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November 17, 2000

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BUREAU OF AIR REGULATION

Florida Department of Environmental Protection
New Source Review Section
2600 Blair Stone Road
Tallahassee, FL

Attention: Jeffery Koerner, P.E.

RE: UNITED STATES SUGAR CORPORATION (U.S. SUGAR) – PSD PERMIT
APPLICATION FOR BOILER NO. 4 AND THE SUGAR REFINERY AT THE
CLEWISTON MILL
DRAFT PERMIT NO. 0510003-010-AC; PSD-FL-272A

Dear Mr. Koerner:

United States Sugar Corporation (U.S. Sugar) received the draft permit for the above referenced project from the Florida Department of Environmental Protection. The draft permit has been reviewed, and several comments and concerns have been identified. The comments are addressed below, in the same order as they appear in the draft permit.

Cover Letter

Mr. Brinson has retired from U. S. Sugar. Mr. William A. Raiola, Vice President, is now the authorized representative for the Clewiston mill.

Placard Page

Mr. William A. Raiola, Vice President, is now the authorized representative for the Clewiston mill.

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3. Footnote "b" of table: insert the word "(net)" after 1160 Btu in order to clarify that this is the net Btu difference between the steam enthalpy and the feedwater enthalpy.

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6. In the second sentence, revise "...from the dedicated storage tank" to "...from a dedicated storage tank", since a tank different than the tank currently used could be utilized in the future.

8. c. The emissions unit description on page 5 of 25 states that a nominal 250 to 500 gallons per minute of water is supplied to the spray nozzles. However, 8.c. states that the water flow rate to the scrubber nozzles shall be maintained above 375 gallons per minute. Based on historic particulate matter (PM) compliance test data for Boiler No. 4, compliance has been demonstrated at scrubber water flow rates of less than 375 gpm. For example, the December 1996 compliance test was conducted with an average scrubber water flow rate of

245 gpm. It is therefore requested that this condition be revised to state that the scrubber water flow rate be maintained at a minimum of 90% of the water flow at which the scrubber was operated during the latest compliance test that demonstrated compliance with the PM emission limit (as a 3-hour block average).

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15. It is noted that consent order 00-0908-26-AP dated August 1, 2000, requires U. S. Sugar to perform twelve (12) 1-hour VOC runs on Boiler No. 4, to be conducted with the CO compliance testing to be performed during the 2000-2001 sugar processing season. Based on the VOC testing, the permittee may apply for a revised VOC limit, and the Department must establish a new VOC limit, based upon this testing, which can be achieved through application of good combustion practices.

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17. Note that the initial performance tests required for Boiler No. 4 under permit no. 0510003-009-AC; PSD-FL-272) have been completed. This included compliance testing for CO, NO_x, PM/PM₁₀, SO₂, VOC, sulfuric acid mist, visible emissions and a boiler thermal efficiency test. The summary pages from the compliance tests are attached. The test results demonstrated compliance for all pollutants, except for VOC. As described above, VOC is being addressed through a consent order. As a result, and based on our recent conversation, no further testing should be required for sulfuric acid mist emissions.

18. The initial SO₂ tests demonstrated emissions less than 0.03 lb/MMBtu, and a boiler thermal efficiency of greater than 50%. Therefore, no annual testing for these parameters are required (see attached stack test results).

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4. In order to clarify that no additional record keeping is required by this permit, it is requested to reword the first sentence as "The maximum capacities for each boiler are stated below. For Boiler Nos. 1, 2 and 3, the capacities are for informational purposes only". Also, in order to be consistent with condition 10 of this subsection, it is requested that the steam capacities be based upon 3-hour averages. It is not expected that the boilers will be operated at steam rates above the stated 1-hour capacities. However, future permits (i.e., Title V) may require recordkeeping on an hourly basis because of the 1-hour capacities, which would be very burdensome. All air quality modeling analysis were based on 3-hour or longer averaging times, except for the pollutant CO. For CO, the very conservative modeling analysis showed that the maximum 1-hour CO impact would not be approached. Therefore, there is little potential for exceeding the 1-hour CO standard based on specifying 3-hour steam capacities.

4.d. It is requested that the limitations for Boiler No. 4 be deleted, as they are repetitious of other conditions in this permit for Boiler No. 4, and therefore are unnecessary.

4.e. It is requested that the limitations for Boiler No. 7 be deleted, as they are repetitious of conditions in other permits for Boiler No. 7, and therefore are unnecessary here.

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5.b. It is requested that wording be added to this condition to allow fuel oil with sulfur content of greater than 1.6%, if SO₂ testing when burning fuel oil demonstrates equivalent SO₂ emissions (due to removal of SO₂ in the boiler/scrubber system when burning fuel oil). Prior to any such testing, a test plan would be submitted to the Department presenting the fuel oil burning conditions for the boiler, scrubber parameters to be measured, etc.

5.c. It is requested that the limitations for Boiler No. 4 be deleted, as they are repetitious of other conditions in this permit for Boiler No. 4, and therefore are unnecessary.

5.d. It is requested that the limitations for Boiler No. 7 be deleted, as they are repetitious of conditions in other permits for Boiler No. 7, and therefore are unnecessary here.

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7.b(1). Please delete this condition. It is unnecessary and unwarranted. The reason for the extensive air modeling analysis conducted by U.S. Sugar, as well as raising the stacks and agreeing to burn lower sulfur fuel oil during the off-season, was to obtain operating flexibility. These efforts were very costly to U. S. Sugar. In addition, the Boiler No. 4 PSD permit specifically allows up to 8,760 hr/yr operation. This condition negates these efforts. The Department and the EPA required U.S. Sugar to model a number of operational scenarios. This included Boiler No. 7 shutdown and only Boiler Nos. 1, 2 and 3 operating during the off-season. Boiler Nos. 1, 2 and 3 had to be treated as totally increment consuming during the off-season. U. S. Sugar should have the flexibility to operate any of the five boilers throughout the year to meet steam demands as well as maintenance schedules.

In the first sentence after condition 7.b(4), add additional language to cover instrument downtime due to breakdown, malfunction, repair and calibration.

10.a. The requirement to calculate and record the 24-hour average steam production rate based on the actual operating hours during the 24-hour period could result in erroneous actual steam rates. For example, under this condition, if a boiler only operated 6 hours during a day, the average 6-hour steam production during this period would also be recorded as the average 24-hour steam rate. However, the actual 6-hour average steam production can be above the permitted 24-hour steam rate, since the 3-hour limitation is higher than the 24-hour limitation. Therefore, the 24-hour average steam rate should be based on 24-hours no matter the actual hours the boiler operated.

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11. Reword the second sentence as: "From this data, the permittee shall calculate and record the **combined** oil firing rates (gallons) for each 3-hour and each 24-hour block of operation for Boiler Nos. 1 - 4."

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1,2. These conditions should specifically state that Subpart Kb applies to EU 024 and 026.

5. Replace the word "facility" with the word "tank" at the end of this condition.

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9. Note that the initial performance tests required for the GCRF under permit no. 0510003-009-AC; PSD-FL-272) have been completed. This included compliance testing for PM, VOC and visible emissions. The summary pages from the compliance tests are attached. The test results demonstrated compliance for all pollutants. As a result, and based upon our recent conversation, no further testing should be required except for the operating permit renewal testing.

11. Reword according to the rule language, which describe production rates during compliance testing and provisions if testing is not performed within 90% of maximum.

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3. Note that since some of these sources have not yet been constructed, it is requested that the construction expiration date be no sooner than November 1, 2002. U. S. Sugar does not have a definitive schedule for construction of these sources at this time. The following sources have not yet been constructed:

- S-13, S-14 and S-15: three (3) sugar silos
- S-16: powdered sugar/starch bins

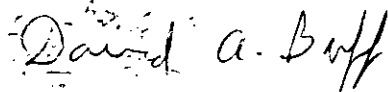
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6. Note that the initial performance tests required for the already constructed sources under permit no. 0510003-009-AC; PSD-FL-272) have been completed. This included compliance testing for visible emissions. The summary pages from the compliance tests are attached. The test results demonstrated compliance for all pollutants.

Thank you for consideration of these comments in issuing the final permit. Please call or e-mail me if you have any additional questions concerning this information.

Sincerely,

GOLDER ASSOCIATES INC.



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

DB/jkw

Attachments

cc: Don Griffin
Bill Wehrum
Lisa Gefen

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C. Mallahan
P. Blackburn, SD
EPA
NPS



**SOURCE TEST REPORT
ASME BOILER EFFICIENCY DETERMINATION**

FOR

**BOILER 4
BAGASSE FIRING
U.S. SUGAR CORPORATION
CLEWISTON, FLORIDA**

**FDEP PERMIT 051-0003-009-AC
PSD-FL-272**

FEBRUARY 24, 2000

PREPARED FOR:

**U.S. SUGAR CORPORATION
SOUTH W.C. OWEN AVENUE
CLEWISTON, FLORIDA 33440**

PREPARED BY:

**AIR CONSULTING AND ENGINEERING, INC.
2106 NW 67TH PLACE, SUITE 4
GAINESVILLE, FLORIDA 32653
(352) 335-1889**

238-00-10

1.0 INTRODUCTION

On February 24, 2000 Air Consulting and Engineering, Inc. (ACE) performed a boiler efficiency test on the Number 4 Boiler at U.S. Sugar Corporation's (USSC) facility in Clewiston, Florida.

Testing was conducted according to the specifications of the American Society of Mechanical Engineer's (ASME) Power Test Code 4.1 (PTC 4.1).

The Boiler Efficiency was determined by the Heat Loss Method (Section 5 of PTC 4.1). This method requires the determination of heat losses and heat credits using results of the proximate and ultimate analysis of a fuel sample, high heat value of the fuel, and fly ash results. Steam output was measured to establish the capacity at which the losses occur.

Testing was conducted using 100% Bagasse Fuel firing at an average steam rate of 195,750 pounds of steam per hour.

Mr. Brett Nesbitt of USSC Clewiston coordinated the test.

2.0 SUMMARY AND DISCUSSION OF RESULTS

The Heat Loss Method was used for calculating boiler efficiency, which resulted in a value of 59.0%.

The following inputs were required for this calculation:

1. Fuel Analysis (Ultimate and Proximate)
2. Flue gas composition
3. Flue gas temperature
4. Temperature of combustion air
5. Combustible content and quantity of dust in exit gases
6. Combustible content and quantity of dust collector hoppers
7. Combustible content and quantity of ash pit refuse
8. Entering fuel temperature
9. Other energy inputs
10. Humidity of combustion air
11. Radiation losses
12. Sensible heat in flue dust
13. Other losses

2.1 Fuel Analysis

Six individual bagasse feed fuel samples were collected over the 1.5-hour duration of the efficiency test. The fuel analysis, ultimate and proximate analysis, was performed by Hazen Research, Inc. (Appendix B) using a composite of these six bagasse samples.

2.2 Flue Gas Composition

United States Environmental Protection Agency's (EPA) Methods 3A, and 10 were conducted by traversing the exhaust stack at a point prior to the primary dust collector, I.D. Fan, and Scrubber (Figure 1). CO concentrations were insignificant and entered as zero values in the PTC 4.1 calculations.

2.3 Flue Gas Temperature

The average flue gas exit temperature was also determined during the traverse conducted in 2.2.

2.4 Combustible Content and Quantity of Flue Gas Dust

EPA Method 5 was used to determine the dust emission rate (see Figure 1 for sampling point location). Of the two stack test ports only one port was utilized to measure O₂, CO₂, PM and CO.

The particulate matter and the fly ash sample collected in the EPA 5 sampling train was analyzed along with a hopper fly ash sample and a grate fly ash sample by Hazen for loss in ignition (% combustible) and % carbon content. These results are also provided in Appendix B. A percentage of the fly ash, hopper and grate ash were added to yield the percent combustible in the refuse sample (Item 22).

2.5 Entering Conditions

The fuel and flue gas temperatures and moisture percentages were measured.

2.6 Radiation and Other Losses

Radiation losses were determined using Figure 8 of PTC 4.1 and were determined to be 0.40 %. "Other Losses" are estimated to be 0.5% of the "as fired" BTU input. This is a typical value.

2.7 SO₂ Reduction Efficiency

SO₂ inlet concentrations were calculated using the sulfur content and the higher heating value from the bagasse analysis. Outlet emissions, measured during the previous compliance test, were 0.00013 lbs/MMBTU. The SO₂ reduction efficiency was 99.92% (see Appendix B for calculations).

3.0 PROCESS DESCRIPTION AND OPERATION

The Number 4 Boiler at USSC's Clewiston facility is a traveling grate stoker design manufactured by Foster Wheeler and capable of producing a maximum of 300,000 lbs/hr of steam at 750 °F and 600 psig. It is primarily used for bagasse fuel firing. Supplemental oil firing was not used during the emission test series. The boiler averaged 195,750 lbs/hr steam production.

Oil meters, steam integrators, and other production monitoring devices were rigorously calibrated prior to the production season.

TEST NO	1	BOILER NO.	4	DATE	2/24/2000
OWNER OF PLANT	USSC - Clewiston Mill		LOCATION	Clewiston, Florida	
TEST CONDUCTED BY	Air Consulting & Eng., Inc		OBJECTIVE OF TEST	Boiler thermal eff. DURATION 1.5 HRS	
BOILER MAKE & TYPE	Foster Wheeler Traveling Grate		RATED CAPACITY	300,000 lbs/hr	
STOKER TYPE & SIZE	Detroit Stoker		633 MM DIA H	750° F @ 600 PSIG	
PULVERIZER, TYPE & SIZE			BURNER, TYPE & SIZE		
FUEL USED	Bagasse	MINE	NA	COUNTY	NA
		STATE		STATE	

PRESSURES & TEMPERATURES				FUEL DATA			
1	STEAM PRESSURE IN BOILER DRUM	psia		37	COAL AS FIRED PROX. ANALYSIS	% wt	
2	STEAM PRESSURE AT S. H. OUTLET	psia	567	37	MOISTURE	53.13	51
3	STEAM PRESSURE AT R. H. INLET	psia		38	VOL MATTER	38.62	52
4	STEAM PRESSURE AT R. H. OUTLET	psia		39	FIXED CARBON	5.70	53
5	STEAM TEMPERATURE AT S. H. OUTLET	F	776	40	ASH	2.55	44
6	STEAM TEMPERATURE AT R. H. INLET	F		TOTAL		100.0	41
7	STEAM TEMPERATURE AT R. H. OUTLET	F		41	Btu per lb AS FIRED	3636	
8	WATER TEMP. ENTERING (ECON.) (BOILER)	F		42	ASH SOFT TEMP. ASTM METHOD		
9	STEAM QUALITY % MOISTURE OR P. P. M.		256	COAL OR OIL AS FIRED ULTIMATE ANALYSIS			54
10	AIR TEMP. AROUND BOILER (AMBIENT)	F	80	43	CARBON	23.06	55
11	TEMP AIR FOR COMBUSTION (This is Reference Temperature) †	F	80	44	HYDROGEN	2.43	56
12	TEMPERATURE OF FUEL	F		45	OXYGEN	18.62	57
13	GAS TEMP. LEAVING (Boiler) (Econ.) (Air Htr.)	F	385	46	NITROGEN	0.18	58
14	GAS TEMP. ENTERING AH (If conditions to be corrected to guarantee)	F	437	47	SULPHUR	0.03	59
				40	ASH	2.55	60
				37	MOISTURE	53.13	61

UNIT QUANTITIES			
15	ENTHALPY OF SAT. LIQUID (TOTAL HEAT)	Btu/lb	
16	ENTHALPY OF (SATURATED) (SUPERHEATED) STM.	Btu/lb	1396.7
17	ENTHALPY OF SAT. FEED TO (BOILER) (ECON.)	Btu/lb	226.7
18	ENTHALPY OF REHEATED STEAM R. H. INLET	Btu/lb	NA
19	ENTHALPY OF REHEATED STEAM R. H. OUTLET	Btu/lb	NA
20	HEAT ABS LB OF STEAM (ITEM 16 - ITEM 17)	Btu/lb	1170
21	HEAT ABS. LB R. H. STEAM (ITEM 19 - ITEM 18)	Btu/lb	NA
22	DRY REFUSE (ASH PIT + FLY ASH) PER LB AS FIRED FUEL	lb/lb	0.0354
23	Btu PER LB IN REFUSE (WEIGHTED AVERAGE)	Btu/lb	4058.6
24	CARBON BURNED PER LB AS FIRED FUEL	lb/lb	0.221
25	DRY GAS PER LB AS FIRED FUEL BURNED	lb/lb	5.80
26	ACTUAL WATER EVAPORATED	lb/hr	
27	REHEAT STEAM FLOW	lb/hr	
28	RATE OF FUEL FIRING (AS FIRED wt)	lb/hr	
29	TOTAL HEAT INPUT (Item 28 x Item 41) / 1000	kB/hr	
30	HEAT OUTPUT IN BLOW-DOWN WATER	kB/hr	
31	TOTAL HEAT OUTPUT (Item 26 + Item 20) + (Item 27 + Item 21) + Item 30 / 1000	kB/hr	
48	GRINDABILITY INDEX*		
49	FINENESS % THRU 50 M*		
50	FINENESS % THRU 200 M*		
64	INPUT-OUTPUT EFFICIENCY OF UNIT %		ITEM 31 = 100 / ITEM 29
HEAT LOSS EFFICIENCY			
65	HEAT LOSS DUE TO DRY GAS	Btu/lb A. F. FUEL	424.6
66	HEAT LOSS DUE TO MOISTURE IN FUEL	% of A. F. FUEL	11.68
67	HEAT LOSS DUE TO H ₂ O FROM COMB OF H ₂		630.7
68	HEAT LOSS DUE TO COMBUST. IN REFUSE		17.35
69	HEAT LOSS DUE TO RADIATION		259.6
70	UNMEASURED LOSSES		7.14
71	TOTAL		147.7
72	EFFICIENCY = (100 - Item 71)		3.95

HOURLY QUANTITIES			
32	FLUE GAS ANAL. (BOILER) (ECON) (AIR HTR) OUTLET	% VOL	
33	CO ₂	% VOL	10
34	O ₂	% VOL	8.73
35	CO	% VOL	0
36	N ₂ (BY DIFFERENCE)	% VOL	81.27
37	EXCESS AIR	%	66.81

* Not Required for Efficiency Testing

† For Point of Measurement See Par. 7.2.8.1-PTC 4.1-1964

ASME TEST FORM
CALCULATION SHEET FOR ABBREVIATED EFFICIENCY TEST Revised September, 1965

OWNER OF PLANT <i>USSC - Uinston B4</i> TEST NO. <i>1</i> BOILER NO. <i>4</i> DATE <i>2/24/2000</i>			
30	HEAT OUTPUT IN BOILER BLOW-DOWN WATER = LB OF WATER BLOW-DOWN PER HR x	$\frac{\text{ITEM 15} - \text{ITEM 17}}{1000}$	= <i>.....</i> kB/hr
24	<p><i>If impractical to weigh refuse, this item can be estimated as follows</i></p> <p>DRY REFUSE PER LB OF AS FIRED FUEL = $\frac{\% \text{ ASH IN AS FIRED COAL}}{100 - \% \text{ COMB. IN REFUSE SAMPLE}}$</p> <p>CARBON BURNED PER LB AS FIRED FUEL = $\frac{\text{ITEM 43}}{100} - \left[\frac{\text{ITEM 22} \times \text{ITEM 23}}{14,500} \right] = \frac{23.06}{100} - \left[\frac{0.0354 \times 4058.6}{14,500} \right] = 0.221$</p>	<p>NOTE: IF FLUE DUST & ASH PIT REFUSE DIFFER MATERIALLY IN COMBUSTIBLE CONTENT, THEY SHOULD BE ESTIMATED SEPARATELY. SEE SECTION 7, COMPUTATIONS.</p>	
25	<p>DRY GAS PER LB AS FIRED FUEL BURNED = $\frac{11\text{CO}_2 + 8\text{O}_2 + 7(\text{N}_2 + \text{CO})}{3(\text{CO}_2 + \text{CO})} \times (\text{LB CARBON BURNED PER LB AS FIRED FUEL} + \frac{3}{8} \text{S})$</p> <p>= $\frac{11 \times \frac{\text{ITEM 32}}{10} + 8 \times \frac{\text{ITEM 33}}{8.73} + 7 \left(\frac{\text{ITEM 35}}{81.37} + \frac{\text{ITEM 34}}{0} \right)}{3 \times \left(\frac{\text{ITEM 32}}{10} + \frac{\text{ITEM 34}}{0} \right)} \times \left[\frac{\text{ITEM 24}}{0.221} + \frac{\text{ITEM 47}}{0.03} \right] = 5.80$</p>		
36	<p>EXCESS AIR % = $100 \times \frac{\text{O}_2 - \frac{\text{CO}}{2}}{.2682\text{N}_2 - (\text{O}_2 - \frac{\text{CO}}{2})}$</p> <p>= $100 \times \frac{\text{ITEM 33} - \frac{\text{ITEM 34}}{2}}{.2682(\text{ITEM 35}) - (\text{ITEM 33} - \frac{\text{ITEM 34}}{2})}$ = <i>66.81</i></p>		
HEAT LOSS EFFICIENCY			
		Btu/lb AS FIRED FUEL	LOSS $\frac{\text{HHV}}{100} \times$ 100 =
65	<p>HEAT LOSS DUE TO DRY GAS = $\frac{\text{LB DRY GAS PER LB AS FIRED FUEL}}{\text{FIRED FUEL}} \times C_p \times (t_{\text{fg}} - t_{\text{air}}) = \frac{\text{ITEM 25}}{5.80} \times 0.24 \times (\text{ITEM 13}) - (\text{ITEM 11}) = 3.85 \times 8.0 = 424.6$</p>	424.6	$\frac{65}{41} \times 100 = 11.68$
66	<p>HEAT LOSS DUE TO MOISTURE IN FUEL = $\frac{\text{LB H}_2\text{O PER LB AS FIRED FUEL} \times [(\text{ENTHALPY OF VAPOR AT 1 PSIA \& T GAS LVG}) - (\text{ENTHALPY OF LIQUID AT T AIR})]}{100} = \frac{\text{ITEM 37}}{100} \times [(\text{ENTHALPY OF VAPOR AT 1 PSIA \& T ITEM 13}) - (\text{ENTHALPY OF LIQUID AT T ITEM 11})] = 6.30.7$</p>	6.30.7	$\frac{66}{41} \times 100 = 17.35$
67	<p>HEAT LOSS DUE TO H₂O FROM COMB. OF H₂ = $9\text{H}_2 \times [(\text{ENTHALPY OF VAPOR AT 1 PSIA \& T GAS LVG}) - (\text{ENTHALPY OF LIQUID AT T AIR})]$</p> <p>= $9 \times \frac{\text{ITEM 44}}{100} \times [(\text{ENTHALPY OF VAPOR AT 1 PSIA \& T ITEM 13}) - (\text{ENTHALPY OF LIQUID AT T ITEM 11})] = 259.6$</p>	259.6	$\frac{67}{41} \times 100 = 7.14$
68	<p>HEAT LOSS DUE TO COMBUSTIBLE IN REFUSE = $\text{ITEM 22} \times \text{ITEM 23} = 0.0354 \times 4058.6 = 147.7$</p>	147.7	$\frac{68}{41} \times 100 = 3.95$
69	<p>HEAT LOSS DUE TO RADIATION* = $\frac{\text{TOTAL BTU RADIATION LOSS PER HR}}{\text{LB AS FIRED FUEL}} = \text{ITEM 28}$</p>	$\frac{69}{41} \times 100 = 0.40$
70	UNMEASURED LOSSES**	$\frac{70}{41} \times 100 = 0.50$
71	TOTAL	41.02
	EFFICIENCY = (100 - ITEM 71)	59.0

† For rigorous determination of excess air see Appendix 9.2 - PTC 4.1-1964
 * If losses are not measured, use ABMA Standard Radiation Loss Chart, Fig. 8, PTC 4.1-1964
 ** Unmeasured losses listed in PTC 4.1 but not tabulated above may be provided for by assigning a mutually agreed upon value for Item 70.

AIR CONSULTING AND ENGINEERING, INC.

ASME BOILER EFFICIENCY TEST

CALCULATION SHEET

COMPANY NAME: United States Sugar Corporation

SOURCE: Boiler 4

LOCATION: Clewiston, Florida

Item 22: Dry Refuse per lb as Fired Fuel

LOI of Fly Ash = 43.17 % used 60% (Appendix B - Laboratory Analysis)
LOI of Hopper Ash = 3.95 % used 30%
LOI of Grate Ash = 5.81 % used 10%

% Combustible in Refuse Sample = $43.17(0.60) + 3.95(0.30) + 5.81(0.10) = 27.99\%$

$$= \frac{\% \text{ Ash in as Fired Bagasse}}{100 - \% \text{ Comb. in Refuse Sample}} = \frac{2.55}{100 - 27.99} = 0.0354 \text{ dry refuse/lb as fired fuel}$$

Item 23: BTU per lb in Refuse

As per PTC 4.1 paragraph 7.3.2.01

= Lab. Determination of % Comb. x 14500 BTU/lb = $(27.99/100) 14500 = 4058.6 \text{ BTU/lb}$

Item 66: Heat Loss due to Moisture in Fuel

Enthalpy of Vapor @ 385 F and 1 psia = 1235.1 BTU/lb

Enthalpy of Water @ 80 F amb. Air and 1 psia = 48.04 BTU/lb

$$\frac{53.13}{100} (1235.1 - 48.04) = 630.7 \text{ BTU/lb}$$

Item 67: Heat Loss due to H₂O from Combustion of H₂

Enthalpy of Vapor @ 385 F and 1 psia = 1235.1 BTU/lb

Enthalpy of Water @ 80 F amb. Air and 1 psia = 48.04 BTU/lb

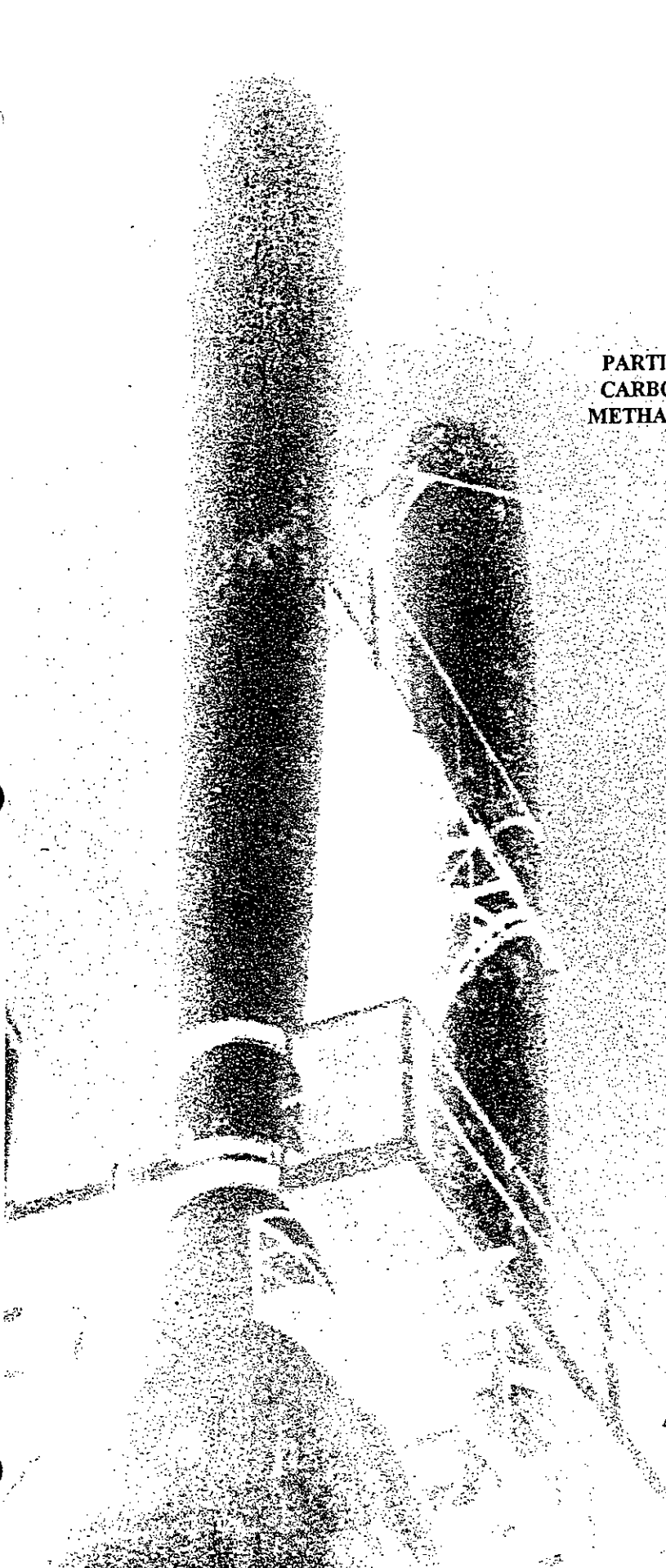
$$9 \left(\frac{2.43}{100} \right) (1235.1 - 48.04) = 259.6 \text{ BTU/lb}$$

Item 69: Heat Loss due to Radiation

PTC 4.1 Figure 8 at 425 MMBTUH Loss = 0.4 %

Item 70: Unmeasured Losses

Typical Loss = 0.5 %



**SOURCE TEST REPORT
FOR
PARTICULATE MATTER, SULFUR DIOXIDE, ACID MIST,
CARBON MONOXIDE, OXIDES OF NITROGEN AND NON-
METHANE VOLATILE ORGANIC COMPOUNDS EMISSIONS**

**BOILER 4
IMPINGEMENT WET SCRUBBER OUTLET
TRAVELING GRATE
CLEWISTON, FLORIDA**

**FDEP PERMIT NUMBER 051-0003-009-AC
PSD-FL-272**

JANUARY 5, 2000

PREPARED FOR:

**U.S. SUGAR CORPORATION
SOUTH W.C. OWEN AVENUE
CLEWISTON, FLORIDA 33440**

PREPARED BY:

**AIR CONSULTING AND ENGINEERING, INC.
2106 N.W. 67TH PLACE
GAINESVILLE, FLORIDA 32653
(352) 335-1889**

238-00-01

2.0 SUMMARY AND DISCUSSION OF RESULTS

Table 1 is a summary of the emission results and flue gas parameters.

Bagasse and oil were used to fire the boiler.

Particulate emissions averaged 62.19 pounds per hour (lbs/hr) and 0.1223 pounds per million BTU (lbs/MMBTU) of heat input to the boiler. Allowable emissions are 74.40 lbs/hr and 0.146 lbs/MMBTU.

Sulfur Dioxide and acid mist emissions averaged 0.07 lbs/hr and 0.0 lbs/MMBTU, and 0.0 lbs/hr and 0.0 lbs/MMBTU, respectively. Permitted SO₂ emissions are 0.06 lbs/MMBTU.

Oxides of nitrogen emissions averaged 37.57 lbs/hr and 0.074 lbs/MMBTU, which is within the permitted limit of 0.20 lbs/MMBTU.

Carbon monoxide emissions averaged 2934.3 lbs/hr and 5.758 lbs/MMBTU compared to the permitted limit of 6.5 lbs/MMBTU.

Non-methane volatile organic compound emissions averaged 410.54 lbs/hr and 0.805 lbs/MMBTU. The permitted emission standard is 0.5 lbs/MMBTU as propane.

Visible emissions could not be conducted at the time of the compliance test, since the plumes of all boilers merged, making an accurate opacity reading for Boiler 4 impossible.

Complete emission summaries, field data sheets, and laboratory data are presented in Appendices A, B, and C.

Production rate summaries are provided in Appendix E. This data was obtained from control room recordings of steam flow, temperature, and pressure as well as feed water temperature and pressure. Steam integrator readings were recorded at the beginning and at the end of the each particulate run.

Table 1. Particulate and Gaseous Emission Summary
 Boiler 4 - Scrubber Outlet
 United States Sugar Corporation - Clewiston Mill
 Clewiston, Florida
 January 5, 2000

Run Number	Time	Flow Rate dscfm	Particulate Emissions		Allowable Emission		CO Emissions		NOx Emissions		Non-Methane VOC Emissions as Propane	
			lbs/MMBTU	lbs/hr	lbs/MMBTU	lbs/hr	lbs/MMBTU	lbs/hr	lbs/MMBTU	lbs/hr	lbs/MMBTU	lbs/hr
1	0950-1059	136759	0.1310	66.45	0.145	73.93	2.76	1404.76	0.089	45.10	0.345	175.54
2	1149-1256	136322	0.1250	64.16	0.146	75.28	7.34	3774.02	0.088	34.83	1.163	598.27
3	1347-1455	135432	0.1110	55.95	0.147	73.99	7.18	3624.11	0.065	32.79	0.907	457.80
Average	---	136171	0.1223	62.19	0.146	74.40	5.758	2934.30	0.074	37.57	0.805	410.54

SO2 Emissions		Acid Mist Emissions	
lbs/MMBTU	lbs/hr	lbs/MMBTU	lbs/hr
0.00E+00	0.00	0.00E+00	0.00
0.00E+00	0.00	0.00E+00	0.00
3.90E-04	0.20	0.00E+00	0.00
1.30E-04	0.07	0.00E+00	0.00

3.0 PROCESS DESCRIPTION AND OPERATIONS

The Number 4 Boiler at USSC's Clewiston plant is a traveling grate stoker design used primarily for bagasse fuel firing. Supplemental oil firing was used during the emission test series. The boiler averaged 238,941 lbs/hr steam production.

Oil meters, steam integrators, and other production monitoring devices were rigorously calibrated prior to the production season.

AIR CONSULTING and ENGINEERING, INC.

COMPLETE EMISSION DATA

UNITED STATES SUGAR CORPORATION

CLEWISTON, FLORIDA

BOILER 4

1/5/2000

	C-1	C-2	C-3	
RUN NUMBER:	C-1	C-2	C-3	
BEGIN TIME:	9:50 AM	11:49 AM	1:47 PM	
END TIME:	10:59 AM	12:56 PM	2:55 PM	
OXYGEN %:	10.02	9.01	9.25	
VOLUMETRIC FLOW (SCFMD):	136759	136322	135432	
STEAM RATE (LB/HR):	238378	241643.8	236800.0	
NET STEAM (MMBTU/Hr):	509.0	514.5124	504.7973	
OXIDES of NITROGEN (NOx) PPM:	46.03	35.66	33.8	
TOTAL HYDROCARBONS PPM as PROPANE (THC):	204.06	834.04	645.16	
METHANE PPM (CH4):	50	580	455	
CARBON MONOXIDE PPM (CO):	2356.14	6350.25	6138.09	
SULFUR DIOXIDE PPM (SO2):	NA	NA	NA	
NOx:				
LB/HR:	45.10	34.83	32.79	37.57
LB/MMBTU	0.089	0.068	0.065	0.07
NON-METHANE VOC as CARBON:				
LB/HR:	143.65	489.57	374.62	335.95
LB/MMBTU:	0.282	0.952	0.742	0.66
NON-METHANE VOC as PROPANE:				
LB/HR:	175.54	598.27	457.80	410.53
LB/MMBTU:	0.345	1.163	0.907	0.80
CO:				
LB/HR:	1404.76	3774.02	3624.11	2934.30
LB/MMBTU:	2.760	7.335	7.179	5.76
SO2:				
LB/HR:	-0.21	-0.20	0.20	-0.07
LB/MMBTU:	0.000	0.000	0.000	0.00
PM:				
LB/HR:	66.45	64.16	55.95	62.19
LB/MMBTU:	0.131	0.125	0.111	0.122

Golder Associates Inc.

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

December 16, 1999



9937606

U.S. Sugar Corporation

111 Ponce de Leon Avenue
Clewiston, FL 33440

Attention: Mr. Don Griffin

RE: U.S. SUGAR CORPORATION CLEWISTON SUGAR REFINERY
1999 USEPA METHOD 9 VISIBLE EMISSION TEST RESULTS

Dear Mr. Griffin:

On December 9, 1999, Golder Associates Inc. performed visible emissions (VE) testing on the baghouse exhausts controlling the following sources: 1) Screening & Distribution Vacuum System; 2) 100 lb. Bagging Vacuum System; 3) 5 lb. Bagging Vacuum System; 4) Packaging Dust Collector; 5) Screening and Distribution #1; 6) Conditioning Silo's 2,4, and 6; 7) White Sugar Dryer; and 8) VHP Sugar Dryer. According to the results from these observations, the USSC Clewiston Sugar Refinery meets the conditions outlined by the Air Construction Permit # 0510003-001-AC and is therefore in compliance.

The visible emission tests were observed by Mr. Earl Baker of the Florida Department of Environmental Protection.

Enclosed please find copies of the data sheets and VE certifications for submittal to the regulatory agency. Should you have any questions concerning these tests please feel free to contact me at 352-336-5600.

Sincerely,

GOLDER ASSOCIATES, INC.

A handwritten signature in black ink, appearing to read 'Michael J. Arrants', written over a horizontal line.

Michael J. Arrants
Certified VE Evaluator

A handwritten signature in black ink, appearing to read 'David A. Buff', written in a cursive style.

David A. Buff, Engineer - P.E.
Principal

Enclosures



VISIBLE EMISSION OBSERVATION FORM

Method Used Circle One
 Method 9 203A 203B Other: _____

Company Name
U.S. SUGAR CORPORATION

Facility Name
CLEWISTON MILL

Street Address
W.C. OWENS AVENUE & SR B2

City State Zip
CLEWISTON FL 33440

Process Unit # Operating Mode
SCREENING & DIST. VACUUM S-1 MAX CAP

Control Equipment Operating Mode
HOFFMAN BAGHOUSE NORMAL

Describe Emission Point
3" ROUND DUCT PROTRUDING HORIZONTALLY THROUGH WALL WESTERN MOST OF 3

Height of Emission Point
 Start ~ 65' End ~ 65' Height of Emission Point Ref. to Observer.
 Start ~ 40' End ~ 60'

Distance to Emission Point
 Start ~ 215' End ~ 215' Direction to Emission Point (Degrees)
 Start 325' End 325'

Vertical Angle to Obs. Pt.
 Start 16° End 16° Direction to Obs. Pt. (Degrees)
 Start 325' End 325'

Distance and Direction to Observation Point from Emission Point
 Start SAME POINT End S/P

Describe Emissions
 Start NOISE APPARENT End N/A

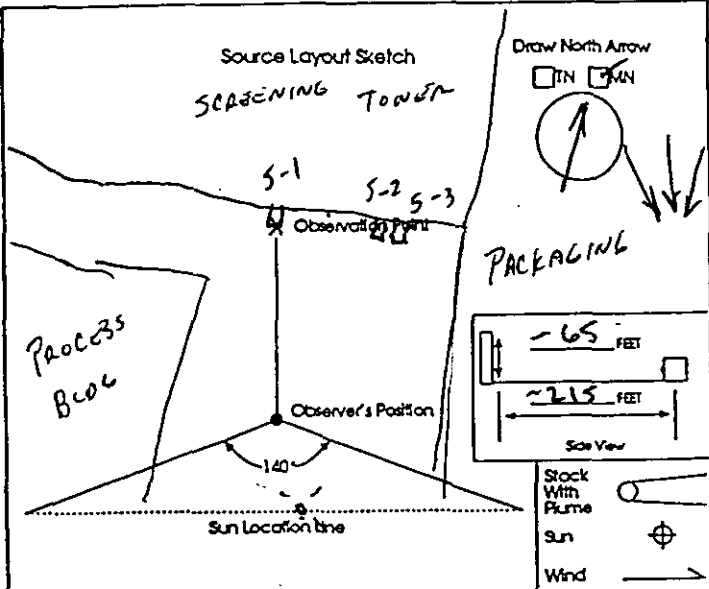
Emission Color
 Start N/A End N/A Water Droplet Plume
 Attached Detached None

Describe Plume Background
 Start BLOK FACE End SAME

Background Color
 Start GRAY End GRAY Sky Conditions
 Start CLEAR End CLEAR

Wind Speed
 Start 5-10 End 5-10 Wind Direction
 Start VARIABLE End SAME

Ambient Temp.
 Start 74 End 74 Wet Bulb Temp. RH Percent
67 69



Latitude Longitude Declination
26° 44' 06" N 80° 56' 19" W _____

Additional Information
0510603-001-AC

Form Number Page of
U.S. 501 1 1

Continued on VEO Form Number
N/A

Observation Date	Time Zone	Start Time	End Time
9 DEC 99	EAST	0920	0950
Sec	0	15	30
Min	0	0	0
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
16	0	0	0
17	0	0	0
18	0	0	0
19	0	0	0
20	0	0	0
21	0	0	0
22	0	0	0
23	0	0	0
24	0	0	0
25	0	0	0
26	0	0	0
27	0	0	0
28	0	0	0
29	0	0	0
30	0	0	0

Observer's Name (Print)
MICHAEL J. ARRANTS

Observer's Signature
[Signature] Date
9 DEC 99

Organization
GOLDER ASSOCIATES INCORPORATED

Certified By
EASTERN TECH. ASSOCIATED Date
24 AUG 99



VISIBLE EMISSION OBSERVATION FORM

Method Used Visual Only
 Method 9 203A 203B Other: _____

Company Name
U.S. SUGAR CORPORATION

Facility Name
CLEWISTON MILL

Street Address
W.C. OWENS AVENUE & SR B2

City CLEWISTON State FL Zip 33440

Process
100lb BAGGING VACUUM SYSTEM Unit # S-2 Operating Mode MAX CAP

Control Equipment
BAG HOUSE (HOFFMAN) Operating Mode NORMAL

Describe Emission Point
~ 3" ROUND STACK PROTRUDING HORIZONTALLY THROUGH SCREENING TOWER SOUTH WALL

Height of Emission Point
 Start ~ 65' End ~ 65' Height of Emission Point Ref. to Observer
 Start ~ 60' End _____

Distance to Emission Point
 Start ~ 212' End ~ 212' Direction to Emission Point (Degrees)
 Start 327° 30' End 327° 30'

Vertical Angle to Obs. Pt.
 Start 16° End 16° Direction to Obs. Pt. (Degrees)
 Start 327° 30' End 327° 30'

Distance and Direction to Observation Point from Emission Point
 Start SAME POINT End S/P

Describe Emissions
 Start NONE APPARENT End N/A

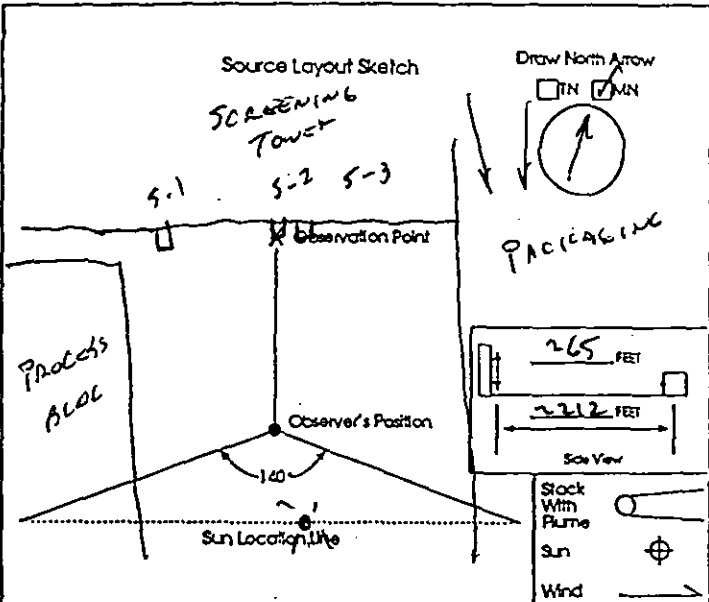
Emission Color
 Start N/A End N/A Water Droplet Plume
 Attached Detached None

Describe Plume Background
 Start BLUE TACE End SAME

Background Color
 Start GRAY End GRAY Sky Conditions
 Start CLEAR End CLEAR

Wind Speed
 Start 5-10 End 5-10 Wind Direction
 Start VARIABLE End SAME

Ambient Temp.
 Start 74 End 74 Wet Bulb Temp. 67 RH Percent 67



Latitude 26° 44' 06" N Longitude 80° 56' 19" W Declination _____

Additional Information
0510603-001-AC

Form Number 05502 Page 1 of 1

Continued on VEO Form Number N/A

Observation Date	Time Zone	Start Time	End Time	
9 DEC 99	EAST	0920	0950	
Sec	0	15	30	45
Min	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0
30	0	0	0	0

Observer's Name (Print)
MICHAEL J. ARRANTS

Observer's Signature
[Signature] Date 9 DEC 99

Organization
GOLDER ASSOCIATED INCORPORATED

Certified By
EASTERN TECH. ASSOCIATED Date 24 AUG 99



VISIBLE EMISSION OBSERVATION FORM

Method Used: Circle One
 Method 9 203A 203B Other: _____

Company Name: **U.S. SUGAR CORPORATION**

Facility Name: **CLEWISTON MILK**

Street Address: **W.C. OWENS AVENUE & SR B2**

City: **CLEWISTON** State: **FL** Zip: **33440**

Process: **S10 BAGGING VACUUM SYSTEMS-3** Unit #: _____ Operating Mode: **MAX CAP**

Control Equipment: **HOFFMAN BAG HOUSE** Operating Mode: **NORMAL**

Describe Emission Point
~3" STACK RESTAURING HORIZONTALLY THROUGH SCREENING TOWER WALL. EAST OF 3

Height of Emission Point
 Start **65'** End **65'** Height of Emission Point Ref. to Observer, Start **~60'** End **~60'**

Distance to Emission Point
 Start **~211'** End **~211'** Direction to Emission Point (Degrees) Start **328°** End **328°**

Vertical Angle to Obs. Pt.
 Start **16°** End **16°** Direction to Obs. Pt. (Degrees) Start **328°** End **328°**

Distance and Direction to Observation Point from Emission Point
 Start **SAME POINT** End **S/P**

Describe Emissions
 Start **NONE APPARENT** End **N/A**

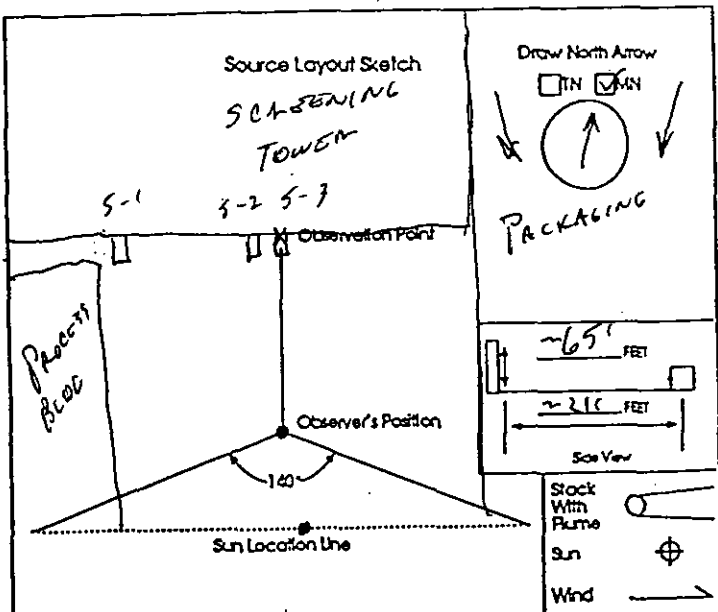
Emission Color
 Start **N/A** End **N/A** Water Droplet Plume Attached Detached None

Describe Plume Background
 Start **DOG FACE** End **SAME**

Background Color
 Start **GRAY** End **GRAY** Sky Conditions Start **CLEAR** End **CLEAR**

Wind Speed
 Start **5-10** End **5-10** Wind Direction Start **NORTHEASTLY** End **SAME**

Ambient Temp.
 Start **74** End **74** Wet Bulb Temp. **67** RH Percent **67**



Latitude: **26° 44' 06" N** Longitude: **80° 56' 19" W** Declination: _____

Additional Information
0510603-001-AC

Form Number: **05503** Page: **1** of **1**

Continued on VEO Form Number: **N/A**

Observation Date	Time Zone	Start Time		End Time
		Sec	Min	
9 DEC 99	EAST	0	0920	0950
		0	15	
		0	30	
		0	45	
1		0	0	0
2		0	0	0
3		0	0	0
4		0	0	0
5		0	0	0
6		0	0	0
7		0	0	0
8		0	0	0
9		0	0	0
10		0	0	0
11		0	0	0
12		0	0	0
13		0	0	0
14		0	0	0
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0

Observer's Name (Print): **MICHAEL J. ARRANTIS**

Observer's Signature: *[Signature]* Date: **9 DEC 99**

Organization: **GOLDER ASSOCIATES INCORPORATED**

Certified By: **EASTERN TECH. ASSOCIATES** Date: **24 AUG 99**



VISIBLE EMISSION OBSERVATION FORM

Method Used: Circle One
 Method 9 203A 203B Other: _____

Company Name: U.S. SUGAR CORPORATION

Facility Name: CLEWISTON MILL

Street Address: W.C. OWENS AVENUE & SR 82

City: CLEWISTON State: FL Zip: 33440

Process: SCREENING & DISTRIBUTION Unit # 3-5 Operating Mode: MANUAL

Control Equipment: DAG HOUSE HOSOKAWA Operating Mode: NORMAL

Describe Emission Point:
~12' x 12" DUCT PROTRUDING HORIZONTALLY THROUGH SCREENING TOWER SOUTH BLOW FACE

Height of Emission Point:
 Start ~70 End ~70 Height of Emission Point Ref. to Observer:
 Start ~65 End ~65

Distance to Emission Point:
 Start ~210 End _____ Direction to Emission Point (Degree):
 Start 332° End 332°

Vertical Angle to Obs. Pt.:
 Start 18° End _____ Direction to Obs. Pt. (Degree):
 Start 332° End 332°

Distance and Direction to Observation Point from Emission Point:
 Start SAME POINT End S/P

Describe Emissions:
 Start NONE APPARENT End N/A

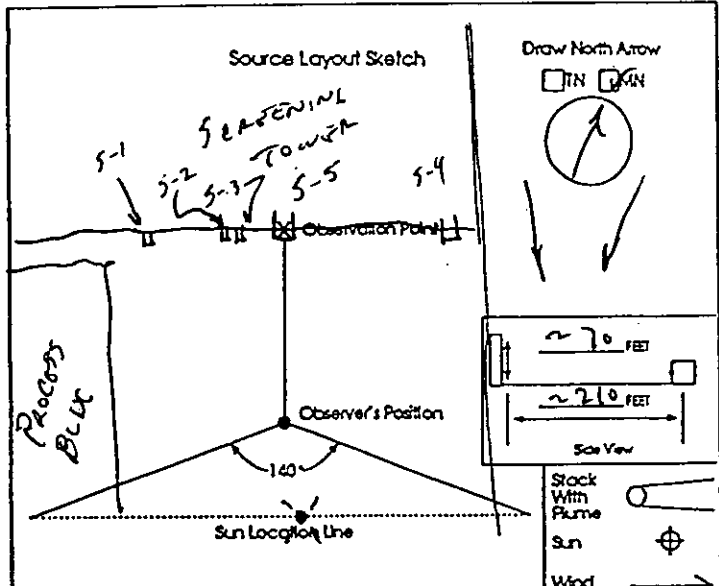
Emission Color:
 Start N/A End N/A Water Droplet Plume:
 Attached Detached None

Describe Plume Background:
 Start BLOW FACE End SAME

Background Color:
 Start GRAY End GRAY Sky Conditions:
 Start CLEAR End CLEAR

Wind Speed:
 Start 5-15 End 5-15 Wind Direction:
 Start VARIOUS End SAME

Ambient Temp.:
 Start 74 End 74 Wet Bulb Temp.: 67 RH Percent: 69



Latitude: 26° 44' 06" N Longitude: 80° 56' 19" W Declination: _____

Additional Information:
0510603-001-AC

Form Number: U 5 5 0 4 Page: 1 of 1

Continued on VEO Form Number: _____

Observation Date	Time Zone	Start Time	End Time	
9 DEC 99	EAST	0955	1025	
Sec	0	15	30	45
Min	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0
30	0	0	0	0

Observer's Name (Print): MICHAEL J. ARRANTIS

Observer's Signature: [Signature] Date: 9 DEC 99

Organization: GOLDER ASSOCIATES INCORPORATED

Certified By: EASTERN TECH. ASSOCIATES Date: 24 AUG 99



VISIBLE EMISSION OBSERVATION FORM

Method Used (Circle One) Method 9 203A 203B Other: _____

Company Name U.S. SUGAR CORPORATION

Facility Name CLEWISTON MILL

Street Address W.C. OWENS AVENUE & SR B2

City CLEWISTON State FL Zip 33440

Process PACKAGING DUST COLLECT Unit # 5-4 Operating Mode MAN CAP

Control Equipment DUST COLLECTOR (HOSOKAWA) Operating Mode NORMAL

Describe Emission Point
~12" X 18" VENT PROTRUDING HORIZONTAL THROUGH SOUTH WALL OF SCREEN TR

Height of Emission Point
Start ~63' End ~63' Height of Emission Point Ref. to Observer
Start ~58' End ~58'

Distance to Emission Point
Start ~210' End ~210' Direction to Emission Point (Degrees)
Start 349° End 349°

Vertical Angle to Obs. Pt.
Start 16° End 16° Direction to Obs. Pt. (Degrees)
Start 349° End 349°

Distance and Direction to Observation Point from Emission Point
Start SAME POINT End S/P

Describe Emissions
Start NONE APPARENT End N/A

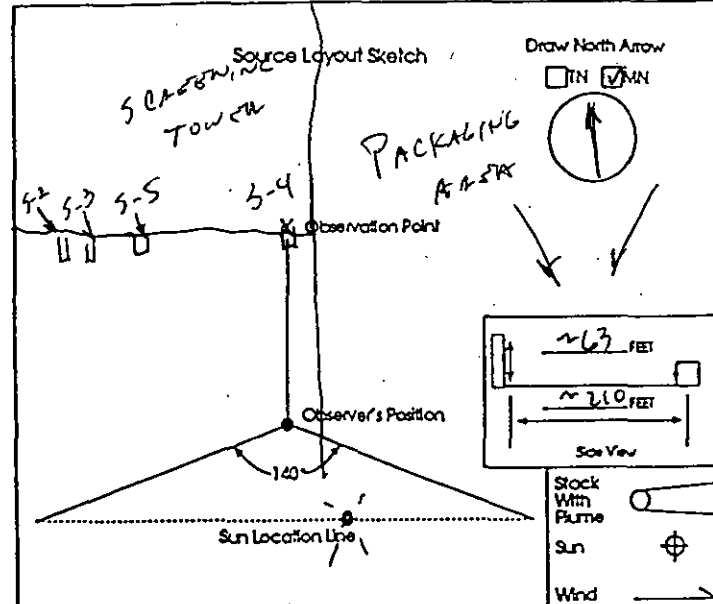
Emission Color
Start N/A End N/A Water Droplet Plume
Attached Detached None

Describe Plume Background
Start BLOG FACE End SAME

Background Color
Start GRAY End GRAY Sky Conditions
Start CLDY End CLEAR

Wind Speed
Start 5-15 End 5-15 Wind Direction
Start VARIABLE End SAME

Ambient Temp.
Start 74 End 74 Wet Bulb Temp. 67 RH Percent 69



Latitude 26° 44' 06" N Longitude 80° 56' 19" W Declination _____

Additional Information
0510603-001-AC

Form Number US505 Page 1 of 1

Continued on VEO Form Number N/A

Observation Date	Time Zone	Start Time	End Time	
9 DEC 99	EAST	955	1025	
Sec	0	15	30	45
Min	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0
30	0	0	0	0

Observer's Name (Print) MICHAEL J. ARRANTS

Observer's Signature [Signature] Date 9 DEC 99

Organization GOLDER ASSOCIATES INCORPORATED

Certified By EASTERN TECH. ASSOCIATES Date 24 AUG 99



VISIBLE EMISSION OBSERVATION FORM

Method Used (Circle One) Method 9 203A 203B Other: _____

Company Name U.S. SUGAR CORPORATION

Facility Name CLEWISTON MILL

Street Address W.C. OWENS AVENUE & SR 82

City CLEWISTON State FL Zip 33440

Process CONDITIONING SILO 2 Unit # 5-7 Operating Mode MAX CAP

Control Equipment HOSOKAWA BAGHOUSE Operating Mode NORMAL

Describe Emission Point
"6x12 RECTANGULAR DUCT PROTRUDING THROUGH SOUTH WALL OF CONCRETE"

Height of Emission Point
 Start -110' End -110' Height of Emission Point Ref. to Observer
 Start +105' End +105'

Distance to Emission Point
 Start ~40' End ~40' Direction to Emission Point (Degrees)
 Start 325 End 325

Vertical Angle to Obs. Pt.
 Start 69° End 69° Direction to Obs. Pt. (Degrees)
 Start 325 End 325

Distance and Direction to Observation Point from Emission Point
 Start SAME POINT End S/P

Describe Emissions
 Start NONE APPARENT End N/A

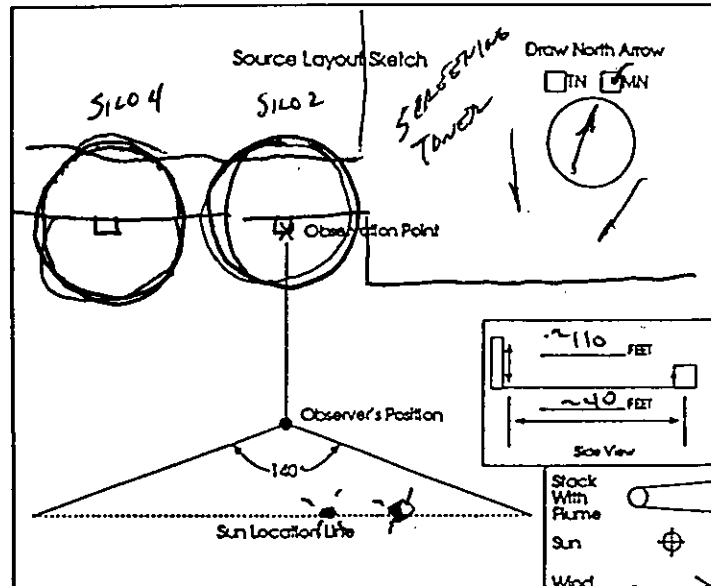
Emission Color
 Start N/A End N/A Water Droplet Plume
 Attached Detached None

Describe Plume Background
 Start SKY End SKY

Background Color
 Start BLUE End BLUE Sky Conditions
 Start CLEAR End CLEAR

Wind Speed
 Start 5-15 End 5-15 Wind Direction
 Start NORTHEAST End SAME

Ambient Temp.
 Start 74° F End 74° F Wet Bulb Temp. 67 RH Percent 69



Latitude 26° 44' 06" N Longitude 80° 56' 19" W Declination _____

Additional Information
0510603-001-AC

Form Number US506 Page 1 of 1

Continued on VEO Form Number N/A

Observation Date	Time Zone	Start Time	End Time		
9 DEC 99	EAST	1032	1102		
Sec	0	15	30	45	
Min	0	0	0	0	
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observer's Name (Print) MICHAEL J. ARRANTS

Observer's Signature [Signature] Date 9 DEC 99

Organization GOLDER ASSOCIATES INCORPORATED

Certified By EASTERN TECH. ASSOCIATES Date 24 AUG 99



VISIBLE EMISSION OBSERVATION FORM

Method Used (Circle One) Method 9 203A 203B Other: _____
 Company Name U.S. SUGAR CORPORATION
 Facility Name CLEWISTON MILK
 Street Address W.C. OWENS AVENUE & SR 82
 City CLEWISTON State FL Zip 33440

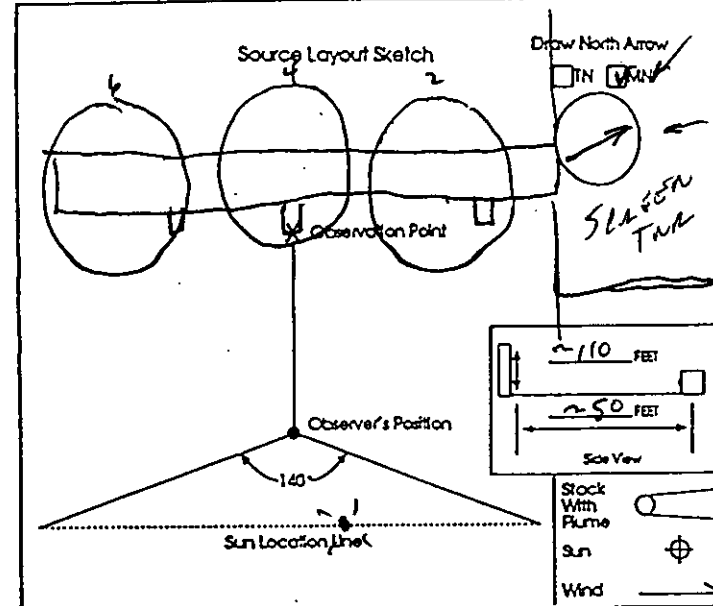
Process CONDITIONING SILO #4 Unit # 5-8 Operating Mode MAX CAP
 Control Equipment HOSOKAWA BAG HOUSE Operating Mode Normal

Describe Emission Point ~6" x 12" RECT VENT PASTROING FLOW
SOUTH SIDE COVERED CONVEYOR OVER #4
 Height of Emission Point Start ~110' End ~110' Height of Emission Point Ref. to Observer Start ~105' End ~105'
 Distance to Emission Point Start ~50' End ~50' Direction to Emission Point (Degrees) Start 306 End 306

Vertical Angle to Obs. Pt. Start 61 End _____ Direction to Obs. Pt. (Degrees) Start 306 End 306
 Distance and Direction to Observation Point from Emission Point Start SAME POINT End S/P

Describe Emissions Start NOV E APPARENT End N/A
 Emission Color Start N/A End N/A Water Droplet Plume Attached Detached None

Describe Plume Background Start SKY End SKY
 Background Color Start BLUE End BLUE Sky Conditions Start CLEAR End CC'AM
 Wind Speed Start 5-15 End 5-15 Wind Direction Start NORTHEAST End SAME
 Ambient Temp. Start 74 End 74 Wet Bulb Temp. 67 RH Percent 69



Latitude 26° 44' 06" N Longitude 80° 56' 19" W Declination _____

Additional Information 0510603-001-AC

Form Number 05507 Page 1 of 1
 Continued on VEO Form Number N/A

Observation Date	Time Zone	Start Time	End Time		
9 DEC 99	EAST	1032	1102		
Sec	0	15	30	45	
Min	0	0	0	0	
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
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25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observer's Name (Print) MICHAEL J. ARRANTIS
 Observer's Signature [Signature] Date 9 DEC 99
 Organization GOLDER ASSOCIATED INCORPORATED
 Certified By EASTERN TECH. ASSOCIATED Date 24 AUG 99



VISIBLE EMISSION OBSERVATION FORM

Method Used (Circle One) **Method 9** 203A 203B Other: _____

Company Name **U.S. SUGAR CORPORATION**

Facility Name **CLEWISTON MILL**

Street Address **W.C. OWENS AVENUE & SR 82**

City **CLEWISTON** State **FL** Zip **33440**

Process **CONDITIONING SILO 6** Unit # **5-9** Operating Mode **MAX CAP**

Control Equipment **HOSO KAWA BAG HOUSE** Operating Mode **NORMAL**

Describe Emission Point
~6" X 12" RECT. DUCT PROTRUDING HORIZ. THROUGH SOUTH SIDE OF COVERED CONVEYOR

Height of Emission Point Start **~110'** End **~110'** Height of Emission Point Ref. to Observer Start **~105'** End **~105'**

Distance to Emission Point Start **~60'** End **~60'** Direction to Emission Point (Degrees) Start **294°** End **294°**

Vertical Angle to Obs. Pt. Start **53°** End **53°** Direction to Obs. Pt. (Degrees) Start **294°** End **294°**

Distance and Direction to Observation Point from Emission Point Start **SAME POINT** End **S/P**

Describe Emissions Start **None APPARENT** End **N/A**

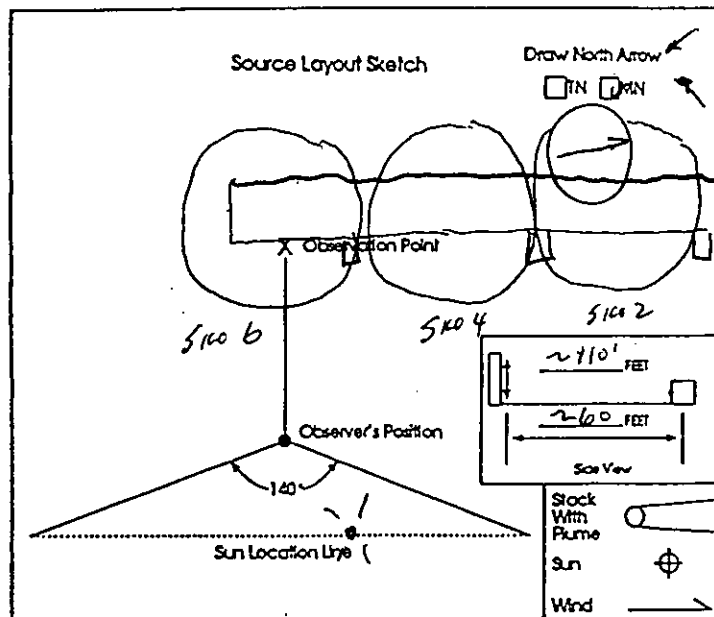
Emission Color Start **N/A** End **N/A** Water Droplet Plume Attached Detached None

Describe Plume Background Start **SKY** End **SKY**

Background Color Start **BLUE** End **BLUE** Sky Conditions Start **CLEAR** End **CLEAR**

Wind Speed Start **5-15** End **5-15** Wind Direction Start **VARIABLE** End **SAME**

Ambient Temp Start **74** End **74** Wet Bulb Temp. **67** RH Percent **69**



Latitude **26° 44' 06" N** Longitude **80° 56' 19" W** Declination _____

Additional Information **0510603-001-AC**

Form Number **US 508** Page **1** of **1**

Continued on VEO Form Number **N/A**

Observation Date	Time Zone	Start Time	End Time	
9 DEC 99	EAST	1032	1102	
Sec	0	15	30	45
Min	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
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25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0
30	0	0	0	0

Observer's Name (Print) **MICHAEL J. ARRANTS**

Observer's Signature **[Signature]** Date **9 DEC 99**

Organization **GOLDER ASSOCIATES INCORPORATED**

Certified By **EASTERN TECH. ASSOCIATES** Date **24 AUG 99**



VISIBLE EMISSION OBSERVATION FORM

Method Used (Circle One)
 Method 9 203A 203B Other: _____

Company Name
U.S. SUGAR CORPORATION

Facility Name
CLEWISTON MILL

Street Address
W.C. OWENS AVENUE & SR 82

City State Zip
CLEWISTON FL 33440

Process Unit # Operating Mode
WHITE SUGAR DRYER S-10 MAX CAP

Control Equipment Operating Mode
BAG HOUSE (BAST ENGINEER) NORMAL

Describe Emission Point
4X6 VENT AT NORTH EAST CORNER OF PROCESS BLOC.

Height of Emission Point Height of Emission Point Ref. to Observer
 Start ~80 End ~80 Start ~75' End ~75'

Distance to Emission Point Direction to Emission Point (Degrees)
 Start ~170 End ~120 Start 334° End 334°

Vertical Angle to Obs. Pt. Direction to Obs. Pt. (Degrees)
 Start 24° End 24° Start 334° End 334°

Distance and Direction to Observation Point from Emission Point
 Start SAME POINT End S/P

Describe Emissions Intermittent End SAME
 Start PUFFS

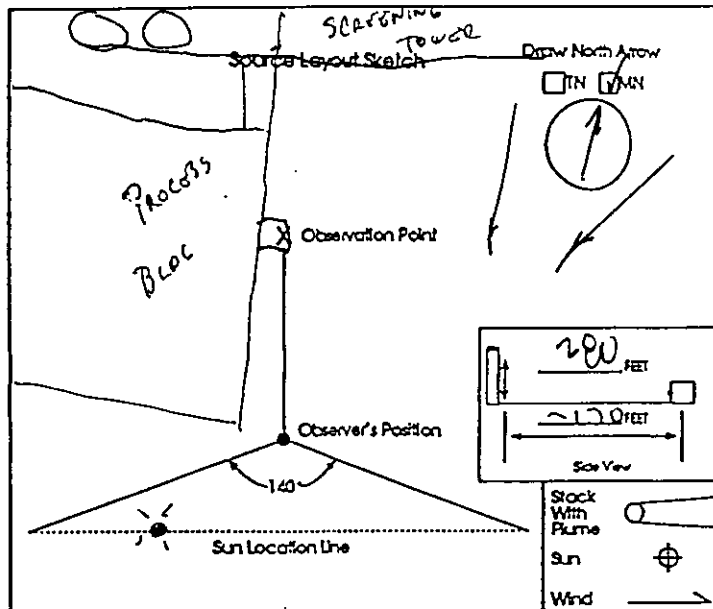
Emission Color Water Droplet Plume
 Start WHITE End WHITE Attached Detached None

Describe Plume Background Start BUILDING FACE End SAME

Background Color Sky Conditions
 Start GRAY End GRAY Start BROKEN End BROKEN

Wind Speed Wind Direction
 Start 5-15 End 5-15 Start VARIABLE End NE-NW

Ambient Temp. Wet Bulb Temp. RH Percent
 Start 78 End 78 67 56



Latitude Longitude Declination
26° 44' 06" N 80° 56' 19" W —

Additional Information
0510603-001-AC

Form Number U S S 0 9 Page 1 of 1

Continued on VEO Form Number
N/A

Observation Date	Time Zone	Start Time		End Time	
		Min	Sec	Min	Sec
9 DEC 99	EAST	15	00	34	00
1		0	5	0	0
2		0	0	5	0
3		5	5	0	0
4		0	0	0	0
5		5	0	0	5
6		0	5	0	5
7		5	5	0	0
8		5	0	0	0
9		0	0	0	0
10		0	0	5	0
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13		0	5	0	5
14		0	0	5	0
15		0	0	0	0
16		0	0	5	0
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23		0	0	0	0
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25		5	0	0	0
26		0	5	0	0
27		5	0	0	5
28		0	0	0	5
29		0	0	0	0
30		0	0	0	0

Observer's Name (Print)
MICHAEL J. ARRANTS

Observer's Signature Date
[Signature] 9 DEC 99

Organization
GOLDER ASSOCIATES INCORPORATED

Certified By Date
EASTERN TECH. ASSOCIATES 24 AUG 99



VISIBLE EMISSION OBSERVATION FORM

Form Number **US510** Page **1** of **1**
 Continued on VEO Form Number **N/A**

Method Used **Method 9** 203A 203B Other: _____
 Company Name **U.S. SUGAR CORPORATION**
 Facility Name **CLEWISTON MILL**
 Street Address **W.C. OWENS AVENUE & SR B2**
 City **CLEWISTON** State **FL** Zip **33440**

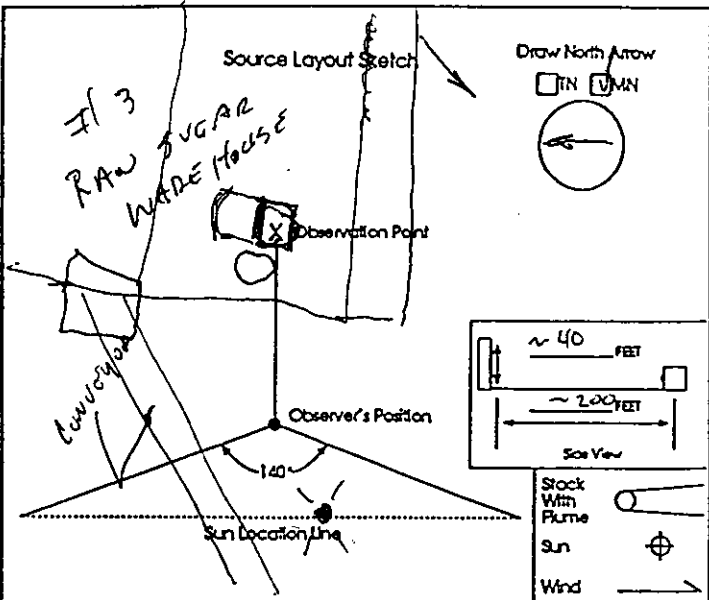
Process **VHP SUGAR DRYER** Unit # **5-12** Operating Mode **MAX CAP**
 Control Equipment **BAG HOUSE (BACT ENG)** Operating Mode **NORMAL**
RECTANGULAR INLET 4'x6'

Describe Emission Point **INVERTED LONER STACK AT SW CORNER OF #3 RAW SUGAR WAREHOUSE**
 Height of Emission Point Start **~40'** End **~40'** Height of Emission Point Ref. to Observer Start **235'** End **235'**
 Distance to Emission Point Start **~200'** End **~200'** Direction to Emission Point (Degrees) Start **90°** End **90°**

Vertical Angle to Obs. Pt. Start **90°** End _____ Direction to Obs. Pt. (Degrees) Start **90°** End **90°**
 Distance and Direction to Observation Point from Emission Point Start **SAME POINT** End **S/P**

Describe Emissions Start **NONE APPARENT** End **N/A**
 Emission Color Start **N/A** End **N/A** Water Droplet Plume Attached Detached None

Describe Plume Background Start **SKY** End **SKY**
 Background Color Start **BLU/WHIT** End **B/W** Sky Conditions Start **BROKEN** End **BROKEN**
 Wind Speed Start **5-15** End **5-15** Wind Direction Start **NE** End **NE-SE**
 Ambient Temp. Start **78** End **78** Wet Bulb Temp. **67** RH Percent **56**



Latitude **26° 44' 06" N** Longitude **80° 56' 19" W** Declination _____

Additional Information **0510603-001-AC**

Observation Date	Time Zone	Start Time	End Time	
9 DEC 99	EAST	1547	1612	
Sec	0	15	30	45
Min	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
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28	0	0	0	0
29	0	0	0	0
30	0	0	0	0

Observer's Name (Print) **MICHAEL J. ARRANTS**
 Observer's Signature *[Signature]* Date **DEC 99**
 Organization **COLDER ASSOCIATES INCORPORATED**
 Certified By **EASTERN TECH. ASSOCIATES** Date **24 AUG 99**

**SOURCE TEST REPORT
FOR
PARTICULATE MATTER, VISIBLE EMISSIONS AND NON-
METHANE VOLATILE ORGANIC COMPOUNDS EMISSIONS**

**GRANULAR CARBON REGENERATIVE FURNACE
WET SCRUBBER EXHAUST
CLEWISTON, FLORIDA**

**FDEP PERMIT NUMBER 051-0003-009-AC
PSD-FL-272**

JANUARY 20, 2000

PREPARED FOR:

**U.S. SUGAR CORPORATION
SOUTH W.C. OWEN AVENUE
CLEWISTON, FLORIDA 33440**

PREPARED BY:

**AIR CONSULTING AND ENGINEERING, INC.
2106 N.W. 67TH PLACE
GAINESVILLE, FLORIDA 32653
(352) 335-1889**

2.0 SUMMARY AND DISCUSSION OF RESULTS

Table 1 is a summary of the emission results and flue gas parameters.

Particulate emissions averaged 0.538 pounds per hour (lbs/hr), which is within the allowable emission rate of 0.7 lbs/hr.

Non-methane volatile organic compounds averaged 0.320 lbs/hr as Carbon and 0.391 lbs/hr as Propane. According to permit conditions VOC emissions shall not exceed 1.0 lbs/hr as Propane.

Complete particulate emission summaries, field data sheets, and laboratory data and are presented in Appendices A, B, and C. Gaseous emission summaries and strip chart copies are enclosed in Appendix D.

The Sulfur content of the Number 2 distillate oil fired in the furnace is 0.05 % by weight, which is within the permitted standard of 0.05 % Sulfur content (see Appendix F for fuel analysis).

Visible emissions from the outlet averaged 10 percent opacity for the highest six minute period of the one-hour test. Permitted emissions are 10 percent opacity (see Appendix E for VE data sheet and observer's certification).

Complete emission summaries, field data sheets, and laboratory data are presented in Appendices A, B, and C.

A copy of the Granular Carbon Regenerative Furnace Log is provided in Appendix F.

Table 1. Particulate and VOC Emission Summary
 Granular Carbon Regenerative Furnace Exhaust - Clewiston Mill
 United States Sugar Corporation
 Clewiston, Florida
 January 20, 2000

Run Number	Time	Flow Rate dscfm	Particulate Emissions		Non-Methane VOC Emissions	
			gr/dscf	lbs/hr	as Carbon lbs/hr	as Propane lbs/hr
1	0909-1011	5526	0.0109	0.5140	0.247	0.302
2	1055-1156	5561	0.0097	0.4640	0.273	0.334
3	1240-1341	4967	0.0149	0.6350	0.439	0.536
Average	—	5351	0.0118	0.5377	0.320	0.391

Allowable Emission:

PM = 0.7 lbs/hr
 VOC = 1.0 lbs/hr