

Golder Associates Inc.

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Gainesville, FL USA 32653
Telephone (352) 336-6600
Fax (352) 336-6603
www.golder.com



April 28, 2006

RECEIVED

043-7615

MAY 01 2006

Florida Department of Environmental Protection
Department of Air Resources Management BUREAU OF AIR REGULATION
2600 Blair Stone Road, MS 5500
Tallahassee, FL 32399-2400

Attention: Mr. Jeffery Koerner, P. E.

RE: UNITED STATES SUGAR CORPORATION – CLEWISTON MILL
 BOILER NO. 8
 PERMIT NO. 0510003-030-AC (PSD-FL-333B)
 ADDITION OF CYCLONE DUST COLLECTOR

Dear Mr. Koerner:

United States Sugar Corporation (U.S. Sugar) was issued air construction Permit No. 0510003-030-AC/ PSD-FL-333B for Boiler No. 8 on April 7, 2006. This construction permit incorporated the final Boiler maximum achievable control technology (MACT) requirements, as well as some minor permit revisions. Boiler No. 8 started operation in early 2005, and initial compliance testing was conducted on March 25-26, 2005. A second annual compliance test was conducted on January 10-11, 2006.

Boiler No. 8 has two wet cyclones (wet scrubbers) which operate in parallel as primary control devices to remove particulate matter (PM) from the boiler exhaust gases. The main function of the wet cyclones is to protect the inside diameter (ID) fan from excessive wear and premature failure due to particle erosion. After exiting the wet cyclones and the ID fan, the Boiler No. 8 exhaust gases pass through an electrostatic precipitator (ESP) to further remove PM before exhausting to the atmosphere.

Through operating experience with the new Boiler No. 8, U.S. Sugar has become aware of a problem with the carryover of water and dust particles out of the wet cyclones and into the ESP. The water and moist dust particles act like a mud within the ESP, leading to fouling and plugging of the ESP plates, and plugging of the ash removal system. The problem has been linked to high velocities through the wet cyclone collectors. The high gas velocity results in carryover of water, which leads to the "mud" and the operating problems in the ESP.

To resolve this issue, U.S. Sugar is proposing to install a third mechanical cyclone to operate in parallel with the two existing cyclones (see attached flow diagram). The new cyclone will be designed to handle approximately 20 percent of the exhaust gases exiting Boiler No. 8. This will effectively reduce the gas flow rate through each of the existing two wet cyclones by approximately 20 percent, thereby reducing water carryover from the cyclones.

The new mechanical collector will be of the dry type, i.e., no water will be added in the cyclone (only for ash removal). Design specifications and a drawing of the new cyclone are attached. Also attached are applicable portions of the Application for Air Permit – Long Form.

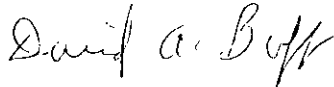


U.S. Sugar is planning on making this change to Boiler No. 8 during the current off-season. As such, we desire approval of this addition of air pollution control equipment as quickly as possible.

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

Sincerely,

GOLDER ASSOCIATES INC.



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

DB/kdk

Enclosures

cc: Don Griffin
Peter Briggs
Ron Blackburn, DEP

Y:\Projects\2004\0437615 US Sugar B1r8\Boiler #8 Dry Scrubber4.1\042806.doc

APPLICATION PAGES



Department of Environmental Protection

Division of Air Resource Management

APPLICATION FOR AIR PERMIT - LONG FORM

I. APPLICATION INFORMATION

Air Construction Permit – Use this form to apply for an air construction permit at a facility operating under a federally enforceable state air operation permit (FESOP) or Title V air permit. Also use this form to apply for an air construction permit:

- For a proposed project subject to prevention of significant deterioration (PSD) review, nonattainment area (NAA) new source review, or maximum achievable control technology (MACT) review; or
- Where the applicant proposes to assume a restriction on the potential emissions of one or more pollutants to escape a federal program requirement such as PSD review, NAA new source review, Title V, or MACT; or
- Where the applicant proposes to establish, revise, or renew a plantwide applicability limit (PAL).

Air Operation Permit – Use this form to apply for:

- an initial federally enforceable state air operation permit (FESOP); or
- an initial/revised/renewal Title V air operation permit.

Air Construction Permit & Title V Air Operation Permit (Concurrent Processing Option) – Use this form to apply for both an air construction permit and a revised or renewal Title V air operation permit incorporating the proposed project.

To ensure accuracy, please see form instructions.

Identification of Facility

1. Facility Owner/Company Name: United States Sugar Corporation	
2. Site Name: Clewiston Mill	
3. Facility Identification Number: 0510003	
4. Facility Location...: Street Address or Other Locator: W.C. Owens Ave. and S.R. 832 City: Clewiston County: Hendry Zip Code: 33440	
5. Relocatable Facility? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6. Existing Title V Permitted Facility? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Application Contact

1. Application Contact Name: William A. Raiola, Sr. Vice President, Sugar Processing Operations	
2. Application Contact Mailing Address... Organization/Firm: United States Sugar Corporation Street Address: 111 Ponce de Leon Avenue City: Clewiston State: Florida Zip Code: 33440	
3. Application Contact Telephone Numbers... Telephone: (863) 983-8121 ext. Fax: (863) 902-2729	
4. Application Contact Email Address: braiola@ussugar.com	

Application Processing Information (DEP Use)

1. Date of Receipt of Application: 5-1-06	3. PSD Number (if applicable):
2. Project Number(s): 0510003-035-AC	4. Siting Number (if applicable):

FACILITY INFORMATION

Purpose of Application

This application for air permit is submitted to obtain: (Check one)

Air Construction Permit

- Air construction permit.
- Air construction permit to establish, revise, or renew a plantwide applicability limit (PAL).
- Air construction permit to establish, revise, or renew a plantwide applicability limit (PAL), and separate air construction permit to authorize construction or modification of one or more emissions units covered by the PAL.

Air Operation Permit

- Initial Title V air operation permit.
- Title V air operation permit revision.
- Title V air operation permit renewal.
- Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is required.
- Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is not required.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit (Concurrent Processing)

- Air construction permit and Title V permit revision, incorporating the proposed project.
- Air construction permit and Title V permit renewal, incorporating the proposed project.

Note: By checking one of the above two boxes, you, the applicant, are requesting concurrent processing pursuant to Rule 62-213.405, F.A.C. In such case, you must also check the following box:

- I hereby request that the department waive the processing time requirements of the air construction permit to accommodate the processing time frames of the Title V air operation permit.

Application Comment

This application is to add a third cyclone to operate in parallel with the existing two cyclones to remove particulate matter prior to the boiler ID fan. No emissions or limits will change as a result of this action.

FACILITY INFORMATION

Scope of Application

Emissions Unit ID Number	Description of Emissions Unit	Air Permit Type	Air Permit Proc. Fee
028	Clewiston Boiler No. 8		

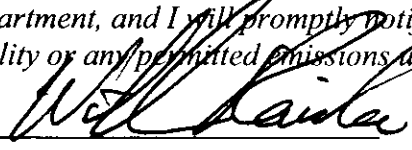
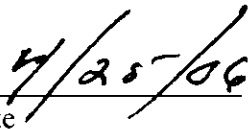
Application Processing Fee

Check one: Attached - Amount: \$ _____ Not Applicable

FACILITY INFORMATION

Owner/Authorized Representative Statement

Complete if applying for an air construction permit or an initial FESOP.

1. Owner/Authorized Representative Name : William A. Raiola, Senior Vice President, Sugar Processing Operations
2. Owner/Authorized Representative Mailing Address... Organization/Firm: United States Sugar Corporation Street Address: 111 Ponce de Leon Avenue City: Clewiston State: Florida Zip Code: 33440
3. Owner/Authorized Representative Telephone Numbers... Telephone: (863) 983-8121 ext. Fax: (863) 902-2729
4. Owner/Authorized Representative Email Address: braiola@ussugar.com
5. Owner/Authorized Representative Statement: <i>I, the undersigned, am the owner or authorized representative of the facility addressed in this air permit application. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof and all other requirements identified in this application to which the facility is subject. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department, and I will promptly notify the department upon sale or legal transfer of the facility or any permitted emissions unit.</i>  Signature  Date

FACILITY INFORMATION

Application Responsible Official Certification

Complete if applying for an initial/revised/renewal Title V permit or concurrent processing of an air construction permit and a revised/renewal Title V permit. If there are multiple responsible officials, the "application responsible official" need not be the "primary responsible official."

1. Application Responsible Official Name:
2. Application Responsible Official Qualification (Check one or more of the following options, as applicable): <input type="checkbox"/> For a corporation, the president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit under Chapter 62-213, F.A.C. <input type="checkbox"/> For a partnership or sole proprietorship, a general partner or the proprietor, respectively. <input type="checkbox"/> For a municipality, county, state, federal, or other public agency, either a principal executive officer or ranking elected official. <input type="checkbox"/> The designated representative at an Acid Rain source.
3. Application Responsible Official Mailing Address... Organization/Firm: Street Address: City: State: Zip Code:
4. Application Responsible Official Telephone Numbers... Telephone: () - ext. Fax: () -
5. Application Responsible Official Email Address:
6. Application Responsible Official Certification: I, the undersigned, am a responsible official of the Title V source addressed in this air permit application. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof and all other applicable requirements identified in this application to which the Title V source is subject. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department, and I will promptly notify the department upon sale or legal transfer of the facility or any permitted emissions unit. Finally, I certify that the facility and each emissions unit are in compliance with all applicable requirements to which they are subject, except as identified in compliance plan(s) submitted with this application. _____ Signature _____ Date

FACILITY INFORMATION

Professional Engineer Certification

1. Professional Engineer Name: David A. Buff Registration Number: 19011
2. Professional Engineer Mailing Address... Organization/Firm: Golder Associates Inc.** Street Address: 6241 NW 23rd Street, Suite 500 City: Gainesville State: FL Zip Code: 32653-1500
3. Professional Engineer Telephone Numbers... Telephone: (352) 336-5600 ext. 545 Fax: (352) 336-6603
4. Professional Engineer Email Address: dbuff@golder.com
5. Professional Engineer Statement: <i>I, the undersigned, hereby certify, except as particularly noted herein*, that:</i> <i>(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this application for air permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and</i> <i>(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.</i> <i>(3) If the purpose of this application is to obtain a Title V air operation permit (check here <input type="checkbox"/>, if so), I further certify that each emissions unit described in this application for air permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance plan and schedule is submitted with this application.</i> <i>(4) If the purpose of this application is to obtain an air construction permit (check here <input checked="" type="checkbox"/>, if so) or concurrently process and obtain an air construction permit and a Title V air operation permit revision or renewal for one or more proposed new or modified emissions units (check here <input type="checkbox"/>, if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.</i> <i>(5) If the purpose of this application is to obtain an initial air operation permit or operation permit revision or renewal for one or more newly constructed or modified emissions units (check here <input type="checkbox"/>, if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.</i> <i>David A. Buff</i> Signature _____ Date <u>4/27/06</u> (seal)

* Attach any exception to certification statement.

** Board of Professional Engineers Certificate of Authorization #00001670

EMISSIONS UNIT INFORMATION

Section [1]

Boiler No. 8

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application – For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application for air permit. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application – For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an “unregulated emissions unit” does not apply. If this is an application for air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised/renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. **The air construction permitting classification must be used to complete the Emissions Unit Information Section of this application for air permit.** A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air construction permitting and insignificant emissions units are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

EMISSIONS UNIT INFORMATION

Section [1]

Boiler No. 8

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)
- The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.
- The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)
- This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).
- This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.
- This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:
Boiler No. 8

3. Emissions Unit Identification Number: **028**

4. Emissions Unit Status Code: A	5. Commence Construction Date: NOV 2003	6. Initial Startup Date: MAR 2005	7. Emissions Unit Major Group SIC Code: 20	8. Acid Rain Unit? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
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9. Package Unit:
Manufacturer: _____ Model Number: _____

10. Generator Nameplate Rating: **MW**

11. Emissions Unit Comment:
Membrane wall, balanced-draft stoker boiler fired with carbonaceous fuel and distillate fuel oil (Grade No. 2) with a maximum sulfur content of 0.05 percent by weight. Fuel oil can include facility-generated, on-specification used oil.

EMISSIONS UNIT INFORMATION

Section [1]

Boiler No. 8

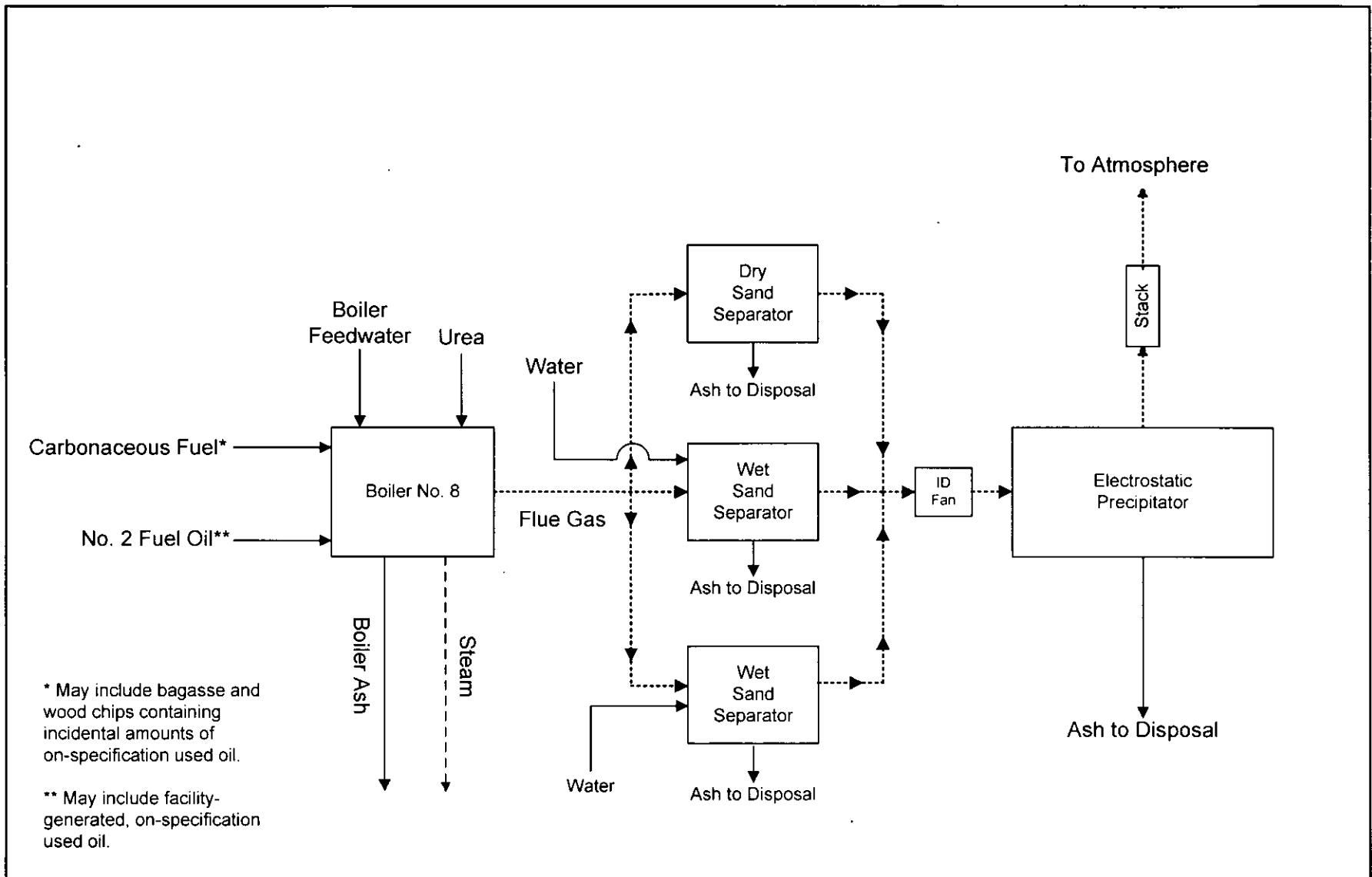
Emissions Unit Control Equipment

1. Control Equipment/Method(s) Description:

**Electrostatic Precipitator
Wet Sand Separator
Selective Non-Catalytic Reduction System (SNCR)
Mechanical Dust Collector**

2. Control Device or Method Code(s): **010, 099, 107, 076**

FLOW DIAGRAM



Attachment USS-EU1-I1
 Boiler No. 8 Process Flow Diagram
 U.S. Sugar Corporation
 Clewiston Mill, Florida

Process Flow Legend
 Solid/Liquid ———▶
 Gaseous▶
 Steam - - - - -▶

File: 0437615/Boiler #8 Wet Scrubber/4.4/USS-EU1-I1.vsd
 Date: 4/28/06



ATTACHMENT USS-EU1-I3

**CONTROL EQUIPMENT PARAMETERS FOR BOILERS NO. 8
AT THE U.S. SUGAR CLEWISTON MILL**

ATTACHMENT USS-EU1-I3a
DESIGN CONTROL EQUIPMENT PARAMETERS FOR BOILER NO. 8
AT U.S. SUGAR CLEWISTON MILL

WET SAND SEPARATORS*

Control Device Type Manufacturer and Model No.	Wet Cyclone Thermal Energy Systems
Inlet Flue Gas Temp (°F)	400
Inlet Design Flue Gas Flow Rate (acfm)	230,000
Inlet Expected Flue Gas Flow Rate (acfm)	168,000
Inlet Moisture (% Volume)	24
Cyclone Diameter (ft)	22
Cyclone Height (ft)	35
No. of Spray Nozzles (Cyclone)	5
No. of Spray Nozzles (Inlet Duct)	9
Total Water Flow to Nozzles (gpm)	713
Pressure Drop (in H ₂ O)	4
Overall PM Collection Efficiency (%)	80

*There are two identical units operating in parallel; data is for each unit.

ATTACHMENT USS-EU1-I3b
DESIGN CONTROL EQUIPMENT PARAMETERS FOR BOILER NO. 8
U.S. SUGAR CLEWISTON MILL
ELECTROSTATIC PRECIPITATOR

Manufacturer and Model No.	PPC Industries Model No. 41R-1536-5712P		
Inlet Flue Gas Temp (°F)	335		
Inlet Design Flue Gas Flow Rate (acfm)	432,500		
Moisture (% Volume)	20		
No. of Precipitators	1		
Precipitation Type	Rigid Electrode		
Total Number of Fields	5		
Total Installed Collection Area (ft ²)	154,360		
Gas Velocity (ft/s)	3.25		
Specific Collection Area (ft ² /1,000 acfm)	356		
Power Consumption (KW)	250		
Pressure Drop (in H ₂ O)	1		
Pollutants	Inlet Loading (lb/hr)	Outlet Loading (lb/hr)	Control Efficiency %
Particulate Matter	5,346	25.8	99.5

Design Inlet loading calculation:

Uncontrolled: 5.19 lb/MMBtu x 1,030 MMBtu/hr = 5,346 lb/hr

ESP outlet loading (max) = 25.75 lb/hr (based on 0.025 lb/MMBtu)

ESP efficiency (min) = (5,346 - 25.75) / 5,346 = 99.5%

ATTACHMENT USS-EU1-I3c
DESIGN CONTROL EQUIPMENT PARAMETERS FOR BOILER NO. 8
AT U.S. SUGAR CLEWISTON MILL

DRY SAND SEPARATOR*

Control Device Type	Dry Multiclone
Manufacturer and Model No.	Howden Energy Systems
Inlet Flue Gas Temp (°F)	385
Inlet Design Flue Gas Flow Rate (acfm)	90,000
Inlet Moisture (% Volume)	24
No. of Cyclones	40
Cyclone Diameter (ft)	1.26
Cyclone Height (ft)	2.70
Pressure Drop (in H ₂ O)	3
Overall PM Collection Efficiency (%)	83

*There is one dry sand separator (multiclone).

**DESIGN SPECIFICATIONS AND
DRAWING OF DRY MULTICLONE**



Howden

Howden Energy System:

1a. Booyens Road
Booyens 2001
Johannesburg

P O Box 9501
Johannesburg 2000

Tel: +27 11 240 4000
Fax: +27 11 493 3861
web: www.howden.co.za

January 27, 2006

Thermal Energy Systems CC
Lagoon Beach Office Park,
Block C Ground Floor,
Cnr Marine Drive & Boundary Road,
Milnerton
7441

Fax No 021 552 2611

ATTENTION: MR BEN MISPLON

Dear Sirs,

GRIT ARRESTER FOR EXPORT
HES REF. NO. T9982/47/06

We thank you for the above enquiry and have pleasure in submitting our proposal for your consideration.

Design Parameters Given

Application:	Bagasse/LFO Fired Boiler
Altitude:	Sea level
Design gas flow: Am ³ /s	± 42.4 (40 cells @ 1.06 Am ³ /s per cell)
Density: kg/Am ³	0.70
Gas temperature: °C	196
Required pressure drop Pa	750
Inlet burden mg/Nm ³	10 000
Particle size distribution	100% < 500 µm
	92% < 150
	73% < 80
	60% < 60
	48% < 50
	37% < 40
	25% < 30
	15% < 20
	5% < 10
	3% < 5
	1% < 1
SG of dust	2.0

Equipment Offered

For this application we would offer the Howden IR Multivortex low energy grit arrester.

No of cells:	8 x 5 = 40
Inlet size:	3 300 w x 2 050 h
Hopper:	Trough with water sluicing
Seal:	Swinging bucket
Mass:	3 100 kg
Pressure drop:	750 Pa
Collection efficiency	83%

We have offered the basic construction with mild steel cells electroless nickel plated.

Prices

Grit arrester c/w mild steel cells: R 324 310.00 ex works excluding VAT

Conditions of Tender

Prices tendered are fixed and firm for the validity of this tender.

Validity

30 days, thereafter subject to confirmation

Delivery

A general arrangement drawing could be provided within 1 - 2 working weeks of an order and delivery ex works could be effected in typically 10 to 12 working weeks after approval but may be negotiated.

Exclusions

In arriving at the above prices we have excluded the following:

1. Supporting steelwork
2. Thermal insulation
3. Container or shipping

Terms of Payment

The prices tendered are based on payment in South African Rands, payable within 30 days of invoices as follows:

- 15% on submission of certified arrangement drawing
- 85 % of contract price on despatch of equipment.

Consequential Loss

Notwithstanding any of the conditions specified or tendered, Howden Energy Systems specifically reject any liability for any form of consequential loss of any description arising from any cause whatsoever during the execution of this contract.

Howden 305 I.R. Multivortex Collector

General Description

The Howden I.R. Collector is a centrifugal type dust collector designed to give a high efficiency and occupy a small space. The collector is the straight through type consisting of a number of cells arranged horizontally and operating in parallel.

The Cell

Each cell would be as shown on the attached sketch. As can be seen the cell consists of four main parts:

- a) The inlet tube
- b) The cell body
- c) The inlet vane assembly
- d) The outlet tube

The cell body is a parallel tube and the vane assembly consists of carefully designed and pressed blades welded to a central boss. The outlet and inlet tubes are short parallel tubes of slightly smaller diameter than the cell body.

The Operation

The dust laden gas having entered the inlet tube is set into a whirling motion by the vane assembly. The dust particles by virtue of the centrifugal force are thus thrown to the inside circumference of the cell body, passing out through the narrow opening formed between the body and the outlet tube and discharge into the collection hopper below. The cleaned gas then passes out through the discharge tube.

The relatively high efficiency achieved from this collector without a secondary collection system is obtained by inducing a secondary flow through the annular space where the dust has to pass. This is achieved by means of the ejector principle i.e. the gas passing through the inlet tube and thence the vane ring induces a flow through the annular space between the inlet tube and the cell body.

This causes a depression in the hopper and thus induces a secondary flow between the cell body and outlet tube.

Construction

The cells, inlet and discharge tubes are manufactured from standard mild steel tubing. The inlet vanes and bosses are pressed from mild steel plate. The casing in which the cells are housed and the dust hoppers are constructed generally in 6 mm mild steel plate adequately stiffened.

Partial List of References

Royal Swazi Sugar Estates – Swaziland
Usutu Pulp - Swaziland
Hippo Valley – Zimbabwe
Triangle Sugar - Zimbabwe
Mon Tresor - Mauritius

HOWDEN ENERGY SYSTEMS

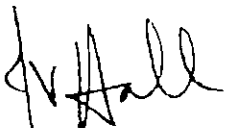
Howden Energy Systems is an operating division of Howden Africa, a company listed on the Johannesburg Stock Exchange

The focal areas of Howden Energy Systems are Gas Cleaning, Combustion and Industrial Furnace Systems. Also marketed is a full range of heat exchanger technology.

Howden Energy Systems are listed by SABS to ISO 9001.2000 for quality management Systems. This followed a Howden Group South Africa policy of obtaining listing for all operating companies. Howden Energy Systems were in fact one of the first true project management companies to obtain the SABS listing.

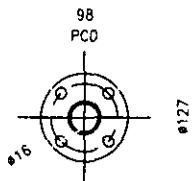
We trust that this is in line with your requirements. Should you have any further queries, please do not hesitate to contact us.

Yours faithfully,
For HOWDEN ENERGY SYSTEMS

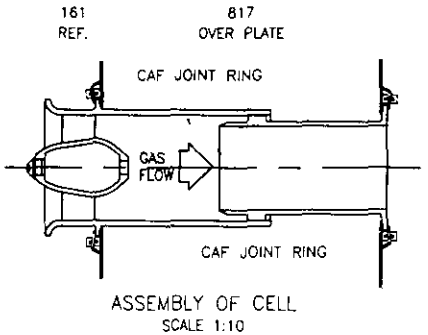
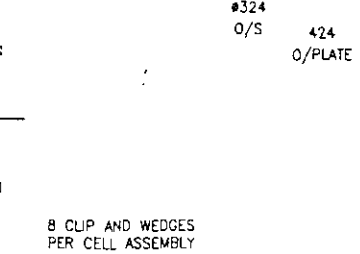
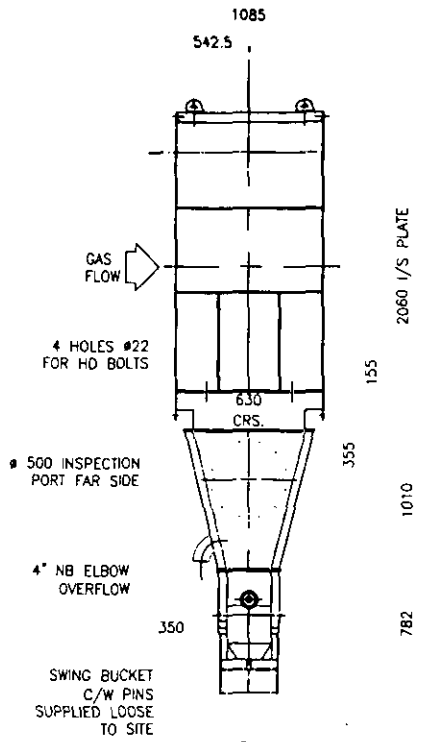


J V HALL
APPLICATIONS – GAS CLEANING

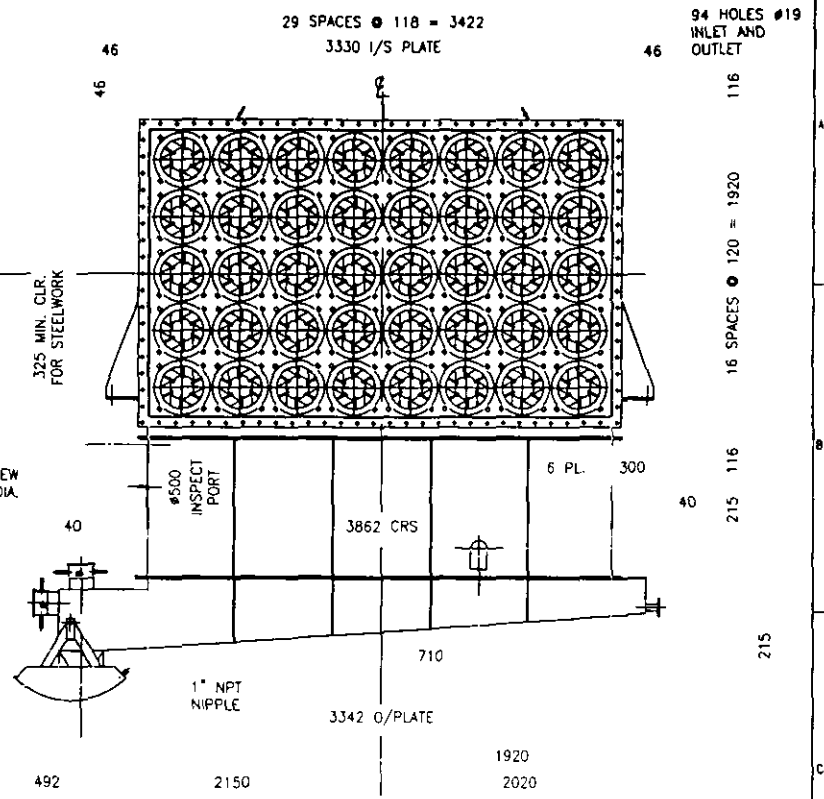
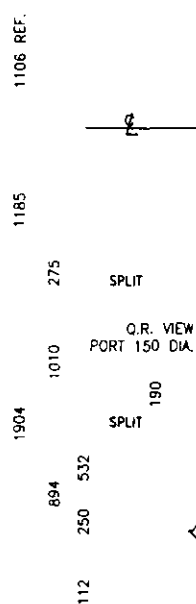
I BLASKO
GENERAL MANAGER



SLUICE WASHING FLANGE 1 1/2" NB
ANSI B16.5 150# S.O.F.F.
SCALE 1:5



ASSEMBLY OF CELL
SCALE 1:10



CASING DESIGN PRESSURE: 35"wg
DESIGN TEMPERATURE: 570°F

GRIT COLLECTOR DEAD MASS: 7761 kg
OPERATING MASS: 8200 kg
CHOKED MASS: 15400 kg

REV. NO.	DATE	BY	CHKD.	DESCRIPTION
A		ERL	WHW	ISSUED
B		ERL	WHW	CHANGES AS PER T.E.S 'MARK-UP' 06/03/06

GENERAL TOLERANCES		
MACH. ABOVE	INCL.	FABR.
0.1	0.3	6
0.2	6	30
0.3	30	120
0.5	120	315
0.8	315	1000
1.2	1000	2000
2	2000	4000
3	4000	8000
4	8000	12000
5	12000	18000
6	18000	20000

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1 ST ANGLE PROJECTION	DRAWN BY ERL
	DATE 02/03/06
ENGINEERING DRAWING PRACTICE AS PER PARTS 1, 2 & 3 (LATEST)	CHKD BY WHW
WELDING TERMS & SYMBOLS AS APP. PART 2 (LATEST)	APPROVED WHW
SCALE 1:25	PROG. ENG.

CLIENT U.S. SUGAR CORPORATION	DRAWING NO. 06 C 47365 001
SITE USSC CLEWISTON MILL	MOD. A B
GENERAL ARRANGEMENT OF 40 CELL IR MVX GRIT COLLECTOR (8Wx5H)	
HOWDEN ENERGY SYSTEMS : JOHANNESBURG	

