.1	0	0.12		0.15	65.51	80.11	235,962
23	2-05-87	237,391	525.7	0	0.11	0.12	0.15	57.90	78.86	231,225
24	2-05-87	240,000	532.8	0	0.15		0.15	80.71	79.92	229,996
25	3-02-88	234,286	519.5	0	0.12		0.15	62.19	77.93	216,176
26	3-02-88	234,286	514.2	0	0.10	0.1366	0.15	49.25	77.12	219,961
27	3-02-88	235,161	512.3	0	0.19		0.15	95.79	76.84	222,097
28	2-03-89	253,235	529.7	0	0.09		0.15	48.91	84.93	201,787
29	2-03-89	247,612	518.5	0	0.14	0.11	0.15	76.73	83.13	211,794
30	2-03-89	253,881	531.6	0	0.10		0.15	54.24	85.23	209,964

Table D-10

COMPILATION OF PARTICULATE EMISSION TESTS
BRYANT BOILER NO. 5
PAGE 2

TEST NO.	DATE	STEAM PRODUCTION #/HR	HEAT INPUT #/MMBTU BAGASSE	HEAT INPUT #/MMBTU OIL	PARTICULATE EMISSION ACTUAL #/MMBTU	AVG.	ALLOWABLE #/MMBTU	ACTUAL #/HR.	ALLOWABLE #/HR.	GAS FLOW ACFM
31	12-21-89	250,833	567.9	0	0.12		0.15	65.84	85.18	215,558
32	12-21-89	244,478	554.3	0	0.14	0.13	0.15	78.00	83.15	229,339
33	12-21-89	240,000	546.0	0	0.14		0.15	76.20	81.90	216,802
34	01-31-91	241,343	521.8	0	0.11		0.15	59.67	78.27	224,468
35	01-31-91	243,971	528.9	0	0.14	0.13	0.15	72.45	79.34	227,183
36	01-31-91	243,971	529.7	0	0.13		0.15	68.39	79.45	266,205
37	03-05-92	240,000	534.2	0	0.14		0.15	60.76	80.12	217,733
38	03-05-92	240,000	534.5	0	0.11		0.15	58.05	80.18	222,231
39	03-05-92	246,522	548.4	0	0.10	0.11	0.15	57.30	82.27	220,993
40	03-04-93	232,703	521.0	0	0.13		0.15	66.53	78.15	190,340
41	03-04-93	227,746	508.3	0	0.08		0.15	41.73	76.24	195,979
42	03-04-93	243,000	543.2	0	0.12	0.11	0.15	66.59	81.48	201,173

ATTACHMENT E

Request For Higher CO Emissions Limit

UNITED STATES SUGAR CORPO

December 15, 1992

Mr. David Knowles
Florida Department of Environmental
Regulation
2295 Victoria Avenue - Suite 364
Fort Myers, Fl. 33901-2896

RE: Hendry County - AP
U. S. Sugar Corporation
Clewiston Boiler No. 4
Permit No. AO-26-14701
4

Dear Mr. Knowles:

Enclosed is the application of United States Sugar Corporation for the renewal of the air operation permit for Clewiston Boiler No. 4, located at the Clewiston sugar processing plant, together with check for $2,000.00 to cover the permit renewal fee.

In accordance with Specific Conditions 7, 9, and 12 of the current permit issued on February 15, 1988, we will conduct compliance tests before February 15, 1993. We will advise your office of the exact dates of the testing as soon as those dates are available. Within 14 days of the compliance test, we will test Boiler No. 4 in accordance with the ASME short-form procedure. The results of this testing will be submitted as soon as they can reasonably be prepared, but no later than 45 days after testing.

We recognize that you will need the results of this testing before taking action to approve the application for renewal. Pursuant to our discussions, we further understand that, until final action is taken on the pending application, the current permit will continue in full force and effect and that we must continue to comply with the conditions of that permit, as previously amended, until a new permit is issued.

As per your suggestion, we have informed Tallahassee of our requests stated herein. Mr. Willard Hanks during this conversation mentioned that you would be able to decide and resolve minor modifications out of the Department's Fort Myers office, but to copy Mr. Clair Fancy. Since this is a PSD boiler, we are also sending a copy to EPA Region IV.

We look forward to hearing from you on this matter.

Sincerely,

UNITED STATES SUGAR CORPORATION

Murray D. Brinson

Murray D. Brinson
Director of Sugar Houses

MTB:jt

Enclosures

cc: Mr. Clair Fancy, DER, Tallahassee
Ms. Jewell Harper, EPA, Atlanta
~~Mr~~. Peter Briggs
✓Mr. Peter Barquin
Mr. David Buff

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICATION FOR RENEWAL OF PERMIT TO OPERATE AIR POLLUTION SOURCE(S)

If major alterations have occurred, the applicant should complete the Standard Air Permit Application Form.

Source Type: *Bagasse/Oil-Fired Boiler* Renewal of DER Permit No. *A026-144701*

Company Name: *U.S. Sugar Corporation* County: *Hendry*

Identify the specific emission point source(s) addressed in this application (i.e., Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired): *Boiler No. 4 with wet scrubber*

Source Location: Street: *W.C. Owens Avenue & S.R. 832* City: *Clewiston*

UTM: East *506.1* North *2,956.9*

Latitude: *2 6*° *4 4*' *0 5*"N Longitude: *8 0*° *5 6*' *1 9*"W.

---

1. Attach a check made payable to the Department of Environmental Regulation in accordance with operation permit fee schedule set forth in Florida Administrative Code Rule 17-4.05.

2. Have there been any alterations to the plant since last permitted? [ ] Yes [X] No If minor alterations have occurred, describe on a separate sheet and attach.
See ATTACHMENT "B"

3. Attach the last compliance test report required per permit conditions if not submitted previously. ***previously submitted***

4. Have previous permit conditions been adhered to? [ ] Yes [X] No If no, explain on a separate sheet and attach.
See ATTACHMENT "C"

5. Has there been any malfunction of the pollution control equipment during tenure of current permit? [ ] Yes [X] No If yes, and not previously reported, give brief details and what action was taken on a separate sheet and attach.

6. Has the pollution control equipment been maintained to preserve the collection efficiency last permitted by the Department? [X] Yes [ ] No

7. Has the annual operating report for the last calendar year been submitted? [X] Yes [ ] No If no, please attach.

8. Please provide the following information if applicable:

A. Raw Materials and Chemical Used in Your Process:

Description	Contaminant Type	%Wt	Utilization Rate lbs/hr
Not Applicable			

B. Product Weight (lbs/hr): *Not Applicable*

C. Fuels

Type (Be Specific)	Consumption* Avg/hr*	Max/hr**	Maximum Heat Input (MMBTU/hr)
Bagasse		*215,889 lb/hr-wet*	*777.2*
No. 6 Fuel Oil		*1,500 gal/hr*	*225.0*

D. Normal Equipment Operating Time: hrs/day *24*; days/wk *7*; wks/yr *22.8*; hrs/yr (power plants only) ____; if seasonal, describe

Operation is seasonal, normally October to March

The undersigned owner or authorized representative*** of U.S. Sugar Corporation is fully aware that the statements made in this application for a renewal of a permit to operate an air pollution source are true, correct and complete to the best of his knowledge and belief. Further, the undersigned agrees to maintain and operate the pollution source and pollution control facilities in such a manner as to comply with the provisions of Chapter 403, Florida Statutes, and all the rules and regulations of the Department. He also understands that a permit, if granted by the Department, will be non-transferable and he will promptly notify the Department upon sale or legal transfer of the permitted facility.

* During actual time of operation.
** Units: Natural Gas-~~MMCF~~/hr; Fuel Oils-barrels/hr; Coal-lbs/hr.
*** Attach letter of authorization if not previously submitted

Murray L. Brinson
Signature, Owner or Authorized Representative
(Notarization is mandatory)

Murray L. Brinson, Director, Sugar Houses
Typed Name and Title

P.O. Drawer 1207
Address

Clewiston FL 33440
City State Zip

12/15/92 (813) 983-8121
Date Telephone No.

STATE OF FLORIDA
COUNTY OF HENDRY

Sworn to and subscribed before me this *15th* day of *Dec.*, 1992.

My commission expires:

JUANITA M. TAYLOR
MY COMMISSION # CC 232756
EXPIRES: October 6, 1996
Bonded Thru Notary Public Underwriters

Juanita M. Taylor
Notary Public, State of Florida at Large

Personally Known ☒ OR Produced Identification ☐
Type of Identification Produced:

OPERATION PERMIT RENEWAL
PROFESSIONAL ENGINEER CERTIFICATION

This certification must be attached to the renewal application (required by Rule 17-4.050(3), FAC) for :

Company Name: *U.S. Sugar Corporation*

Source ID: *52/26/0003/09*

County: *Hendry*

Renewal of DER Permit No.: *A026-144701*

PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (WHERE REQUIRED BY Chapter 471, F.S.)

This is to certify that the engineering features of this pollution source(s) have been examined by me and found to be in conformity with good engineering principles which provide reasonable assurance, in my professional judgment, that the pollution source(s), 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 source(s).

Signed David A. Buff

David A. Buff
Name (Please Type)

Affix Seal

KBN Engineering and Applied Sciences, Inc.
Company Name (Please Type)

1034 N.W. 57th Street, Gainesville, FL 32605
Mailing Address (Please Type)

Florida Registration No. 19011

Date 12/3/92

Telephone No. (904)331-9000

DER FORM 17-1.202(4) -----attachment (Effective 10-01-88) (Revised 04-10-91)

12033Y1/F2/ARPS.ATT (11/23/92)

ATTACHMENT A

Application for Renewal of Permit to Operate
Boiler No. 4
U.S. Sugar Corporation - Clewiston Mill

In this application for renewal of the operating permit for Boiler No. 4, U.S. Sugar requests that Specific Conditions 5, 8, and 13 in the current operating permit be revised. The requested changes are summarized as follows:

Specific Condition 5 -	A revision is requested to provide that the limit on burning more than 6,300 gallons of fuel oil in any 3 hour period, which is intended as a limit on emissions, may be exceeded during startup, shutdown or malfunction in accordance with DER Rule 17-2.250, F.A.C.
Specific Condition 8 -	A revision is requested to incorporate the clarification provided by DER on October 26, 1989, with respect to the timing of measurements.
Specific Condition 13 -	U.S. Sugar has completed testing carbon monoxide (CO) emissions from Boiler No. 4 using EPA Method 10 and requests the establishment of a reasonable CO limit, as previously intended by DER. The proposed emission limit and the basis for the limit is provided.

Each of these items are discussed in the following paragraphs.

Specific Condition 5

This condition in the current permit requires that during any 3-hour period, not more than 6,300 gallons of fuel oil shall be burned in all stationary fuel oil burning equipment at the plant. This condition is included in the permit to limit SO_2 emissions. It is requested that this condition be revised to permit excess emissions resulting from startup, shutdown or malfunction, such as when power is lost at the mill. Startup conditions occur during the "grind-in" period (which usually occurs on one day approximately one week prior to the sugar mill startup), during startup of the sugar mill at the beginning of the crop season, and at other times when the mill has been shut down for an extended period (such as during the Christmas holidays). The purpose of the grind-in period is to test major equipment for proper operation. Plant emergencies are very rare, but when they do occur, bagasse feed to the boilers may be interrupted, and it may become necessary to switch to fuel oil.

Excess emissions during these limited and unusual periods are expressly allowed under DER Rule 17-2.250, F.A.C. The rule allows excess emissions from fossil fuel steam generators during such periods "provided that best operational practices to minimize emissions are adhered to and the duration of excess emissions" is minimized. It is readily apparent that this rule was intended to cover precisely the type of situation encountered by U.S. Sugar during startups and other emergencies. Indeed, the rule would apply by its own terms if Specific Condition 5 were expressed as an emission limit rather than a fuel burning limit. Accordingly, we request that Specific Condition 5 be revised to read as follows:

5. During any 3-hour period, not more than 6,300 gallons of fuel oil shall be burned in all stationary fuel oil burning equipment at the plant. Excess fuel oil burning resulting from startup, shutdown, or malfunction of any source shall be permitted provided that best operational practices to minimize emissions are adhered to and the duration of excess emissions shall be minimized. All permits to operate other oil burning equipment at this plant are revised to include this limitation.

Specific Condition 8

DER has clarified the intent of Specific Condition 8 of the current operating permit to required that the flue gas pressure drop across the scrubber be measured and recorded once in each 8-hour shift. Reference letter from Phillip R. Edwards, Deputy Assistant Secretary of DER, to Peter Barquin of U.S. Sugar Corporation, October 26, 1989 (copy enclosed). The letter states further that the pH of the scrubber water shall be measured and recorded once per day. We request that Specific Condition 8 of the permit be revised to reflect these modified requirements.

Specific Condition 13

Specific Condition 13 of the current permit limits CO emissions to 0.25 lb/MMBtu as determined by EPA Method 10. U.S. Sugar has addressed the concern with this condition in a letter addressed to DER dated October 8, 1990.

The concern with the condition is that the 0.25 lb/MMBtu limit was not based on Method 10 testing, but was based instead on EPA emission factors which have proven to be inappropriate as estimates of actual CO emissions from sugar processing mills. Subsequent testing at U.S. Sugar and other sugar mills has demonstrated that the 0.25 lb/MMBtu limit is much too low based on Method 10 testing, as acknowledged by the USEPA Region IV and the DER through correspondence in 1989.

Presented in the attached Table 1 are CO test results for the three mills known to have conducted Method 10 tests. A total of 20 individual test runs have been conducted on Boiler No. 4 at the U.S. Sugar mill in Clewiston. These were all conducted by Air Consulting and Engineering, Inc. Boiler No. 4 is a traveling grate boiler. The average CO emission rate for this boiler, as reflected in the test data, is 5.44 lb/MMBtu. The individual measurements range from 2.2 to 14.9 lb/MMBtu.

In order to determine an acceptable upper CO limit for compliance purposes, a statistical analysis of the test data was performed, using the average test results from each test date, consistent with the manner in which compliance tests are performed. The average test results are shown in Table 2. A frequency distribution for the data is presented in Figure 1. This plot shows that a CO emission level of 9.0 lb/MMBtu would have the probability of being exceeded only about 10 percent of the time. This probability of exceedance is acceptable to U.S. Sugar. Therefore, U.S. Sugar requests an allowable CO emission rate of 9.0 lb/MMBtu for Boiler No. 4.

Table 1. Summary of CO Emission Tests Performed on Bagasse Boilers in Florida Using EPA Method 10

Unit	Boiler Type	Date	Steam Rate (lb/hr)	Heat Input (MMBtu/hr)	Bagasse Firing Rate[a] (TPH wet)	CO Emissions lb/hr	CO Emissions lb/MMBtu	CO Emissions lb/ton,wet
U.S. Sugar Bryant								
Boiler 5	Vibrating Grate	02/16/89	256,928	577	80.14	2,586.9	4.48	32.28
Boiler 5	Vibrating Grate	02/17/89	249,228	561	77.92	2,658.0	4.74	34.11
Boiler 5	Vibrating Grate	02/17/89	249,480	562	78.06	1,693.3	3.01	21.69
						Max. =	4.74	34.11
						Avg. =	4.08	29.36
Osceola Farms								
Boiler 3	Fuel Cell	01/17/89	NA	NA	NA	NA	3.07	22.10
Boiler 3	Fuel Cell	12/05/89	NA	NA	NA	NA	0.81	5.83
Boiler 3	Fuel Cell	01/24/90	NA	NA	NA	NA	3.14	22.61
Boiler 6	Traveling Grate	01/16/89	NA	NA	NA	NA	5.42	39.02
Boiler 6	Traveling Grate	11/15/89	NA	NA	NA	NA	5.48	39.46
Boiler 6	Traveling Grate	02/02/90	NA	NA	NA	NA	5.93	42.70
						Max. =	5.93	42.70
						Avg. =	3.98	28.62
U.S. Sugar - Clewiston								
Boiler 4	Traveling Gate	02/20/90	308,636	691.7	96.07	1,940	2.80	20.19
Boiler 4	Traveling Gate	02/20/90	306,666	690.3	95.88	1,520	2.20	15.85
Boiler 4	Traveling Gate	02/20/90	310,298	698.8	97.06	2,240	3.20	23.08
Boiler 4	Traveling Gate	02/15/91	289,091	624.9	86.79	4,760	7.62	54.84
Boiler 4	Traveling Gate	02/15/91	291,200	629.5	87.43	2,710	4.30	31.00
Boiler 4	Traveling Gate	02/18/91	288,358	622.8	86.50	2,430	3.90	28.09
Boiler 4	Traveling Gate	02/18/91	285,224	616.4	85.61	2,640	4.28	30.84
Boiler 4	Traveling Gate	02/18/91	302,647	653.3	90.74	2,060	3.16	22.70
Boiler 4	Traveling Gate	02/19/91	290,769	627.9	87.21	4,430	7.05	50.80
Boiler 4	Traveling Gate	02/19/91	294,583	637.1	88.49	3,400	5.33	38.42
Boiler 4	Traveling Gate	02/19/91	293,382	633.5	87.99	2,480	3.92	28.19
Boiler 4	Traveling Gate	02/22/91	300,000	647.9	89.99	4,900	7.56	54.45
Boiler 4	Traveling Gate	02/22/91	293,382	634.2	88.08	9,450	14.90	107.28
Boiler 4	Traveling Gate	01/07/92	293,425	613.6	85.22	3,200	5.22	37.55
Boiler 4	Traveling Gate	01/07/92	282,800	591.3	82.13	6,270	10.60	76.35
Boiler 4	Traveling Gate	01/08/92	299,178	623.2	86.56	2,030	3.26	23.45
Boiler 4	Traveling Gate	01/08/92	297,973	621.5	86.32	3,160	5.09	36.61
Boiler 4	Traveling Gate	01/08/92	300,811	627.4	87.14	3,540	5.64	40.62
Boiler 4	Traveling Gate	01/09/92	302,065	630.0	87.50	2,770	4.40	31.66
Boiler 4	Traveling Gate	01/09/92	295,135	615.8	85.53	2,710	4.40	31.69
						Max. =	14.90	107.28
						Avg. =	5.44	39.18

Note: lb/hr = pounds per hour.
lb/MMBtu = pounds per million British thermal units.
lb/ton = pounds per ton.
MMBtu/hr = million British thermal units per hour.
NA = not available.
TPH = tons per hour.

[a] Calculated from reported heat input rate, assumed 3,600 Btu/lb average heat content for wet bagasse.

Table 2. Summary of CO Test Averages, U.S. Sugar Clewiston Boiler No. 4

Test Date	Number of Runs	Average CO Emissions (lb/MM Btu)
February 20, 1990	3	2.73
February 15, 1991	2	3.97
February 18, 1991	3	3.78
February 19, 1991	3	5.43
February 22, 1991	2	11.23
January 7, 1992	2	7.91
January 8, 1992	3	4.66
January 9, 1992	2	4.40

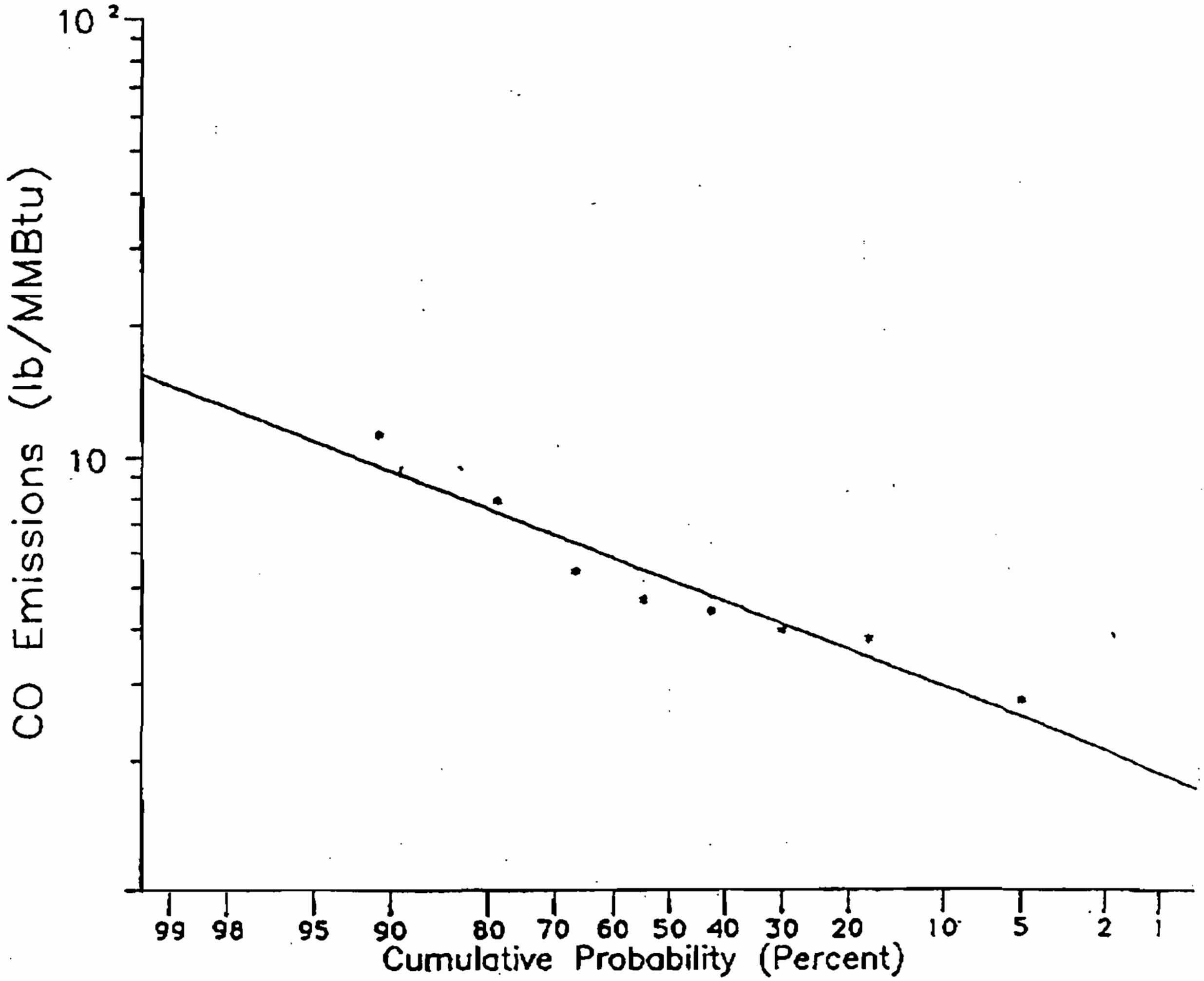


Figure 1 FREQUENCY DISTRIBUTION OF CO TEST DATA, CLEWISTON BOILER NO. 4

KBN

ATTACHMENT B

Application for Renewal of Permit to Operate

Boiler No. 4

U.S. Sugar Corporation - Clewiston Mill

No plant or process changes have been made. Modifications of pollution control equipment for Boiler No. 1 were completed as approved by the Department on July 24, 1992.

ATTACHMENT C

Application for Renewal of Permit to Operate

Boiler No. 4

U.S. Sugar Corporation - Clewiston Mill

Because the underlying assumptions about carbon monoxide emission rates have proven to be erroneous, we have not complied with Specific Condition 13 of the permit. The inappropriateness and inapplicability of this condition has been recognized and acknowledged by the Department in correspondence with U.S. Sugar. Reference the letter from Philip Edwards of DER to Peter Barquin of U.S. Sugar, dated October 26, 1989. Accordingly, U.S. Sugar has conducted testing pursuant to instructions from the Department to provide the basis for establishing reasonable CO emissions levels for this boiler. The results of that testing are included in Attachment A of this application, and U.S. Sugar is requesting a revision of Specific Condition 13.

In addition, it has not always been possible to complete testing in accordance with the dates specified in the specific conditions of this permit. On those occasions when testing would not be completed within the specified time period, U.S. Sugar has advised the Department of the specific date scheduled for testing and has obtained authorization to complete testing on the alternative date, allowing an opportunity for witnessing by the Department.

Florida Department of Environmental Regulation

South District • 2269 Bay Street • Fort Myers, Florida 33901-2896 • 813-332-2667

Bob Martinez, Governor | Dale Twachtmann, Secretary | John Shearer, Assistant Secretary | Philip Edwards, Deputy Assistant Secretary

October 26, 1989

Peter Barquin
U. S. Sugar Corporation
Post Office Drawer 1207
Clewiston, Florida 33440

Re: Hendry County - AP
U. S. Sugar Corporation
Boiler No. 4
AC26-126965 and AO26-144701

Dear Mr. Barquin:

As requested in your recent telephone conversation with David Knowles, we hereby clarify the intent of the specific conditions of the operating permit AO26-144701 for boiler No. 4.

The intent of specific condition No. 8 is that the flue gas pressure drop across the scrubber be measured and recorded once in each 8 hour shift. The pH of the scrubber water shall be measured and recorded once per day.

We request that you test the CO emissions from Boiler #4 using EPA Method 10 during the 1989-1990 crop season. The purpose of the this test is to help us determine a reasonable CO emission factor for boilers of this type. Please notify this office in advance of the date and time of each test.

If you have any questions please call David Knowles.

Sincerely,

Philip C. Barbour
for

Philip R. Edwards
Deputy Assistant Secretary

PRE/DMK/jsw

cc: Williard Hanks

Best Available Copy

UNITED STATES SUGAR CORPORATION

Post Office Drawer 1207 Clewiston, Florida 33440
Telephone: (813) 983-8121 Telex: 510-952-7753

October 8, 1990

Mr. David Knowles
Florida Department of Environmental
Regulation
2269 Bay Street
Fort Myers, Florida 33901-2896

RE: Hendry County - AP
U. S. Sugar Corporation
Clewiston Boiler No. 4
Permit AC26-126965 and
AO26-144701

Dear Mr. Knowles:

Following Mr. Philip R. Edward's request as per his letter of October 26, 1989, we are sending you Report No. 1376-A for CO Emissions from Boiler No. 4.

We would have wanted to make more tests in this boiler, but due to certain difficulties with the testing company and the early end of the crop due to the extensive freeze which we sustained last winter, we were unable to run a more adequate number of tests.

Results from these three (3) one (1) hour runs might not be representative of the actual range and average emissions from this boiler.

The purpose of this test as requested by Mr. Edwards is to help the Department determine a reasonable CO Emission Factor for boilers of this type. We suggest you consider and evaluate the results of the nine (9) runs carried out at our Bryant Boiler No. 5 as well, in making this determination.

Very truly yours,

UNITED STATES SUGAR CORPORATION

Peter Barquin
Administative Ass't. to
Senior Vice President
Sugar Houses

PB:jt
Enclosures

ATTACHMENT F

Calculation of Proposed Clewiston Mill Emissions for Impact Analysis

Attachment F

Calculation of Proposed Clewiston Mill Emissions for Impact Analysis

To ensure that ambient air quality standards (AAQS) for annual, 24-hour and 3-hour emissions are not exceeded by the proposed project, U.S. Sugar Corporation evaluated the worst-case annual, 24-hour and 3-hour operating conditions for the Clewiston mill. Tables F-1, F-2 and F-3 present the boiler emissions associated with the worst-case annual, 24-hour, and 3-hour scenarios, respectively. Each of the emission factors and related activity factors are presented for reference.

Tables F-1, F-2 and F-3 are based on the following factors and assumptions:

- EPA AP-42 emission factors were used in all cases, except as noted below.
- PM emission are based on current permit limits for boilers No. 1-4 and proposed permit limit for boiler No. 7.
- Boilers No. 1-3 were assumed to be firing 2.5% sulfur fuel oil, while boilers No. 4 and 7 were assumed to be firing 1.5% and 0.5% sulfur oil, respectively. Scrubber SO_2 removal efficiency was assumed to be 0% for oil firing.
- Bagasse CO emissions are based on permit limit of 9 lb/MM Btu for all boilers which has been previously proposed (see Attachment E).
- Boiler No. 1-3 bagasse SO_2 emissions were based on mass balance. Bagasse sulfur content was assumed to be 0.1% (wet basis). Scrubber SO_2 removal efficiency was assumed to be 75% for bagasse combustion.
- Boiler No. 4 and 7 bagasse emissions for SO_2, NO_x and VOC were based on current boiler No. 4 permit limits, which are in turn based on stack testing.
- Heating values of 4,000 Btu/lb for wet bagasse and 150,000 Btu/gal for residual oil
- Boiler efficiency of 80% when firing oil and 55% when firing bagasse.
- Boiler steam enthalpy differential (heat gain) assumed as follows:
  - No. 1, 2: 1150 Btu/lb
  - No. 3: 1111 Btu/lb
  - No. 4, 7: 1160 Btu/lb

The current PM emission limits for the existing boilers No. 1, 2, 3, and 4 are 0.25, 0.25, 0.3, and 0.15 lb/MM Btu respectively, when firing bagasse and 0.1 lb/MM Btu when firing oil. Similarly, the proposed boiler must meet a PM emission limit of 0.15 lb/MM Btu for bagasse and 0.1 lb/MM Btu for oil. The worst-case operating condition for PM emissions is thus the firing of 100% bagasse in all of the boilers.

Boilers No. 1-3 burn fuel oil with 2.5% sulfur, while boiler No. 4 burns 1.5% sulfur fuel oil and the proposed boiler No. 7 will burn 0.5% sulfur oil. Therefore, the worst SO_2 impacts will occur when 2.5% fuel oil is burned in boilers No. 1, 2, and 3 at maximum rate. This equates to 2,100 gal/hr for the 3-hour case (6,300 gal per 3 hours) and 1,700 gal/hr (40,800 gal/day). The remainder of maximum steam capacity for each of the boilers is generated by burning bagasse.

The SO_2 emission rates shown in these tables reflect a 75% reduction in the theoretical amount of SO_2 resulting from burning bagasse. No reduction in theoretical SO_2 is assumed for fuel oil burning.

Attachment G provides more detailed emission calculations for boiler No. 7 only.

TABLE F-1. CLEWISTON MILL POTENTIAL ANNUAL EMISSIONS (Ton/yr)

Fuel Oil Combustion

	Activity Factor MMBtu/yr	Activity Factor Mgal/yr	Emission Factor Lb/MMBtu	PM Emission Ton/yr	Emission Factor Lb/Mgal	SO2 Emission Ton/yr	Emission Factor Lb/Mgal	NOx Emission Ton/yr	Emission Factor Lb/Mgal	CO Emission Ton/yr	Emission Factor Lb/Mgal	VOC Emission Ton/yr
Boiler No.1	13,385	89.23	0.10	0.67	157*2.5	17.51	55	2.45	5	0.22	0.28	0.01
Boiler No.2	12,977	86.51	0.10	0.65	157*2.5	16.98	55	2.38	5	0.22	0.28	0.01
Boiler No.3	7,346	48.97	0.10	0.37	157*2.5	9.61	55	1.35	5	0.12	0.28	0.01
Boiler No.4	7,400	49.33	0.10	0.37	157*1.5	5.81	55	1.36	5	0.12	0.28	0.01
Boiler No.7	429,231	2,862	0.10	21.46	157*0.5	112.32	55	78.69	5	7.15	0.28	0.40
Total	470,339	3,136		23.5		162.2		86.2		7.8		0.4

Bagasse Combustion

	Activity Factor MMBtu/yr	Activity Factor TPY Wet Feed	Emission Factor Lb/MMBtu	PM Emission Ton/yr	Emission Factor Lb/ton	SO2 Emission Ton/yr	Emission Factor Lb/ton	NOx Emission Ton/yr	Emission Factor Lb/MMBtu	CO Emission Ton/yr	Emission Factor Lb/ton	VOC Emission Ton/yr
Boiler No.1	1,592,430	199,054	0.25	199.1	0.5	49.8	1.2	119.4	9	7,166	2	199.1
Boiler No.2	1,543,854	192,982	0.25	193.0	0.5	48.2	1.2	115.8	9	6,947	2	193.0
Boiler No.3	844,554	105,569	0.30	126.7	0.5	26.4	1.2	63.3	9	3,800	2	105.6
Boiler No.4	2,315,069	289,384	0.15	173.6	0.166	192.2	180.7	346.9	9	10,418	1.7	246.0
No. 7 crop	2,418,728	302,341	0.15	181.4	0.166	200.8	180.7	346.9	9	10,884	1.7	257.0
No.7 off	1,468,512	183,564	0.15	110.1	0.166	121.9	180.7	294.9	7.74	5,683	1.7	156.0
Total TPY	10,183,147	1,272,893		984		639		1,287		44,899		1,157

NOTE: SO2 and NOx emissions factors for boilers No. 4 & 7 are in terms of lb/MMBtu and lb/hr, respectively

TABLE F-2. CLEWISTON MILL POTENTIAL EMISSIONS, 24-hour case (lb/hr)

Fuel Oil Combustion

	Activity Factor MMBtu/yr	Activity Factor Mgal/yr	Emission Factor Lb/MMBtu	PM Emission Ton/yr	Emission Factor Lb/Mgal	SO2 Emission Ton/yr	Emission Factor Lb/Mgal	NOx Emission Ton/yr	Emission Factor Lb/Mgal	CO Emission Ton/yr	Emission Factor Lb/Mgal	VOC Emission Ton/yr
Boiler No.1	103.5	0.69	0.10	10.4	157*2.5	270.8	55	38.0	5	3.45	0.28	0.19
Boiler No.2	94.5	0.63	0.10	9.5	157*2.5	247.3	55	34.7	5	3.15	0.28	0.18
Boiler No.3	57.0	0.38	0.10	5.7	157*2.5	149.2	55	20.9	5	1.90	0.28	0.11
Boiler No.4	0.0	0.00	0.10	0.0	157*1.5	0.0	55	0.0	5	0.00	0.28	0.00
Boiler No.7	0.0	0.00	0.10	0.0	157*0.5	0.0	55	0.0	5	0.00	0.28	0.00
Total Lb/hr	255.00	1.70		25.5		667.3		93.5		8.50		0.48

Bagasse Combustion

	Activity Factor MMBtu/yr	Activity Factor TPY Wet Feed	Emission Factor Lb/MMBtu	PM Emission Ton/yr	Emission Factor Lb/ton	SO2 Emission Ton/yr	Emission Factor Lb/ton	NOx Emission Ton/yr	Emission Factor Lb/MMBtu	CO Emission Ton/yr	Emission Factor Lb/ton	VOC Emission Ton/yr
Boiler No.1	341	42.6	0.25	85.2	0.5	21.3	1.2	51.1	9	3,067	2	85.2
Boiler No.2	354	44.2	0.25	88.5	0.5	22.1	1.2	53.1	9	3,185	2	88.5
Boiler No.3	190	23.7	0.30	56.9	0.5	11.9	1.2	28.5	9	1,708	2	47.4
Boiler No.4	707	88.3	0.15	106.0	0.166	117.3	180.7	180.7	9	6,359	1.7	150.2
Boiler No.7	738	92.3	0.15	110.7	0.166	122.5	180.7	180.7	9	6,644	1.7	156.9
Total Lb/hr	2,329	291		447		295		494		20,964		528

TABLE F-3. CLEWISTON MILL POTENTIAL EMISSIONS, 3-hour case (lb/hr)

Fuel Oil Combustion

	Activity Factor MMBtu/yr	Activity Factor Mgal/yr	Emission Factor Lb/MMBtu	PM Emission Ton/yr	Emission Factor Lb/Mgal	SO2 Emission Ton/yr	Emission Factor Lb/Mgal	NOx Emission Ton/yr	Emission Factor Lb/Mgal	CO Emission Ton/yr	Emission Factor Lb/Mgal	VOC Emission Ton/yr
Boiler No.1	122.3	0.82	0.10	12.2	157*2.5	320.0	55	44.8	5	4.08	0.28	0.23
Boiler No.2	120.0	0.80	0.10	12.0	157*2.5	314.0	55	44.0	5	4.00	0.28	0.22
Boiler No.3	72.8	0.49	0.10	7.3	157*2.5	190.5	55	26.7	5	2.43	0.28	0.14
Boiler No.4	0.0	0.00	0.10	0.0	157*1.5	0.0	55	0.0	5	0.00	0.28	0.00
Boiler No.7	0.0	0.00	0.10	0.0	157*0.5	0.0	55	0.0	5	0.00	0.28	0.00
Total Lb/hr	315.1	2.10		31.5		824.5		115.5		10.50		0.59

Bagasse Combustion:

	Activity Factor MMBtu/yr	Activity Factor TPY Wet Feed	Emission Factor Lb/MMBtu	PM Emission Ton/yr	Emission Factor Lb/ton	SO2 Emission Ton/yr	Emission Factor Lb/ton	NOx Emission Ton/yr	Emission Factor Lb/MMBtu	CO Emission Ton/yr	Emission Factor Lb/ton	VOC Emission Ton/yr
Boiler No.1	313	39.2	0.25	78.4	0.5	19.6	1.2	47.0	9	2,821	2	78.4
Boiler No.2	317	39.6	0.25	79.2	0.5	19.8	1.2	47.5	9	2,851	2	79.2
Boiler No.3	167	20.9	0.30	50.0	0.5	10.4	1.2	25.0	9	1,501	2	41.7
Boiler No.4	707	88.3	0.15	106.0	0.166	117.3	180.7	192.4	9	6,359	1.7	150.2
Boiler No.7	738	92.3	0.15	110.7	0.166	122.5	180.7	192.4	9	6,644	1.7	156.9
Total Lb/hr	2,242	280		424		290		504		20,177		506

ATTACHMENT G

Calculation of Estimated Emissions for Proposed Boiler No. 7

Attachment G

Derivation of Estimated Emissions
For Proposed Boiler No. 7

I. MAXIMUM FUEL USAGE

A. BOILER DATA

Maximum steam capacity = 350,000 lb/hr (6-hour average) and 368,500 lb/hr (1-hour average) when firing bagasse (600 psig, 750°F)
= 175,850 lb/hr when firing oil

Btu value of water entering boiler = 219 Btu/lb

Btu value of steam leaving boiler = 1,379 Btu/hr at 600 psig, 750°F

Btu requirements per lb steam = 1,379-219 = 1,160 Btu/hr

Boiler efficiency = 55% when firing bagasse
= 80% when firing oil

B. FUEL ANALYSIS

Parameter	Bagasse (dry basis)	Fuel Oil
Btu/lb	8,800 (4,000 wet)	---
Btu/gal	---	150,000
lb/gal	---	8.2 (API gravity 11.8)
wt % Sulfur	0.1 (avg), 0.2 (max)	0.5 max
% Nitrogen	0.3	0.3
% Ash	0.5-0.3	0.1
% H_20	0 (55% wet)	0.2

C. BAGASSE BURNING

350,000 lb/hr steam x 1,160 Btu/lb ÷ 0.55 = 738 MM Btu/hr
738 MM Btu/hr ÷ 4,000 Btu/lb = 92.25 ton/hr wet bagasse

485,905 ton/yr x 4,000 Btu/lb x 2000 lb/ton = 3,887 billion Btu/yr

D. OIL BURNING

175,850 lb/hr steam x 1,160 Btu/lb ÷ 0.80 = 255 MM Btu/hr
255 MM Btu/hr ÷ 150,000 Btu/gal = 1,700 gal/hr oil

1,700 gal/hr x 24 hr/day x 69 day/yr (off season) + 51,540 gal (crop-season) = 2,866,740 gal/yr
2,866,740 gal/yr x 150,000 Btu/gal = 430 billion Btu/yr

E. TOTAL FUEL COMBUSTION

3,887 + 430 = 4,317 billion Btu/yr
430 ÷ 4,317 = 9.96% of annual heat release from oil

II. ESTIMATED EMISSIONS

A. BAGASSE

Particulate. Potential (uncontrolled) emissions - from "Compilation of Emission Factors," U.S. Environmental Protection Agency (EPA), AP-42, Table 1.8-1:

15.6 lb/ton bagasse (wet) x 92.3 ton/hr bagasse (wet) = 1,440 lb/hr

15.6 lb/ton bagasse (wet) x 485,905 ton/yr bagasse (wet) / 2,000 lb/ton = 3,790 ton/yr

Actual emissions - based on proposed emission limit of 0.15 lb PM/MM Btu:

92.3 ton/hr x 4,000 Btu/lb x 2,000 lb/ton x 0.15 lb/MM Btu = 110.7 lb/hr

485,905 ton/yr x 4,000 Btu/lb x 0.15 lb/MM Btu = 291.5 tons/yr

Sulfur Dioxide. Potential (uncontrolled) emissions - from mass balance, based on 0.1% sulfur (wet basis):

485,905 ton/yr x 0.001 x 2 ton SO_2/ton S = 971.8 tons/yr

92.3 ton/hr x 0.001 x 2 ton SO_2/ton S = 0.185 tons/hr

Actual emissions - based on proposed emission limit of 0.166 lb SO_2/MM Btu:

92.3 ton/hr x 2000 lb/ton x 4,000 Btu/lb x 0.166 lb/MM Btu = 122.5 lb/hr

485,905 ton/yr x 4,000 Btu/lb x 0.166 lb/MM Btu = 322.6 tons/yr

Nitrogen Oxides. Based on proposed emission limit of 0.26 lb NO_x/MM Btu:

92.3 ton/hr x 2000 lb/ton x 4,000 Btu/lb x 0.26 lb/MM Btu = 192.4 lb/hr

485,905 ton/yr x 4,000 Btu/lb x 0.25 lb/MM Btu = 485.9 tons/yr

Carbon Monoxide. Based on proposed emission limit of 9 lb CO/MM Btu for crop-season:

92.3 ton/hr x 2000 lb/ton x 4,000 Btu/lb x 9 lb/MM Btu = 6,644 lb/hr

9 lb/MM Btu x 630 MM Btu/hr x 160 days/yr x 24 hr/day/2000 lb/ton = 10,884 tons/yr

Based on proposed emission limit of 7.74 lb CO/MM Btu for crop-season:

65.9 ton/hr x 2000 lb/ton x 4,000 Btu/lb x 7.74 lb/MM Btu = 4,081 lb/hr

7.74 lb/MM Btu x 450 MM Btu/hr x 136 days/yr x 24 hr/day = 5,683 tons/yr

Total CO emissions: 10,884 + 5,683 = 16,567 tons/yr

Volatile Organic Compounds. Based on proposed emission limit of 0.21 lb VOCs/MM Btu:

92.3 ton/hr x 2000 lb/ton x 4,000 Btu/lb x 0.21 lb/MM Btu = 156.9 lb/hr

485,905 ton/yr x 4,000 Btu/lb x 0.21 lb/MM Btu = 413 tons/yr.

B. FUEL OIL

Particulate Potential (uncontrolled) emissions - from AP-42 Table 1.3-1:

10(%S) + 3 lb/M gal = 10(0.5) + 3 = 8 lb/M gal
1,700 gal/hr x 8 lb/M gal = 13.6 lb/hr
2.87 MM gal/yr x 8 lb/M gal ÷ 2,000 = 11.5 tons/yr

Actual emissions - based on proposed emission limit of 0.1 lb PM/MM Btu:

1,700 gal/hr x 150,000 Btu/gal x 0.1 lb/MM Btu = 25.5 lb/hr
2.87 MM gal/yr x 150,000 Btu/gal x 0.1 lb/MM Btu ÷ 2,000 = 21.52 tons/yr

Sulfur Dioxide (based upon no removal in scrubber) From AP-42 Table 1.3-1:

157(%S) lb/M gal = 157(0.5) = 78.5 lb/M gal
1,700 gal/hr x 78.5 lb/M gal = 133.45 lb/hr
2.87 MM gal/yr x 78.5 lb/M gal ÷ 2,000 = 112.6 tons/yr

Nitrogen Oxides From AP-42 Table 1.3-1:

1,700 gal/hr x 55 lb/M gal = 93.5 lb/hr
2.87 MM gal/yr x 55 lb/M gal ÷ 2,000 = 78.9 tons/yr

Carbon Monoxide From AP-42, Table 1.3-1:

1,700 gal/hr x 5 lb/M gal = 8.5 lb/hr
2.87 MM gal/yr x 5 lb/M gal ÷ 2,000 = 7.2 tons/yr

Volatile Organic Compounds From AP-42, Table 1.3-1:

1,700 gal/hr x 0.28 lb/M gal = 0.48 lb/hr
2.87 MM gal/yr x 0.28 lb/M gal ÷ 2,000 = 0.4 tons/yr

Sulfuric Acid Mist. From AP-42, sulfuric acid mist emissions are estimated to be 3% of the SO_2 emissions, thus:

133.45 lb/hr x 0.03 = 4.0 lb/hr
112.6 tons/yr x 0.03 = 3.37 tons/yr

Arsenic, Beryllium, Cadmium, Chromium, Copper, Lead, Mercury, Manganese, Nickel, Formaldehyde. The emission factors for these constituents were obtained from "Estimating Air Toxics Emissions From Coal and Oil Combustion Sources", EPA publication EPA-450/2-89-001 (1989). The emission factors and the resultant emissions are presented in the attached Table G-1. 20% of the chromium was assumed to be emitted as Cr^{+6}

As there is no available data for removal efficiency of these constituents in a wet scrubber, no removal efficiency was assumed. This is an extremely conservative assumption.

Antimony, Barium, Bromine, Cobalt, Fluoride, Hydrogen Chloride, Molybdenum, Phosphorus, Selenium, Tin, Zinc Emission factors for these constituents were obtained from "Emission Assessment of Conventional Stationary Combustion Systems: Volume V", EPA publication EPA-600.7-81-0300c (1981). These factors are presented in this document as pg/J; conversion to lb/MM Btu is as follows:

pg/J x 10^{-12}g/pg x 1,055 J/Btu = 2.324×10^{-6} lb/MM Btu

The emission factors and the resultant emissions are presented in the attached Table G-1.

As there is no available data for removal efficiency of these constituents in a wet scrubber, no removal efficiency was assumed. This is an extremely conservative assumption.

TABLE G-1: BOILER No. 7 AIR TOXICS EMISSIONS FROM FUEL OIL

POLLUTANT	Emission Factor lb/MM Btu	Activity Factor MM Btu/yr	Annual Emission TPY	Activity Factor MM Btu/hr	Hourly Emission lb/hr
Antimony	2.324E-05	446,700	0.00519	255	0.00593
Arsenic	1.900E-05	446,700	0.00424	255	0.00485
Barium	6.693E-05	446,700	0.01495	255	0.01707
Beryllium	4.200E-06	446,700	0.00094	255	0.00107
Bromine	6.972E-06	446,700	0.00156	255	0.00178
Cadmium	1.570E-05	446,700	0.00351	255	0.00400
Chromium	2.100E-05	446,700	0.00469	255	0.00536
Chromium (IV)	4.200E-06	446,700	0.00094	255	0.00107
Cobalt	1.174E-04	446,700	0.02621	255	0.02993
Copper	2.800E-04	446,700	0.06254	255	0.07140
Fluoride	6.275E-06	446,700	0.00140	255	0.00160
Formaldehyde	4.050E-04	446,700	0.09046	255	0.10328
Hydrogen Chloride	6.368E-04	446,700	0.14222	255	0.16238
Lead	2.800E-05	446,700	0.00625	255	0.00714
Manganese	2.600E-05	446,700	0.00581	255	0.00663
Mercury	3.200E-06	446,700	0.00071	255	0.00082
Molybdenum	4.880E-05	446,700	0.01090	255	0.01245
Nickel	1.260E-03	446,700	0.28142	255	0.32130
Phosphorus	5.810E-05	446,700	0.01298	255	0.01482
Selenium	3.718E-05	446,700	0.00831	255	0.00948
Tin	3.300E-04	446,700	0.07371	255	0.08415
Zinc	6.693E-05	446,700	0.01495	255	0.01707

REFERENCES FOR ATTACHMENT G

PB89-194229

United States
Environmental Protection
Agency

Office of Air Quality
Planning And Standards
Research Triangle Park, NC 27711

EPA-450/2-89-001
April 1989

AIR

EPA

ESTIMATING AIR TOXICS EMISSIONS FROM COAL AND OIL COMBUSTION SOURCES

TABLE 4-1. SUMMARY OF TOXIC POLLUTANT EMISSION FACTORS FOR OIL COMBUSTION[a]

Pollutant	Emission Factor ($lb/10^{12}$ Btu) Residual Oil	Distillate Oil
Arsenic	19	4.2
Beryllium	4.2	2.5
Cadmium	15.7	10.5
Chromium	21	48
Copper	280	280
Lead	28[c]	8.9[d]
Mercury	3.2	3.0
Manganese	26	14
Nickel	1260	170
POM	8.4[b]	22.5
Formaldehyde	405[e]	405[e]

[a]All emission factors are uncontrolled, and are applicable to oil-fired boilers and furnaces in all combustion sectors unless otherwise noted.

[b]This value was calculated using all available residual oil data given in Table 4-35. If the upper end of the range of available data is excluded when calculating an average value (which could be used in this table), the average factor for POM from residual oil combustion becomes 4.1 $lb/10^{12}$ BTU.

[c]Applicable to utility boilers only.

[d]Applicable to industrial, commercial, and residential boilers.

[e]The formaldehyde factors are based on very limited and relatively old data. Consult Table 4-37 and accompanying discussion for more detailed information.

PB81-225559

Emissions Assessment of Conventional Stationary Combustion Systems: Volume V: Industrial Combustion Sources

TRW, Inc.
Redondo Beach, CA

Prepared for

Industrial Environmental Research Lab.
Research Triangle Park, NC

1981

U.S. Department of Commerce
National Technical Information Service
NTIS

TABLE 18. TRACE ELEMENT EMISSION FACTORS AND MEAN AMBIENT SEVERITY FACTORS FOR RESIDUAL OIL-FIRED INDUSTRIAL BOILERS

Trace element	Concentration (ppm)	Emission factor (pg/J)	Ambient[a] severity factor
Aluminum (Al)	3.8	87	0.002
Arsenic (As)	0.8	18	1.1
Boron (B)	0.41	9.4	<0.001
Barium (Ba)	1.26	28.8	0.008
Beryllium (Be)	0.08	1.8	0.11
Bromine (Br)	0.13	3.0	<0.001
Calcium (Ca)	14	320	0.002
Cadmium (Cd)	2.27	51.9	0.64
Chlorine (Cl)	12	274	0.012
Cobalt (Co)	2.21	50.5	0.12
Chromium (Cr)	1.3	30	2.7
Copper (Cu)	2.8	64	0.638
Fluorine (F)	0.12	2.7	<0.001
Iron (Fe)	18	411	0.05
Mercury (Hg)	0.04	0.9	0.002
Potassium (K)	34	777	0.48
Lithium (Li)	0.06	1.4	0.006
Magnesium (Mg)	13	297	0.006
Manganese (Mn)	1.33	30.4	<0.001
Molybdenum (Mo)	0.9	21	<0.081
Sodium (Na)	31	708	0.034
Nickel (Ni)	42.2	964	7.8
Phosphorus (P)	1.1	25	0.004
Lead (Pb)	3.5	80	0.056
Antimony (Sb)	0.44	10	0.002
Selenium (Se)	0.7	16	0.010
Silicon (Si)	17.5	400	0.004
Tin (Sn)	6.2	142	0.004
Strontium (Sr)	0.15	3.4	<0.001
Thorium (Th)	<0.001	0.02	<0.001
Uranium (U)	0.7	16	0.22
Vanadium (V)	160	3656	0.90
Zinc (Zn)	1.26	28.8	<0.001

[a]Based on a firing rate of 50 x 10^9 J/hr.

PB86-124906
PART 1 OF 2

AP-42
Fourth Edition
September 1985

COMPILATION OF AIR POLLUTANT EMISSION FACTORS

Volume I: Stationary Point And Area Sources

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office Of Air And Radiation
Office Of Air Quality Planning And Standards
Research Triangle Park, North Carolina 27711

September 1985

TABLE 1.3-1. UNCONTROLLED EMISSION FACTORS FOR FUEL OIL COMBUSTION

EMISSION FACTOR RATING: A

Boiler Type[a]	Particulate Matter[b]		Sulfur Dioxide[c]		Sulfur Trioxide		Carbon Monoxide[d]		Nitrogen Oxide[e]		Volatile Organics[f] Nonmethane		Volatile Organics[f] Methane	
	kg/10^3l	lb/10^3gal	kg/10^3l	lb/10^3gal	kg/10^3l	lb/10^3gal	kg/10^3l	lb/10^3gal	kg/10^3l	lb/10^3gal	kg/10^3l	lb/10^3gal	kg/10^3l	lb/10^3gal
Utility Boilers														
Residual Oil	[g]	[g]	19S	157S	0.34S[h]	2.9S[h]	0.6	5	8.0 (12.6)(5)[i]	67 (105)(42)[i]	0.09	0.76	0.03	0.28
Industrial Boilers														
Residual Oil	[g]	[g]	19S	157S	0.24S	2S	0.6	5	6.6[j]	55[j]	0.034	0.28	0.12	1.0
Distillate Oil	0.24	2	17S	142S	0.24S	2S	0.6	5	2.4	20	0.024	0.2	0.006	0.052
Commercial Boilers														
Residual Oil	[g]	[g]	19S	157S	0.24S	2S	0.6	5	6.6	55	0.14	1.13	0.057	0.475
Distillate Oil	0.24	2	17S	142S	0.24S	2S	0.6	5	2.4	20	0.04	0.34	0.026	0.216
Residential Furnaces														
Distillate Oil	0.3	2.5	17S	142S	0.24S	2S	0.6	5	2.2	18	0.085	0.713	0.214	1.78

[a] Boilers can be approximately classified according to their gross (higher) heat rate as shown below:
  Utility (power plant) boilers: >106 x 10^9 J/hr (>100 x 10^6 Btu/hr)
  Industrial boilers: 10.6 x 10^9 to 106 x 10^9 J/hr (10 x 10^6 to 100 x 10^6 Btu/hr)
  Commercial boilers: 0.5 x 10^9 to 10.6 x 10^9 J/hr (0.5 x 10^6 to 10 x 10^6 Btu/hr)
  Residential furnaces: <0.5 x 10^9 J/hr (<0.5 x 10^6 Btu/hr)

[b] References 3-7 and 24-25. Particulate matter is defined in this section as that material collected by EPA Method 5 (front half catch).

[c] References 1-5. S indicates that the weight % of sulfur in the oil should be multiplied by the value given.

[d] References 3-5 and 8-10. Carbon monoxide emissions may increase by factors of 10 to 100 if the unit is improperly operated or not well maintained.

[e] Expressed as NO_2. References 1-5, 8-11, 17 and 26. Test results indicate that at least 95% by weight of NO_x is NO for all boiler types except residential furnaces, where about 75% is NO.

[f] References 18-21. Volatile organic compound emissions are generally negligible unless boiler is improperly operated or not well maintained, in which case emissions may increase by several orders of magnitude.

[g] Particulate emission factors for residual oil combustion are, on average, a function of fuel oil grade and sulfur content:
  Grade 6 oil: 1.25(S) + 0.38 kg/10^3 liter [10(S) + 3 lb/10^3 gal] where S is the weight % of sulfur in the oil. This relationship is based on 81 individual tests and has a correlation coefficient of 0.65.
  Grade 5 oil: 1.25 kg/10^3 liter (10 lb/10^3 gal)
  Grade 4 oil: 0.88 kg/10^3 liter (7 lb/10^3 gal)

[h] Reference 25.

[i] Use 5 kg/10^3 liters (42 lb/10^3 gal) for tangentially fired boilers, 12.6 kg/10^3 liters (105 lb/10^3gal) for vertical fired boilers, and 8.0 kg/10^3 liters (67 lb/10^3 gal) for all others, at full load and normal (>15%) excess air. Several combustion modifications can be employed for NO_x reduction: (1) limited excess air can reduce NO_x emissions 5-20%, (2) staged combustion 20-40%, (3) using low NO_x burners 20-50%, and (4) ammonia injection can reduce NO_x emissions 40-70% but may increase emissions of ammonia. Combinations of these modifications have been employed for further reductions in certain boilers. See Reference 23 for a discussion of these and other NO_x reducing techniques and their operational and environmental impacts.

[j] Nitrogen oxides emissions from residual oil combustion in industrial and commercial boilers are strongly related to fuel nitrogen content, estimated more accurately by the empirical relationship:
  kg NO_2/10^3 liters = 2.75 + 50$(N)^2$ [lb NO_2/10^3gal = 22 + 400$(N)^2$] where N is the weight % of nitrogen in the oil. For residual oils having high (>0.5 weight %) nitrogen content, use 15 kg NO_2/10^3 liter (120 lb NO_2/10^3gal) as an emission factor.

1.8 BAGASSE COMBUSTION IN SUGAR MILLS

1.8.1 Process Description[1-4]

Bagasse is the matted cellulose fiber residue from sugar cane that has been processed in a sugar mill. Previously, bagasse was burned as means of solid waste disposal. However, as the cost of fuel oil, natural gas, and electricity have increased, the definition of bagasse has changed from refuse to a fuel.

The U.S. sugar cane industry is located in the tropical and subtropical regions of Florida, Texas, Louisiana, Hawaii, and Puerto Rico. Except for Hawaii, where sugar cane production takes place year round, sugar mills operate seasonally from 2 to 5 months per year.

Sugar cane is a large grass with a bamboo-like stalk that grows 8 to 15 feet tall. Only the stalk contains sufficient sucrose for processing into sugar. All other parts of the sugar cane (i.e., leaves, top growth and roots) are termed "trash." The objective of harvesting is to deliver the sugar cane to the mill with a minimum of trash or other extraneous material. The cane is normally burned in the field to remove a major portion of the trash and to control insects and rodents. See Section 11.1 for methods to estimate these emissions. The three most common methods of harvesting are hand cutting, machine cutting, and mechanical raking. The cane that is delivered to a particular sugar mill will vary in trash and dirt content depending on the harvesting method and weather conditions. Inside the mill, cane preparation for extraction usually involves washing the cane to remove trash and dirt, chopping, and then crushing. Juice is extracted in the milling portion of the plant by passing the chopped and crushed cane through a series of grooved rolls. The cane remaining after milling is bagasse.

Bagasse is a fuel of varying composition, consistency, and heating value. These characteristics depend on the climate, type of soil upon which the cane is grown, variety of cane, harvesting method, amount of cane washing, and the efficiency of the milling plant. In general, bagasse has a heating value between 1,700 and 2,200 kcal/kg (3,000 and 4,000 Btu/lb) on a wet, as-fired basis. Most bagasse has a moisture content between 45 and 55 percent by weight.

Fuel cells, horseshoe boilers, and spreader stoker boilers are used to burn bagasse. Horseshoe boilers and fuel cells differ in the shapes of their furnace area but in other respects are similar in design and operation. In these boilers (most common among older plants), bagasse is gravity-fed through chutes and piles onto a refractory hearth. Primary and overfire combustion air flows through ports in the furnace walls; burning begins on the surface pile. Many of these units have dumping hearths that permit ash removal while the unit is operating.

In more-recently built sugar mills, bagasse is burned in spreader stoker boilers.

Bagasse feed to these boilers enters the furnace through a fuel chute and is spread pneumatically or mechanically across the furnace, where part of the fuel burns while in suspension. Simultaneously, large pieces of fuel are spread in a thin, even bed on a stationary or moving grate. The flame over the grate radiates heat back to the fuel to aid combustion. The combustion area of the furnace is lined with heat exchange tubes (waterwalls).

1.8.2 Emissions and Controls[1-3]

The most significant pollutant emitted by bagasse-fired boilers is particulate matter, caused by the turbulent movement of combustion gases with respect to the burning bagasse and resultant ash. Emissions of SO_2 and NO_x are lower than conventional fossil fuels due to the characteristically low levels of sulfur and nitrogen associated with bagasse.

Auxiliary fuels (typically fuel oil or natural gas) may be used during startup of the boiler or when the moisture content of the bagasse is too high to support combustion. If fuel oil is used during these periods, SO_2 and NO_x emissions will increase. Soil characteristics such as particle size can affect the magnitude of PM emissions from the boiler. Mill operations can also influence the bagasse ash content by not properly washing and preparing the cane. Upsets in combustion conditions can cause increased emissions of carbon monoxide (CO) and unburned organics, typically measured as volatile organic compounds (VOCs) and total organic compounds (TOCs).

Mechanical collectors and wet scrubbers are commonly used to control particulate emissions from bagasse-fired boilers. Mechanical collectors may be installed in single cyclone, double cyclone, or multiple cyclone (i.e., multiclone) arrangements. The reported PM collection efficiency for mechanical collectors is 20 to 60 percent. Due to the abrasive nature of bagasse fly ash, mechanical collector performance may deteriorate over time due to erosion if the system is not well maintained.

The most widely used wet scrubbers for bagasse-fired boilers are impingement and venturi scrubbers. Impingement scrubbers normally operate at gas-side pressure drops of 5 to 15 inches of water; typical pressure drops for venturi scrubbers are over 15 inches of water. Impingement scrubbers are in greater use due to lower energy requirements and fewer operating and maintenance problems. Reported PM collection efficiencies for both scrubber types are 90 percent or greater.

Gaseous emissions (e.g., SO_2, NO_X, CO, and organics) may also be absorbed to a significant extent in a wet scrubber. Alkali compounds are sometimes utilized in the scrubber to prevent low pH conditions. If CO_2-generating compounds (such as sodium carbonate or calcium carbonate) are used, CO_2 emissions will increase.

Fabric filters and electrostatic precipitators have not been used to a significant extent for controlling PM from bagasse-fired boilers due to potential fire hazards (fabric filters) and relatively higher costs (both devices).

Emission factors and emission factor ratings for bagasse-fired boilers are shown in Table 1.8-1.

Fugitive dust may be generated by truck traffic and cane handling operations at the sugar mill. Particulate matter emissions from these sources may be estimated by consulting Section 11.2.

Table 1.8-1. EMISSION FACTORS FOR BAGASSE-FIRED BOILERS[a]

Pollutant	Emission factor		Rating
	lb/1,000 lb steam[b]	lb/ton bagasse[c]	
Particulate matter[d]			
Uncontrolled	3.9	15.6	C
Controlled			
Mechanical collector	2.1	8.4	D
Wet scrubber	0.4	1.6	B
PM-10[d]			
Controlled			
Wet scrubber	0.34	1.36	D
Carbon dioxide			
Uncontrolled[e]	390	1,560	A
Nitrogen oxides			
Uncontrolled	0.3	1.2	C
Polycyclic organic matter			
Uncontrolled[f]	2.5E-4	1.0E-3	D

[a]Source Classification Code is 10201101. Reference 5.
[b]Based on 2 pounds of steam produced per pound of wet bagasse fired.
[c]Based on wet, as-fired bagasse containing approximately 50 percent moisture, by weight.
[d]Includes only filterable PM (i.e., that particulate collected on or prior to the filter of an EPA Method 5 (or equivalent) sampling train.
[e]CO_2 emissions will increase following a wet scrubber in which CO_2-generating reagents (such as sodium carbonate or calcium carbonate) are used.
[f]Based on measurements collected downstream of PM control devices which may have provided some removal of POM condensed on PM.

REFERENCES FOR SECTION 1.8

1. *Potential Control Strategies for Bagasse Fired Boilers*, EPA Contract No. 68-02-0627, Engineering-Science, Inc., Arcadia, CA, May 1978.

2. *Background Document: Bagasse Combustion in Sugar Mills*, EPA-450/3-77-077, U. S. Environmental Protection Agency, Research Triangle Park, NC, January 1977.

3. *Nonfossil Fuel Fired Industrial Boilers - Background Information*, EPA-450/3-82-007, U. S. Environmental Protection Agency, Research Triangle Park, NC, March 1982.

4. *A Technology Assessment of Solar Energy Systems: Direct Combustion of Wood and Other Biomass in Industrial Boilers*, ANL/EES-TM--189, Angonne National Laboratory, Argonne, IL, December 1981.

5. *Emission Factor Documentation for AP-42 Section 1.8 - Bagasse Combustion in Sugar Mills*, Technical Support Division, Office of Air Quality Planning and Standards, U. S. Environmental Protection Agency, Research Triangle Park, NC, April 1993.

AIRS Facility Subsystem

Source Classification Codes and Emission Factor Listing

for Criteria Air Pollutants

EPA Document Number: EPA 450/4-90-003

Prepared by the

MONITORING & REPORTS BRANCH and the
NATIONAL AIR DATA BRANCH

Technical Support Division
Office of Air Quality Planning & Standards

U.S. ENVIRONMENTAL PROTECTION AGENCY

Research Triangle Park, North Carolina 27711

MARCH 1990

SCC	Process Name	PART Lbs/Unit	PM10 Lbs/Unit	SOx Lbs/Unit	NOx Lbs/Unit	VOC Lbs/Unit	CO Lbs/Unit	LEAD Lbs/Unit	UNITS	NOTES
***Process Gas - 1000-3999* (c)**										
									Burned	
1-02-007-10	- Cogeneration	---	---	950.0 S	---	2.8	---	---	Million Cubic Feet Burned	
1-02-007-99	- Other: Specify in Comments	XXX	XXX	950.0 S	XXX	XXX	XXX	XXX	Million Cubic Feet Burned	
***Coke - 1000-3999* (c)**										
1-02-008-02	- All Boiler Sizes	7.0 A	5.5 A	39.0 S	14.0	0.07	0.6	---	Tons Burned	
1-02-008-04	- Cogeneration	7.0 A	5.5 A	39.0 S	14.0	0.07	0.6	---	Tons Burned	
Wood/Bark Waste - 1000-3999										
1-02-009-01	- Bark-Fired Boiler (> 50,000 LB Steam)	47.0	16.8	0.15	2.8	1.4	4.0	---	Tons Burned	
1-02-009-02	- Wood/Bark-Fired Boiler (> 50,000 LB STM)	7.2	6.48	0.15	2.8	1.4	4.0	---	Tons Burned	
1-02-009-03	- Wood-Fired Boiler (> 50,000 LB STM)	8.8	7.9	0.15	2.8	1.4	4.0	---	Tons Burned	
1-02-009-04	- Bark-Fired Boiler (< 50,000 LB Steam)	47.0	16.8	0.15	0.68	1.4	4.0	---	Tons Burned	
1-02-009-05	- Wood/Bark-Fired Boiler (< 50,000 LB STM)	7.2	6.48	0.15	0.68	1.4	4.0	---	Tons Burned	
1-02-009-06	- Wood-Fired Boiler (< 50,000 LB Steam)	8.8	7.9	0.15	0.68	1.4	4.0	---	Tons Burned	
1-02-009-07	- Wood Cogeneration	7.2	6.48	0.15	2.8	1.4	4.0	---	Tons Burned	
Liquified Petroleum Gas (LPG) - 1000-3999										
1-02-010-01	- Butane	0.28	0.28	86.5 S,(c)	13.2	0.26	3.3	---	1000 Gallons Burned	
1-02-010-02	- Propane	0.26	0.26	86.5 S,(c)	12.4	0.25	3.1	---	1000 Gallons Burned	
Bagasse - 1000-3999										
1-02-011-01	- All Boiler Sizes	16.0	5.6	0.0	1.2	2.0	2.0	---	Tons Burned	
Solid Waste - 1000-3999										
1-02-012-01	- Specify Waste	---	---	1.6	5.9	2.0	---	---	Tons Burned	

ATTACHMENT H

Calculation of Emission Offsets for Boilers No. 5 and 6
and PSD Baseline Emissions

Attachment H
Calculation of Emission Offsets for
Boilers No. 5 and 6 and PSD Baseline Emissions

As in Attachment F, Table H-1 provides more details on the emission factors and related activity factors for maximum annual and hourly emissions from existing boilers No. 5 and 6. As discussed previously, the proposed project would include placing these boilers on standby; the emissions presented here would therefore be offsets to the proposed project emissions.

Table H-2 provides more details on the baseline emissions in Table 3-3. These emissions formed the basis of the PSD source applicability for each pollutant.

TABLE H-1. POTENTIAL EMISSIONS FOR BOILERS No. 5 AND 6 (lb/hr)

Annual Emissions

	Activity Factor MMBtu/yr	Activity Factor TPY Wet Feed	Emission Factor Lb/MMBtu	PM Emission Ton/yr	Emission Factor Lb/ton	SO2 Emission Ton/yr	Emission Factor Lb/ton	NOx Emission Ton/yr	Emission Factor Lb/MMBtu	CO Emission Ton/yr	Emission Factor Lb/ton	VOC Emission Ton/yr
Boiler No.5	384,041	48,005	0.30	57.6	0.5	12.0	1.2	28.8	9	1,728	2	48.0
Boiler No.6	465,854	58,232	0.30	69.9	0.5	38.7	1.2	346.9	9	2,096	2	49.5
Total TPY	849,895	106,237		127		51		376		3,825		98

Hourly Emissions

	Activity Factor MMBtu/hr	Activity Factor TPH Wet Feed	Emission Factor Lb/MMBtu	PM Emission Lb/hr	Emission Factor Lb/ton	SO2 Emission Lb/hr	Emission Factor Lb/ton	NOx Emission Lb/hr	Emission Factor Lb/MMBtu	CO Emission Lb/hr	Emission Factor Lb/ton	VOC Emission Lb/hr
Boiler No.5	132	16.5	0.30	33.0	0.5	8.3	1.2	19.8	9	1,189	2	33.0
Boiler No.6	133	16.6	0.30	39.9	0.5	8.3	1.2	19.9	9	1,197	2	33.2
Total Lb/hr	265	33		73		17		40		2,385		66

TABLE H–2. CLEWISTON MILL PSD BASELINE ANNUAL EMISSIONS (TON/YEAR)

FUEL OIL COMBUSTION

	Avg. MMBtu/hr	Day/yr	Mgal/yr	PM	SO2	NOx	CO	VOC
Boiler No.1	3.49	160	89.23	0.67	17.51	2.45	0.22	0.01
Boiler No.2	3.38	160	86.51	0.65	16.98	2.38	0.22	0.01
Boiler No.3	1.91	160	48.97	0.37	9.61	1.35	0.12	0.01
Boiler No.4	1.93	160	49.33	0.37	5.81	1.36	0.12	0.01
Total TPY			274	2.1	49.9	7.5	0.7	0.0

	Be	F	Pb	Hg
Boiler No.1	2.81E–05	4.20E–05	1.87E–04	2.14E–05
Boiler No.2	2.73E–05	4.07E–05	1.82E–04	2.08E–05
Boiler No.3	1.54E–05	2.30E–05	1.03E–04	1.18E–05
Boiler No.4	1.55E–05	2.32E–05	1.04E–04	1.18E–05
Total TPY	8.63E–05	1.29E–04	5.76E–04	6.58E–05

BAGASSE COMBUSTION

	Avg. MMBtu/hr	Day/yr	Wet Feed TPY	PM	SO2	NOx	CO	VOC
Boiler No.1	415	160	199,054	199.1	49.8	119.4	7,166	199.1
Boiler No.2	402	160	192,982	193.0	48.2	115.8	6,947	193.0
Boiler No.3	220	160	105,569	126.7	26.4	63.3	3,800	105.6
Boiler No.4	603	160	289,384	173.6	192.2	346.9	10,418	246.0
Boiler No.5	100	160	48,005	57.6	12.0	28.8	1,728	48.0
Boiler No.6	121	160	58,232	69.9	14.6	34.9	2,096	58.2
Total TPY			893,225	820	343	709	32,156	850

TOTAL COMBUSTION EMISSIONS

	Avg. MMBtu/hr	PM	SO2	NOx	CO	VOC
Boiler No.1	418	200	67	122	7,166	199
Boiler No.2	405	194	65	118	6,948	193
Boiler No.3	222	127	36	65	3,801	106
Boiler No.4	605	174	198	348	10,418	246
Boiler No.5	100	58	12	29	1728	48
Boiler No.6	121	70	15	35	2096	58
Total TPY		822	393	717	32,157	850

ATTACHMENT I

Florida Sugar Cane League PM-10 and SO_2 Monitoring Data

AUG 2 4 1993

Florida Sugar Cane League, Inc.
POST OFFICE DRAWER 1208
CLEWISTON, FLORIDA 33440
(813) 983-9151

AUG 1993
CLEWISTON
SUGAR HOUSE

August 23, 1993

MEMORANDUM

TO: All Sugarcane Growers
Agricultural Research Committee
Environmental Quality Committee
Environmental Technical Subcommittee-Air

FROM: John Dunckelman

Attached for your information is a summary report from Ken Roberts and Mike Bellamy on the operation of the League's air monitoring network during the first half of 1993.

The data from the League's particulate monitoring network are an important and substantial proof of acceptable air quality in the EAA throughout the year including the harvest season.

cmw
Attachment

FLORIDA SUGAR CANE LEAGUE
PARTICULATE AIR MONITORING REPORT

1st & 2nd Quarters
1993
****

EXECUTIVE SUMMARY

Particulates are solid or liquid particles in the air that range in size from .005 to 250 microns in diameter (1 micron = 0.00004 inches); as a reference a human hair is about 20 microns in diameter. The Environmental Protection Agency (EPA) has determined that those particles less than 10 microns in diameter (PM10) are most hazardous to human health and have established air quality limits for particles in that size range. The average annual levels for these respirable particulates cannot be higer than 50 micrograms per cubic meter and the highest daily levels cannot be higher than 150 micrograms per cubic meter (One microgram is equal to 0.000000000099 ounces).

The Florida Sugar Cane League operates eleven PM10 particulate monitors along the southern and eastern shore of Lake Okeechobee in the area known as the Everglades Agricultural Area (EAA).

The highest daily levels measured during the 1st and 2nd quarters were 82 and 126 micrograms per cubic meter, respectively. The average levels measured for all monitors during the 1st and 2nd quarters were 22 and 23 micrograms per cubic meter, respectively. Both of these levels are comparable to urban Palm Beach County and state levels.
****

TABLE OF CONTENTS

INTRODUCTION

Particulates are dispersed, airborne solid or liquid particles which range in size from 0.005 to 250 microns (1 micron = 0.00004 inches). Particles of this size range may remain in the air from a few seconds to several months. Gravitational settling on trees, cars, buildings, and other objects are the main way larger particles are removed from the air. Rain also removes particles from the air, but is ineffective when particle sizes are less than 2 microns.

SOURCES

Particulates are emitted from both natural and manmade sources. Bacteria, spores, salt, pollen, volcanic ash and soil are all particulate matter provided by nature. Manmade sources of particulate matter include traditional sources such as motor vehicles, boilers and commercial combustion sources, and materials handling facilities. Nontraditional sources include agricultural, construction and mining activities; reentrained road dust from unpaved and paved roads; controlled forest burning and wildfires.

The predominant sources of particulate matter in the EAA are road dust from unpaved roads, field tilling, preharvest burning of sugar cane, cane harvesting operations, and emissions from sugar mill boilers.

EFFECTS

A large fraction of the pollutants in the air are particulates and can often be the most hazardous to human health and welfare, especially in urban areas. Human health effects are related to the chemical and physical state of the particles. Injuries to the respiratory system are the primary health effect. Particles less than 10 microns can penetrate the bronchial passages and those with diameters of 1 micron or less can penetrate deeper into the lung. Particulates can also cause burning eyes, soiling, and decreased visibility.

STANDARDS

The PM10 National Ambient Air Quality Standards (NAAQS) were established in 1987 and replaced EPA's earlier TSP standard. PM10 focuses on those particulates with aerometric diameters less than 10 microns because of their ability to reach the lower regions of the respiratory tract. PM10 appears to represent essentially all of the particulate emissions from transportation sources and most of the emissions in other source categories.

The federal and state standard for PM10 is 50 micrograms per cubic meter for an annual average and 150 micrograms per cubic meter in any 24 hour period. Neither of the standards can be exceeded more than once per year.

SAMPLING NETWORK

The Florida Sugar Cane League (FSCL), as part of its environmental program, operates an extensive particulate monitoring network in an area along the south and east shore of Lake Okeechobee. The network consists of 11 PM10 monitors that measure atmospheric dust less than 10 microns in diameter.

Particulates are measured using an instrument known as a High Volume Sampler or HIVOL that is equipped with a sampling apparatus that separates or fractionates the larger and smaller particles. The HIVOL uses a heavy duty vacuum cleaner motor to draw a measured amount of air through a pre-weighed glass fiber filter for 24 hours. Prior to passing through the filter the particles are accelerated through a set of nozzles. The larger particles, because they have more inertia, impact on a greased plate. The smaller particles, having less inertia stay in the air stream and are trapped on the filter. After sampling, the filter is reweighed with the difference being attributed to PM10 particles. A schematic of a typical PM10 HIVOL sampler is shown in Figure 1.

The samplers are operated from midnight to midnight every sixth day according to a schedule established by EPA. If a monitor operates properly a total of 60 samples are obtained each year from each sampler. A technician visits the site every six days to replace the used PM10 filter with a new one. The flow rate through each unit is checked before and after each run to ensure that the instrument is operating within established guidelines. The technician must also calibrate the unit annually and check the calibration quarterly.

Monitor Locations

Specific locations of the current monitors are as follows:

Site No.	Location
3	USDA Sugar Cane Field Sta. Canal Point, Fl.
4	Pahokee Water Treatment Plt. Pahokee, Fl.

5	Glades Mercantile Belle Glade, Fl.
7	FSCL Office Clewiston, Fl.
11	Sunshine Sod Co. South Bay, Fl.
13	Belle Glade Golf Course Belle Glade, Fl.
14	Boyle Residence, SR 827 Belle Glade, Fl.
15	Badcock Farms at 9 Mile Bend Belle Glade, Fl.
19	Delta Ranch, S. of Clewiston Clewiston, Fl.
20	Pump Station, 1.8 mi. S of Hatton Hwy. Canal Point, Fl.
22	East Shore Drainage District Belle Glade, Fl.

DATA SUMMARY

As shown in Figure 2, the average readings from all stations for the first and second quarters of 1993 were 22 and 23 micrograms per cubic meter, respectively. These are considerably less than the maximum allowable average of 50 micrograms per cubic meter, and are comparable to previous years.

Figure 3 indicates average readings for individual monitoring stations. The highest average was at Station #20 during the first quarter and station #7 during the second quarter.

Figure 4 indicates the highest daily reading for the individual monitoring stations. Site #20 had the highest reading of 82 micrograms per cubic meter on March 8 during the 1st quarter and Site #3 showed the highest reading of 126 micrograms per cubic meter on May 25 during the 2nd quarter. Both readings were below the highest allowable reading of 150 micrograms per cubic meter.

CONCLUSIONS

The overall particulate air quality in the EAA is quite good. Even though there was intense agricultural activity in the

EAA due to the harvesting and processing of sugarcane during the 1st quarter, particulate levels continued to be well below both state and federal air quality standards. Readings obtained during both quarters were comparable to readings during previous years.

Figures

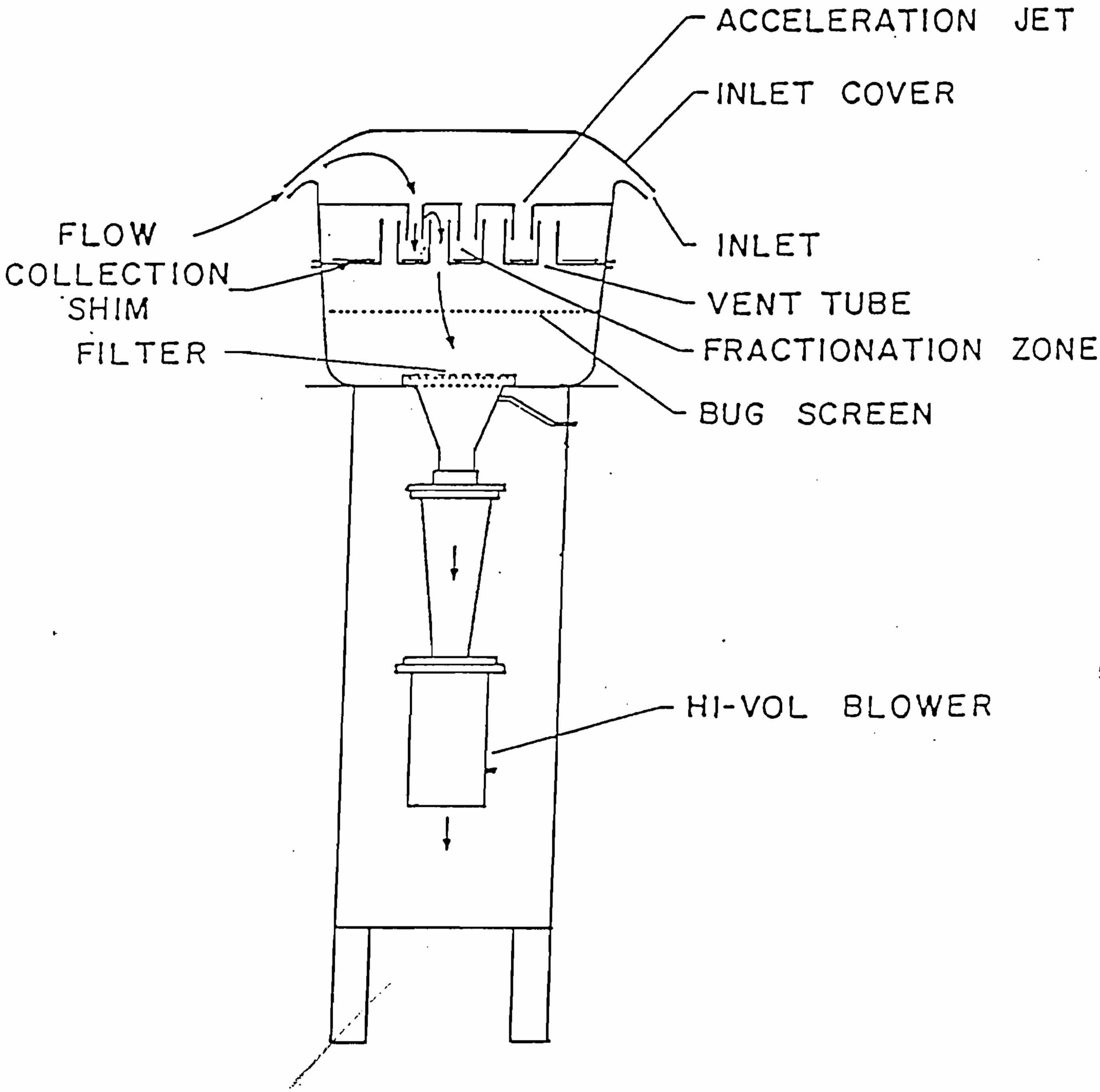
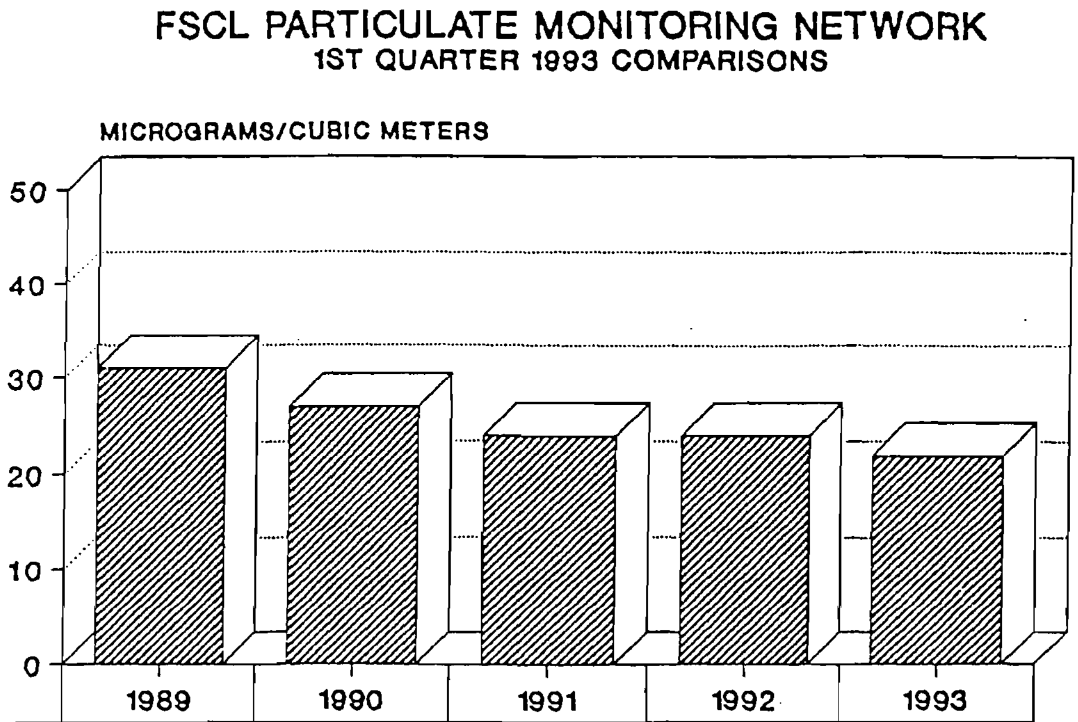


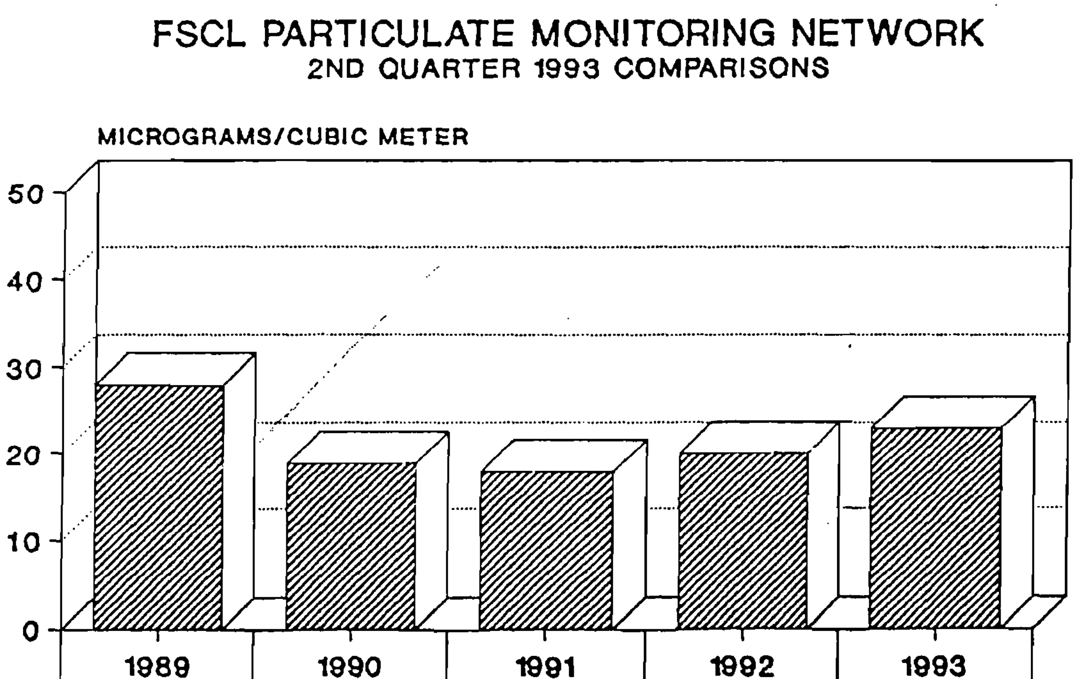
Figure 1. Schematic of HIVOL Sampler



1989	1990	1991	1992	1993
31	27	24	24	22

AVERAGE - ALL STATIONS

Highest Allowable Reading
50 micrograms/cubic meter



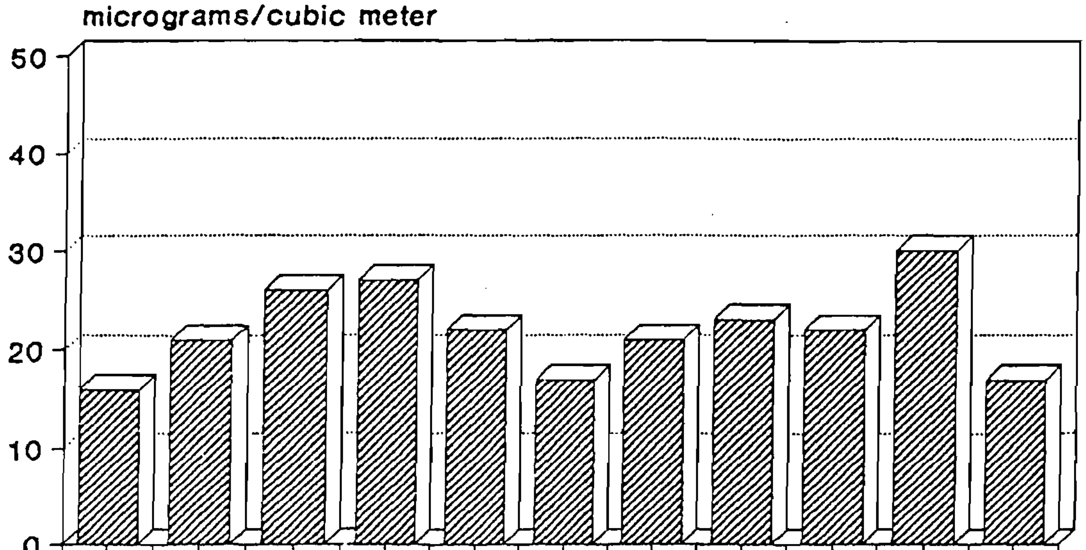
1989	1990	1991	1992	1993
28	19	18	20	23

AVERAGE - ALL STATIONS

Highest Allowable Reading
50 micrograms/cubic meter

Figure 2. Average - All Stations

FSCL PARTICULATE MONITORING NETWORK
1ST QUARTER 1993

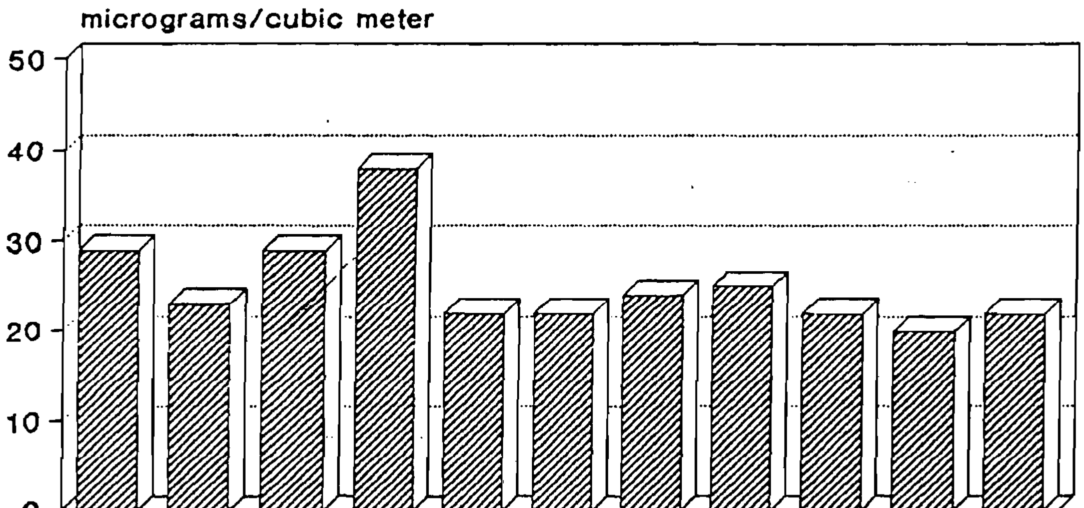


#3	#4	#5	#7	#11	#13	#14	#15	#19	#20	#22
16	21	26	27	22	17	21	23	22	30	17

STATION AVERAGES

Highest Allowable Reading
50 micrograms/cubic meter

FSCL PARTICULATE MONITORING NETWORK
2ND QUARTER 1993



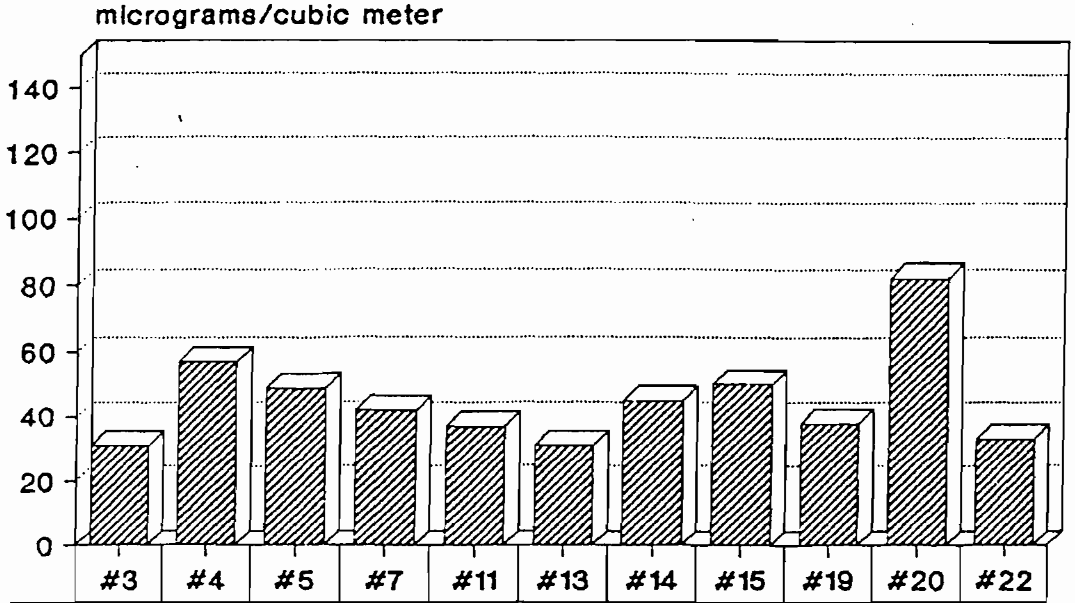
#3	#4	#5	#7	#11	#13	#14	#15	#19	#20	#22
29	23	29	38	22	22	24	25	22	20	22

STATION AVERAGES

Highest Allowable Reading
50 micrograms/cubic meter

Figure 3. Station Averages

FSCL PARTICULATE MONITORING NETWORK
1ST QUARTER 1993

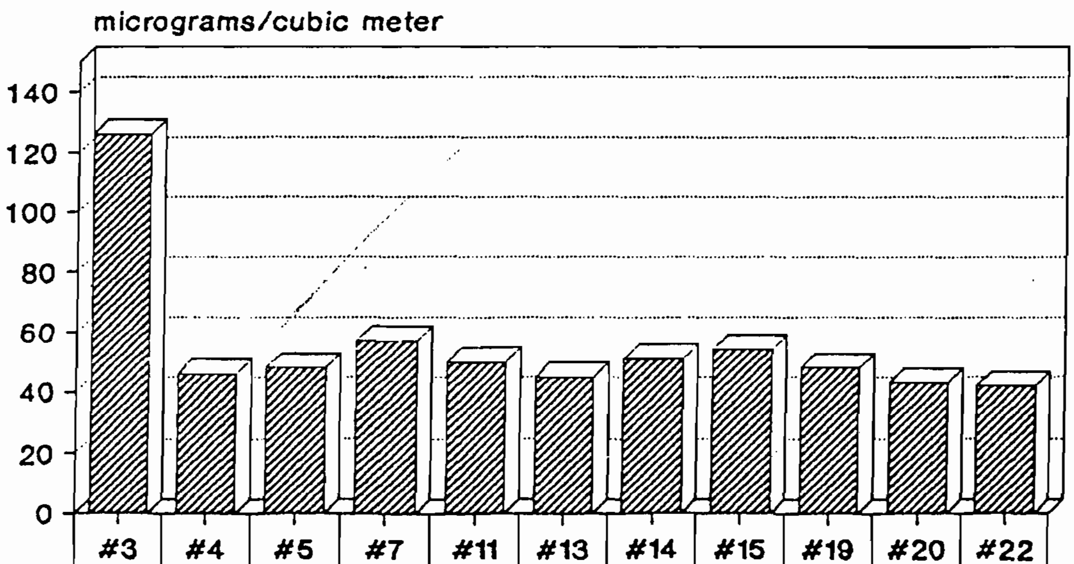


#3	#4	#5	#7	#11	#13	#14	#15	#19	#20	#22
31	57	49	42	37	31	45	50	38	82	33

HIGHEST DAILY READING

Highest Allowable Reading
150 micrograms/cubic meter

FSCL PARTICULATE MONITORING NETWORK
2ND QTR 1993



#3	#4	#5	#7	#11	#13	#14	#15	#19	#20	#22
126	46	48	57	50	45	51	54	48	43	42

HIGHEST DAILY READING

Highest Allowable Reading
150 micrograms/cubic meter

Figure 4. Highest Daily Readings

FLORIDA SUGAR CANE LEAGUE
AMBIENT AIR MONITORING REPORT

PARTICULATE
SULFUR DIOXIDE
1989, 1990, 1991

Prepared for:

FLORIDA SUGAR CANE LEAGUE
115 South Lopez St.
Clewiston, Florida 33440

Prepared by:

SOUTHERN ENVIRONMENTAL
SCIENCES, INC.
1204 North Wheeler St.
Plant City, Florida 33566
(813) 752-5014
Kenneth Roberts, Project Leader

EXECUTIVE SUMMARY

The Florida Sugar Cane League operates eleven ambient particulate (PM10) samplers and one sulfur dioxide (SO_2) monitor in the area known as the Everglades Agricultural Area of south Florida.

The ambient air standards for PM10 are 150 micrograms per cubic meter (ug/m^3), maximum 24 hour average and 50 ug/m^3, annual arithmetic mean. The ambient SO_2 standards are 0.02 parts per million (PPM), annual arithmetic mean; 0.10 PPM, maximum 24 hour average; and 0.5 PPM, maximum 3 hour average.

The annual arithmetic means for the PM10 network for the years 1989, 1990, and 1991 were 26, 23, and 21 ug/m^3, respectively, well below the standard. The maximum 24 hour average for any one site was also well below the applicable standard. Trend analyses indicate that overall PM10 concentrations have decreased slightly over the last three years and that levels in the EAA are comparable to urban Palm Beach County and state levels.

The annual average SO_2 concentrations for the years 1989, 1990 and 1991, were 0.003, 0.002 and 0.001 PPM, respectively. This was well below the standard. Maximum 24 hour and 3 hour concentrations were also well below the respective standards.

FLORIDA SUGAR CANE LEAGUE
AMBIENT AIR MONITORING REPORT
1989 THROUGH 1991

TABLE OF CONTENTS

1.0 INTRODUCTION

The Florida Sugar Cane League (FSCL) is a trade association of the south Florida sugar industry. As part of its environmental program the association operates an extensive ambient air monitoring network in an area along the south and east shore of Lake Okeechobee in what is commonly referred to as the Everglades Agricultural Area (EAA). The network consists of 11 monitors that measure atmospheric respirable dust (PM10) and one continuous sulfur dioxide (SO_2) monitor. Data analyzed in this report includes the years 1989 through 1991. All monitoring information was provided by FSCL Chief Environmental Technician, Mike Bellamy.

2.0 MONITORING OBJECTIVES

The predominant land use in the EAA is for cultivation of sugar cane. In addition, seven sugar mills are located in the area to process the raw cane into crystalline sugar. The industrial boilers at the mills are issued air pollution operating permits by the Florida Department of Environmental Regulation (FDER). Current PSD (Prevention of Significant Deterioration) regulations require new major sources and modifications to major sources to undergo extensive preconstruction regulatory review prior to permit issuance. In the case of sugar mill boilers, that review would require up to one year of pre-application ambient air monitoring for particulates and sulfur dioxide to establish baseline concentrations. The primary purpose of the monitoring network is to establish those baseline levels on a continuing basis to eliminate pre-application delays should major modifications or construction be needed at the mills.

A secondary, although no less important, purpose of the monitoring program is to assess the overall impact from the agricultural activity in the EAA on the ambient air quality.

3.0 HISTORY

A short term ambient air quality study conducted by the Palm Beach County Health Department from June, 1967 through May, 1968 indicated that the level of particulate air pollution in the western portion of Palm Beach County was higher than any other area of the county. A section of the study directed attention to air emissions from pre-harvest sugar cane burning as a possible cause. In response to the report the FSCL developed and implemented a massive ambient air study in the EAA to attempt to establish if field burning had a deleterious impact on ambient air particulate levels. The results of that study were inconclusive.

Since the initial study the FSCL has continued to maintain a particulate sampling network in the EAA. With the establishment of prevention of significant deterioration (PSD) pre-construction review requirements, several of the monitoring stations were evaluated by FDER and modified by FSCL to fulfill PSD siting requirements. An additional continuous SO_2 monitoring system was installed in a central location to establish baseline concentrations of that pollutant.

On July 1, 1987 the U.S. Environmental Protection Agency (EPA) promulgated new regulations for particulate matter of 10 micrometers (um) or less in diameter (PM10). The federal regulations established new ambient air quality standards for PM10 that superseded the old total suspended particulate (TSP) standards. In January 1989 the entire particulate network was converted from TSP to PM10 monitoring.

4.0 NETWORK DESCRIPTION

4.1 General Location and Topography

The EAA is located in the south central part of the state generally adjacent to the eastern and southern shore of Lake Okeechobee. The region is characterized by relatively slight variation in elevation. The predominant land use is for agricultural pursuits and water conservation. Small population centers in the area include Belle Glade, Canal Point, Pahokee, South Bay and Clewiston. The Palm Beaches lie some forty miles to the east.

4.2 Meteorology

The EAA experiences tropical and semi-tropical climatic conditions. Prevailing winds are from the east during the summer. Strong north and northwesterly winds accompany passing cold fronts during the late fall and winter months.

4.3 Monitor Locations

A map indicating monitor locations is included as Figure 1.

Specific locations of the current monitors are as follows:

Site No.	Location	SAROAD No.	UTM Coordinates
3	USDA Sugar Cane Field Sta. Canal Point, Fl. T41S, R37E, SEC.34	10-3420-015	17-537.1 km E 2971.9 km N
4	Pahokee Water Treatment Plt. Pahokee, Fl. T42S, R37E, SEC. 31	10-3340-002	17-533.2 km E 2966.7 km N
5	Glades Mercantile Belle Glade, Fl. T43S, R37E, SEC. 31	10-0240-006	17-533.1 km E 2951.1 km N
7	FSCL Office Clewiston, Fl. T43S, R34E, SEC. 16	10-0660-002	17-505.9 km E 2958.9 km N
11	Sunshine Sod Co. South Bay, Fl. T45S, R36E, SEC. 34	10-3420-009	17-526.4 km E 2934.2 km N
13	Belle Glade Golf Course Belle Glade, Fl. T43S, R36E, SEC. 26	10-0240-004	17-528.9 km E 2953.1 km N
14	Boyle Residence, SR 827 Belle Glade, Fl. T45S, R38E, SEC. 10	10-3420-010	17-547.0 km E 2939.3 km N
15	Badcock Farms at 9 mile bend Belle Glade, Fl. T43S, R38E, SEC. 4	10-3420-001	17-549.9 km E 2949.8 km N
19	Delta Ranch, S. of Clewiston Clewiston, Fl. T44S, R34E,SEC. 15	10-1720-002	17-507.9 km E 2947.8 km N
20	Pump Station, 1.8 mi. S of Hatton Hwy. Canal Point, Fl. T42S, R38E, SEC. 18	10-3420-016	17-547.1 km E 2962.3 km N
22	East Shore Drainage District Belle Glade, Fl. T43S, R37E, SEC. 7	10-3420-014	17-531.6 km E 2858.4 km N
SO_2	Florida Celery Exchange Belle Glade, Fl.	10-3420-017	17-535.9 km E 2947.4 km N

5.0 NETWORK OPERATIONS

5.1 PM10 Samplers

These samplers are operated from midnight to midnight every sixth day. EPA distributes a master schedule of run days to which all official sampling networks, including the FSCL, must adhere. By requiring monitors throughout the country to run on the same day, a statistically valid data base is generated. If a monitor operates properly a total of 60 samples are obtained each year from each sampler.

A technician visits each site at least once every six days to replace the used PM10 filter with a new one. The flow rate through each unit is checked before and after each run to ensure that the instrument is operating within established guidelines. The technician must also calibrate the unit annually and check the calibration quarterly. The units are cleaned routinely and preventative maintenance is performed on all sampler components on a routine basis.

5.2 Sulfur Dioxide Monitor

The sulfur dioxide monitor is an electronic instrument that continually monitors SO_2 concentrations. The unit is sheltered in an air conditioned trailer to protect its components from moisture and high temperature. The site is visited frequently to check the operation of the instrument and the condition of the shelter. Calibrations are performed on a quarterly basis and checked daily by an automated calibration system. The monitor is connected via telephone lines to a computer where current monitoring data can be observed and past data can be downloaded.

6.0 AMBIENT AIR QUALITY STANDARDS

The ambient air quality standards for PM10 particulate matter for the state of Florida are 50 micrograms per cubic meter (ug/m^3), annual arithmetic mean, and 150 ug/m^3, maximum 24 hour average, not to be exceeded more than once per year.

The ambient air quality standard for sulfur dioxide for the state of Florida are 60 ug/m^3 or 0.02 parts per million (ppm), annual arithmetic mean; 260 ug/m^3 or 0.10 ppm, 24 - hour average, not to be exceeded more than once per year; and 1300 ug/m^3 or 0.5 ppm, 3-hour average, not to be exceeded more than once per year.

7.0 MONITORING RESULTS AND TRENDS

7.1 PM10

PM10 is a term used to describe airborne particles with a size range of 10 micrometers or less. Anthropogenic (manmade) sources of particulate matter include traditional sources such as motor vehicles, boilers and commercial combustion sources, and materials handling facilities. Nontraditional sources include agricultural, construction and mining activities; reentrained road dust from unpaved and paved roads; controlled burning, wildfires, and general fugitive emissions.

The predominant sources of particulate matter in the EAA are road dust from unpaved roads, field tilling, preharvest burning of sugar cane, cane harvesting operations. and emissions from sugar mill boilers.

As shown in Figure 2, the network annual arithmetic mean concentrations of PM10 for the years 1989 through 1991 were 26, 23, and 21 ug/m^3, respectively. These are considerably less than the allowable concentration of 50 ug/m^3, and in fact appear to show a downward trend.

To assess the possible impact of the sugar cane harvesting and milling operations on PM10 levels, the network averages during the sugar cane harvesting season of October through March were compared to the non-harvesting season of April through September. As seen in Figure 3, PM10 levels appear to be slightly higher during the harvesting season. This minor elevation may be due to: 1) the increased agricultural activity and resultant increase in unpaved road traffic in close proximity to the monitoring stations; 2) a decrease in rainfall and higher wind speeds associated with typical winter weather patterns of south Florida; and 3) to a lessor extent by preharvest burning of cane fields. Monitors operated by the Palm Beach County Health Department, in predominately urban areas. have exhibited a similar increase in the past during the winter months perhaps due to the same weather patterns.

To determine how particulate air quality in the EAA compared to other areas of Florida, the FSCL annual network averages were compared to those of coastal Palm Beach County[1] and the statewide average[2]. The resultant data, presented in Figure 4, shows that particulate air quality in the EAA is comparable to both the statewide and the coastal Palm Beach County averages.

Figures 5 and 6 indicate annual arithmetic averages for individual monitoring stations. The highest average was at Station #5 located in Belle Glade. Since this station is more affected by motor vehicles and reentrained road dust from paved roads it is actually more representative of urban air quality than from agricultural activities.

Figures 7 and 8 indicate the maximum 24 hour concentration for individual monitoring stations. Site #20 showed the highest concentration of 114 ug/m^3. This elevated reading is indicative of either harvesting of an adjacent cane field or temporary location of a sugar cane transfer station in close proximity to the monitor.

7.2 SULFUR DIOXIDE

Anthropogenic emissions of sulfur dioxide account for about 33 percent of the total atmospheric emissions, with the major source being combustion of sulfur containing fuel.

Ambient levels of SO_2 continue to be extremely low in the EAA. Annual average concentrations for the years 1989 through 1991 were 0.003, 0.002, and 0.001 ppm, respectively, with an allowable concentration of 0.030 ppm (Figure 9).

Maximum 24 hour concentrations for 1989 through 1990 were 0.006, 0.006, 0.003 ppm, respectively with an allowable concentration of 0.140 ppm (Figure 10). The maximum 3 hour concentrations were 0.005, 0.005, and 0.004 ppm, respectively, with an allowable of 0.500 ppm (Figure 11).

8.0 QUALITY ASSURANCE

It is the policy of the Florida Sugar Cane League that there shall be adequate quality control and quality assurance functions to insure that all ambient air data collected for PSD permitting purposes are of acceptable completeness, comparability, representativeness, precision and accuracy to support the permitting actions based upon them.

To implement its QA policy the FSCL currently follows quality assurance guidelines developed and updated by a statewide quality assurance task force of monitoring personnel from private industry, local air pollution control agencies, and the FDER. Due to its early experience with PM10 monitors the FSCL was instrumental in helping formulate statewide operating and QA procedures. In spite of its active participation the League has since been excluded from this organization. New QA procedures emanating from FDER continue to be evaluated, however. If a new procedure will substantially improve the quality of data submitted while not requiring excessive manpower and/or duplication of effort it will be incorporated into the FSCL monitoring system.

9.0 CONCLUSIONS

Particulate and sulfur dioxide levels continue to be well below both state and federal air quality standards. The annual average PM10 concentration over the last three years was 46.7 percent of the allowable standard. Levels during the six month sugar cane harvesting and processing season are slightly higher. Increased agricultural activity associated with cane harvesting and transport, and seasonal weather patterns is thought the most likely cause. Sulfur dioxide levels in the EAA are negligible with the annual average levels over the last three years being only 6.7 percent of the standard.

Figures

Best Available Copy

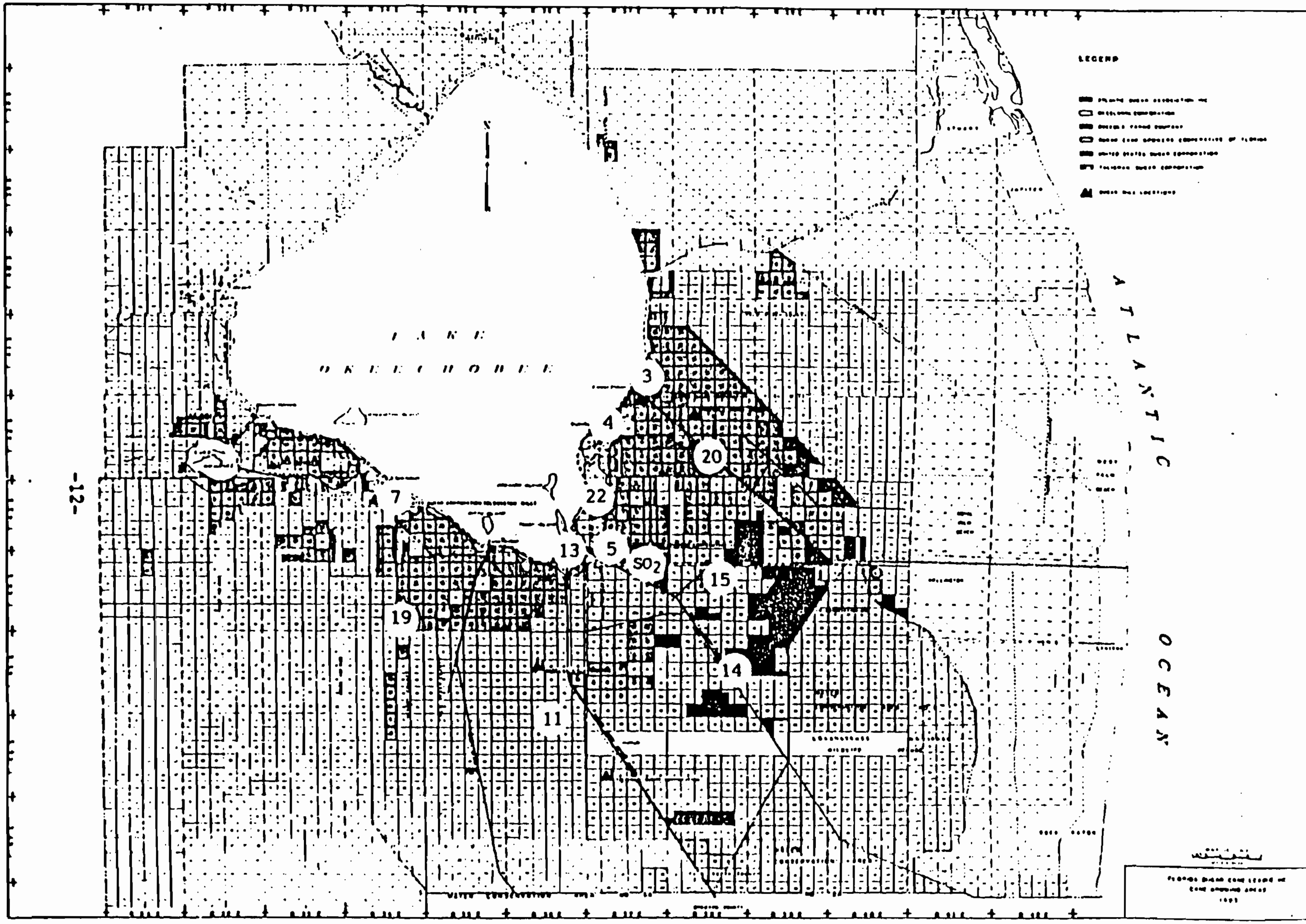


Figure 1: EAA Map and Sampler Locations

PARTICULATE MATTER (PM10)
FSCL NETWORK

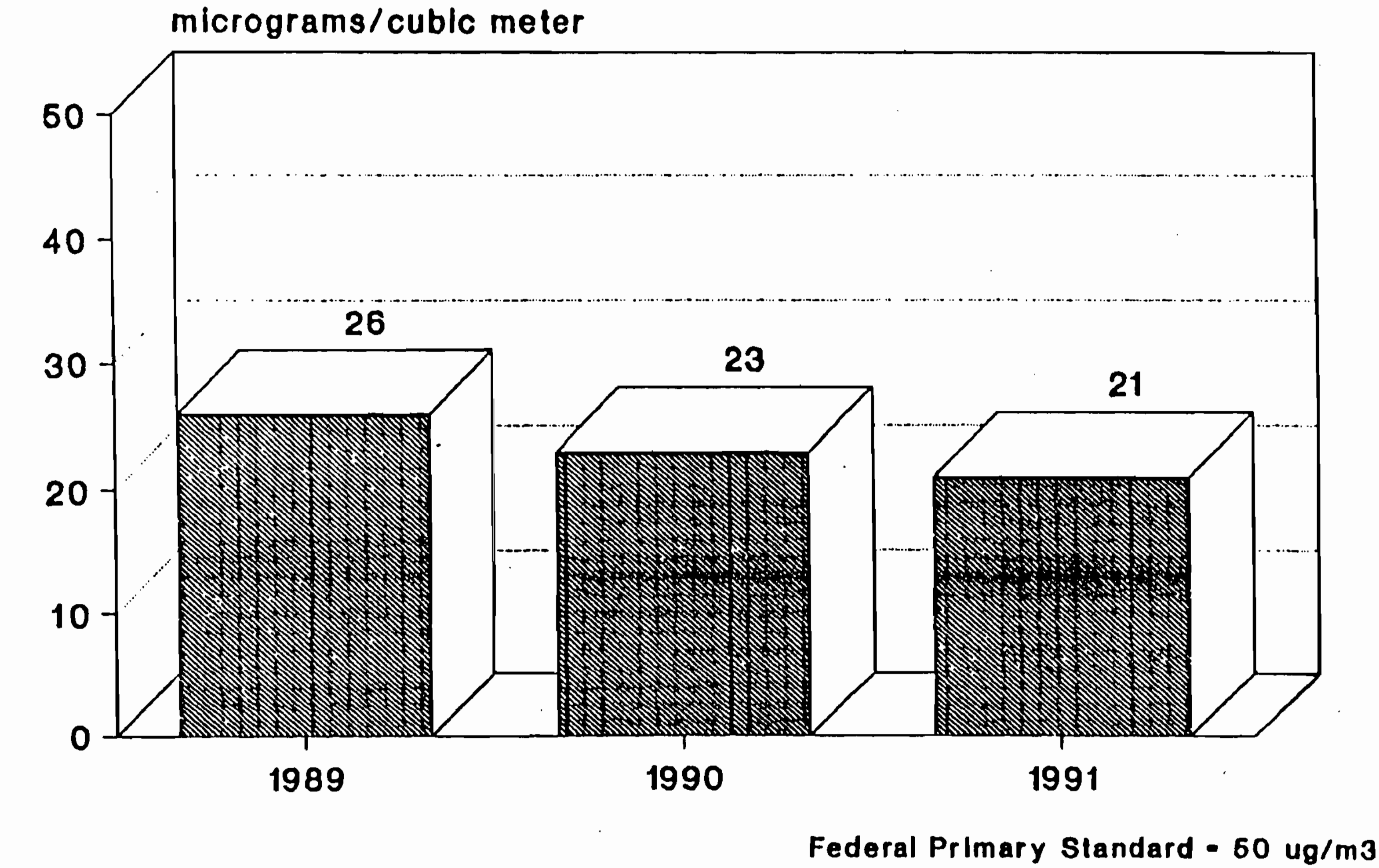
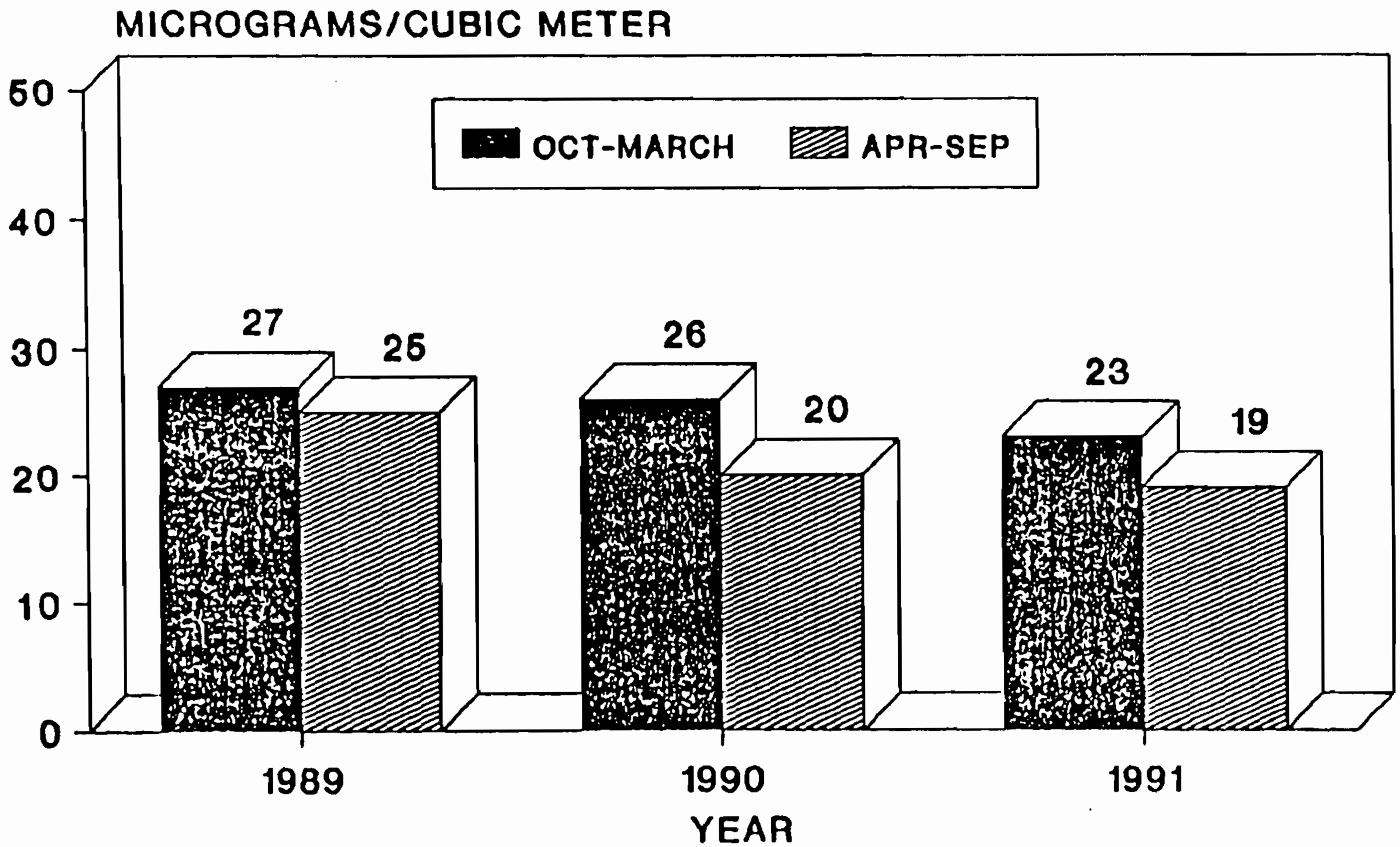


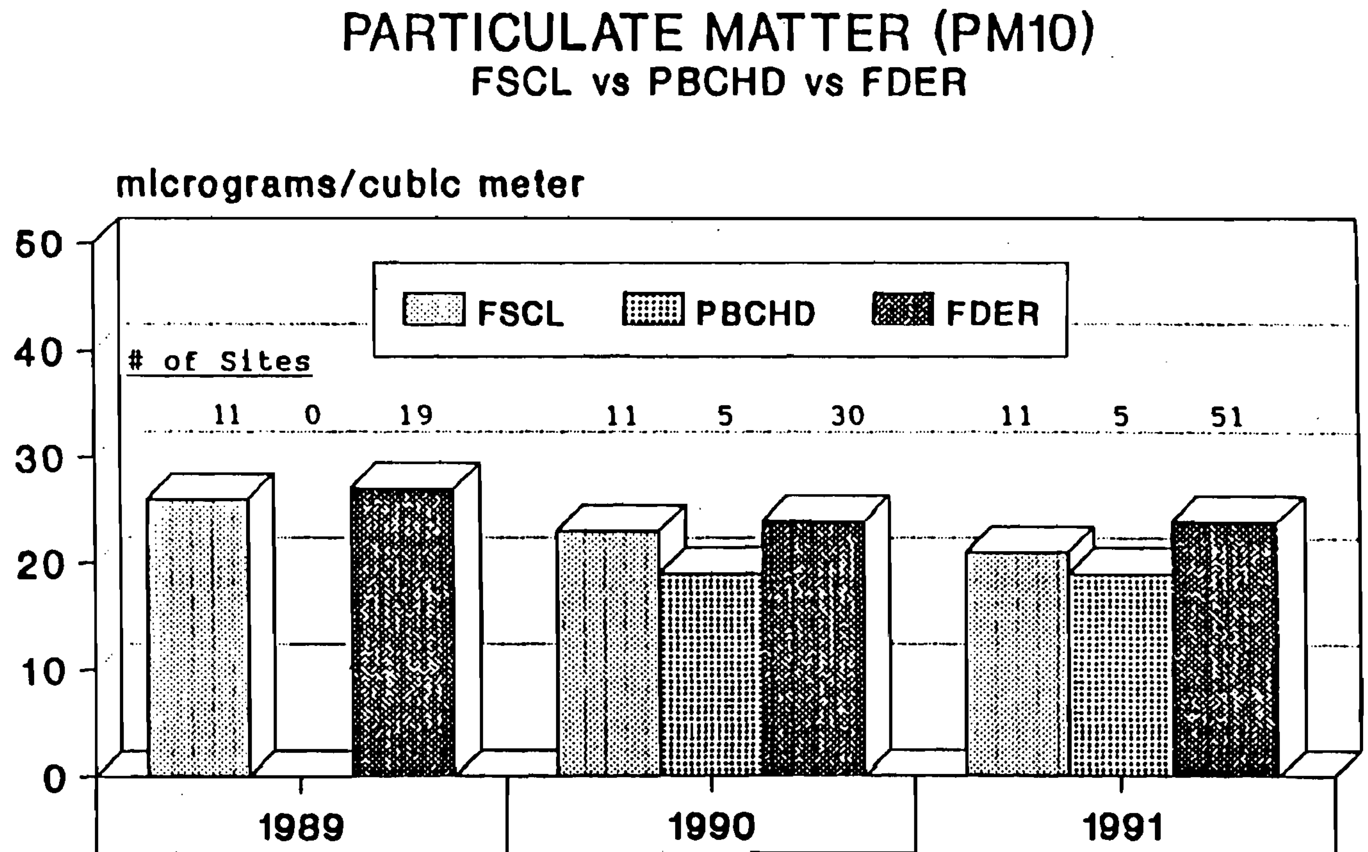
Figure 2: Network Annual Average

PARTICULATE (PM10)
FSCL NETWORK
Harvest vs Nonharvest Average



Federal Primary Standard = 50 ug/m3

Figure 3: Harvest vs Nonharvest Average



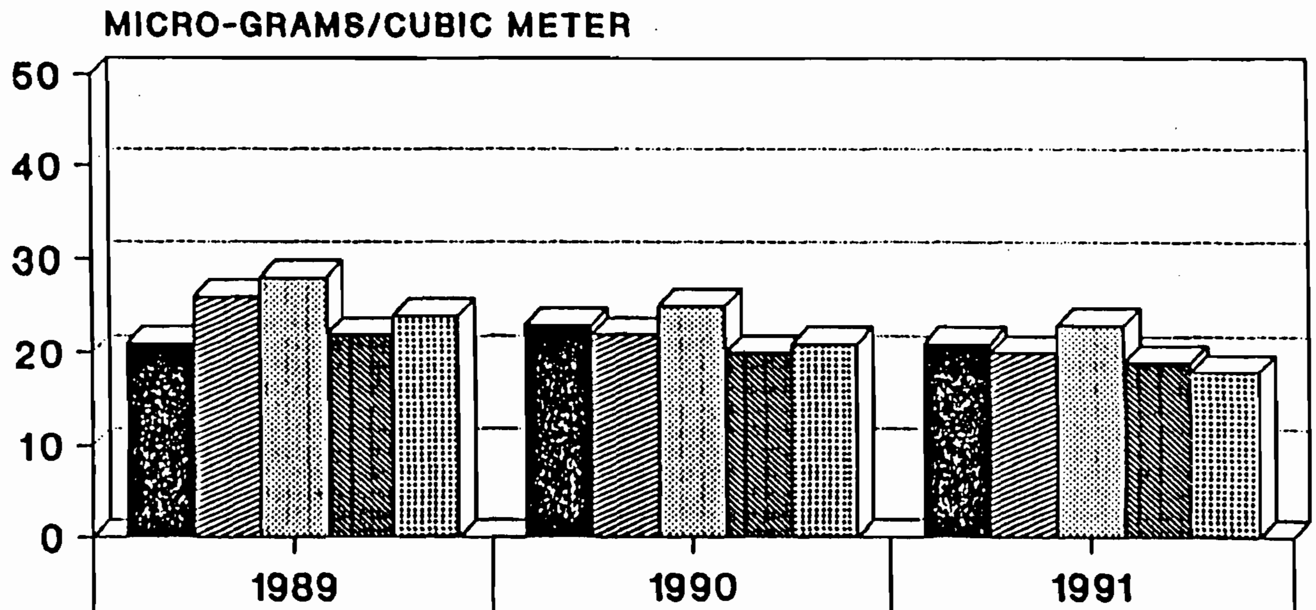
	1989	1990	1991
FSCL	26	23	21
PBCHD		19	19
FDER	27	24	24

NETWORK ARITHMETIC AVERAGE

Federal Primary Standard = 50 ug/m3

Figure 4: Comparison of PM10 Levels

PARTICULATE MATTER (PM10)
FSCL NETWORK

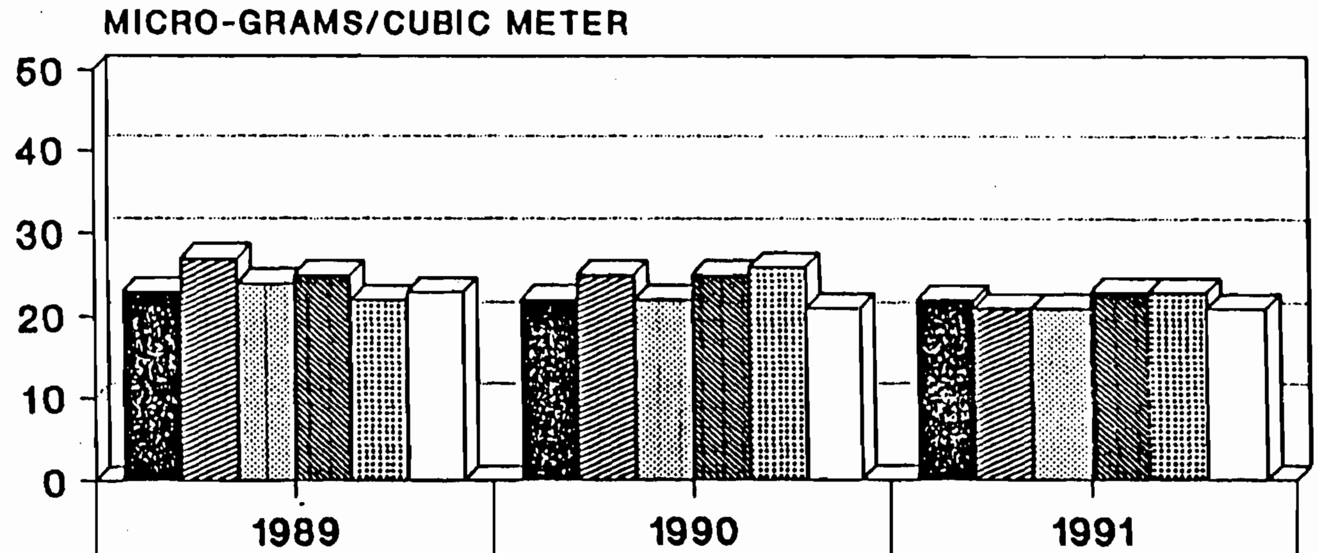


	1989	1990	1991
#3	21	23	21
#4	26	22	20
#5	28	25	23
#13	22	20	19
#22	24	21	18

Federal Primary Standard = 50 ug/m3

Figure 5: PM10 Annual Arithmetic Means

PARTICULATE MATTER (PM10)
FSCL NETWORK

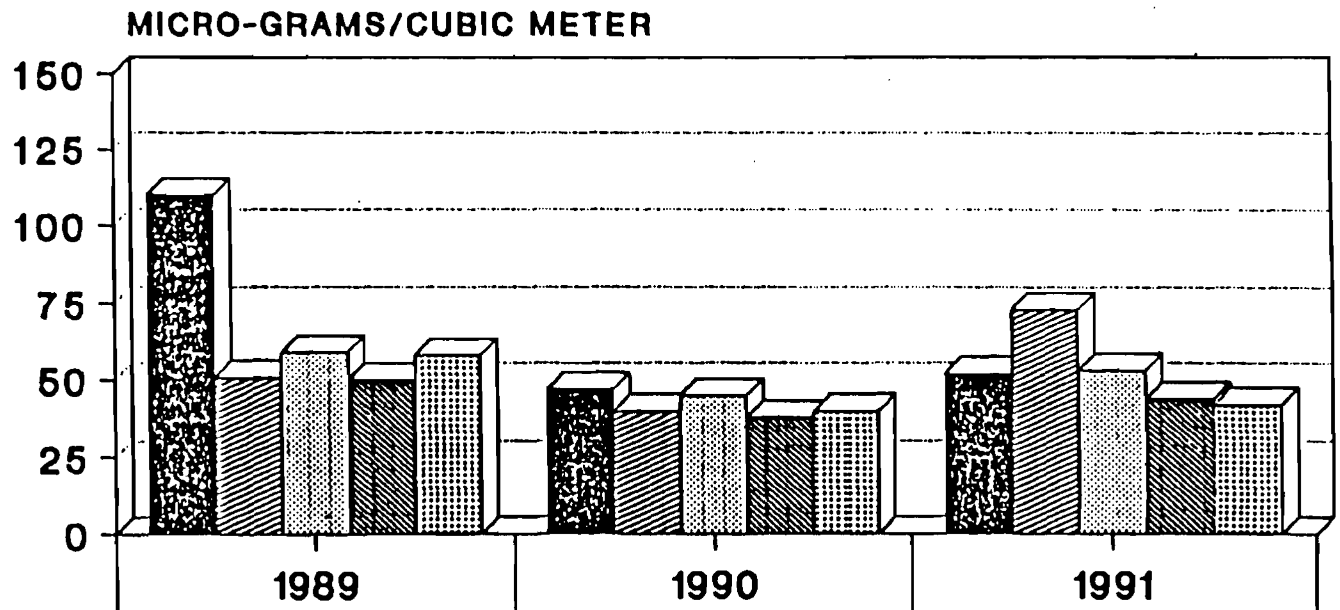


	1989	1990	1991
#7	23	22	22
#19	27	25	21
#11	24	22	21
#14	25	25	23
#20	22	26	23
#15	23	21	21

Federal Primary Standard = 50 ug/m3

Figure 6: PM10 Annual Arithmetic Means

PARTICULATE MATTER (PM10)
FSCL NETWORK

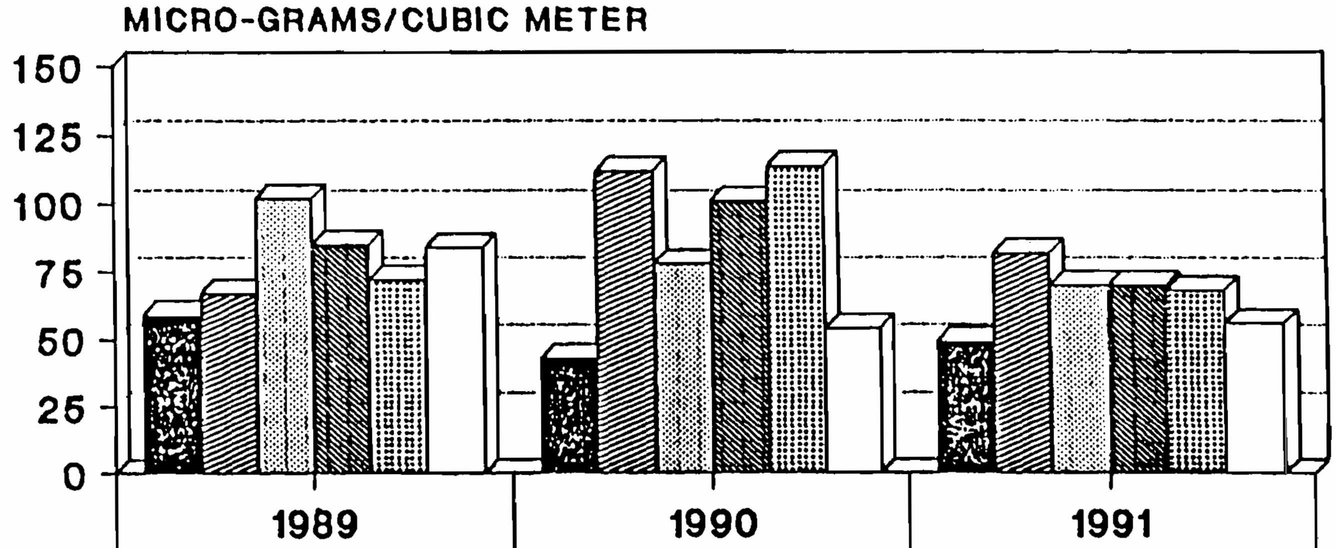


		1989	1990	1991
#3		110	47	52
#4		51	40	73
#5		59	45	53
#13		50	38	44
#22		58	40	42

Federal Primary Standard • 150 ug/m3

Figure 7: Maximum 24 Hour Concentrations

PARTICULATE MATTER (PM10)
FSCL NETWORK

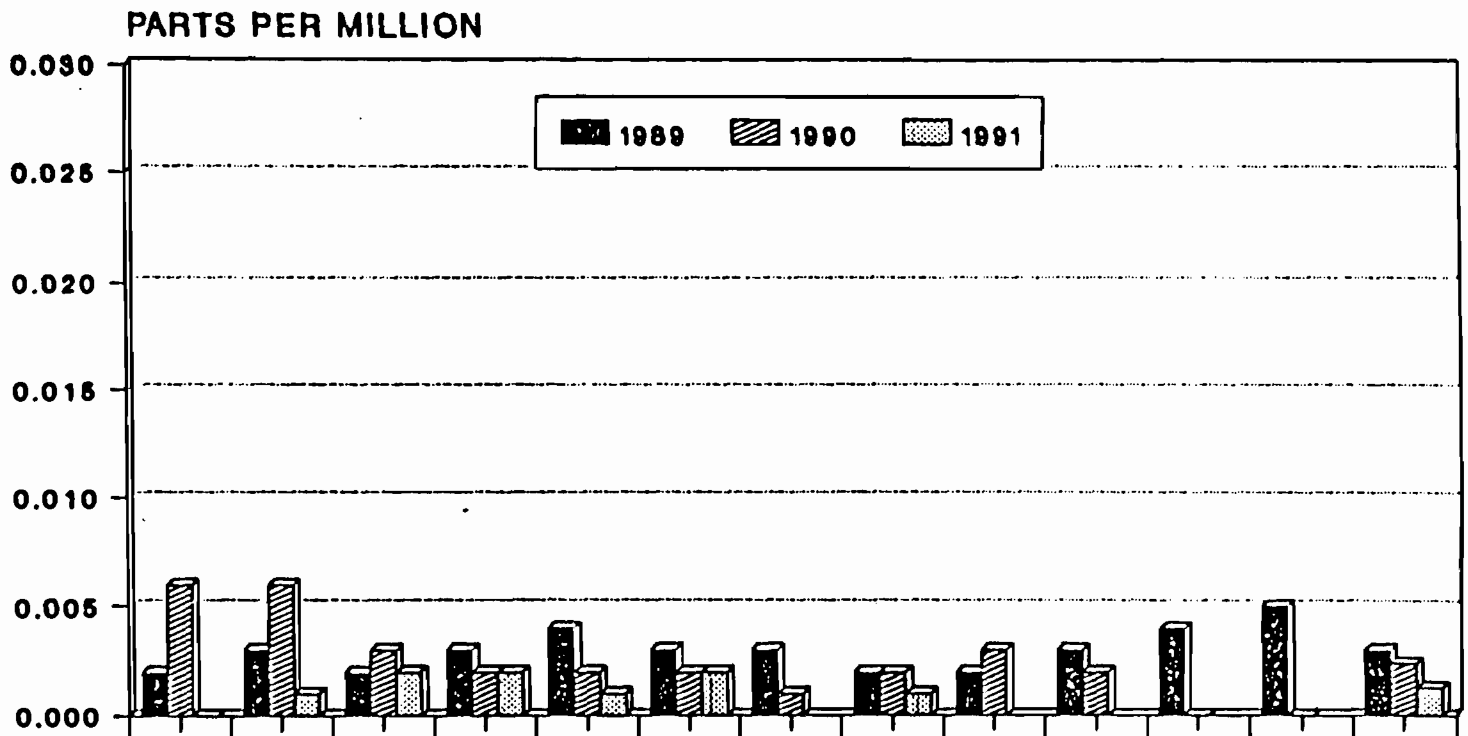


	1989	1990	1991
#7	59	43	49
#19	67	112	82
#11	102	78	70
#14	85	101	70
#20	72	114	68
#15	84	54	56

Federal Primary Standard = 150 ug/m3

Figure 8: 24 Hour Maximum Concentrations

SULFUR DIOXIDE
FSCL AIRLAB

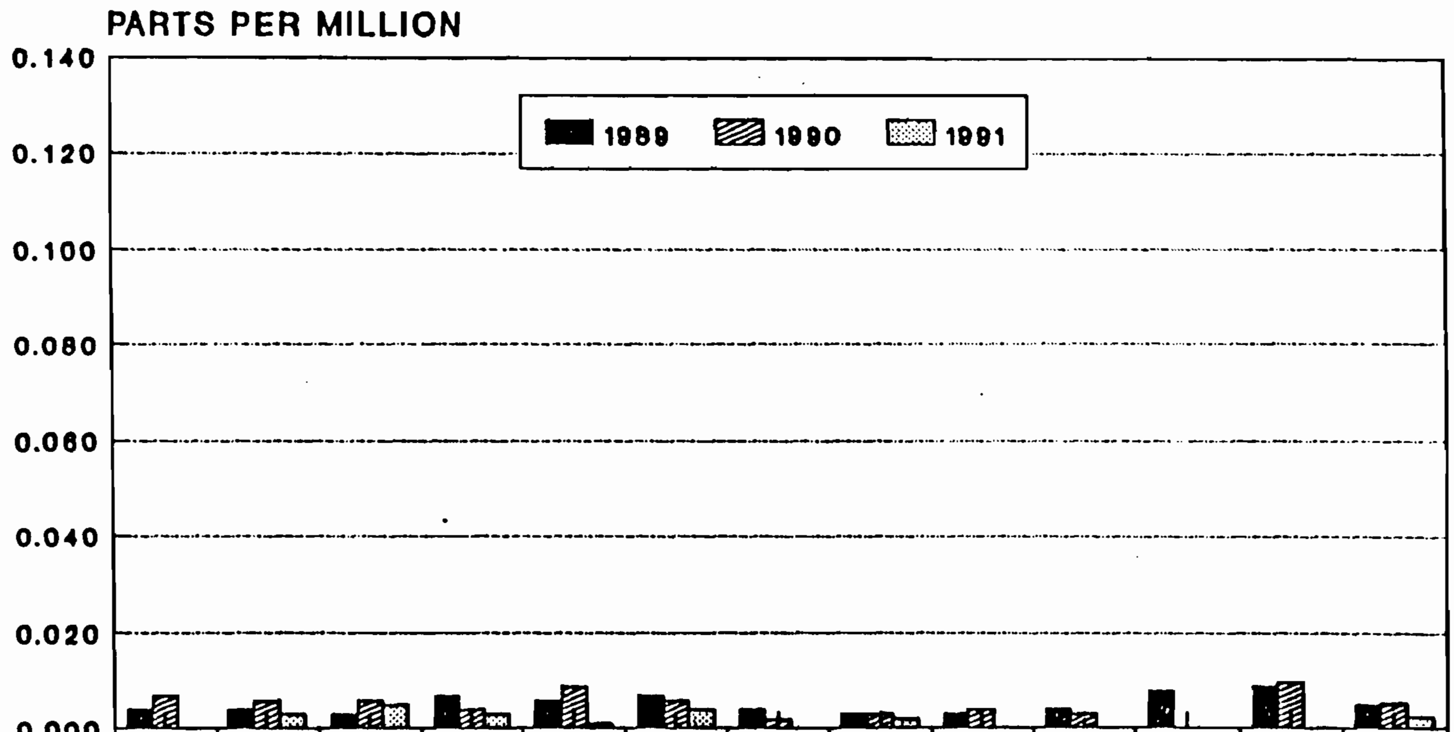


	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNL
1989	0.002	0.003	0.002	0.003	0.004	0.003	0.003	0.002	0.002	0.003	0.004	0.005	0.003
1990	0.006	0.006	0.003	0.002	0.002	0.002	0.001	0.002	0.003	0.002	0.000	0.000	0.002
1991	0.000	0.001	0.002	0.002	0.001	0.002		0.001					0.001

Federal Primary Standard = 0.030

Figure 9: Annual Arithmetic Mean

SULFUR DIOXIDE
FSCL AIRLAB

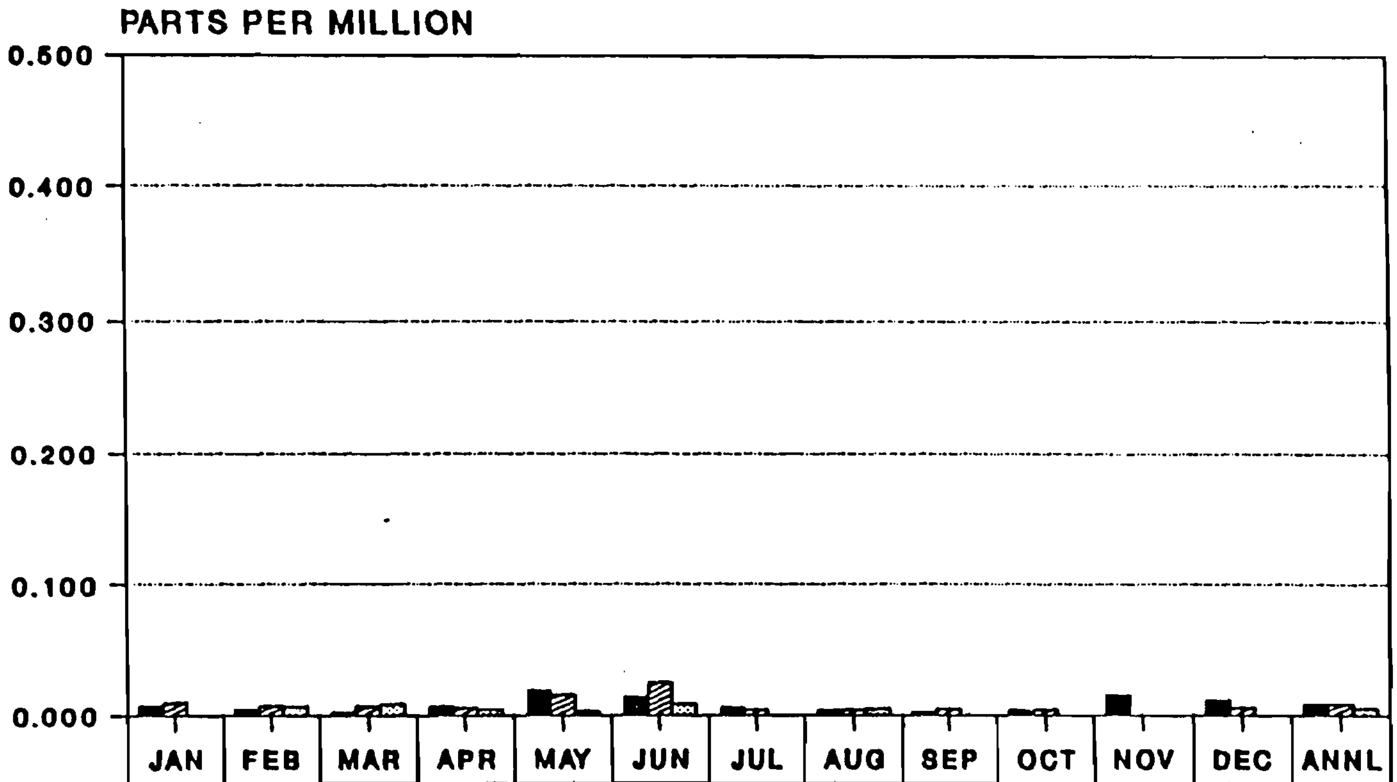


	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNL
1989	0.004	0.004	0.003	0.007	0.006	0.007	0.004	0.003	0.003	0.004	0.008	0.009	0.005
1990	0.007	0.006	0.006	0.004	0.009	0.006	0.002	0.003	0.004	0.003		0.010	0.005
1991	0.000	0.003	0.005	0.003	0.001	0.004		0.002					0.003

Federal Primary Standard • 0.140 ppm

Figure 10: 24 Hour Max. Concentrations

SULFUR DIOXIDE
FSCL AIRLAB



	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNL
1989	0.007	0.005	0.003	0.007	0.019	0.014	0.006	0.004	0.003	0.004	0.016	0.012	0.008
1990	0.010	0.008	0.007	0.006	0.016	0.026	0.004	0.004	0.005	0.004		0.006	0.009
1991	0.000	0.007	0.009	0.005	0.003	0.009		0.005					0.005

Federal secondary standard = 0.500 ppm

Figure 11: 3 Hour Max. Concentrations

BEST AVAILABLE COPY

21-Oct-91	11	8	15	12		15	15	32		19	47	
27-Oct-91	27	19	19	20			17			20	40	
02-Nov-91	25	29	35	31	25	29	21	24		34	33	22
08-Nov-91	32	30	36	36	35	33	25	32		32	34	25
14-Nov-91	25	73	32	33	24	25	24	42		25	36	24
20-Nov-91	16	15	19	19	22	17	17	37			14	13
26-Nov-91	14	11	30	21	14	19	14	33	23	15	24	14
02-Dec-91	23	20	23	20	26	17	20	17	15	20	17	19
08-Dec-91	15	21	20	20	19		18	19	20	45	15	17
14-Dec-91	16	16	24	23	24	70	16	18	14	28	18	15
20-Dec-91	25	27	25	35	25	33	30	32		36	32	23
26-Dec-91	13	13	24	24	21	20	19	23	19	25	24	13
01-Jan-92												
ANNUAL SUM	1184	1177	1279	1275	1055	1048	1098	1314	1046	1172	1166	1030
# OF SAMPLES	57	60	55	55	47	49	56	57	49	57	51	57
ARITH MEAN	21	20	23	22	22	21	19	23	21	21	23	18
MAX VALUE	52	73	53	50	49	70	44	70	56	82	68	42
MIN VALUE	8	8	11	12	10	9	11	9	9	9	10	10

													avg
JANUARY	20	19	20	22	20	15	16	26	21	17	20	17	19
FEBRUARY	17	19	30	25	22	27	17	36	24	30	31	17	25
MARCH	28	25	35	32	30	26	25	28	36	26	27	25	29
APRIL	21	16	20	18	17	13	15	16	15	16	15	15	17
MAY	22	18	19	18	21	14	19	15	15	16	17	17	18
JUNE	24	21	21	19	26	21	17	20	18	18	17	17	20
JULY	20	20	22	21	19	24	22	25	26	17	25	20	22
AUGUST	21	19	24	22	23	24	21	20	21	18	22	19	21
SEPTEMBER	17	15	21	18	16	16	18	17	19	15	20	15	17
OCTOBER	16	12	16	15	16	15	16	18	22	15	28	12	17
NOVEMBER	22	32	28	28	26	25	21	34	23	27	28	20	26
DECEMBER	21	20	26	25	23	35	21	22	17	33	21	20	24

Appendix

PM10 Data

Sulfur Dioxide Data

PARTICULATE VALUES FOR PM-10 SAMPLERS
(ug/m3)

PM10 RUN DATE	#3	#4	#5	#6	#7	#11	#13	#14	#15	#19	#20	#21	#22
04-Jan-89	37		34	30	23	42			35				
10-Jan-89	17		28	30	24	34			26				
16-Jan-89	25	28	42	44	29	102		44	40	29		36	28
22-Jan-89	6	8	11	9		11	6		11	10		9	8
28-Jan-89	22	28	41	39	23	30	23	44	27	64		24	23
03-Feb-89	20	25	30	31	34	20	24	27	18	65		43	27
09-Feb-89	39	37	59	53	31	34	28		37	32		31	29
15-Feb-89	76	47	45	44	35		33	28	34	48		58	49
21-Feb-89	79	47	34	36	27		30	36	38	33		77	33
27-Feb-89	110		44	48			45	56	38	40		64	42
05-Mar-89	26	23	22	20			20	16	17	20		39	17
11-Mar-89	20	18	29	29	19			21	23	22		33	18
17-Mar-89	17	24	20	19	19	19	17	17	14	27		51	18
23-Mar-89	30	29	24	24	18	17	22	30	23	31		53	25
29-Mar-89	25	24	27	24	20	18	24	20	18	36		30	28
04-Apr-89	48	51	31	32	29	24	24	23	25	53		31	39
10-Apr-89	38	42	53	52	34	44	50	23	27	34		45	58
16-Apr-89	17	15	25		15	35		22	22	14		19	21
22-Apr-89	26	20	18		17	17	15	25	14	12		14	13
28-Apr-89	41	25	29		27	23	22	39	26	17		30	22
04-May-89	42	27	26	29	26	31	26	25	26	25		25	24
10-May-89	31	33	39	39	28	26	27	27	26	29		34	26
16-May-89	15	16	20	20	16	14	17	16	19	12		15	16
22-May-89	36	39	32	33	30	23	25	23	25	34		30	29
28-May-89	21		49	49	42	43	49	25	25	35	23	38	40
03-Jun-89		21	19	20	28	27	20	17	15	39	16	17	21
09-Jun-89	57		57	56	54	50		50	51	49	51		52
15-Jun-89	63	42	47	49	45	41	42	39	37	46	37	45	52
21-Jun-89	14	15	15	15	16	12	14	15	14	11	14	13	12
27-Jun-89	18	14	14	14	11	10	12		11	10	13	12	19
03-Jul-89		17	18	16	16	12	15		13	12	15	17	13
09-Jul-89		27	27	29	25	23	24	25	25	22	24	25	24
15-Jul-89		22			20	43	18	17	20	16	21	22	21
21-Jul-89		28			16	16			18	16	17	23	24
27-Jul-89		28			27	23		24	26	22	18	29	23
02-Aug-89		40	37	38	34	29		32	32		34	27	26
08-Aug-89	21	32	24	24	24	21	24	27	29	21	29	28	25
14-Aug-89	17	11		16	15	12	15	15	14	14	19	15	15
20-Aug-89	18	16	16	14	13	13	16	14	17	13	17	15	21
26-Aug-89	31	37	30	31	20	22	24	25	22	22	25	31	26
01-Sep-89	17	26	19	20	18	15	16	15	14	13	17	13	14
07-Sep-89	15		20	20	18	19	16	22	19	19	20	21	20
13-Sep-89	15	23	17	18	16	15	14			12	16	15	13
19-Sep-89	17	18	16	18	16	13	17	14	12	13	16	18	15
25-Sep-89	18	18	15	14	17	15		15	19	25	17	18	18
01-Oct-89	17	21	15	14	14	14	14		15	15	15	18	
07-Oct-89	22	27	23	22	22	19	22	18	22	20	20	22	22
13-Oct-89	10	18	17	17	13	15	15	16	13	13	12		[illegible]

BEST AVAILABLE COPY

19-Oct-89			16	15	18	12	14	14	14	27	18		[illegible]
25-Oct-89	16	47	18	18	14	19	12	17	16	17	17	15	[illegible]
31-Oct-89	16	20	25	24	15	20	14	21	19	19	19	15	[illegible]
06-Nov-89				23	22	28	18	16	24	35	24	21	
12-Nov-89	16	23	22	23	15	15	16	16	22	37	20	28	[illegible]
18-Nov-89	25	13	24	23	11	19	12	28	15		18	15	
24-Nov-89		20	19	19	14	23	15	85	21		16	17	
30-Nov-89		18	25		22	20	18		19		23	21	
06-Dec-89		39	57		28	41	28		84	67	72	37	31
12-Dec-89		24	26		20	20	32	15	16	45	19	17	16
18-Dec-89		24	30		27	25	23	31	28	30	23	25	24
24-Dec-89				19	14	14	12	15	13	12	12	14	12
30-Dec-89	28	33	27	25	25	17	22	28		33	27	29	24
ANNUAL SUM	1347	1272	1546	1385	1309	1359	1101	1273	1360	1457	817	1526	1309
# OF SAMPLES	46	52	55	51	58	56	51	50	59	55	37	56	55
ARITH MEAN	29	26	28	27	23	24	22	25	22	27	22	27	24
MAX VALUE	110	51	59	56	54	102	50	85	84	67	72	77	59
MIN VALUE	6	6	11	9	11	10	6	14	11	10	12	9	8

JANUARY	22	21	31	30	25	44	15	44	28	34		23	19
FEBRUARY	65	39	42	42	32	27	32	37	33	44		55	37
MARCH	24	24	24	23	19	18	21	21	19	27		41	[illegible]
APRIL	34	31	31	42	24	29	28	26	23	26		28	31
MAY	21	29	33	34	28	27	29	23	24	27	23	28	27
JUNE	39	23	30	31	31	28	22	30	26	31	26	22	31
JULY		25	21	20	19	18	17	20	20	17	20	21	20
AUGUST	22	27	27	24	21	19	20	23	23	18	25	24	23
SEPTEMBER	17	21	18	18	17	15	16	17	16	16	17	17	16
OCTOBER	16	26	19	19	16	17	15	17	16	19	17	17	14
NOVEMBER	20	19	23	22	17	21	16	36	20	36	20	20	21
DECEMBER	28	31	35	22	23	23	23	22	35	37	32	25	22

14

PARTICULATE VALUES FOR PM-10 SAMPLERS
(ug/m3)

PM10 RUN DATE	#3	#4	#5	#16	#7	#11	#13	#14	#15	#19	#20	#2[illegible]
05-Jan-90	18	21	27	22	21	21	16		17	21	18	15
11-Jan-90	35	30	45	44	31	49	29		54	43		23
17-Jan-90	23	38	37	37	25		28		47	55	32	[illegible]
23-Jan-90	32	29	32	30	22	26	27		27	41	64	22
29-Jan-90	26	23	24	24	19	16	19	19	18	13	114	15
04-Feb-90	26	25	36	28	20	18	23	15	21	112	50	24
10-Feb-90	31	27	32	33	29	18	23	21	29	25	25	23
16-Feb-90	38	40	33	32	35		33	29	26	34	17	25
22-Feb-90	25	25	21	23	31	18	21	19	17	22	20	24
28-Feb-90	17	25	20	21	15		19	13	13	24	12	46
06-Mar-90	23	32	28	28	19	19	20	20	16	15	17	23
12-Mar-90	23	32	22	22	21	20	19	22	24	26	20	30
18-Mar-90	17	30	19	20	17	14	16	53	15	21	16	27
24-Mar-90	20	20	24	23	20	16	19	20	19		15	20
30-Mar-90	30	34	27	27	22	24	24	23	21	21	21	39
05-Apr-90	26	22	32	31	26	22	23	23	23	18	26	23
11-Apr-90	23	23	29	29	24	20	21	20	25	21	19	19
17-Apr-90	30	20	18	18	19	25	17	15	13	22	14	15
23-Apr-90	30	22	25	26	19	17	18	22	16	17	21	20
29-Apr-90	16	15	15	16	14	14	16	16	17	13	16	15
05-May-90	21	24			21	19	19	23	24	19	20	19
11-May-90	35	29	38	37	30	24	28	26	26		22	29
17-May-90	23	28	30	29	26	24	24	24	22	20	22	25
23-May-90	18	14	19	18	14	14	13	13	15	13	15	13
29-May-90	14	14	20	20	17	14	14	14	13	13	13	14
04-Jun-90	14	16	16	16	14	12	14	13	13	11	12	13
10-Jun-90	14	16	16	17	17	13	12	15	14	13	14	14
16-Jun-90	27	26	26	24	28	26		29	30	24	33	23
22-Jun-90	18	16	16	16	18			15	15	15	14	13
28-Jun-90	18	19	20		20	16		17	18	15	18	15
04-Jul-90	24	25	25		28	26		25	26	24		25
10-Jul-90	26	32	30			25		29		22		27
16-Jul-90	17	18	19			20		19	19	17		27
22-Jul-90	14	11	13	14	19	12		12	12	15		13
28-Jul-90	14	18	18	18	18	18		24	15	15	20	13
03-Aug-90	25	22	25	25	25	20		28	23	22	28	21
09-Aug-90	19	13	20	20	20	18	17	20	18	17	21	15
15-Aug-90	34	39	39	42	43	34	38	36	37	33	40	37
21-Aug-90	22	16	17	19	21	16	16	21	18	16	17	18
27-Aug-90	12	11	12	15	18	14	14	11	12	11	13	10
02-Sep-90	17	15	18	19	17	19	18	21	16	17	20	18
08-Sep-90	17	19	26	27	18	19	16	13	13	13	17	15
14-Sep-90	27	15	17	18	17	15	14	26	14	14	16	18
20-Sep-90	13	12	16	17	15	16	19	14	13		13	14
26-Sep-90	22	19	22	21	22	14	16	16		14	19	13
02-Oct-90	10	7	12	13	12	14	13	11		9	10	18
08-Oct-90	19	17	17		17	16	18	17		15	16	16
14-Oct-90	20	20	18	15		20	20	15		20	19	20

20-Oct-90 :	16	16	18	17		19	18	18	18	18	18	16
26-Oct-90 :	32	22	32	33	24	31	23	25	23	25	31	20
01-Nov-90 :	12	13	19	20	12	16	18	31	10	19	13	12
07-Nov-90 :	47	32	39	40	24	22	25	95	24	32	40	29
13-Nov-90 :		18	30	30	21	26	15	29	25	25	27	15
19-Nov-90 :		20	30	31	21	55	19	34	35	112	96	20
25-Nov-90 :	22	22	30	31	27	78	22	101	22	23	31	22
01-Dec-90 :	24	27	26	29	23	23	25	30	22	29	30	28
07-Dec-90 :		30	29	29	24	19	23	29	17	33	28	29
13-Dec-90 :		20	43	44	21	37	20	57	43	34	70	23
19-Dec-90		24	25	25	22	23	21	45	20	30	28	
25-Dec-90		17	23	24	15	21	20	15	15	15	18	
31-Dec-90		16	21	21	23	19	14	18	16	18	20	
ANNUAL SUM	1222	1353	1470	1372	1234	1245	1036	1440	1173	1456	1447	1244
# OF SAMPLES	54	61	60	55	57	57	52	57	56	56	55	53
ARITH MEAN	23	22	25	25	22	22	20	25	21	25	26	21
MAX VALUE	47	40	45	44	43	78	38	101	54	112	114	40
MIN VALUE	10	7	12	13	12	12	12	11	10	9	10	10

													avg
JANUARY	28	28	33	31	24	28	24	19	33	43	57	24 :	3[illegible]
FEBRUARY	27	29	27	27	26	18	24	20	21	43	27	32 :	[illegible]
MARCH	23	30	24	24	20	19	20	28	19	21	18	28 :	23
APRIL	25	20	24	24	20	20	19	19	19	18	19	18 :	20
MAY	22	22	27	26	22	19	19	20	20	16	19	20 :	21
JUNE	18	19	19	18	19	17	13	18	18	16	18	16 :	17
JULY	19	21	21	16	22	20		22	18	19	20	21 :	20
AUGUST	23	22	23	24	26	21	21	23	21	20	23	20 :	22
SEPTEMBER	19	16	20	20	18	16	16	18	14	15	17	17 :	17
OCTOBER	19	16	19	20	18	20	18	17	20	17	19	18 :	19
NOVEMBER	27	21	30	30	21	39	20	58	23	42	41	20 :	31
DECEMBER	24	23	28	29	23	23	20	34	22	26	32	27 :	28

BEST AVAILABLE COPY

PARTICULATE VALUES FOR PM-10 SAMPLERS
(ug/m3)

PM10 RUN DATE	#3	#4	#5	#18	#7	#11	#13	#14	#15	#19	#20	#22
06-Jan-91		18	14	16	16	18	15			24	19	
12-Jan-91		16	15	19	15	13	15	15	15	12	16	12
18-Jan-91	14	19	19	20	15	14	14	12		13		17
24-Jan-91	28	25	27	27	24		19	21	30	20	25	20
30-Jan-91	18	19	25	27	30	15	19	53	15	15	20	18
05-Feb-91	20	23	28	27	21	19	16	18	19	20	65	22
11-Feb-91	22	23	34	36		65	21	48	33	32	32	19
17-Feb-91	13	14		19	22	16	12	70	26	18	20	16
23-Feb-91	17	16		24	24	14	15	27	19	14	18	15
01-Mar-91	15	18		19	20	15	16	15		16	16	15
07-Mar-91	33	23		31		49	22	24	58	22		21
13-Mar-91	40	35	37	36	27	24	30	29	41	37	35	37
19-Mar-91	18	17	36	34	28	24	26	28	29	27	26	24
25-Mar-91		37	49	46	49		33	45	41	33	34	30
31-Mar-91	22	14	17	14	19	15	13	13	13	13	13	12
06-Apr-91	13	17	17	16		16	15	16	15	16	18	16
12-Apr-91	17	17	26	21	16	16	20	15	17	20	15	19
18-Apr-91	12	15	18	17	19	13	13	18	13	13		13
24-Apr-91	41	16	21	21		12	14	19	14	16	15	14
30-Apr-91	21	16	17	18		9	13	13	14	14	13	15
06-May-91	26	24	24	23	22	16	22	16	21	21	19	26
12-May-91	16	18	19	17	15	15	15	19	15	15	25	17
18-May-91	11	12	12	12	20	11		11	10	12	10	11
24-May-91	8	14	14	12	19	11		11	12	10	12	12
30-May-91	47	20	25	24	30	18	21	16	19	22	17	19
05-Jun-91	30	24	28	26	22	22	21	29	22	20	23	21
11-Jun-91	15	13	12	12	14		11	13	9	10	14	10
17-Jun-91	21	21	19	17	22	17	15	17	17	16	15	18
23-Jun-91	17	18	19	19	46	22	19	16	19	21		17
29-Jun-91	34	32	24	22	26	22	20	26	21	21		19
05-Jul-91	16	20	23	24	18	27	26	23	26	18	21	20
11-Jul-91	20	19	21	19	21	23	20	20	37	15		18
17-Jul-91	31	32	37	34	32	33	33	31	34	30	29	33
23-Jul-91	14	12	15	12	10		12	14	13	11		11
29-Jul-91	16	15	16	14	14	13	17	36	21	11		17
04-Aug-91	16	19	16	15	16	13	15	14	19	13	15	15
10-Aug-91	9	9	11	12	37	45	13	11	11	12	10	10
16-Aug-91	52	43	53	50			44	45	46	36	55	42
22-Aug-91	17	12	17	17	16		18	16	17	15	18	16
28-Aug-91	13	11	20	18		13	15	12	13	12	12	12
03-Sep-91	13	10	16	16			15	13	14		16	15
09-Sep-91	18	15	22				21	21	22		20	17
15-Sep-91	21	20	23			18	23	22	21	15		15
21-Sep-91	14	12	15	14	16	14	11	12	12	10	21	11
27-Sep-91	20	17	27	25			20		27	20	25	18
03-Oct-91	19	13	16	15	17	17	17	16	30	13	19	14
09-Oct-91	12	10	16	14	17	16	16	15	14	13	21	11
15-Oct-91	11	11	13	13	14	10	13	9		9	11	10

SULFUR DIOXIDE DATA

AQCR: 000 AGENCY(J): PRIVATE
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED
AREA: 3420 PARM(42401): SULFUR DIOXIDE
SITE: 003 UNITS(07): PARTS PER MILLION
YEAR: 1989 MONTH(01): JANUARY
LOCALE: FLORIDA CELERY EXCHANGE

..LECT METH: INSTRUMENTAL
..ALYSIS METH: PULSED FLUORSCENCE
SAMPLING INTR: 01 HOURS
SAROAD KEY: 10/3420/003/J/01
MINIMUM DETEC: 00000+
BELLE GLADE

SLAMS/NAMS(0):
RPT AGNCY/SMSA: 0000
UTM ZONE: 17
UTM EASTING: 000535
TIME ZONE(07): EASTERN

PRIMARY
FEDERAL STANDARD

SECONDARY
SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01	.003	.002	.002	.002	.002	.002	.002	.003	.003	.003	.002	.002	.002	.002	.001	.001	.002	.003	.002	.002	.002	.002	CALB	.003	.002
02	.002	.002	.002	.002	.001	.001	.003	.003	.002	.002	.001	.001	.001	:001	.001	.001	.001	.002	.002	.002	.002	.002	CALB	.003	.002
03	.002	.002	.002	.002	.002	.002	.003	.003	.003	.002	.002	.003	.002	.002	.002	.001	.002	.001	.001	.001	.001	.001	CALB	.002	.002
04	.001	.001	.001	.001	.001	.001	.001	.001	.002	.001	.001	.001	.002	.002	.001	.001	.001	.002	.002	.002	.002	.002	CALB	.002	.001
05	.002	.002	.002	.002	.001	.002	.003	.005	.003	.002	.002	.002	.002	.002	.002	.003	.003	.004	.004	.004	.003	.003	CALB	.005	.003
06	.005	.006	.005	.005	.004	.004	.006	.007	.007	.006	.005	.004	.003	.003	.002	.002	.002	.003	.003	.003	.003	.003	CALB	.007	.004
07	.006	.004	.004	.006	.005	.005	.006	.005	.005	.005	.004	.003	.002	.002	.002	.003	.002	.003	.003	.003	.002	.002	CALB	.004	.004
08	.003	.003	.003	.002	.003	.003	.004	.005	.005	.004	.003	.003	.002	.002	.002	.002	.002	.002	.003	.002	.002	.002	CALB	.004	.003
09	.003	.003	.003	.003	.003	.003	.004	.005	.005	.004	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	CALB	.005	.003
10	.004	.003	.003	.004	.004	.004	.004	.005	.003	.003	.003	.002	.002	CALB	CALB	.003	.002	.002	.003	.003	.003	.002	CALB	.005	.003
11	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.004	.002
12	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.002	.002	.002	.002	.001	.002	.002	CALB	.004	.002
13	.003	.002	.002	.002	.002	.002	.004	.006	.005	.004	.003	.003	.003	.002	.002	.002	.001	.002	.003	.003	.002	.002	CALB	.004	.003
14	.003	.002	.002	.002	.002	.002	.003	.002	.002	.002	.002	.002	.002	.001	.001	.001	.001	.001	.002	.002	.002	.002	CALB	.004	.002
15	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.001	.001	.001	.002	.002	.002	.001	.002	.001	CALB	.003	.002
16	.002	.002	.002	.002	.002	.002	.003	.004	.004	.003	.002	.002	.002	.002	.001	.001	.002	.003	.003	.002	.002	.002	CALB	.004	.002
17	.003	.002	.002	.002	.002	.002	.003	.004	.003	.004	.004	.004	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.005	.003
18	.003	.003	.002	.002	.002	.002	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.001	.002	.002	.002	.002	.002	CALB	.003	.002
19	.002	.002	.002	.001	.001	.001	.002	.002	.002	.002	.002	.002	.002	.001	.001	.001	.001	.001	.002	.002	.002	.002	CALB	.003	.002
20	.002	.002	.002	.001	.001	.002	.002	.002	.002	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.004	.002
21	.002	.002	.001	.001	.001	.001	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.004	.001
22	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.003	.001
23	.002	.002	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	CALB	CALB	.002	.002	.002	.001	.001	.001	CALB	.002	.001
24	.002	.001	.001	.001	.001	.001	.001	.002	.002	.004	.002	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.003	.001
25	.002	.001	.001	.001	.001	.001	.001	.002	.002	.001	.001	.001	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	CALB	.003	.001
26	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.002	.002	CALB	.003	.001
27	.002	.002	.001	.002	.001	.002	.002	.004	.003	.003	.002	.002	.002	.002	.001	.001	.001	.001	.003	.003	.002	.002	CALB	.003	.002
28	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.003	.002	.002	.002	.002	.001	.002	.002	.002	.001	.001	.002	CALB	.003	.002
29	.002	.002	.002	.002	.001	.001	.002	.002	.002	.002	.002	.002	.002	.002	.001	.001	.002	.001	.002	.001	.001	.001	CALB	.004	.002
30	.002	.002	.002	.002	.002	.002	.003	.005	.004	.003	.003	.002	.002	.002	.002	.001	.001	.001	.002	.002	.001	.001	CALB	.004	.002
31	.002	.002	.002	.001	.001	.002	.001	.002	.002	.002	.003	.003	.003	.002	.002	.003	.002	.002	.002	.002	.002	.002	CALB	.004	.002
NO	31	31	31	31	31	31	31	31	31	31	31	31	31	30	29	30	31	31	31	31	31	31		31	709
MEAN	.003	.002	.002	.002	.002	.002	.003	.003	.003	.003	.002	.002	.002	.002	.001	.002	.002	.002	.002	.002	.002	.002		.004	.002
MAX	.006	.006	.005	.006	.005	.005	.006	.007	.007	.006	.005	.004	.003	.003	.002	.003	.003	.004	.004	.004	.003	.003		.007	.007

'MALF' - MACHINE MALFUNCTION
'WTHR' - BAD WEATHER
'VAND' - VANDALISM
'COLL' - COLLECTION ERROR
'LAB ' - LAB ERROR
'QUAL' - QUALITY ASSURANCE
'CALB' - CALIBRATION
'WAIV' - MONITORING WAIVED
'*** ' - NOT ENOUGH READINGS
'   ' - NUL VALUE

3hr - .007

ΙTE: FLORIDA (10) **Best Available Copy** AQDHS-II AIR QUAL DATA REPORT DISPLAY N (9999 PAGE 2

.CR: 000 AGENCY(J): PRIVATE
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED
AREA: 3420 PARM(42401): SULFUR DIOXIDE
SITE: 003 UNITS(07): PARTS PER MILLION
YEAR: 1989 MONTH(02): FEBRUARY
LOCALE: FLORIDA CELERY EXCHANGE BELLE GLADE

COLLEC ETH: INSTRUMENTAL
ANALYSIS METH: PULSED FLUORSCENCE
SAMPLING INTR: 01 HOURS
SAROAD KEY: 10/3420/003/J/01
MINIMUM DETEC: 00000+

SLAMS/NAMS(0):
RPT AGNCY/SMSA: 0000
UTM ZONE: 17
UTM EASTING: 000535
TIME ZONE(07): EASTERN

PRIMARY
FEDERAL STANDARD

SECONDARY
SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01	.003	.002	.002	.002	.002	.002	.002	.003	.003	.003	.003	.002	.002	.002	.003	.003	.002	.002	.002	.003	.002	.002	CALB	.004	.002
02	.002	.002	.003	.003	.003	.003	.005	.004	.004	.002	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.004	.003
03	.003	.003	.002	.002	.002	.002	.003	.003	.003	CALB	~~.011~~	.005	.003	.003	.003	.003	.003	.003	.002	.002	.002	.002	CALB	.006	.003
04	.004	.003	.002	.002	.002	.003	.004	.004	.004	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.002	.002	CALB	.005	.003
05	.003	.002	.003	.003	.002	.002	.003	.003	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.004	.002
06	.003	.002	.002	.002	.002	.003	.003	.003	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.005	.002
07	.003	.003	.003	.002	.002	.002	.003	.004	.003	.003	.004	.003	.003	.003	.003	.002	.003	.003	.002	.002	.002	.002	CALB	.006	.003
08	.004	.003	.003	.002	.002	.002	.003	.004	.004	.004	.004	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.005	.003
09	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.003	.002	.002	.002	.002	.001	.002	.002	.003	.002	CALB	.003	.002
10	.004	.003	.003	.003	.004	.004	.003	.003	.004	.004	.005	.005	.004	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.003	.003
11	.002	.002	.002	.002	.002	.002	.002	.004	.003	.003	.003	.004	.003	.002	.002	.002	.002	.002	.002	.002	.002	.003	CALB	.010	.003
12	.009	.008	.004	.003	.003	.002	.003	.002	.003	.003	.004	.004	.005	.003	.003	.003	.002	.002	.002	.002	.002	.002	CALB	.002	.003
13	.002	.002	.002	.002	.002	.002	.002	.002	.002	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.003	.002
14	.002	.002	.002	.002	.002	.002	.003	.003	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.003	.002
15	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.002	.002	.002	.002	.001	.002	CALB	.003	.002
16	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	MALF	.002	.002	.002	.002	.002	.002	.002	CALB	.003	.002
17	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.002	.002	.002	.002	.002	.002	CALB	.003	.002
18	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.002	.002	.002	.002	.002	CALB	.004	.002
19	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.002	.002	.002	.001	CALB	.004	.002
20	.003	.002	.002	.002	.002	.002	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.004	.002
21	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.004	.002
22	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002				.003	.003	.003	.002	CALB	.005	.002
23	.003	.003	.003	.003	.003	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.001	.001	.001	.001	MALF	.001	.002	CALB	.003	.002
24	.003	.003	.003	MALF	MALF	MALF	MALF	MALF	MALF	.003	.003	.003	.003	.003	.003	.003	.003	.006	.006	.003	.003	.004	CALB	.005	.004
25	.003	.003	MALF	MALF	MALF	MALF	MALF	MALF	MALF	.004	.004	.004	.003	.003	.003	.003	.003	.003	.004	.004	.004	.004	CALB	.003	.003
26	.003	MALF	MALF	MALF	MALF	MALF	MALF	MALF	.004	.004	.007	.006	.004	.002	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.003	.004
27	.002	.003	.002	.002	.002	.002	MALF	.004	.005	.004	.003	.003	.003	.002	.002	.002	.002	.001	.001	.002	.002	.002	CALB	.003	.002
28	.003	.003	(.005	.007	.005)	.004	.004	.004	.004	.004	.003	.003	.002	.002	.001	.002	.002	.002	.002	.002	.002	.002	CALB	.004	.003
NO	28	27	26	25	25	25	24	25	26	27	28	28	28	28	27	26	27	27	28	27	28	28		28	616
MEAN	.003	.003	.002	.002	.002	.002	.003	.003	.003	.003	.003	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002		.004	.003
MAX	.009	.008	.005	.007	.005	.004	.005	.004	.005	.004	~~.011~~	.006	.005	.003	.003	.003	.003	.006	.006	.004	.004	.004		.010	.011

'MALF' - MACHINE MALFUNCTION 'WTHR' - BAD WEATHER 'VAND' - VANDALISM 'COLL' - COLLECTION ERROR
'LAB ' - LAB ERROR 'QUAL' - QUALITY ASSURANCE 'CALB' - CALIBRATION 'WAIV' - MONITORING WAIVED
'*** ' - NOT ENOUGH READINGS ' ' - NUL VALUE

3hr - .005

STATE: FLORIDA (10) Best Available Copy AUDHS-11 QUALITY DATA REPORT DISPLAY N (9999 PA

AQCR: 000 AGENCY(J): PRIVATE
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED
AREA: 3420 PARM(42401): SULFUR DIOXIDE
SITE: 003 UNITS(07): PARTS PER MILLION
YEAR: 1989 MONTH(03): MARCH
LOCALE: FLORIDA CELERY EXCHANGE BELLE GLADE

COLLECT METH: INSTRUMENTAL
ANALYSIS METH: PULSED FLUORSCENCE
SAMPLING INTR: 01 HOURS
SAROAD KEY: 10/3420/003/J/01
MINIMUM DETEC: 00000+

SLAMS/NAMS(O):
RPT AGNCY/SMSA: 0000
UTM ZONE: 17
UTM EASTING: 000535
TIME ZONE(07): EASTERN

PRIMARY
FEDERAL STANDARD

SECONDARY
SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01	.003	.003	.003	.004	.003	.003	.003	.004	.003	.003	.003	.003	.003	.003	.002	.003	.003	.002	.002	.002	.002	.003	CALB	.006	.003
02	.004	.003	.003	.003	.003	.002	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.005	.002
03	.003	.003	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.005	.002
04	.003	.003	.003	.003	.003	.003	.002	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.005	.002
05	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.004	.002
06	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.005	.003	.003	.002	.002	.002	CALB	.006	.002
07	.004	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.001	.001	.001	.001	.001	CALB	.004	.002
08	.003	.002	.002	.002	.002	.002	.002	.002	.002	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.001	.002	.002	CALB	.003	.002
09	.002	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.002	.001	.002	.002	.002	.002	.002	.002	.002	CALB	.003	.002
10	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.001	.001	.002	.002	.002	.002	.002	.002	.001	.002	CALB	.003	.002
11	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.003	.003	.002	.001	.002	.001	.001	.001	.001	.001	.001	.001	CALB	.002	.002
12	.002	.002	.001	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.003	.003	.003	.002	CALB	.002	.002
13	.002	.002	.002	.001	.002	.002	.001	.001	.001	.001	.001	.002	.001	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.003	.002
14	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.003	CALB	.003	.002
15	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.004	.002
16	.003	.002	.002	.002	.002	.002	.002	.002	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.003	.003	CALB	.004	.002
17	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.005	.002
18	.003	.003	.002	.002	.002	.002	.002	.003	.002	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.004	.002
19	.002	.003	.003	.003	.003	.003	.004	.003	.003	.004	.003	.003	.003	.002	.002	.002	.002	.002	.002	.003	.003	.002	CALB	.004	.003
20	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.004	.002
21	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	~~.006~~	.002	.002	.002	.002	.002	.003	.003	.003	.002	CALB	.003	.002
22	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.003	.002	.002	.002	.002	.002	CALB	.003	.002
23	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.002	.002	.002	.002	.002	.002	.001	.001	CALB	.003	.002
24	.002	.003	.003	.002	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.004	.002
25	.003	.004	.003	.003	.002	.002	.002	.002	.002	.003	.002	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.003	.002
26	.002	.002	.002	.002	.002	.002	.002	.002	.002	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.001	.002	.002	CALB	.003	.002
27	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.003	.002
28	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.003	.002
29	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.002	.002
30	.002	.002	.002	.002	.002	.002	.002	.002	.001	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.003	.002
31	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.002	.002	.001	CALB	.002	.002
NO	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	30	31	31	31	31	31	31		31	711
MEAN	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002		.004	.002
MAX	.004	.004	.003	.004	.003	.003	.004	.004	.003	.004	.003	.003	.006	.003	.002	.003	.005	.003	.003	.003	.003	.003		.006	.006

'MALF' - MACHINE MALFUNCTION
'LAB ' - LAB ERROR
'*** ' - NOT ENOUGH READINGS
'WTHR' - BAD WEATHER
'QUAL' - QUALITY ASSURANCE
' ' - NUL VALUE
'VAND' - VANDALISM
'CALB' - CALIBRATION
'COLL' - COLLECTION ERROR
'WAIV' - MONITORING WAIVED

3hr - .003

S : FLORIDA (10) **Best Available Copy** AQDHS-II AIR QUAL[illegible] [illegible]TA REPORT DISPLAY N (9939 PAGE 4

[illegible]R: 000 AGENCY(J): PRIVATE COLLECT [illegible].H: INSTRUMENTAL SLAMS/NAMS(0):
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED ANALYSIS METH: PULSED FLUORSCENCE RPT AGNCY/SMSA: 0000
AREA: 3420 PARM(42401): SULFUR DIOXIDE SAMPLING INTR: 01 HOURS UTM ZONE: 17
SITE: 003 UNITS(07): PARTS PER MILLION SAROAD KEY: 10/3420/003/J/01 UTM EASTING: 000535
YEAR: 1983 MONTH(04): APRIL MINIMUM DETEC: 00000+ TIME ZONE(07): EASTERN
LOCALE: FLORIDA CELERY EXCHANGE BELLE GLADE

PRIMARY
FEDERAL STANDARD

SECONDARY
SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01	.002	.002	.002	.002	.003	.003	.003	.002	.002	.002	.002	.003	.003	.003	.003	.003	.002	.002	.002	.002	.002	.002	CALB	.002	.002
02	.002	.002	.002	.002	.002	MALF	MALF	.002	.002	.001	.002	.001	.002	.001	.002	.001	.001	.001	.002	.002	.002	.002	CALB	.002	.002
03	.001	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.001	.002	.001	.002	.002	.002	CALB	.002	.002
04	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.001	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.003	.002
05	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.003	.002
06	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.003	.002	CALB	.002	.002
07	.002	.002	.002	.002	.002	.002	.002	.002	.003	.003	.003	.003	.002	.002	.002	CALB	.003	.002	.002	.002	.002	.003	CALB	.002	.002
08	.002	.002	.002	.002	.002	.002	.002	.002	.003	.003	.003	.003	.002	.002	.002	.003	.002	.002	.002	.003	.003	.002	CALB	.002	.002
09	.002	.002	.002	.003	.004	.004	.004	.005	.004	.004	.003	.003	.003	.003	.003	.002	.003	.003	.003	.002	.002	.003	CALB	.003	.003
10	.002	.002	.002	.002	.002	.003	.004	.004	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.003	.002
11	.004	.003	.005	.004	.003	.003	.003	.004	.004	.004	.004	.003	.003	.003	.003	.003	.003	.003	.002	.002	.002	.002	CALB	.004	.003
12	.003	.003	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.003	.002	.002	.002	.002	.003	.003	.003	.003	.002	CALB	.005	.003
13	.003	.003	.003	.002	.003	.003	.003	.003	.003	CALB	CALB	CALB	CALB	CALB	CALB	.005	.004	.003	.003	.003	.003	.003	CALB	.005	.003
14	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.003	.003
15	.004	.004	.003	.003	.003	.003	.003	.004	.004	.003	.003	.003	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	.003
16	MALF	MALF	.003	.006	.006	~~.011~~	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	.007
17	MALF	MALF	MALF	.002	.002	.002	.002	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	.002
18	.003	.002	.002	.002	.002	.002	.002	.002	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	MALF	.002
19	MALF	.002	.001	.002	.001	.002	.002	.002	.001	.001	.001	CALB	.002	.002	.002	.002	.002	.002	.002	.002	.003	.002	CALB	.004	.002
20	.003	.002	.002	.002	.002	.003	.003	.003	.003	.003	.002	.002	.002	.002	.002	.003	.002	.002	.002	.002	.002	.002	CALB	.004	.002
21	.003	.003	.003	.002	.003	.003	.003	.003	.004	.004	.004	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.004	.003
22	.003	.003	.003	.002	.003	.001	.003	.002	.003	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.004	.002
23	.003	.003	.002	.002	.003	.003	.002	.002	.002	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.004	.002
24	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.003	.002	.003	.003	.003	.003	.003	.003	CALB	.004	.003
25	.003	.003	.003	.003	.003	.003	.004	.004	.003	CALB	.012	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.004	.004
26	.003	.003	.003	.003	.004	.004	.003	.004	.004	.003	.004	.004	.004	.004	.005	.003	.003	.003	.003	.003	.003	.004	CALB	.005	.004
27	.004	.003	.003	.003	.003	.003	.003	.004	.006	.009	.006	.006	.005	.004	.004	.004	.004	.004	.004	.004	.003	.003	CALB	.004	.004
28	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.004	.004	.003	.003	.003	.004	.003	.003	.003	CALB	.005	.003
29	.004	.003	.003	.003	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.003	.003	.003	.003	.003	CALB	.005	.003
30	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.003	.004	.004	.003	.003	CALB	.003	.003
NO	27	28	29	30	30	29	28	28	27	25	26	25	25	25	25	25	26	26	26	26	26	26		26	614
MEAN	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.003	.003	.002	.002	.003	.003	.003	.002		.004	.003
MAX	.004	.004	.005	.006	.006	~~.011~~	.004	.005	.006	.009	.012	.006	.005	.004	.005	.005	.004	.004	.004	.004	.003	.004		.005	.012

'MALF' - MACHINE MALFUNCTION 'WTHR' - BAD WEATHER 'VAND' - VANDALISM 'COLL' - COLLECTION ERROR
'LAB ' - LAB ERROR 'QUAL' - QUALITY ASSURANCE 'CALB' - CALIBRATION 'WAIV' - MONITORING WAIVED
'*** ' - NOT ENOUGH READINGS ' ' - NUL VALUE

3hr - .007

Best Available Copy

ADCR: 000 AGENCY(J): PRIVATE
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED
AREA: 3420 PARM(42401): SULFUR DIOXIDE
SITE: 003 UNITS(07): PARTS PER MILLION
YEAR: 1989 MONTH(05): MAY
LOCALE: FLORIDA CELERY EXCHANGE BELLE GLADE

COLLECT METH: INSTRUMENTAL
ANALYSIS METH: PULSED FLUURSCENCE
SAMPLING INTR: 01 HOURS
SAROAD KEY: 10/3420/003/J/01
MINIMUM DETEC: 00000+

SLAMS/NAMS(0):
RPT AGNCY/SMSA: 0000
UTM ZONE: 17
UTM EASTING: 000535
TIME ZONE(07): EASTERN

PRIMARY
FEDERAL STANDARD

SECONDARY
SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01	.004	.003	.003	.003	.003	.003	.003	.003	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.002	MALF	.005	.003
02	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.004	.003	.003	.003	CALB	CALB	.004	.003	.003	.003	.003	.003	CALB	.005	.003
03	.004	.003	.003	.003	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.005	.003
04	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.004	.003
05	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.005	.003
06	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.003	.002	.003	.003	.002	.003	.002	CALB	.005	.003
07	.004	.003	.003	.004	.005	.006	.007	.005	.004	.004	.003	.003	.003	.003	.003	.003	.004	.005	.005	.004	.004	.004	CALB	.009	.004
08	.005	.003	.003	.003	.003	.003	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.005	.003
09	.003	.003	.003	.003	.003	.003	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.004	.003
10	.004	.003	.003	.003	.003	.003	.003	.004	.003	.003	.003	.003	CALB	CALB	.004	.003	.003	.003	.003	.003	.003	.003	CALB	.005	.003
11	.004	.003	.003	.003	.003	.003	.004	.003	.003	.003	.003	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	.004	CALB	.008	.003
12	.008	.005	.004	.004	.004	.004	.004	.004	.004	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.005	.004
13	.004	.004	.003	.003	.003	.003	.003	.003	.004	.004	.004	.004	.004	.003	.003	.003	.003	.003	.003	.004	.003	.003	CALB	.006	.003
14	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.003	.003	.004	.004	.003	CALB	.006	.004
15	.005	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.006	.004
16	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.003	.004	.003	.004	.004	CALB	.006	.004
17	.005	.004	.004	.004	.004	.004	.004	.004	.005	.005	.004	.004	.004	.004	.004	.003	.004	.003	.004	.003	.003	.003	CALB	.006	.004
18	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.005	.004
19	.004	.004	.004	.003	.003	.004	.004	.004	.004	.004	.005	.005	.004	.004	.004	.004	.004	.004	.004	.004	.003	.003	CALB	.005	.004
20	.004	.004	.004	.004	.004	.004	.005	.004	.004	.004	.003	.004	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.005	.004
21	.004	.004	.003	.003	.004	.004	.004	.004	.004	.004	.004	.003	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.006	.004
22	.007	.003	.005	.004	.004	.004	.004	.005	.005	.004	.004	.004	.004	.004	.005	.004	.004	.004	.003	.004	.004	.004	CALB	.006	.004
23	.005	.004	.004	.004	.004	.004	.004	.004	.005	.005	.005	.004	.004	.004	.004	.004	.004	.004	.003	.003	.003	.004	CALB	.006	.004
24	.005	.004	.004	.004	.004	.004	.004	CALB	CALB	CALB	.007	.005	.004	.004	.004	.004	.004	.004	.004	.003	.004	.004	CALB	.005	.004
25	.004	.004	.004	.004	.004	.004	.005	.004	(.016	.029	.012)	.007	.005	.004	.004	.003	.003	.004	.004	.004	.003	.003	CALB	.006	.006
26	.005	.004	.004	.004	.004	.004	.005	.008	.007	.006	.005	.005	.005	.004	.004	.004	.004	.004	.004	.004	.005	.004	CALB	.006	.005
27	.005	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.003	.003	.004	.003	.004	.004	CALB	.006	.004
28	.004	.004	.004	.005	.005	.007	.008	.007	.006	.006	.005	.005	.004	.004	.004	.004	.004	.004	.003	.004	.003	.004	CALB	.006	.005
29	.005	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.006	.004
30	.005	.004	.004	.003	.003	.003	.003	.004	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.006	.003
31	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.003	.003	.004	.003	.003	.003	.004	.003	.003	.003	.003	.003	CALB	.006	.004
NO	31	31	31	31	31	31	31	30	30	30	31	31	30	30	30	30	31	31	31	31	31	31		31	706
MEAN	.004	.004	.004	.004	.004	.004	.004	.004	.004	.005	.004	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003		.006	.004
MAX	.008	.005	.005	.005	.005	.007	.008	.008	.016	.029	.012	.007	.005	.004	.005	.004	.004	.005	.005	.004	.005	.004		.009	.029

'MALF' - MACHINE MALFUNCTION 'WTHR' - BAD WEATHER 'VAND' - VANDALISM 'COLL' - COLLECTION ERROR
'LAB ' - LAB ERROR 'QUAL' - QUALITY ASSURANCE 'CALB' - CALIBRATION 'WAIV' - MONITORING WAIVED
'*** ' - NOT ENOUGH READINGS ' ' - NUL VALUE

2\... .019

AQCR: 000 AGENCY(J): PRIVATE
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED
AREA: 3420 PARM(42401): SULFUR DIOXIDE
SITE: 003 UNITS(07): PARTS PER MILLION
YEAR: 1989 MONTH(06): JUNE
LOCALE: FLORIDA CELERY EXCHANGE

COLLECT METH: INSTRUMENTAL
ANALYSIS METH: PULSED FLUORSCENCE
SAMPLING INTR: 01 HOURS
SAROAD KEY: 10/3420/003/J/01
MINIMUM DETEC: 00000+
BELLE GLADE

SLAMS/NAMS(0):
RPT AGNCY/SMSA: 0000
UTM ZONE: 17
UTM EASTING: 000535
TIME ZONE(07): EASTERN

PRIMARY
FEDERAL STANDARD

SECONDARY
SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01	.005	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.003	.003	.003	.004	.003	.003	.004	.004	.003	.003	CALB	.006	.004
02	.004	.004	.004	.003	.004	.004	.004	.004	.004	.004	.004	.003	.003	.003	.005	.004	.004	.003	.003	.003	.003	.003	MALF	.003	.004
03	.004	.003	.003	.003	.004	.004	.004	.003	.003	.004	.004	.004	.004	.003	.004	.003	.003	.003	.003	.003	.004	.004	CALB	.004	.004
04	.003	.004	.003	.004	.004	.004	.004	.004	.004	.006	.005	.006	.005	.005	.004	.004	.004	.004	.003	.004	.004	.004	CALB	.003	.004
05	.004	.003	.003	.003	.004	.004	.004	.004	.004	.003	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.006	.004	CALB	.005	.004
06	.004	.005	.008	(.013	.015	.015)	.011	.008	.007	.007	.007	.007	.007	.006	.005	.005	.005	.005	.004	.004	.004	.004	CALB	.004	.007
07	.004	.004	.004	.004	.004	.004	.004	CALB	CALB	CALB	.009	.006	.005	.004	.004	.003	.003	.003	.003	.003	.003	.003	CALB	.003	.004
08	.003	.003	.003	.003	.003	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.003	.003
09	.004	.004	.003	.004	.004	.004	.005	.004	.004	.004	.004	.004	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.004	.004
10	.004	.004	.004	.004	.004	.004	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.003	.003
11	.003	.003	.003	.003	.003	.003	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.003	.003
12	.003	.003	.003	.003	.003	.003	.004	.003	.004	.005	.004	.004	.004	.004	.004	.003	.003	.003	.003	.003	.003	.003	CALB	.003	.003
13	.003	.003	.003	.003	.003	.003	.004	.003	.004	.003	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.003	.003
14	.003	.004	.003	.003	.004	.004	.004	.003	.003	.003	.003	.003	.003	.004	.004	.004	.003	.003	.003	.003	.003	.003	CALB	.003	.003
15	.003	.003	.003	.003	.003	.003	.004	.003	.003	.003	.003	.003	.003	.004	.003	.004	.004	.004	.004	.004	.004	.004	CALB	.003	.003
16	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.004	.005	.004	.003	.003	.003	.003	.003	.003	.003	CALB	.003	.003
17	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.003	.003
18	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.003	.003
19	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.003	.003
20	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.003	.003
21	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.003	.003
22	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	CALB	CALB	CALB	.005	.004	.003	.003	.003	.003	.003	.003	CALB	.003
23	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.003	.003	.003	.003	.003	.003	.003	.002	CALB	.003
24	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.003
25	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.002	.003	.003	CALB	.003
26	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.003	.002	.003	.003	.003	.003	CALB	.003
27	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.003	.003	CALB	.003
28	.003	.003	.003	.003	.003	.002	.003	.003	.003	.003	.003	.003	.003	.002	.003	.003	.003	.002	.003	.003	.003	.003	.002	CALB	.003
29	.003	.003	.003	.003	.003	.003	.002	.003	.003	.003	.003	.003	.002	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	CALB	.003
30	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.003
NO	30	30	30	30	30	30	30	29	28	29	30	29	29	29	25	30	30	30	30	30	30	30	9	21	682
MEAN	.003	.003	.003	.004	.004	.004	.004	.003	.003	.003	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003
MAX	.005	.005	.008	.013	.015	.015	.011	.008	.007	.007	.008	.007	.007	.006	.005	.005	.005	.005	.004	.004	.006	.004	.003	.006	.015

'MALF' - MACHINE MALFUNCTION
'LAB ' - LAB ERROR
'*** ' - NOT ENOUGH READINGS
'WTHR' - BAD WEATHER
'QUAL' - QUALITY ASSURANCE
' ' - NUL VALUE
'VAND' - VANDALISM
'CALB' - CALIBRATION
'COLL' - COLLECTION ERROR
'WAIV' - MONITORING WAIVED

3hr - .014

Best Available Copy

AQCR: 000 AGENCY(J): PRIVATE
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED
AREA: 3420 PARM(42401): SULFUR DIOXIDE
SITE: 003 UNITS(07): PARTS PER MILLION
YEAR: 1989 MONTH(07): JULY
LOCALE: FLORIDA CELERY EXCHANGE BELLE GLADE

ECT METH: INSTRUMENTAL
LYSIS METH: PULSED FLUORSCENCE
SAMPLING INTR: 01 HOURS
SAROAD KEY: 10/3420/003/J/01
MINIMUM DETEC: 00000+

SLAMS/NAMS(0):
RPT AGNCY/SMSA: 0000
UTM ZONE: 17
UTM EASTING: 000535
TIME ZONE(07): EASTERN

PRIMARY
FEDERAL STANDARD

SECONDARY
SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.003
02	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.002	.003	.003	.003	.002	.003	CALB	.003
03	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.003	.003	.003	.003	.003	CALB	.003
04	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.003
05	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.003
06	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.003
07	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	CALB	.008	.005	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003
08	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003
09	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003
10	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003
11	.003	.003	.003	.003	.003	.003	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003
12	.003	.003	.003	.003	.003	.003	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.003
13	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.003
14	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.003
15	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.003
16	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.003
17	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.003
18	.003	.003	.003	.003	.003	.003	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.003
19	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.003
20	.003	.003	.003	.003	.003	.003	.004	.003	.003	.004	MALF	MALF	MALF	.007	.006	.004	.004	.003	.003	.003	.003	.003	.003	.003	.004
21	.003	.004	.003	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.003	.003	.003	.003	.003	.003	.004
22	.003	.003	.003	.003	.003	.003	.003	.004	.003	.003	.003	.003	.003	.003	.003	.003	.004	.003	.003	.003	.003	.003	.003	CALB	.003
23	.003	.003	.003	.003	.003	.003	.003	.003	.003	.004	.003	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.003
24	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.004	.004	.004	.003	.003	.003	.003	.004	.004	.004	.003	CALB	.003
25	.004	.003	.004	.004	.004	.004	.003	.004	.004	.003	.003	.003	.003	.004	.004	.003	.003	.004	.004	.003	.003	.004	.003	CALB	.004
26	.003	.003	.003	.003	.003	.003	.003					.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	.004	.003	CALB	.003
27	.004	.004	.004	.003	.003	.004	.004	.004	.003	.004	.003	.004	.003	.003	.004	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.003
28	.004	.004	.003	.004	.004	.004	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.003
29	.003	.003	.003	.003	.004	.003	.004	.004	.004	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	CALB	.003
30	.004	.003	.003	.003	.003	.004	.004	.004	.004	.004	.004	.003	.003	.003	.003	.004	.003	.003	.004	.003	.003	.003	.004	CALB	.003
31	.003	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.003	.003	.003	.003	.003	.004	.004	.003	CALB	.004
NO	31	31	31	31	31	31	31	30	30	30	29	29	29	31	31	31	31	31	31	31	31	31	31	7	711
MEAN	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003
MAX	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.008	.006	.004	.004	.004	.004	.004	.004	.004	.004	.003	.008

'MALF' - MACHINE MALFUNCTION
'WTHR' - BAD WEATHER
'VAND' - VANDALISM
'COLL' - COLLECTION ERROR
'LAB ' - LAB ERROR
'QUAL' - QUALITY ASSURANCE
'CALB' - CALIBRATION
'WAIV' - MONITORING WAIVED
'*** ' - NOT ENOUGH READINGS
'   ' - NUL VALUE

3h-- .006

Best Available Copy

[illegible]ATE: FLORIDA (10) AQDHS-II AIR [illegible]Y DATA REPORT DISPLAY N (9999 PAGE 8

AQCR: 000 AGENCY(J): PRIVATE
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED
AREA: 3420 PARM(42401): SULFUR DIOXIDE
SITE: 003 UNITS(07): PARTS PER MILLION
YEAR: 1989 MONTH(08): AUGUST
LOCALE: FLORIDA CELERY EXCHANGE BELLE GLADE

COLLECT METH: INSTRUMENTAL
ANALYSIS METH: PULSED FLUORSCENCE
SAMPLING INTR: 01 HOURS
SAROAD KEY: 10/3420/003/J/01
MINIMUM DETEC: 00000+

SLAMS/NAMS(0):
RPT AGNCY/SMSA: 0000
UTM ZONE: 17
UTM EASTING: 000535
TIME ZONE(07): EASTERN

PRIMARY
FEDERAL STANDARD

SECONDARY
SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01	.003	.003	.003	.003	.003	.004	.004	.004	.004	MALF	MALF	MALF	CALB	CALB	.002	.002	.002	.002	.002	.001	.001	.001	CALB	.005	.003
02	.002	.002	.002	.002	.002	.002	.002	.002	.002	.004	.003	.003	.002	.002	.002	.002	.002	.001	.001	.001	.001	.001	CALB	.005	.002
03	.002	.002	.002	.001	.001	.002	.002	.001	.002	.002	.002	.002	.001	.001	.002	.002	.001	.001	.001	.001	.001	.001	CALB	.004	.002
04	.002	.002	.002	.002	.002	.002	.002	.002	.001	.002	.002	.002	.002	.002	.002	.002	.001	.001	.001	.001	.001	.001	CALB	.004	.002
05	.002	.002	.002	.001	.002	.002	.001	.001	.001	.001	.002	.001	.002	.001	.001	.001	.002	.002	.002	.002	.002	.001	CALB	.005	.002
06	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.002	.002	.002	.002	.002	.002	.003	CALB	.004	.002
07	.002	.002	.002	.002	.002	.002	.002	.002	.001	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.001	CALB	.005	.002
08	.002	.002	.002	.001	.001	.002	.002	.002	.002	.001	.001	.001	.001	.001	.002	.002	.001	.001	.002	.001	.002	.001	CALB	.005	.002
09	.002	.002	.002	.002	.002	.002	.001	.002	.002	.002	.001	.002	.002	.002	.001	.002	.002	.002	.001	.001	.001	.001	CALB	.004	.002
10	.002	.002	.002	.002	.002	.002	.002	.001	.002	.002	.002	.001	.001	.001	.001	.001	.001	.000	.001	.001	.001	.002	CALB	.005	.002
11	.002	.002	.001	.001	.001	.002	.002	.002	.002	.002	.002	.002	.001	.001	.001	.001	.001	.002	.001	.002	.002	.002	CALB	.005	.002
12	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.002	.002	.002	.001	.001	.002	.001	.002	.002	.002	.002	CALB	.005	.002
13	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.001	.002	.001	.002	.001	.002	.002	.002	.002	CALB	.006	.002
14	.002	.002	.002	.002	.001	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.002	.001	.002	.002	.001	.002	.002	CALB	.006	.002
15	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.003	.002	.002	.002	.002	.002	.002	.001	.001	.001	CALB	.005	.002
16	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.003	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.004	.002
17	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	CALB	CALB	CALB	CALB	.003	.002	.002	.002	.002	.002	.002	.002	CALB	.006	.002
18	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.005	.002
19	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.005	.002
20	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.006	.002
21	.003	.003	.003	.003	.002	.003	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.007	.003
22	.003	.003	.003	.003	.003	.002	.002	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.006	.002
23	.003	.003	.002	.002	.003	.003	.003	.002	CALB	CALB	.003	.002	.002	.002	.003	.002	.002	.002	.002	.002	.002	.002	CALB	.006	.003
24	.003	.003	.002	.002	.003	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.006	.002
25	.003	.003	.003	.003	.003	.003	.003	.002	.002	.002	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.005	.002
26	.003	.003	.003	.002	.003	.003	.003	.003	.002	.003	.003	.002	.002	.002	.003	.002	.002	.002	.002	.002	.002	.002	CALB	.006	.003
27	.003	.003	.002	.002	.002	.002	.002	.002	.003	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.006	.002
28	.003	.003	.002	.003	.003	.003	.002	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.003	CALB	.006	.003
29	.003	.003	.002	.003	.003	.003	.002	.002	.002	.002	CALB	~~.002~~	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.005	.003
30	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.006	.002
31	.003	.003	.003	.002	.003	.003	.003	.003	.002	.002	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.006	.003
NO	31	31	31	31	31	31	31	31	30	28	28	29	29	29	31	31	31	31	31	31	31	31		31	700
MEAN	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002		.005	.002
MAX	.003	.003	.003	.003	.003	.004	.004	.004	.004	.004	.003	.009	.003	.003	.003	.002	.002	.002	.002	.002	.002	.003		.007	.009

'MALF' - MACHINE MALFUNCTION 'WTHR' - BAD WEATHER 'VAND' - VANDALISM 'COLL' - COLLECTION ERROR
'LAB ' - LAB ERROR 'QUAL' - QUALITY ASSURANCE 'CALB' - CALIBRATION 'WAIV' - MONITORING WAIVED
'*** ' - NOT ENOUGH READINGS ' ' - NUL VALUE

3hr - .004

DISPLAY N (9959 PAGE 9

Best Available Copy

AQCR: 000 AGENCY(J): PRIVATE
CNTY: 3420 PROJECT(01): POPULATION - ORIENTED
AREA: 3420 PARM(42401): SULFUR DIOXIDE
SITE: 003 UNITS(07): PARTS PER MILLION
YEAR: 1989 MONTH(09): SEPTEMBER
LOCALE: FLORIDA CELERY EXCHANGE BELLE GLADE

COLLECT METH: INSTRUMENTAL
ANALYSIS METH: PULSED FLUORSCENCE
SAMPLING INTR: 01 HOURS
SAROAD KEY: 10/3420/003/J/01
MINIMUM DETEC: 000004

SLAMS/NAMS(0):
RPT AGNCY/SMSA: 0000
UTM ZONE: 17
UTM EASTING: 000535
TIME ZONE(07): EASTERN

PRIMARY
FEDERAL STANDARD

SECONDARY
SULFUR DIOXIDE

HOURS

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
01	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.006	.003
02	.003	.003	.002	.002	.003	.002	.003	.002	.002	.003	.002	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.006	.002
03	.003	.002	.002	.003	.002	.002	.002	.003	.002	.002	.002	.002	.002	.002	.003	.002	.002	.002	.002	.002	.002	.002	CALB	.005	.002
04	.003	.003	.002	.002	.002	.002	.002	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.006	.002
05	.003	.003	.002	.002	.002	.002	.002	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.006	.002
06	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.003	CALB	.006	.003
07	.003	.003	.002	.002	.002	.002	.002	.002	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.005	.002
08	.003	.002	.002	.002	.002	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.005	.002
09	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.006	.002
10	.003	.003	.002	.002	.002	.002	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.003	.003	.003	.002	.002	CALB	.006	.002
11	.003	.003	.002	.003	.002	.002	.002	.002	.003	.002	.002	.002	.002	.002	.002	.002	.002	.003	.003	.003	.003	.003	CALB	.006	.003
12	.003	.003	.003	.003	.002	.003	.003	.003	.002	.003	.002	.002	.002	.002	.003	.003	.003	.003	.002	.002	.002	.002	CALB	.006	.003
13	.003	.003	.003	.003	.003	.003	.003	.003	CALB	~~.009~~	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.005	.003
14	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.002	.002	.002	.002	CALB	.006	.002
15	.003	.002	.002	.002	.002	.003	.002	.002	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.006	.002
16	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.006	.002
17	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.001	.002	.002	CALB	.006	.002
18	.003	.002	.002	.002	.002	.002	.002	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.006	.002
19	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.005	.002
20	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.002	.002	.001	.001	.001	CALB	.004	.002
21	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.005	.002
22	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.003	.002	.002	.001	.002	.002	.002	.002	.002	.002	CALB	.004	.002
23	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.005	.002
24	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.004	.002
25	.003	.002	.002	.002	.002	.002	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.005	.002
26	.003	.003	.003	.003	.003	.003	.003	.003	CALB	CALB	CALB	CALB	CALB	CALB	CALB	CALB	CALB	CALB	CALB	CALB	CALB	CALB	MALF	.003	.003
27	.003	.003	.003	.003	.003	.003	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.002	.002
28	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	~~.005~~	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.006	.002
29	.003	.003	.002	.002	.002	.002	.003	.002	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.006	.002
30	.003	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	CALB	.006	.002
NO	30	30	30	30	30	30	30	30	28	26	29	29	29	29	29	29	29	29	29	29	29	29		30	674
MEAN	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002		.005	.002
MAX	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.005	.003	.003	.002	.003	.003	.003	.003	.003	.003	.003	.003		.006	.003

'MALF' - MACHINE MALFUNCTION 'WTHR' - BAD WEATHER 'VAND' - VANDALISM 'COLL' - COLLECTION ERROR
'LAB ' - LAB ERROR 'QUAL' - QUALITY ASSURANCE 'CALB' - CALIBRATION 'WAIV' - MONITORING WAIVED
'*** ' - NOT ENOUGH READINGS ' ' - NUL VALUE

3hr = .003