

Golder Associates Inc.

6241 NW 23rd Street, Suite 500
Gainesville, FL USA 32653
Telephone (352) 336-5600
Fax (352) 336-6603
www.golder.com



RECEIVED

MAY 18 2006

063-7563

May 17, 2006

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

BUREAU OF AIR REGULATION

Attention: Mr. Jeffery Koerner, P.E.

RE: UNITED STATES SUGAR CORPORATION (U.S. SUGAR) – CLEWISTON MILL
BOILER NO. 8
40 CFR PART 63, SUBPART DDDDD
SUBMITTAL OF SITE-SPECIFIC TEST PLANS

Dear Mr. Koerner:

United States Sugar Corporation (U.S. Sugar) currently operates Boiler No. 8 at the Clewiston Mill under Air Construction Permit No. 0510003-030-AC/PSD-FL-333B, issued April 7, 2006. The new boiler began commercial operation in mid-March 2005.

Boiler No. 8 is subject to the provisions of 40 CFR Part 63, Subpart DDDDD, which is the National Emissions Standards for Hazardous Air Pollutants (NESHAPs) for Industrial, Commercial, and Institutional Boilers and Process Heaters, promulgated on September 13, 2004. This rule is referred to as the "Boiler MACT" rule, since it incorporates the maximum achievable control technology (MACT) requirements of the NESHAPs.

The Boiler MACT rule requires annual performance testing for at least the first three years of operation. U.S. Sugar will be performing annual Boiler MACT performance testing on the boiler during the current sugarcane off-season. Annual particulate matter (PM) testing was performed on the boiler in January 2006. However, hydrogen chloride (HCl) or mercury (Hg) testing was not performed at that time. In addition, Boiler No. 8 was recently permitted to burn wood fuel, and this fuel could be the worst case fuel for HCl or Hg emissions.

U.S. Sugar also intends to demonstrate compliance with the PM emission limit while operating at lower pressure drop and water flow rates through the wet cyclones, and while operating at lower electrostatic precipitator (ESP) power input. These lower rates are more reflective of off-season operation, when Boiler No. 8 is only operating at about 50 percent of load.

Finally, U.S. Sugar intends to develop curves of flue gas moisture content versus boiler load for both bagasse and wood fuel in order to eliminate the requirement for both a wet and dry flue gas oxygen (O₂) monitor, from which flue gas moisture is derived. The wet O₂ monitor has been problematic in operation. This alternative is allowed under Permit No. 0510003-030-AC. The off-season testing



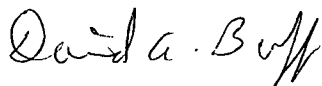
will allow U.S. Sugar to develop this information for lower load operation, which takes place during the off-season.

The purpose of this submittal is to provide the site-specific performance testing and fuel sampling and analysis plans required by Subpart DDDDD for performance testing. The dates of the performance testing have been set for June 1-2, 2006. This plan is being submitted since Subpart DDDDD requires test plans be submitted 60 days prior to performance testing. U.S. Sugar requests that the Florida Department of Environmental Protection waive the 60-day notification requirement in lieu of the 15-day state notification requirement.

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
Cecily Tart, DEP
Doug Neeley, EPA Region 4
Connie Oldham, EPA RTP

Y:\Projects\2006\0637563 USSC Boilers 1 & 2\4.1\051706.doc

**BOILER MACT – SUBPART DDDDD
SITE-SPECIFIC TEST PLAN
FOR BOILER NO. 8
UNITED STATES SUGAR CORPORATION
*CLEWISTON, FLORIDA***

Prepared For:

**United States Sugar Corporation
111 Ponce de Leon Ave.
Clewiston, Florida 33440**

Prepared By:

**Golder Associates Inc.
6241 NW 23rd Street, Suite 500
Gainesville, Florida 32653-1500**

May 2006

0637563

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
1.0 INTRODUCTION	1-1
2.0 APPLICABLE LIMITS	2-1
3.0 COMPLIANCE DEMONSTRATION AND PLAN	3-1
3.1 Particulate Matter (PM)	3-1
3.2 Hydrogen Chloride (HCl)	3-2
3.2.1 Stack Testing	3-2
3.2.2 Bagasse and Wood Chip Fuel Sampling and Analysis	3-3
3.3 Mercury (HG)	3-7
3.3.1 Fuel Sampling and Analysis Methods During Performance Testing	3-7
3.4 Data Quality Objectives	3-7
3.5 Internal and External Quality Assurance	3-7
3.5.1 Internal Quality Assurance	3-7
3.5.2 External Quality Assurance	3-7
3.6 Calculations	3-13
3.7 Reporting	3-13

LIST OF TABLES

Table 3-1	Comparison of Proposed U.S. Sugar Clewiston Mill Sampling and Analysis Procedures with Final Boiler MACT Rule
-----------	---

1.0 INTRODUCTION

The U.S. Environmental Protection Agency (EPA) has issued maximum achievable control technology (MACT) standards to control the emissions of hazardous air pollutants (HAPs) from the burning of solid fuels in industrial boilers (codified under 40 CFR 63, Subpart DDDDD). To control emissions of HAP metals, a total particulate matter (PM) standard for new and existing solid fuel boilers of 0.025 and 0.07 pounds per million British thermal units (lb/MMBtu) of heat input, respectively, is contained in the rule. However, since the EPA has recognized that PM emissions display a high variability based on boiler type and fuels, an alternative eight-metals standard [total selected metals (TSM) standard], has been included in the rule. The eight metals that are included in this standard are arsenic (As), beryllium (Be), cadmium (Cd), chromium (Cr), lead (Pb), manganese (Mn), nickel (Ni), and selenium (Se). As an option to meeting the PM standard, sources can choose to demonstrate that the sum of the mass emissions rate of these eight metals is below 0.001 lb/MMBtu for existing boilers and 0.0003 lb/MMBtu for new boilers.

In addition to PM or TSM, the rule also regulates hydrogen chloride (HCl) and mercury (Hg) emissions. The emission limits for HCl are 0.02 lb/MMBtu for new solid fuel boilers and 0.09 lb/MMBtu for existing solid fuel boilers. The emission limits for Hg are 0.000003 lb/MMBtu for new solid fuel boilers and 0.000009 lb/MMBtu for existing solid fuel boilers.

Compliance with the PM emission limit is demonstrated through performance (compliance) tests, while compliance with the TSM, HCl, and Hg emission limits can be demonstrated by conducting performance (compliance) tests or by fuel analysis.

Bagasse, a co-product of sugarcane processing, is used as a boiler fuel throughout Florida's sugarcane industry to supply steam for processing sugarcane into raw sugar. The United States Sugar Corporation (U.S. Sugar) Clewiston Mill currently has five operating bagasse/oil-fired boilers: Boiler Nos. 1, 2, 4, 7, and 8.

Boiler No. 8 is permitted for a 1-hour maximum capacity of 550,000 pounds per hour (lb/hr) steam at a heat input rate of 1,036 MMBtu/hr. The 24-hour average capacity is limited to 500,000 lb/hr steam and 936 MMBtu/hr. The boiler is fired primarily by bagasse, with wood chips and No. 2 fuel oil used for startup, shutdown, malfunction, and supplemental fuels.

Boiler No. 8 was subject to the new source MACT standards upon commercial start-up of the boiler in March 2005. Initial MACT performance testing was conducted in March 2005. Annual compliance testing for PM was also performed in January 2006.

U.S. Sugar will demonstrate compliance with Subpart DDDDD for Boiler No. 8 by several different methods, including stack testing and fuel analysis. Subpart DDDDD, and the general provisions (Subpart A) to 40 CFR Part 63, require that a site-specific test plan and fuel analysis plan be submitted to the reviewing agency within 60 days prior to conducting the performance test [40 CFR 63.7520(a) and 63.7521(b)].

The applicable Subpart DDDDD regulations, the proposed compliance plan, and the proposed performance test plan for Boiler No. 8 are described in the following sections.

2.0 APPLICABLE LIMITS

Boiler No. 8 is subject to new source standards under Subpart DDDDD since construction was commenced on Boiler No. 8 after January 13, 2003. The emission limits applicable to new solid fuel-fired boilers are as follows:

- PM – 0.025 lb/MMBtu, or as an alternative, TSM of 0.0003 lb/MMBtu;
- Hg – 3×10^{-6} lb/MMBtu;
- HCl – 0.02 lb/MMBtu; and
- CO – 400 ppmvd at 7-percent O₂, 30-day rolling average.

U.S. Sugar has elected to meet the PM limit of 0.025 lb/MMBtu, in lieu of meeting the TSM limit.

3.0 COMPLIANCE DEMONSTRATION AND PLAN

3.1 Particulate Matter (PM)

U.S. Sugar will demonstrate compliance with the PM standard for Boiler No. 8 by conducting stack testing using the following methods and procedures:

1. PM will be measured using EPA Method 5.
 - a. A minimum of three test runs will be performed.
 - b. Sampling time for each run will be a minimum of 60 minutes.
2. For determining sample port location and number of traverse points, EPA Method 1 or 1A will be used.
3. Velocity and volumetric gas flow rate will be measured out of the stack using EPA Method 2, 2F, or 2G.
4. Oxygen concentration will be measured using EPA Method 3A or 3B. The gas sample must be taken at the same time and at the same traverse points as the PM sample.
5. Moisture content of stack gas will be measured using EPA Method 4.
6. Steam production rate, steam temperature, and steam pressure will be measured by process monitors.
7. Voltage and secondary current will be monitored, and then the total power input to the electrostatic precipitator (ESP) will be calculated. The voltage and secondary current to each field will be recorded at least once every 15 minutes. For each test run, the average total power input to the ESP will be determined. The minimum total power input for continuous compliance purposes will be set at 90 percent of the lowest test run average.
8. The pressure drop and water flow rate for each wet cyclone will be monitored. The EPA has classified the wet cyclones as wet scrubbers since they are used for PM control. The pressure drop across each wet cyclone and the water flow rate to each wet cyclone will be recorded at least once every 15-minutes. For each test run, the average pressure drop and water flow rate will be determined. The minimum pressure drop and water flow rate to

each wet cyclone for continuous compliance purposes will be set at 90 percent of the lowest test run average.

A total of three individual runs will be performed, with each run lasting for at least 1 hour. The average of the three test runs will be used to compare to the 0.025 lb/MMBtu limit. Testing will be conducted while Boiler No. 8 is operating at its normal maximum off-season operating load (i.e., within 50 percent of permitted capacity, if such load is achievable). Testing will also be conducted at lower and/or higher operating loads if process conditions permit. Testing will be conducted while burning bagasse fuel in the boiler. Compared to wood fuel, bagasse should create higher PM emissions due to the nature of and combustion properties of bagasse (higher in moisture than wood).

The F-factor methodology contained in 40 CFR 60, Appendix A, Method 19, Section 12.3.2, will be used to convert the measured PM concentrations to lb/MMBtu heat input emission rates. Fuel analysis, described in Section 3.2.2, will be used to develop the F-Factor during the test.

Since Boiler No. 8 employs an ESP as its dry control system, but additionally will employ a wet control system, the voltage and secondary current (or total power input) to the ESP and the pressure drop and water flow rate for the wet cyclones must be utilized as operating parameters.

Performance tests for PM and HCl emissions from Boiler No. 8 will be conducted concurrently on the same day.

3.2 Hydrogen Chloride (HCl)

3.2.1 Stack Testing

Performance testing in 2005 demonstrated that HCl emissions prior to the wet cyclones (i.e., uncontrolled HCl emissions) were below the Boiler MACT standard. Therefore, U.S. Sugar will demonstrate compliance with the HCl standard by conducting stack testing at the inlet to the wet cyclones (i.e., prior to any control device) while Boiler No. 8 is operating at its normal maximum off-season operating load (i.e., within 50 percent of permitted capacity, if such load is achievable). Testing will also be conducted at lower and/or higher operating loads if process conditions permit. Testing will be conducted while burning bagasse fuel in the boiler. Fuel sampling of wood chips in early 2006 demonstrated that bagasse fuel is the worst-case fuel for HCl emissions (chlorine content of the fuel). This will be confirmed further through this performance testing.

The following test methods and procedures will be used:

1. HCl will be measured using EPA Method 26A.
 - a. A minimum of three test runs will be performed at the inlet to the wet cyclones.
 - b. Sampling time for each run will be a minimum of 60 minutes.
2. For determining sample port location and number of traverse points, EPA Method 1 or 1A will be used.
3. Velocity and volumetric gas flow rate of the stack gas will be measured using EPA Method 2, 2F, or 2G.
4. Oxygen concentration will be measured using EPA Method 3A or 3B. The gas sample must be taken at the same time and at the same traverse points as the HCl sample.
5. The moisture content of stack gas will be measured using EPA Method 4.
6. Steam production rate, steam temperature, and steam pressure will be measured using process monitors.

A total of three individual runs will be performed, with each run lasting for at least 1 hour. The average of the three test runs will be used to compare to the 0.02 lb/MMBtu limit. Testing will be conducted while Boiler No. 8 is operating at its normal off-season maximum operating load (i.e., within 50 percent of permitted capacity, if such load is achievable) and burning bagasse. The F-factor methodology contained in 40 CFR 60, Appendix A, Method 19, Section 12.3.2, will be used to convert the measured HCl concentrations to lb/MMBtu heat input emission rates. Cl₂ gas emissions will also be reported in lb/MMBtu.

Performance tests for PM and HCl emissions from Boiler No. 8 will be conducted concurrently on the same day.

3.2.2 Bagasse and Wood Chip Fuel Sampling and Analysis

Subpart DDDDD requires that fuel sampling be conducted during performance testing for HCl emissions. The following sections present the sampling and analysis methodologies that will be employed by U.S. Sugar.

Methods

The final MACT rule requires the following steps for fuel analysis (40 CFR 63.7521):

1. Obtain at least three composite samples of each fuel type, following specific procedures;
2. Prepare each composite sample according to specific procedures; and
3. Determine pollutant concentrations in the fuel in lb/MMBtu of each composite sample.

The sample collection methods will differ slightly from the requirements contained in the final MACT rule. A summary of the differences between the rule requirements and the procedures followed for the fuel sampling and analysis for the Boiler MACT testing at U.S. Sugar are presented in Table 3-1, and are described below.

Bagasse Sample Collection

Bagasse fuel sample collection will be performed during each stack test run (over approximately 1-hour discrete intervals) during testing of Boiler No. 8. Three discrete bagasse samples will be taken at approximately the beginning, middle, and end of each run.

At the U.S. Sugar Mill, during the off-season, bagasse fuel is fed from the bagasse storage pile to the bagasse conveying system via front-end loader. The bagasse is dropped onto a conveyor belt and is then conveyed to the boilers. Boiler No. 8 is fed by the bagasse conveying system. Bagasse will be sampled directly from the moving conveyor belt at the point where bagasse is introduced into the bagasse feeders. This will allow fuel samples to be taken of the bagasse going directly into the boiler. These grab samples will be composited. Composite samples will be obtained at the beginning, middle and end of each test run.

Note that it is not possible to “stop” the bagasse conveyor belts at the Clewiston Mill without disrupting the boiler fuel feed and, therefore, the boiler operation, since the conveyor belt directly feeds the bagasse feeders on Boiler No. 8. There is no intermediate storage of bagasse between the bagasse storage pile, the conveyor belt and the bagasse feeders. Therefore, the bagasse fuel sampling procedure will vary slightly from the Boiler MACT rule, which requires that the conveyor belt be stopped prior to taking the sample and sampling across the width of the conveyor belt.

Grab samples will be taken at approximately the beginning, midpoint, and end of each sampling run, resulting in three grab samples per run. Each grab sample will consist of approximately 1 gallon of bagasse, or about 1.5 lb of bagasse.

Wood Chip Sample Collection

Fuel sampling for wood chips will also be conducted to demonstrate that wood chip fuel is not the worst-case fuel for HCl emissions. Wood chip fuel sample collection will be performed at the fuel storage pile.

Fuel sampling procedures for fuel pile sampling are specified in 40 CFR 63.5721(c)(2). A minimum of three composite samples must be taken for each fuel type. For each composite sample, a minimum of five sampling locations uniformly spaced over the surface of the pile must be selected. At each sampling site, a sample must be taken at a depth of approximately 18 inches. A clean flat square shovel must be inserted into the hole to withdraw a sample, making sure the large pieces do not fall off during sampling. Each sample is transferred to a clean plastic bag.

At the U. S. Sugar Mill, five sampling sites will be used, uniformly spaced over the extent of the storage pile. Each sample will be collected by digging into the pile to a depth of 18 inches, inserting a clean, flat, square shovel into the hole, and withdrawing a sample. Each grab sample will consist of approximately 1 gallon of wood chips, or about 1.5 lbs of wood chips. The sample will be transferred to a clean plastic bag. Each of the individual samples will be used to form a single composite sample according to the rule requirements (see Table 3-1). The composite sample will be documented and labeled appropriately. This procedure will be repeated three times to obtain three composite samples.

Throughout the sample collection, compositing, and delivery to the laboratories, a chain-of-custody will be utilized to document sample collection.

Sample Storage, Handling and Compositing

Each grab sample of bagasse and/or wood chips will be placed in a clean plastic bag and transported to Golder Associates Inc. in Gainesville. Golder's staff members will composite the samples from the Clewiston Mill for each run, according to the procedures in the Boiler MACT rule, with minor deviations as noted in Table 3-1. The procedure that will be followed for the Clewiston Mill will vary from the Boiler MACT rule in that the bagasse samples will not be broken apart, since the bagasse particles are fairly uniform. Wood fuel sample pieces greater than 3 inches in size will be broken apart during compositing, as required by the rule.

Laboratory Analysis

Two laboratories may be used. One split sample may be sent to a laboratory (Hazen Research) for proximate, ultimate, chlorine, and heat content analyses, while one split sample may be sent to a laboratory (PPB Environmental Laboratories) for metals analysis.

Analysis procedures will follow American Society for Testing and Materials (ASTM) methodologies for coal and coke analysis, modified for biomass samples, as shown in Table 3-1. Preparation of the biomass samples for analysis will be by Method 3050B from the Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Integrated Manuals (SW-846; EPA, 1997).

The composite samples will be processed by a third party vendor and/or laboratory for required analysis. It is noted that the National Council for Air and Stream Improvement (NCASI) has identified grinding of biomass samples in the laboratory as a possible point of sample contamination, due to the metals contained in the grinding equipment used in labs. As a result, the analytical laboratory will not grind the sample, but instead will cut the samples to appropriate size prior to digestion and analysis.

The heat content analysis will be performed by using ASTM Method E711-87, and the solids (moisture) content analysis will utilize ASTM D3173-02 or ASTM E871. All of these methods are specified in the rule.

Mercury concentrations, although not being stack tested, will be determined for the biomass fuel by using SW846-7471A, which is the method specified in the rule. The minimum detection limit for mercury analysis will be 0.01 to 0.02 parts per million (ppm), dry basis.

Total selected metals concentrations, although not being stack tested or required to be analyzed for fuel testing, will be determined. ASTM E885-88, which is the method specified in Subpart DDDDD for biomass, will be utilized.

Chlorine concentrations will be determined using ASTM E776-87. This method allows the use of sodium hydroxide or potassium hydroxide (see Note 3 in the method). The chloride excess will be monitored and the endpoint found where the chloride content disappears.

Results

The F-factor will be calculated from the fuel analysis, based on the equation presented in EPA Method 19 of 40 CFR 60, Appendix A [as required by 40 CFR 63.7520(g)]. From the stack test results and the F-factor, the heat input to the boiler will be determined for each run.

The biomass composite sample results for chlorine, Hg and total selected metals will be presented in ppm and lb/MMBtu. The heat contents in Btu/lb from the heat content analysis will be used to convert the concentrations from ppm (as reported by the laboratory) to lb/MMBtu.

3.3 Mercury (HG)

U.S. Sugar will demonstrate compliance with the Hg limit specified in Subpart DDDDD by performing fuel sampling and analysis. The procedures that will be employed are described below.

3.3.1 Fuel Sampling and Analysis Methods During Performance Testing

The procedures described in Section 3.2.2 for fuel sampling and analysis will also be employed for Hg sampling and analysis during the performance tests.

3.4 Data Quality Objectives

U.S. Sugar expects to follow the precision and accuracy that is required in the Boiler MACT requirements and the specific test methods in the rule. U.S. Sugar expects to have a complete set of performance test data, including calculations, as outlined in this test plan, by the time the initial performance test plan reports are submitted. These reports will be submitted as part of the Notification of Compliance Status required by 40 CFR 63.7545(e) and 63.9(h)(2)(ii).

3.5 Internal and External Quality Assurance

3.5.1 Internal Quality Assurance

U.S. Sugar has implemented the following quality assurance (QA) procedures, which will also be followed during the Boiler No. 8 performance testing:

- Equipment is calibrated at least annually;
- Gauges are checked at least annually;
- Systems are inspected prior to testing;
- Flow meters are calibrated at least annually; and
- Malfunctioning equipment is repaired and recalibrated as soon as practicable.

3.5.2 External Quality Assurance

The stack testing company that will be performing the testing is Air Consulting & Engineering (ACE). The ACE QA program is broken down into the following categories:

Pretest

Calibrations

ACE uses a Precision Analytical Model 63123 meter as a calibration standard. The wet test meter is operated at one cubic foot per revolution. Calibrations are performed at five points in triplicates according to EPA specifications. Calibration checks are performed annually at two calibration points in triplicate (the EPA requires only one reading per point).

All original calibration data and updates, as well as the calibration curve, are presented in the QA section of all ACE reports.

Field meters are calibrated against this standard annually or after 200 hours of use (whichever occurs first). The field meters are recalibrated anytime a post-calibration test check yields results which deviate by more than 2 percent (EPA requires recalibration at ± 5 percent). ACE participates in the EPA's Emission Monitoring Laboratory voluntary audit program.

The thermometers, pyrometers, and thermocouples are calibrated annually and spot checked frequently (post-test calibrations). When physically possible, field checks are made by comparison to a mercury-in-glass thermometer in the field under stack conditions.

Pitot tubes are constructed to EPA specifications and are calibrated by measurement technique. Each pitot is visually inspected for proper alignment and possible damage prior to each use.

All calibration data are included in the QA section of ACE reports. Calibration logs are maintained and are available for inspection at the ACE office in Gainesville, Florida.

Analytical Instruments

All instruments used by ACE for compliance testing and continuous emissions monitoring (CEM) certification have been approved by the EPA for such use. Manufacturers' recommended calibration and maintenance procedures are strictly adhered to. Documentation of each instrument's Performance Specifications, Interference Response, and Accuracy Verification are included in each report.

Calibration Gases

ACE uses National Bureau of Standards (NBS) traceable calibration gases. These gases have been analyzed according to EPA Protocol 1. A Certification of Protocol Analysis for all calibration gases is provided in each report.

Tare Weights

Particulate filters and beakers are tare weighed in ACE's Gainesville, Florida, laboratory weight room. The weight room is humidity controlled and maintained at 30 to 50 percent relative humidity. Our balance is a Mettler H10 Model. It is serviced and calibrated annually or as needed by Weight Check, Inc. of Jupiter, Florida.

Filters are visually inspected for irregularities, numbered, oven-fired at 200 degrees Fahrenheit (°F) for two hours, and desiccated for 24 hours.

Beakers are washed with warm, soapy water, rinsed with tap water, and finally, rinsed with distilled water. They are then drip-dried, oven-dried at 200°F for two hours, and desiccated for 24 hours.

Prior to use, the Mettler level bubble is checked and the balance is zeroed. Linearity is checked with 0.5, 10.0, and 100.0-gram Type S certified weights. The certified weight checks, along with temperature, humidity, date, time, and technician's name performing the weighing, are recorded in the tare weight book. Filters and beakers are then weighed and recorded in the tare weight book. The weighed items are then replaced in desiccators and reweighed at a minimum of six hours elapsed time. Weights that vary no more than 0.5 mg are considered constant. Two acceptable weighings are averaged for the final tare weight. One out of ten filters and beakers are later analyzed by the QA officer. Beakers are kept in desiccators until needed. Filters are either placed directly in sealed filter holders for field use or sealed in Petri dishes and plastic bags for future use.

Sample Bottles

Sample bottles are washed with warm, soapy water, rinsed with tap water, and finally rinsed with distilled water. The bottles are then visually inspected for particulate residue and allowed to air-dry. They are then tightly sealed and taped for use in the field.

Silica Gel

Upon purchase, silica gel is inspected for proper color and mesh size. ACE pre-weighs all silica gel to exactly 200 grams in the field containers, including the lids. This prevents possible silica gel pre-test weight errors. The silica gel containers are then tightly sealed and stored for field use.

Acetone or Distilled Water

Before opening a new container of rinse reagent, it is thoroughly shaken, and three 100-milliliter aliquots are taken. These samples are treated as field blanks to ensure the quality of our cleanup reagents. Bad acetone is returned to the supplier.

In the Field

ACE's field team leader is responsible for all QA in the field.

Leak Checks

ACE places emphasis on pre-test leak checks. The meter box is leak-checked (inclusive of post-pump portions) at 15+ inches of water (H₂O) pressure, respectively, to ensure meter integrity during transit.

Both sides of the pitot tube are leak-checked at 3+ inches of H₂O pressure.

The Orsat analyzer and integrated bag are checked under pressure by observation over a 10-minute period.

When the sampling train is assembled, all components are leak-checked at 15+ inches of Hg vacuum.

If any leaks are detected, they are corrected before any sampling is initiated. All required leak checks are repeated after each sampling run.

Nozzle Calibration

Nozzle calibration is performed in the field by the field team leader. Three different diameters of the nozzle opening are measured with calipers and averaged. These measurements are recorded on the first page of the field data sheet.

Field Testing

The numbers of the filter, silica gel, meter box, pyrometer, and pitot-thermocouple are recorded prior to testing. The names of the test participants, coordinator, and agency observers are also recorded on the field data sheets.

The barometric pressure is obtained from an aneroid barometer taken to the sampling platform. This eliminates need for altitude corrections. The barometer is calibrated against the mercury barometer used by the United States Weather Service at the Gainesville Regional Airport (approximately 1.5 miles from our laboratory) and is spot checked for accuracy after each test in the post test calibration.

Field calculations are made at the conclusion of each sample run to insure isokinetic limits have been met and that moisture content and flow rates are within the expected performance of the unit tested. This procedure detects any tube leaks and fan imbalances that can be detrimental in meeting compliance standards.

Sample Recovery

Upon completion of a sample run, the probe is placed in a secure position and the exterior of the nozzle is carefully wiped clean. After the leak check, the nozzle is removed and rinsed with acetone (or water) into a prepared sample bottle. The nozzle is then thoroughly brushed and rinsed until all particulate has been captured. The sample bottle is then securely closed and the liquid level is marked. The bottle is labeled with the plant name, source number, run number, and date. It is then placed in an upright position in the sample box.

The condensate collected in the first, second, and third impingers is carefully measured and recorded on the first page of the field data sheet. Any unusual characteristics (color, odor, etc.) are noted. The silica gel in the fourth impinger is carefully recovered, placed in its original container, and labeled with the plant name, source name, run number, and date.

Used silica gel is also kept in the sample box.

The filter holder is then removed from the probe. It is securely sealed at both ends and labeled as the sample bottle. All filter recovery, if possible, is performed at ACE's laboratory.

If filter recovery in the field is required, the filter holder is taken to a clean environment, usually the mobile CEM lab or the sampler's motel room, and the exterior is cleaned to prevent contamination. The holder is carefully opened and the filter is removed. A spatula and nylon bristled brush are used to recover any pieces of the filter adhering to the gasket or filter holder. The filter is placed in a plastic Petri dish, sealed, and labeled. The sample side of the holder is then washed and thoroughly brushed. The wash is added to the nozzle wash sample bottle and the liquid level is remarked. All samples are kept in the sample box.

Blanks

A filter and acetone sample blank are taken in the field during sample recovery. Care is taken to ensure the blank samples have received the same treatment as field samples. Blanks are transported and treated in the same manner as field samples.

Post Test**Analysis**

Nozzle, probe, and filter holder washes are checked for liquid loss. They are then thoroughly shaken and poured into tared beakers. The container is rinsed with acetone or water and the contents are added to the beaker. The total volume is recorded on the laboratory data sheet. Beakers are evaporated to dryness at ambient temperature and pressure, oven dried at 200°F for two hours, and finally desiccated until cool.

Filters are placed in glass Petri dishes, oven dried at 200°F for two hours, and desiccated until cool. Final weights are determined using the same procedure as the tare weighing process. Time, date, temperature, humidity, Type S weight results, and the name of the technician are recorded on the laboratory data sheet for each weighing. Two such determinations and the average are shown on the laboratory data sheet.

Bagasse heat content and chlorine content will be determined by Hazen Research, Inc. Lab analysis for HCl for Method 26A will be performed by Pace Laboratories.

Chain of Custody

The chain of custody is initiated at the time of sample recovery. Run number, container number, liquid level check, color of sample, and comments are all noted on the chain of custody sheet. Silica gel data is also included on this sheet. Technicians performing recovery and analysis sign the bottom of the chain of custody sheet. This sheet is included in the QA section of all ACE's reports.

Post-test Calibrations

Post-test calibration checks are performed on the dry gas meter, the meter temperature thermometer, the stack thermocouple, and the barometer. These checks are made under conditions approximating the actual field test.

The meter is checked in triplicate at the maximum vacuum encountered during sampling. The stack thermocouple is compared to a mercury-in-glass thermometer at the average stack temperature and the meter temperature is checked at ambient conditions prior to meter use. The post-test calibration sheet is signed by the technician performing the calibrations and is included in all ACE stack reports.

Reports

ACE uses a report format that is acceptable to all regulatory agencies. ACE reports are written by a principal or engineer (of ACE) and are reviewed by a designated QA professional for data and document accuracy. Each report contains a signed statement by a principal or engineer of ACE attesting to the authenticity of the test and the report.

3.6 Calculations

The PM and HCl stack mass emission rates will be converted to lb/MMBtu units using the following equation:

$$E = \text{lb/hr} \div \text{MMBtu/hr (lb/MMBtu)}$$

Where:

E = the emission rate in terms of the MACT standard

lb/hr = the measured mass emission rate of PM or HCl

MMBtu/hr = the heat input to the boiler based on the F-factor

3.7 Reporting

The results of the stack tests will be submitted to the FDEP within 45 days of completion of the tests while the results of the initial performance test will be submitted to the Administrator before the close of business on the 60th day following the completion of the performance test. The report will include:

- The PM and HCl emissions results for Boiler No. 8 determined from the initial performance test;
- The calculations and supporting documentation used to determine the PM and HCl emission rates;
- The minimum values for wet scrubber and ESP operating parameters, established during these initial performance tests; and
- Data and information demonstrating good quality assurance.

**TABLE 3.1
COMPARISON OF PROPOSED BOILER NO. 8 BAGASSE FUEL SAMPLING
AND ANALYSIS PROCEDURES WITH BOILER MACT RULE**

Rule Citation	Boiler MACT Rule Requirement	U.S. Sugar's Procedures/Methods
	<u>BAGASSE FUEL SAMPLING PROCEDURES</u>	
63.7521(c)	Must obtain at least 3 composite samples of each fuel type, following these procedures for a belt/screw feeder:	Collect a composite sample during each individual test run.
	1. Stop belt and withdraw 6-inch wide sample from fuel cross-section of belt to obtain a minimum of 2 lbs. of sample. Collect all material in full cross-section. Transfer to clean plastic bag.	Grab samples will be taken from the conveyor belt located at the bagasse feeders feeding Boiler No. 8. These grab samples will be composited into a single sample. This will provide a representative sample of the bagasse directly entering the boiler. A total grab sample of approximately 1-gallon will be obtained (approx. 1.5 lbs). The samples will be collected and stored in a plastic bag and shipped to Golder for compositing.
	2. Each composite sample must consist of at least 3 samples collected at approximately equal intervals during testing period.	Each composite sample will consist of three (3) individual grab samples as described in Step 1 above, obtained at equal intervals over the test run (beginning, middle and end).
63.7521(d)	Prepare each composite sample according to these procedures:	
	1. Thoroughly mix and pour entire composite sample over a clean plastic sheet.	Consistent with rule.
	2. Break sample pieces over 3 inches into smaller sizes.	Not necessary since bagasse fuel has already been ground in the sugar mill grinding mills.
	3. Make a pie shape with entire composite sample and subdivide it into 4 equal parts.	Consistent with rule.
	4. Separate one of 1/4 samples as first subset.	Consistent with rule.
	5. If subset is too large for grinding, repeat step #3.	Not applicable.
	6. Grind sample in a mill.	Will not grind the samples, since not necessary due to small particle size of bagasse fuel. Lab will cut the samples prior to digestion as necessary.
	7. Use step #3 to obtain a 1/4 subsample for analysis.	Consistent with rule.
	8. If 1/4 sample is too large, subdivide it further using same procedure.	Consistent with rule.
63.7521(e)	Determine pollutant (Hg, HCl, and/or TSM) concentrations in fuel in lb/MMBtu of each composite sample.	Proximate, ultimate, heat content, metals, and chlorine analyses will be performed. All pollutants will be calculated in lb/MMBtu based on heat content.

**TABLE 3.1
COMPARISON OF PROPOSED BOILER NO. 8 BAGASSE FUEL SAMPLING
AND ANALYSIS PROCEDURES WITH BOILER MACT RULE**

Rule Citation	Boiler MACT Rule Requirement	U.S. Sugar's Procedures/Methods
	<u>WOOD CHIP FUEL SAMPLING PROCEDURES</u>	
63.7521(c)	Must obtain at least 3 composite samples of each fuel type, following these procedures for a fuel pile or truck:	Collect three (3) composite samples from the fuel pile.
	1. For each composite sample, select a minimum of five sampling locations uniformly spaced over the surface of the pile.	Consistent with rule.
	2. At each sampling site, dig into the pile to a depth of 18 inches. Insert a clean flat square shovel inot the hole and withdraw a sample, making sure that large pieces do not fall off during sampling.	Consistent with rule.
	3. Transfer all samples to a clean plastic bag.	Consistent with rule.
	<u>BIOMASS FUEL ANALYTICAL PROCEDURES</u>	
Table 6	1. Collect fuel samples--63.7521(c) or ASTM D6323-98 (2003) or equivalent	See above for differences in procedure
	2. Composite fuel samples--63.7521(d) or equivalent	See above for differences in procedure
	3. Prepare composited fuel samples--SW846-3050B or ASTM D5198-92 (2003) or equivalent	SW846-3050B
	4. Determine heat content of fuel type--ASTM E711-87 or equivalent	ASTM E711-87
	5. Determine moisture content of fuel type--ASTM D3173-02 or ASTM E871 or equivalent	ASTM D3173-02 or ASTM E871
	6. Measure pollutant concentration in fuel sample:	
	--Mercury--SW-846-7471A	SW846-7471A (0.01 to 0.02 ppm, dry,
	--Total selected metals--ASTM E885-88 (1996)	ASTM E885-88 (1996)
	--Hydrogen chloride (Chlorine)--SW-846-9250 or ASTM E776-87 (1996) or equivalent	ASTM E776-87, which allows sodium hydroxide or potassium hydroxide (see Note 3 in the method). The chloride excess is monitored and the endpoint found where the chloride content dissappears.
	7. Convert concentrations into units of lbs pollutant/MMBtu of heat content	Converted using concentrations in ppm and heat content.

**TABLE 3.1
COMPARISON OF PROPOSED BOILER NO. 8 BAGASSE FUEL SAMPLING
AND ANALYSIS PROCEDURES WITH BOILER MACT RULE**

Rule Citation	Boiler MACT Rule Requirement	U.S. Sugar's Procedures/Methods
Table 5	<u>STACK TESTING PROCEDURES</u>	
	PARTICULATE MATTER AND HYDROCHLORIC ACID:	
	1. Select sampling ports location and number of traverse points.--Method 1	Method 1
	2. Determine velocity and volumetric flow rate of stack gas--Method 2, 2F, or 2G.	Manual method (incorporated into pollutant emission Methods)
	3. Determine oxygen and carbon dioxide concentrations of the stack gas--Method 3A or 3B or ASME PTC 19,	Manual method 3A (incorporated into pollutant emission Methods)
	4. Measure moisture content of stack gas--Method 4	Manual method (incorporated into pollutant emission Methods)
	5. Measure pollutant emission concentrations:	
	--PM emission concentration--Method 5 or 17 (positive pressure fabric filters must use Method 5D)	Method 5
	--total selected metals emission concentration--Method 29	Not applicable; no testing for TSM.
	--hydrogen chloride emission concentration--Method 26 or 26A	Method 26A; also measures for chlorine gas
--mercury emission concentration--Method 29, Method 101A (Appendix B), or ASTM Method D6784-02	Not applicable; no testing for mercury.	
6. Convert emissions concentration to lb/MMBtu emission rates--Method 19 F-factor methodology	Method 19 F-Factor methodology.	