FLORIDA

# Department of Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Colleen M. Castille
Secretary

October 12, 2005

CERTIFIED MAIL – Return Receipt Requested

Mr. F. J. Perrett
Environmental Manager
Rayonier Performance Fibers LLC
Fernandina Beach Mill
The Foot of Gum Street
P.O. Box 2002
Fernandina Beach, Florida 32035

RE: Request to Install the No. 6 Power Boiler and the No. 6 Batch Digester System
0890004-018-AC

Dear Mr. Perrett:

On September 12, 2005, the Department's Northeast District office received a request to install the No. 6 Power Boiler and the No. 6 batch digester system at the existing sulfite mill located in Fernandina Beach, Nassau County, Florida. The project has been transferred to the Department's Bureau of Air Regulation office located in Tallahassee. Based on our review of the proposed project, we have determined that the application is incomplete and the following additional information is needed in order to continue processing this application package. Please provide all assumptions, calculations, and reference material(s), that are used or reflected in any of your responses to the following issues:

1. The Department disagrees that the projects are unrelated and should be separately reviewed for PSD applicability. You state that the three existing boilers "... are unreliable and require frequent repair." This means that they experience frequent periods of down time during which they are not available. The new boiler project will clearly provide more operation to support the increased production. Nevertheless, based on timing alone and the proposed netting analysis for the boilers, these projects are considered one project for purposes of PSD applicability. As such, include the emissions increases from the production increase with the netting analysis for the boiler project and the total net emissions increase for each affected pollutant will be compared to Table 400-2 for significance. Therefore, please provide an emissions netting analysis that encompasses all of the permitting projects (contemporaneous emission increases and decreases) for the last five years from the date of the application.

2. From the Department's ARMS database, the following air construction permit projects from the last 5 years have been identified.

Project No. 0890004-014-AC: Brinks Bypass AC
Project No. 0890004-015-AC: Heat Input AC-Power Boilers
Project No. 0890004-017-AC: Subpart MM/Used Oil

Please provide a description and a summary of the annual emissions increases resulting from each project. These appear to be non-PSD minor source projects. Such projects must be included as contemporaneous emissions increases within the netting analysis. The revised netting analysis must also include increases from the requested production increase.

3. If the emissions netting analysis requested in No. 1, above, reflects that the proposed facility's modification is equal to or greater than the significant emission rate for any pollutant pursuant to Table 400-2 in Chapter 62-212, F.A.C., then a processing fee is required pursuant to Rule 62-4.050, F.A.C., and the requirements of Rule 62-212.400(5), F.A.C., must be addressed and provided.

4. The application indicates that "small amounts" of TDF and used oil fuel will be fired. Please identify the maximum hourly and annual throughputs for these fuels. Identify the hourly and annual emissions of metals associated with firing these fuels. Describe the methods that will be used to handle, store and feed TDF. Identify the procedures that will be used to ensure that the used oils meet the requirements for "on-specifications" used oil.

5. For the new No. 6 batch digester system's (BDS) effects on the mill's proposed production increase, provide the actual and future potential pollutant changes from affected emissions units in the pulping operations, the chemical recovery process operations, the bleach plant operations, and the power and steam production operations for the years 2003 and 2004. Please provide all calculations, emissions factors, assumptions and any reference material. Also, include the results of the analysis in the netting analysis. On page 27 of the rule applicability analysis, the discussion for the recovery boiler references 40 CFR 52.21(b)(41)(ii)(c) as the justification for excluding emissions from the netting analysis. This federal rule has not been adopted by Florida. Please revise accordingly.

6. The recovery boiler operated for 8072 hours for the calendar year 2004 and 7871 hours for the calendar year 2003; and, the production reported was 223,276 TADUP (tons of air dried unbleached pulp) for calendar year 2004 and 223,692 TADUP for calendar year 2003. However, the Annual Operation Report showed that the calculated pollutant emissions for NOx, PM/PM10 and CO were approximately twice as much for the calendar year 2004 than what was reported for the calendar year 2003. With all things being approximately equal, please explain why there is such a large difference in the reported emissions between the two years of operation.

7. The Department does not necessarily agree with the method used to estimate past actual NOx emissions. Please provide the emissions data for each of the test runs conducted (lb/MMBtu and lb/hour). Have all test runs been included? Identify the fuel blends and the percentage of each fuel fired during the tests. Identify the annual heat input from each fuel fired during the year. Was the Department's Northeast District Office afforded the opportunity to observe these tests by written notification and/or phone call? How does the method account for the firing of various fuel blends? Were tests also conducted for CO and/or VOC emissions? Identify all emissions tests results (CO, NOx, SO2, and VOC) conducted for Boilers 1 – 3.

8. The application proposes to convert a 1983 (NSPS: 40 CFR 60, Subpart D) traveling grate, coal-fired boiler to a bubbling fluidized bed boiler firing primarily wood waste. The application suggests that the costs of such a conversion will be less than half of the cost of a new "replacement" boiler.

Since initial construction of the 1983 boiler, identify each subsequent modification, the purpose, and the associated costs.

Please verify the costs provided to convert the existing boiler to a bubbling fluidized bed boiler. The estimate appears low given the extent of work proposed.

Please verify the estimated costs of $40 million for an equivalent "new" replacement 525 MMBtu/hour unit for this project. The estimate appears high with respect to recent projects. For example, U.S. Sugar recently constructed a new biomass boiler at its Clewiston facility. The 936 MMBtu/hour unit is a membrane wall boiler with balanced draft stoker, overfire air, rotating feeders, and pneumatic spreaders. The system also includes wet cyclone collectors, an electrostatic precipitator (ESP), a urea-based selective non-catalytic reduction (SNCR) system, and CO/NOx CEMS. The cost of the boiler system was reported to be approximately $40 million.

9. Identify the maximum emissions rates for the 1983 boiler as previously permitted. Are the emissions rates proposed for the converted boiler greater than the previously permitted emissions rates?

10. Discuss and compare the emission rates and dispersion characteristics of the existing stacks with the proposed stack.

11. On page 16 of the rule applicability analysis, Table 7 indicates that the steam measurement is not available. What was the problem with this year?

12. Appendix A identifies the source of the emissions factors used to determine estimated past actual annual emissions. Provide the emissions factors, activity factors, and annual estimates for each boiler. What are the maximum continuous heat input rates and steam production rates for each unit?

13. Identify the scrubber SO2 removal efficiency used to estimate annual emissions from the existing boilers. What is the basis of the removal efficiency? Has the removal efficiency been determined by stack tests? Identify any stack tests conducted related to SO2 emission rates.

14. Table 13 identifies "baseline" SO2 emissions from the pulping systems of 65.42 tons/year, which is based on actual emissions from 2000 and 2001. However, new federal regulations implemented more stringent controls for these units. Revise the baseline SO2 emissions accordingly.

15. Permit No. 0890004-010-AC established a facility-wide pulp production limit of 153,205 ADMT/year. Prior to this limit, was the facility restricted by permit as to production? Prior to the addition of the No. 6 digester, what was the maximum annual production rate (potential) of the facility?

16. Please perform SO2 NAAQS and PSD Class II increment modeling taking into Rayonier's requested new boiler with its new stack parameters, the lagoon and Rayonier's interaction with Smurfit-Stone's Fernandina Beach Mill. All property boundaries used in this modeling should be based on fence lines or boundaries that are routinely patrolled to prevent access of the public to the property.

The Department will resume processing this application after receipt of the requested information. If you have any questions regarding this matter, please call Bruce Mitchell at (850)413-9198 or Cleve Holladay at (850)921-8986.

Sincerely,

Jeffery J. Koerner

Jeffery F. Koerner, P.E.
Permitting North Administrator
Bureau of Air Regulation

JFK/bm

cc: Chris Kirts, DEP - NED
David Tudor, Contact, RPF
David A. Buff, P.E., GAI

7001 0320 0001 3692 1926

**U.S. Postal Service**

# CERTIFIED MAIL RECEIPT

*(Domestic Mail Only; No Insurance Coverage Provided)*

| | | |
|---|---|---|
| Postage | $ | Postmark Here |
| Certified Fee | | |
| Return Receipt Fee (Endorsement Required) | | |
| Restricted Delivery Fee (Endorsement Required) | | |
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Mr. F. J. Perrett
General Manager
Rayonier, Inc.
Post Office Box 2002
Fernandina Beach, FL 32035-2002

# Department of Environmental Protection

Northeast District
7825 Baymeadows Way, Suite B200
Jacksonville, Florida 32256-7590

Jeb Bush
Governor

Colleen Castille
Secretary

RECEIVED
SEP 30 2005
BUREAU OF AIR REGULATION

**CERTIFIED - RETURN RECEIPT**

September 28, 2005

Mr. F.J. Perret, General Manager
Rayonier Performance Fibers, LLC.
The Foot of Gum Street
P.O. Box 2002
Fernandina Beach, FL 32035-2002

Dear Mr. Perret:

Nassau County – Air Permitting
Rayonier Performance Fibers, LLC. - Fernandina Mill
0890004-018-AC
Construction Permit Application

On September 12, 2005 the Northeast District of the Department of Environmental Protection, (NED), received an application for a minor modification. NED transmitted a copy of the application to the Division of Air Resource Management, (DARM), in Tallahassee.

Please find that the following presents a background in relation to discussions that took place between NED and DARM as it relates to the subject application.

The Department's Northeast District received a request for a minor modification to modify the mill by increasing the production capacity from 153,205 ADMT/yr to 175,000 ADMT/yr. On February 5, 2002, the Northeast District issued an air construction permit, No. 0890004-010-AC, for the installation of a new batch digester (No. 6), which would allow the mill to avoid a loss in production while the existing batch digesters (Nos. 1 thru 5) were being rebuilt/rebricked. In this permit, a federally enforceable facility and annual production rate limitation of 153,205 ADMT/yr was placed in the specific conditions, specifically Nos. 3 and 4, respectively; and, the justification for each of these conditions was Rule 62-212.400(2)(g), F.A.C. In Chapter 62-212, F.A.C., this rule is titled "Relaxations of Restrictions on Pollutant Emitting Capacity" and states:

> "If a previously permitted facility or modification which would be subject to the preconstruction review requirements of this rule if it were a proposed new facility or modification solely by virtue of a relaxation in any federally enforceable limitation on the capacity of the facility or modification to emit a pollutant (such as a restriction on hours of operation), which limitation was established after August 7, 1980, then at the time of such relaxation the preconstruction review requirements of this rule shall apply to the facility or modification as though construction had not yet commenced on it."

In a RAI (request for additional information) response letter from Mr. Michael Burch, General Manager, dated August 23, 2001, regarding project 0890004-010-AC, it seems very apparent that the representatives of the mill understood the implications of Rule 62-212.400(2)(g), F.A.C. On page 2, specifically the last sentence in the next-to-last paragraph, it is stated:

> "It is understood that pursuant to Rule 62-212.400(2)(g) any request to increase production over the limits placed in the permit now to avoid PSD review will result in a full PSD review of number 6 batch digester as if it were a new source at the time of the request for an increase in the production rate."

In conclusion, per determinations made by DARM, the Department's Northeast District is returning your application request for a minor modification of the facility, received September 12, 2005, because the request is a relaxation in a federally enforceable limit that triggers PSD new source review (NSR) requirements at Rule 62-212.400(5), F.A.C. In addition, the application for a PSD NSR permit should be submitted to the Department's Bureau of Air Regulation, located in Tallahassee, and should include the appropriate processing fee pursuant to Rule 62-4.050, F.A.C.

In regards to questions concerning PSD applicability as it relates to this project, please feel to call Bruce Mitchell , at (850) 488-0114.

Sincerely,

Christopher L. Kirts, P.E
District Air Program Administrator

CC: Trina Vielhauer – DARM
Jeff Koerner – DARM
Bruce Mitchell - DARM

Rayonier

*Performance Fibers*

*Fernandina Mill*

RECEIVED
SEP 12 2005
STATE OF FLORIDA
DEPARTMENT OF ENV. PROTECTION
NORTHEAST DISTRICT - JACKSONVILLE

RECEIVED
SEP 15 2005
BUREAU OF AIR REGULATION

August 30, 2005

Mr. Christopher Kirts, P. E.
Air Program District Administrator
7825 Baymeadows Way, Suite B-200
Jacksonville, FL 32256-7590

RE: Title V Permit No.
Construction Permit
Number 6 Power Boiler Construction

Dear Mr. Kirts:

Attached is a permit application for the installation of a replacement boiler at Rayonier Performance Fibers LLC's Fernandina Beach Dissolving Sulfite Pulp Mill and an unrelated production increase. This is a rather straightforward application in that the new boiler is replacing three older boilers with much less stringent emission standards. The new boiler will have four Continuous Emission Monitors, for $NO_x$, $SO_2$, flow and Opacity, along with oxygen and carbon monoxide monitors for better process control. The old boilers have no Continuous Emission Monitors and only oxygen process monitors. Once the new boiler is installed the old boilers will be decommissioned and eventually dismantled.

As discussed with you and your staff this application covers both the boiler and increasing the production limit placed on the permit in 1998 at the time No. 6 digester was installed. These projects are entirely separate. They are only combined here for ease of permitting. Indeed, the two projects are completely separate. The old boilers need to be replaced because they are unreliable and require frequent repair. The old boilers are, however, capable of producing enough steam in conjunction with the recovery boiler to produce the additional product which is the subject of the second project included in this application. Because the new boiler is not necessary to manufacture this additional product, the production increase is completely separate from the new boiler installation. In fact, the production increase is merely the removal of an artificial limit taken to avoid PSD when #6 digester was added in order to facilitate inspection and repair of the existing digesters.

The boiler permit alone does not trigger PSD permitting. The production increase does not trigger PSD permitting. Any increase in emissions is less than the PSD Significance Level. The power boiler project increases $NO_x$ and $SO_2$ emissions to less than significant levels and decreases PM, VOC and carbon monoxide emissions. The Production increase project increases $SO_2$ and CO emissions and due to emission reductions in the bleach plant VOC emissions will decrease at the final production rate.

The replacement boiler in this application is actually a used boiler, constructed in 1983, before promulgation of NSPS Subpart Db. A Reconstruction Analysis is provided to demonstrate that this boiler will not undergo reconstruction and therefore retains its status as an existing boiler. The applicable NSPS for this boiler is Subpart D. Because it is not reconstructed the boiler remains an existing source under boiler MACT. It will clearly meet boiler MACT upon startup. It will start up about the deadline for Boiler MACT compliance deadline of September 17, 2007.

The new boiler will be more efficient and reliable and will reduce the consumption of #6 oil in favor of wood waste. The Production Increase Project is a modest increase in production to make full use of the No. 6 digester added in 1998 to avoid production loss during the extensive inspection and maintenance undertaken by the industry on all existing digesters subsequent to the catastrophic loss of a digester at a Florida mill. Because No. 6 digester was added by accepting a production limit in 1998, the PSD analysis had to be done as if the digester had never been constructed. This analysis has been done beginning with 2003-2004 emissions because emission estimates prior to this date would not include reductions mandated by 40 CFR Part 63. The analysis starts with the baseline used in 1998 No. 6 digester permit of 149,957 ADMT/yr (air dried metric tons per year). An increase in the production limit from 153,205 to 175,000 ADMT/year is proposed. Few pieces of the new equipment needed to achieve this rate have emissions. Some additional drying and cooling cans at the machine, and additional washers in the bleach plant. Nanofiltration of the HCE liquor which will free up sufficient evaporator capacity for the additional red liquor produced, and capture of waste heat will also capture VOC emissions at the bleach plant. This project is entirely separate from the boiler project. The mill has sufficient steam capacity with existing boilers to achieve this production.

Since this boiler already exists and engineering work is proceeding quickly we could start moving and working on the boiler and preparing foundations in the October - November 2005 period. This application seems rather straightforward. Your prompt action on it would be appreciated. To expedite timing, this application is only for the Construction Permit leaving the longer lead-time Title V Permit Application to be submitted after issuance of the Construction Permit.

If you have questions regarding this application please contact either Dick Hopper, (904)277-1480, email: dick.hopper@rayonier.com or Dave Tudor (904)277-1452, email: david.tudor@rayonier.com.

Sincerely,

F. J. Perrett
General Manager

## APPLICATION TABLE OF CONTENTS

# Department of Environmental Protection

## Division of Air Resource Management

## APPLICATION FOR AIR PERMIT - LONG FORM

RECEIVED
SEP 15 2005
BUREAU OF AIR REGULATION

# I. APPLICATION INFORMATION

**Air Construction Permit** – 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
- at an existing federally enforceable state air operation permit (FESOP) or Title V permitted facility.

**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 & Revised/Renewal 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: **Rayonier Performance Fibers LLC** | |
| 2. Site Name: **Fernandina Beach Dissolving Sulfite Pulp Mill** | |
| 3. Facility Identification Number: 0890004 | |
| 4. Facility Location...<br>Street Address or Other Locator: **Foot of Gum Street**<br>City: **Fernandina Beach** County: **Nassau** Zip Code: **32034** | |
| 5. Relocatable Facility?<br>☐ Yes ☒ No | 6. Existing Title V Permitted Facility?<br>☒ Yes ☐ No |

**Application Contact**

| |
|---|
| 1. Application Contact Name: **David E. Tudor** |
| 2. Application Contact Mailing Address...<br>Organization/Firm: **Rayonier Inc.**<br>Street Address: **Post Office Box 2002**<br>City: **Fernandina Beach** State: **FL** Zip Code: **32035** |
| 3. Application Contact Telephone Numbers...<br>Telephone: **(904) 277 - 1452** ext. Fax: **(904) 277 - 1411** |
| 4. Application Contact Email Address: **david.tudor@rayonier.com** |

**Application Processing Information (DEP Use)**

| | |
|---|---|
| 1. Date of Receipt of Application: | |
| 2. Project Number(s): | |
| 3. PSD Number (if applicable): | |
| 4. Siting Number (if applicable): | |

## APPLICATION INFORMATION

**Purpose of Application**

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

### Air Construction Permit

[X] Air construction permit.

**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**

**A Title V Permit Amendment Application will follow issuance of the Construction Permit. Construction is planned to begin in late November 2005.**

## APPLICATION INFORMATION

**Scope of Application**

| Emissions Unit ID Number | Description of Emissions Unit | Air Permit Type | Air Permit Proc. Fee |
|---|---|---|---|
| **PB06** | **Bubbling Bed 450 mmBtu/hr boiler** | **AC** | **NA** |

**Application Processing Fee**

**Check one:** ☐ Attached - Amount: $______________ ☒ Not Applicable

## APPLICATION INFORMATION

**Owner/Authorized Representative Statement**

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

1. Owner/Authorized Representative Name : **F. J. Perrett**

2. Owner/Authorized Representative Mailing Address...
   Organization/Firm: **Rayonier Performance Fibers LLC**
   Street Address: **Post Office Box 2002**
   City: **Fernandina Beach** State: **FL** Zip Code: **32035**

3. Owner/Authorized Representative Telephone Numbers...
   Telephone: **(904)277-1405_** ext. Fax: **(904)277-1411**

4. Owner/Authorized Representative Email Address: **jack.perrett@rayonier.com**

5. Owner/Authorized Representative Statement:

   *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.*

   Fred J Perrett
   Signature

   8/30/05
   Date

## APPLICATION 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):

- [ ] 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.
- [ ] For a partnership or sole proprietorship, a general partner or the proprietor, respectively.
- [ ] For a municipality, county, state, federal, or other public agency, either a principal executive officer or ranking elected official.
- [ ] 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

## APPLICATION INFORMATION

**Professional Engineer Certification**

| | |
|---|---|
| 1. | Professional Engineer Name: **David A. Buff**<br>Registration Number: **19011** |
| 2. | Professional Engineer Mailing Address...<br>Organization/Firm: **Golder Associates Inc.**<br>Street Address: **6241 N.W. 23rd Street, Suite 500**<br>City: **Gainesville** State: **FL** Zip Code: **32653** |
| 3. | Professional Engineer Telephone Numbers...<br>Telephone: **(325)336-5600** ext. **545** Fax: **(352)336-6603** |
| 4. | Professional Engineer Email Address: **dbuff@golder.com** |
| 5. | Professional Engineer Statement:<br>*I, the undersigned, hereby certify, except as particularly noted herein*, that:*<br>*(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*<br>*(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.*<br>*(3) If the purpose of this application is to obtain a Title V air operation permit (check here ☐, 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.*<br>*(4) If the purpose of this application is to obtain an air construction permit (check here* **X** *, 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 ☐, 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.*<br>*(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 ☐, 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.*<br>David A. Buff 9/7/05<br>Signature Date<br>(seal) |

* Attach any exception to certification statement.

# II. FACILITY INFORMATION

## *A. GENERAL FACILITY INFORMATION*

**Facility Location and Type**

| 1. Facility UTM Coordinates... Zone **14** East (km) **454.7** North (km) **3392.2** | | 2. Facility Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS) | |
|---|---|---|---|
| 3. Governmental Facility Code: **NA** | 4. Facility Status Code: **A** | 5. Facility Major Group SIC Code: **26** | 6. Facility SIC(s): **2611** |
| 7. Facility Comment : | | | |

**Facility Contact**

| |
|---|
| 1. Facility Contact Name: **Richard Hopper** |
| 2. Facility Contact Mailing Address... Organization/Firm: **Rayonier Performance Fibers LLC** Street Address: **Post Office Box 2002** City: **Fernandina Beach** State: **FL** Zip Code: **32035** |
| 3. Facility Contact Telephone Numbers: Telephone: ( **904**)**277-1480** ext. Fax: (**904**)**277-** |
| 4. Facility Contact Email Address: dick.hopper@rayonier.com |

**Facility Primary Responsible Official**
**Complete if an "application responsible official" is identified in Section I. that is not the facility "primary responsible official."**

| |
|---|
| 1. Facility Primary Responsible Official Name: |
| 2. Facility Primary Responsible Official Mailing Address... Organization/Firm: Street Address: City: State: Zip Code: |
| 3. Facility Primary Responsible Official Telephone Numbers... Telephone: ( ) - ext. Fax: ( ) - |
| 4. Facility Primary Responsible Official Email Address: |

## *Facility Regulatory Classifications*

Check all that would apply *following* completion of all projects and implementation of all other changes proposed in this application for air permit. Refer to instructions to distinguish between a "major source" and a "synthetic minor source."

| | |
|---|---|
| 1. ☐ Small Business Stationary Source | ☐ Unknown |
| 2. ☐ Synthetic Non-Title V Source | |
| 3. ☒ Title V Source | |
| 4. ☒ Major Source of Air Pollutants, Other than Hazardous Air Pollutants (HAPs) | |
| 5. ☐ Synthetic Minor Source of Air Pollutants, Other than HAPs | |
| 6. ☒ Major Source of Hazardous Air Pollutants (HAPs) | |
| 7. ☐ Synthetic Minor Source of HAPs | |
| 8. ☐ One or More Emissions Units Subject to NSPS (40 CFR Part 60) | |
| 9. ☐ One or More Emissions Units Subject to Emission Guidelines (40 CFR Part 60) | |
| 10. ☒ One or More Emissions Units Subject to NESHAP (40 CFR Part 61 or Part 63) | |
| 11. ☐ Title V Source Solely by EPA Designation (40 CFR 70.3(a)(5)) | |
| 12. Facility Regulatory Classifications Comment: | |

## FACILITY INFORMATION

**List of Pollutants Emitted by Facility**

| 1. Pollutant Emitted | 2. Pollutant Classification | 3. Emissions Cap [Y or N]? |
|---|---|---|
| **See Attachment 3** | | |
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## B. EMISSIONS CAPS

**Facility-Wide or Multi-Unit Emissions Caps**

| 1. Pollutant Subject to Emissions Cap | 2.Facility Wide Cap [Y or N]? (all units) | 3. Emissions Unit ID No.s Under Cap (if not all units) | 4.Hourly Cap (lb/hr) | 5.Annual Cap (ton/yr) | 6. Basis for Emissions Cap |
|---|---|---|---|---|---|
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7. Facility-Wide or Multi-Unit Emissions Cap Comment:
**There are no Facility-wide caps proposed in the application.**

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## *C. FACILITY ADDITIONAL INFORMATION*

**Additional Requirements for All Applications, Except as Otherwise Stated**

| |
|---|
| 1. Facility Plot Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)<br>☒ Attached, Document ID: **Attachment 1** ☐ Previously Submitted, Date: |
| 2. Process Flow Diagram(s): (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)<br>☒ Attached, Document ID: **Attachment 2** ☐ Previously Submitted, Date:_______ |
| 3. Precautions to Prevent Emissions of Unconfined Particulate Matter: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)<br>☐ Attached, Document ID:___________ ☒ Previously Submitted, Date: **11/6/2002** |

**Additional Requirements for Air Construction Permit Applications**

| |
|---|
| 1. Area Map Showing Facility Location:<br>☐X☐ Attached, Document ID: **Attachment 4** ☐ Not Applicable (existing permitted facility) |
| 2. Description of Proposed Construction or Modification:<br>☒ Attached, Document ID: **Attachment 5** |
| 3. Rule Applicability Analysis:<br>☒ Attached, Document ID: **Attachment 5**__ |
| 4. List of Exempt Emissions Units (Rule 62-210.300(3)(a) or (b)1., F.A.C.):<br>☐ Attached, Document ID:_________ ☒ Not Applicable (no exempt units at facility) |
| 5. Fugitive Emissions Identification (Rule 62-212.400(2), F.A.C.):<br>☐ Attached, Document ID:_________ ☒ Not Applicable |
| 6. Preconstruction Air Quality Monitoring and Analysis (Rule 62-212.400(5)(f), F.A.C.):<br>☐ Attached, Document ID:_________ ☒ Not Applicable |
| 7. Ambient Impact Analysis (Rule 62-212.400(5)(d), F.A.C.):<br>☐ Attached, Document ID:_________ ☒ Not Applicable |
| 8. Air Quality Impact since 1977 (Rule 62-212.400(5)(h)5., F.A.C.):<br>☐ Attached, Document ID:_________ ☒ Not Applicable |
| 9. Additional Impact Analyses (Rules 62-212.400(5)(e)1. and 62-212.500(4)(e), F.A.C.):<br>☐ Attached, Document ID:_________ ☒ Not Applicable |
| 10. Alternative Analysis Requirement (Rule 62-212.500(4)(g), F.A.C.):<br>☐ Attached, Document ID:_________ ☒ Not Applicable |

## FACILITY INFORMATION

**Additional Requirements for FESOP Applications**

| |
|---|
| 1. List of Exempt Emissions Units (Rule 62-210.300(3)(a) or (b)1., F.A.C.):<br>☐ Attached, Document ID:________ ☒ Not Applicable (no exempt units at facility) |

**Additional Requirements for Title V Air Operation Permit Applications**

| |
|---|
| 1. List of Insignificant Activities (Required for initial/renewal applications only):<br>☐ Attached, Document ID:________ ☒ Not Applicable (revision application) |
| 2. Identification of Applicable Requirements (Required for initial/renewal applications, and for revision applications if this information would be changed as a result of the revision being sought):<br>☐ Attached, Document ID:________<br>☒ Not Applicable (revision application with no change in applicable requirements) |
| 3. Compliance Report and Plan (Required for all initial/revision/renewal applications):<br>☐ Attached, Document ID:________<br>Note: A compliance plan must be submitted for each emissions unit that is not in compliance with all applicable requirements at the time of application and/or at any time during application processing. The department must be notified of any changes in compliance status during application processing. |
| 4. List of Equipment/Activities Regulated under Title VI (If applicable, required for initial/renewal applications only):<br>☐ Attached, Document ID:________<br>☐ Equipment/Activities On site but Not Required to be Individually Listed<br>☒ Not Applicable |
| 5. Verification of Risk Management Plan Submission to EPA (If applicable, required for initial/renewal applications only) :<br>☐ Attached, Document ID:__________ ☒ Not Applicable |
| 6. Requested Changes to Current Title V Air Operation Permit:<br>☐ Attached, Document ID:__________ ☒ Not Applicable |

**Additional Requirements Comment**

| |
|---|
| **Since this is not a Title V or a PSD permit application, Preconstruction Monitoring, Ambient Impact, Air Quality Impact and Additional Impact analyses are not required by regulation. All pollutants but $NO_x$ and $SO_2$ decrease. $NO_x$ and $SO_2$ increase less than the PSD significance level of 40 tons per year for each pollutant. The $NO_x$ Ambient Air Quality Standard is only expressed on a annual average. The new boiler stack height is taller than the existing stacks being replaced. Thus there is no reason to expect such analyses would predict air quality violations. There are no fugitive emissions associated with either project included in this application. Bark, knots and wood chips are wet and not subject to dusting. Only fresh wood chips made onsite are pneumatically conveyed. It was shown in the 1995 Title V permit application that chips contain only minute amounts of suspendable material.** |

# III. EMISSIONS UNIT INFORMATION - PB06

**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.

## 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.)

[X] 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)

[X] 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: **This emission unit is a fluidized bed boiler burning a variety of fuels but mostly waste wood and bark. The boiler was constructed in 1983 and has not been reconstructed in this conversion.**

3. Emissions Unit Identification Number: **PB06**

| 4.Emissions Unit Status Code: **C** | 5. Commence Construction Date: **11/2005** | 6.Initial Startup Date: **11/2006** | 7.Emissions Unit Major Group SIC Code: **2611** | 8. Acid Rain Unit? [ ] Yes [X] No |
|---|---|---|---|---|

9. Package Unit: **NA**
Manufacturer: Model Number:

10. Generator Nameplate Rating: **NA** MW

11. Emissions Unit Comment:

## Emissions Unit Control Equipment

| | |
|---|---|
| 1. Control Equipment/Method(s) Description: **The particulate emissions from this boiler are controlled by a large settling chamber followed by a large ESP capable of achieving 0.07 lb/mmBtu PM emissions. Sulfur dioxide emissions are controlled by an alkaline scrubber. The boiler will rely mostly on staged combustion, flue gas recirculation and boiler design to achieve the $NO_x$ limits. Should it be necessary to lower $NO_x$ emissions to achieve the annual Cap the boiler is designed to receive an SNCR system.** | |
| 2. | Control Device or Method Code(s):**005,010, 129, 204. 025, 026, possibly 032** |

## *B. EMISSIONS UNIT CAPACITY INFORMATION*

**(Optional for unregulated emissions units.)**

**Emissions Unit Operating Capacity and Schedule**

| | |
|---|---|
| 1. Maximum Process or Throughput Rate: **NA** | |
| 2. Maximum Production Rate: **NA** | |
| 3. Maximum Heat Input Rate: **525** million Btu/hr **See comment below.** | |
| 4. Maximum Incineration Rate: **NA** pounds/hr<br>tons/day | |
| 5. Requested Maximum Operating Schedule:<br>**24** hours/day<br>**52** weeks/year | <br>**7** days/week<br>**8760** hours/year |
| 6. Operating Capacity/Schedule Comment:<br>**Maximum Heat Input Rate Comment**: **The annual average operating rate will not exceed 450 mmBtu/h. However, a maximum heat input rate of 525 mmBtu/hr will be needed for periods when the only other boiler at the facility is down.** | |

## C. EMISSION POINT (STACK/VENT) INFORMATION
**(Optional for unregulated emissions units.)**

**Emission Point Description and Type**

| | |
|---|---|
| 1. Identification of Point on Plot Plan or Flow Diagram: **PB06** | 2. Emission Point Type Code: **1** |

3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking:
**This is a single bubbling fluidized bed power boiler burning mostly biomass to produce steam for electrical generation and manufacturing process use. The emission exhaust through a single stack.**

4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:
**PB06**

| | | |
|---|---|---|
| 5. Discharge Type Code: **V** | 6. Stack Height: feet **190 above ground** | 7. Exit Diameter: feet **10** |
| 8. Exit Temperature: **150** °F | 9. Actual Volumetric Flow Rate: **183,421** acfm | 10. Water Vapor: **21.3** % |

| | |
|---|---|
| 11. Maximum Dry Standard Flow Rate: **144,352** dscfm | 12. Nonstack Emission Point Height: feet **NA** |
| 13. Emission Point UTM Coordinates... Zone: East (km): North (km): | 14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) **30/39/30** Longitude (DD/MM/SS) **81/28/40** |

15. Emission Point Comment:

## D. SEGMENT (PROCESS/FUEL) INFORMATION

**Segment Description and Rate:** Segment **1** of **4**

| | | |
|---|---|---|
| 1. Segment Description (Process/Fuel Type): **This fuel segment is for green bark at about 50% moisture.** | | |
| 2. Source Classification Code (SCC): **10100901** | 3. SCC Units: **tons burned** | |
| 4. Maximum Hourly Rate: **52** | 5. Maximum Annual Rate: **451,425** | 6. Estimated Annual Activity Factor: **NA** |
| 7. Maximum % Sulfur: **0.03** | 8. Maximum % Ash: **2.27** | 9. Million Btu per SCC Unit: **9** |
| 10. Segment Comment: **Approximately 60% is self produced as a byproduct.** | | |

Segment Description and Rate: Segment **2** of **4**

| | | |
|---|---|---|
| 1. Segment Description (Process/Fuel Type): **This fuel segment is for knots and sidehill fines recovered as process byproduct at about 50% - 60% moisture.** | | |
| 2. Source Classification Code (SCC): **10100901** | 3. SCC Units: **tons burned** | |
| 4. Maximum Hourly Rate: **5.3** | 5. Maximum Annual Rate: **46,269** | 6. Estimated Annual Activity Factor: **NA** |
| 7. Maximum % Sulfur: **0.40** | 8. Maximum % Ash: **0.41** | 9. Million Btu per SCC Unit: **9** |
| 10. Segment Comment: **100% of this fuel is produced as a pulping byproduct.** | | |

## *D. SEGMENT (PROCESS/FUEL) INFORMATION (CONTINUED)*

Segment Description and Rate: Segment **3** of **4**

| | | |
|---|---|---|
| 1. Segment Description (Process/Fuel Type): **This segment is for Tire Derived Fuel.** | | |
| 2. Source Classification Code (SCC): **10100801** | 3. SCC Units: **tons burned** | |
| 4. Maximum Hourly Rate: **3.0** | 5. Maximum Annual Rate: **26,159** | 6. Estimated Annual Activity Factor: **NA** |
| 7. Maximum % Sulfur: **1.85** | 8. Maximum % Ash: **4.78** | 9. Million Btu per SCC Unit: **31** |
| 10. Segment Comment: | | |

Segment Description and Rate: Segment **4** of **4**

| | | |
|---|---|---|
| 1. Segment Description (Process/Fuel Type): **This segment is for No. 6 oil.** | | |
| 2. Source Classification Code (SCC): **10100401** | 3. SCC Units: **thousand gallons burned** | |
| 4. Maximum Hourly Rate: **1.4** | 5. Maximum Annual Rate: **11,927** | 6. Estimated Annual Activity Factor: **NA** |
| 7. Maximum % Sulfur: **2.5** | 8. Maximum % Ash: **0.12** | 9. Million Btu per SCC Unit: **150** |
| 10. Segment Comment: **This segment includes small amounts of self-generated on-spec used oil.** | | |

## *E. EMISSIONS UNIT POLLUTANTS*

List of Pollutants Emitted by Emissions Unit

| 1. Pollutant Emitted | 2. Primary Control Device Code | 3. Secondary Control Device Code | 4. Pollutant Regulatory Code |
|---|---|---|---|
| PM | 005 | 010 | EL |
| PM10 | 010 | | EL |
| SO2 | 129 | | EL |
| $NO_x$ | 025 | 026 | EL |
| CO | 204 | | NS |
| Pb | 010 | | NS |
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## *F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –*

### POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

**(Optional for unregulated emissions units.)**

Potential/Estimated Fugitive Emissions

**Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.**

| | |
|---|---|
| 1. Pollutant Emitted: **PM** | 2. Total Percent Efficiency of Control: **99.9% +** |
| 3.Potential Emissions: **36.75** lb/hour **137.97** tons/year | 4. Synthetically Limited? ☐ Yes ☒ No |
| 5. Range of Estimated Fugitive Emissions (as applicable): **NA** to tons/year | |
| 6. Emission Factor: **0.07 lb/mmBtu**<br>Reference: **40 CFR 63.7500 Table** | 7. Emissions Method Code: **0** |
| 8. Calculation of Emissions:<br>**hrly: 525 mmBtu/hr x 0.07 lb/mmBtu = 36.75 lbs/hr**<br>**ann: 450 mmBtu/hr x 0.07 lb/mmBtu x 1/2000 tons/lbs x 8760 hr/year = 137.97 TPY** | |
| 9. Pollutant Potential/Estimated Fugitive Emissions Comment: | |

## F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

**Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.**

Allowable Emissions Allowable Emissions **1** of **3**

| | |
|---|---|
| 1. Basis for Allowable Emissions Code: **RULE 62-296.410(2)(b)(2)** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **0.2 lb/mmBTU** | 4. Equivalent Allowable Emissions: **105** lb/hour **394.2** tons/year |
| 5. Method of Compliance: **Settling Chamber followed by Electrostatic Precipitator** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **Normal operating mode this boiler will burn mostly bark and knots.**<br>**0.2 lb/mmBtu x 450 mmBtu/hr x 8760/2000 = 394.2 TPY**<br>**0.2 lb/mmBtu x 525 mmBtu/hr = 105.0 lb/hr** | |

Allowable Emissions Allowable Emissions **2** of **3**

| | |
|---|---|
| 1. Basis for Allowable Emissions Code: **RULE 40 CFR 60.42** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **0.1 lb/mmBtu** | 4. Equivalent Allowable Emissions: **52.5** lb/hour **197.1** tons/year |
| 5. Method of Compliance: **Settling Chamber followed by Electrostatic Precipitator** | |
| 6. Allowable Emissions Comment (Description of Operating Method):<br>**0.1 lb/mmBtu x 450 mmBtu/hr x 8760/2000 = 197.1 TPY**<br>**0.1 lb/mmBtu x 525 mmBtu/hr = 52.5 lb/hr** | |

Allowable Emissions Allowable Emissions **3** of **3**

| | |
|---|---|
| 1. Basis for Allowable Emissions Code: **RULE 40.CFR 63.7500** | 2. Future Effective Date of Allowable Emissions: **09/13/2007** |
| 3. Allowable Emissions and Units: **0.07 lb/mmBTU** | 4. Equivalent Allowable Emissions: **36.75** lb/hour **137.97** tons/year |
| 5. Method of Compliance: **Settling Chamber Electrostatic Precipitator** | |
| 6. Allowable Emissions Comment (Description of Operating Method):<br>**0.07 lb/mmBtu x 450 mmBtu/hr x 8760/2000 = 137.97 TPY**<br>**0.07 lb/mmBtu x 525 mmBtu/hr = 36.75 lb/hr** | |

## *F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –*

### POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

**(Optional for unregulated emissions units.)**

**Potential/Estimated Fugitive Emissions**

**Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.**

| | |
|---|---|
| 1. Pollutant Emitted: **PM10** | 2. Total Percent Efficiency of Control: **99.9% +** |
| 3.Potential Emissions: **36.75** lb/hour **137.97** tons/year | 4. Synthetically Limited? ☐ Yes ☒ No |
| 5. Range of Estimated Fugitive Emissions (as applicable): **NA** to tons/year | |
| 6. Emission Factor: **0.07 lb/mmBtu** Reference: **assume same as PM** | 7. Emissions Method Code: **0** |

8. Calculation of Emissions:

**hrly: 525 mmBtu/hr x 0.07 lb/mmBtu = 36.75 lbs/hr**

**ann: 450 mmBtu/hr x 0.07 lb/mmBtu x 1/2000 tons/lbs x 8760 hr/year = 137.97 TPY**

9. Pollutant Potential/Estimated Fugitive Emissions Comment:

## *F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -*

### ALLOWABLE EMISSIONS

**Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.**

**Allowable Emissions** Allowable Emissions __ of __

| | |
|---|---|
| 1. Basis for Allowable Emissions Code: | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: | 4. Equivalent Allowable Emissions: lb/hour tons/year |
| 5. Method of Compliance: | |
| 6. Allowable Emissions Comment (Description of Operating Method): **There are no rule based PM10 emission limits applicable to this boiler. For purposes of calculating emission increases and decreases PM10 is considered equal to PM. The electrostatic precipitator will capture PM10 as well** | |

**Allowable Emissions** Allowable Emissions __ of __

| | |
|---|---|
| 1. Basis for Allowable Emissions Code: | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: | 4. Equivalent Allowable Emissions: lb/hour tons/year |
| 5. Method of Compliance: | |
| 6. Allowable Emissions Comment (Description of Operating Method): | |

**Allowable Emissions** Allowable Emissions __ of __

| | |
|---|---|
| 1. Basis for Allowable Emissions Code: | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: | 4. Equivalent Allowable Emissions: lb/hour tons/year |
| 5. Method of Compliance: | |
| 6. Allowable Emissions Comment (Description of Operating Method): | |

## *F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –*

**POTENTIAL/ESTIMATED FUGITIVE EMISSIONS**

**(Optional for unregulated emissions units.)**

**Potential/Estimated Fugitive Emissions**

**Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.**

| | |
|---|---|
| 1. Pollutant Emitted: **SO2** | 2. Total Percent Efficiency of Control: **99** |
| 3. Potential Emissions: **420** lb/hour **220.95** tons/year | 4. Synthetically Limited? [X] Yes [ ] No |
| 5. Range of Estimated Fugitive Emissions (as applicable): **NA** to tons/year | |
| 6. Emission Factor: **0.8 lb/mmBtu** Reference: **40 CFR 60.43(1)** | 7. Emissions Method Code: **0** |

8. Calculation of Emissions:

**hrly: 525 mmBtu/hr x 0.8 lb/mmBtu = 420.00 lbs/hr**

**ann: 450 mmBtu/hr x 0.1121 lb/mmBtu x 1/2000 tons/lbs x 8760 hr/year = 220.95 TPY**

9. Pollutant Potential/Estimated Fugitive Emissions Comment:

**An annual CAP on $SO_2$ emissions is requested on this source in this application to avoid PSD permitting.**

## *F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -*

### ALLOWABLE EMISSIONS

**Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.**

**Allowable Emissions** Allowable Emissions **1** of **3**

| | |
|---|---|
| 1. Basis for Allowable Emissions Code: **RULE 40 CFR 60.43** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **0.8 lb/mmBtu** | 4. Equivalent Allowable Emissions: **420** lb/hour **1,576.8** tons/year |
| 5. Method of Compliance: **Alkali scrubber** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **0.8 lb/mmBtu x 450 mmBtu/hr x 8760/2000 = 1,576.8 TPY**<br>**0.8 lb/mmBtu x 525 mmBtu/hr = 420 lb/hr** | |

**Allowable Emissions** Allowable Emissions **2** of **3**

| | |
|---|---|
| 1. Basis for Allowable Emissions Code: **ESCPSD** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **0.1121 lb/mmBtu** | 4. Equivalent Allowable Emissions: **58.85** lb/hour **220.95** tons/year |
| 5. Method of Compliance: **Alkali scrubber and CEMS for $SO_2$** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **0.1121 lb/mmBtu x 450 mmBtu/hr x 8760/2000 = 220.95 TPY**<br>**0.1121 lb mmBtu x 525 mmBtu/hr = 58.85 lb/hr**<br>**Equivalent hourly and annual emissions are based on an annual averaging time.** | |

**Allowable Emissions** Allowable Emissions **3** of **3**

| | |
|---|---|
| 1. Basis for Allowable Emissions Code: | 2. Future Effective Date of Allowable Emissions |
| 3. Allowable Emissions and Units: | 4. Equivalent Allowable Emissions: lb/hour tons/year |
| 5. Method of Compliance: | |
| 6. Allowable Emissions Comment (Description of Operating Method): | |

## *F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –*

**POTENTIAL/ESTIMATED FUGITIVE EMISSIONS**

**(Optional for unregulated emissions units.)**

**Potential/Estimated Fugitive Emissions**

**Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.**

| | |
|---|---|
| 1. Pollutant Emitted: **$NO_x$** | 2. Total Percent Efficiency of Control: **See Comment.** |
| 3.Potential Emissions: **157.5** lb/hour **379.95** tons/year | 4. Synthetically Limited? [X] Yes [ ] No |
| 5. Range of Estimated Fugitive Emissions (as applicable): **NA** to tons/year | |
| 6. Emission Factor: **0.3 lb/mmBtu** Reference: **Hourly 40 CFR 60.44** | 7. Emissions Method Code: **0** |

8. Calculation of Emissions:

**hrly:**
**525 mmBtu/hr x 0.3 lb/mmBtu = 157.5 lbs/hr**

**annual:**
**450 mmBtu/hr x 0.1928 lb/mmBtu x 8760/2000 = 379.95 TPY**

9. Pollutant Potential/Estimated Fugitive Emissions Comment:

**$NO_x$ control is based on methods and designs that prevent the pollutant from forming, or minimizing the fuel bound $NO_x$ that does form. Therefore it is not possible to calculate a control efficiency as if there were collection of a pollutant.**

**An annual CAP on $NO_x$ emissions is requested on this emission unit in this application to avoid PSD permitting.**

## *F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -*

ALLOWABLE EMISSIONS

**Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.**

Allowable Emissions Allowable Emissions **1** of **2**

| | |
|---|---|
| 1. Basis for Allowable Emissions Code: **RULE 40 CFR 60.44** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **0.3 lb/mmBtu** | 4. Equivalent Allowable Emissions: **157.5** lb/hour **591.3** tons/year |
| 5. Method of Compliance: **boiler design, staged combustion and flue gas recirculation** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **0.3 lb/mmBtu x 450 mmBtu/hr x 8760/2000 = 591.3 TPY** **0.3 lb/mmBtu x 525 mmBtu/hr = 157.5 lb/hr** | |

Allowable Emissions Allowable Emissions **2** of **2**

| | |
|---|---|
| 1. Basis for Allowable Emissions Code: **ESCPSD** | 2. Future Effective Date of Allowable Emissions: **11/2005** |
| 3. Allowable Emissions and Units: **379.95 tons per year** | 4. Equivalent Allowable Emissions: **101.20** lb/hour **379.95** tons/year |
| 5. Method of Compliance: **CEMS for $NO_x$. The boiler will minimize $NO_x$ formation by furnace design, flue gas recirculation and staged combustion. If these methods are inadequate the boiler is designed to have SNCR installed.** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **0.1928 lb/mmBtu x 450 mmBtu/hr x 8760/2000 = 379.95 TPY** **0.1928 lb/mmBTU x 525 mmBtu/hr = 101.20 lb/hr** **Equivalent hourly and annual emissions are based on an annual averaging time.** | |

Allowable Emissions Allowable Emissions __ of __

| | |
|---|---|
| 1. Basis for Allowable Emissions Code: | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: | 4. Equivalent Allowable Emissions: lb/hour tons/year |
| 5. Method of Compliance: | |
| 6. Allowable Emissions Comment (Description of Operating Method): | |

## *F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –*

### POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

**(Optional for unregulated emissions units.)**

**Potential/Estimated Fugitive Emissions**

**Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.**

| | |
|---|---|
| 1. Pollutant Emitted: **CO** | 2. Total Percent Efficiency of Control: **See Comment.** |
| 3.Potential Emissions: **105** lb/hour **394.2** tons/year | 4. Synthetically Limited? ☐ Yes ☒ No |
| 5. Range of Estimated Fugitive Emissions (as applicable): **NA** to tons/year | |
| 6. Emission Factor: **0.2 lb/mmBtu** Reference: | 7. Emissions Method Code: |

8. Calculation of Emissions:

**hrly: 525 mmBtu/hr x 0.2 lb/mmBtu = 105 lbs/hr**

**annual: 450 mmBtu/hr x 0.2 lb/mmBtu X 8760/2000 = 394.2 TPY**

9. Pollutant Potential/Estimated Fugitive Emissions Comment:

**CO control is based on methods and designs that prevent the pollutant from forming. Therefore it is not possible to calculate a control efficiency as if there were collection of a pollutant.**

## *F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -*

### ALLOWABLE EMISSIONS

**Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.**

**Allowable Emissions** Allowable Emissions __ of __

| | |
|---|---|
| 1. Basis for Allowable Emissions Code: | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: | 4. Equivalent Allowable Emissions: lb/hour tons/year |
| 5. Method of Compliance: | |
| 6. Allowable Emissions Comment (Description of Operating Method): **There is no rule based emission limit for CO for this boiler. CO emissions for this boiler are expected to be significantly less than experienced with the less efficient existing boilers that CO emissions decrease and PSD limits should not be of concern.** | |

**Allowable Emissions** Allowable Emissions __ of __

| | |
|---|---|
| 1. Basis for Allowable Emissions Code: | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: | 4. Equivalent Allowable Emissions: lb/hour tons/year |
| 5. Method of Compliance: | |
| 6. Allowable Emissions Comment (Description of Operating Method): | |

**Allowable Emissions** Allowable Emissions __ of __

| | |
|---|---|
| 1. Basis for Allowable Emissions Code: | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: | 4. Equivalent Allowable Emissions: lb/hour tons/year |
| 5. Method of Compliance: | |
| 6. Allowable Emissions Comment (Description of Operating Method): | |

## F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

**(Optional for unregulated emissions units.)**

**Potential/Estimated Fugitive Emissions**

**Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.**

| | |
|---|---|
| 1. Pollutant Emitted: **Pb** | 2. Total Percent Efficiency of Control: |
| 3.Potential Emissions: **0.38** lb/hour **1.65** tons/year | 4. Synthetically Limited? ☐ Yes ☒ No |
| 5. Range of Estimated Fugitive Emissions (as applicable): **NA** to tons/year | |
| 6. Emission Factor: **see calculation and commment**<br>Reference: **calculated from NCASI** | 7. Emissions Method Code: |

8. Calculation of Emissions:

**451,425t bark/yr X 0.0073 lb Pb/ton bark = 3,295.4 lbs/yr**
**46,269 t knots/yr x 0.0013 lb Pb/ton knots = 60.2 lb/yr**

**3355.6 lb/yr /8760 = 0.38 lb/hr**

9. Pollutant Potential/Estimated Fugitive Emissions Comment:

**Pb emissions from burning bark and knots are based on the Pb in bark and wood, and assuming all Pb is emitted, where generally it stays with the bottom ash. Further this calculation does not consider the collection efficiency of the ESP. Thus this is a worst case projection.**

## *F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -*

### ALLOWABLE EMISSIONS

**Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.**

**Allowable Emissions** Allowable Emissions __ of __

| | |
|---|---|
| 1. Basis for Allowable Emissions Code: | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: | 4. Equivalent Allowable Emissions: lb/hour tons/year |
| 5. Method of Compliance: | |
| 6. Allowable Emissions Comment (Description of Operating Method): **There are no regulation based emission limits for Pb applicable to this boiler.** | |

**Allowable Emissions** Allowable Emissions __ of __

| | |
|---|---|
| 1. Basis for Allowable Emissions Code: | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: | 4. Equivalent Allowable Emissions: lb/hour tons/year |
| 5. Method of Compliance: | |
| 6. Allowable Emissions Comment (Description of Operating Method): | |

**Allowable Emissions** Allowable Emissions __ of __

| | |
|---|---|
| 1. Basis for Allowable Emissions Code: | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: | 4. Equivalent Allowable Emissions: lb/hour tons/year |
| 5. Method of Compliance: | |
| 6. Allowable Emissions Comment (Description of Operating Method): | |

## G. VISIBLE EMISSIONS INFORMATION

**Complete if this emissions unit is or would be subject to a unit-specific visible emissions limitation.**

**Visible Emissions Limitation:** Visible Emissions Limitation 1 of 3

| | |
|---|---|
| 1. Visible Emissions Subtype: **VE20** | 2. Basis for Allowable Opacity: [X] Rule [ ] Other |
| 3. Allowable Opacity: Normal Conditions: **30** % Exceptional Conditions: **40** % Maximum Period of Excess Opacity Allowed: **2** min/hour | |
| 4. Method of Compliance: **Electrostatic Precipitator** | |
| 5. Visible Emissions Comment: **62-296.410(2)(b)(1)** | |

**Visible Emissions Limitation:** Visible Emissions Limitation 2_ of 3

| | |
|---|---|
| 1. Visible Emissions Subtype: **VE20** | 2. Basis for Allowable Opacity: [X] Rule [ ] Other |
| 3. Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: **27** % Maximum Period of Excess Opacity Allowed: **6** min/hour | |
| 4. Method of Compliance: **Electrostatic Precipitator** | |
| 5. Visible Emissions Comment: **40 CFR 60.42** | |

**Visible Emissions Limitation:** Visible Emissions Limitation 3_ of 3

| | |
|---|---|
| 1. Visible Emissions Subtype: **VE20** | 2. Basis for Allowable Opacity: [X] Rule [ ] Other |
| 3. Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: **27** % Maximum Period of Excess Opacity Allowed: **6** min/hour | |
| 4. Method of Compliance: **Electrostatic Precipitator** | |
| 5. Visible Emissions Comment: **40 CFR 63. 7500** | |

## *H. CONTINUOUS MONITOR INFORMATION*

**Complete if this emissions unit is or would be subject to continuous monitoring.**

Continuous Monitoring System: Continuous Monitor **1** of **4**

| | |
|---|---|
| 1. Parameter Code: **VE** | 2. Pollutant(s): **visible emissions (opacity)** |
| 3. CMS Requirement: [X] Rule [ ] Other | |
| 4. Monitor Information... **See comment**<br>Manufacturer:<br>Model Number: | Serial Number: |
| 5. Installation Date: **projected by 11/2006** | 6. Performance Specification Test Date: **projected by 5/2007** |
| 7. Continuous Monitor Comment:<br>**Rule – 40 CFR 63.7525 and 63.7535**<br>**This monitor has not been selected at submittal of this construction application. The details of the selected monitor will be submitted with the Title V operating permit to follow. The location of this instrument is also to be determined as there is a wet scrubber prior to stack exit.** | |

Continuous Monitoring System: Continuous Monitor **2** of **4**

| | |
|---|---|
| 1. Parameter Code: **EM** | 2. Pollutant(s): **SO2** |
| 3. CMS Requirement: [x] Rule [ ] Other | |
| 4. Monitor Information...**See comment**<br>Manufacturer:<br>Model Number: | Serial Number: |
| 5. Installation Date: **projected by 11/2006** | 6. Performance Specification Test Date: **projected by 5/2007** |
| 7. Continuous Monitor Comment:<br>**There is a rule requirement for a SO2 CEM (40 CFR 60.45(a)). Also, a SO2 CAP is requested for this boiler to avoid PSD review. This monitor is proposed to document compliance with the emissions CAP.**<br><br>**This monitor has not been selected at submittal of this construction application. The details of the selected monitor will be submitted with the Title V operating permit to follow.** | |

## H. CONTINUOUS MONITOR INFORMATION (CONTINUED)

**Complete if this emissions unit is or would be subject to continuous monitoring.**

Continuous Monitoring System: Continuous Monitor **3** of **4**

| | |
|---|---|
| 1. Parameter Code: **EM** | 2. Pollutant(s): **NOX** |
| 3. CMS Requirement: ☐ Rule **X** Other | |
| 4. Monitor Information...**See comment**<br>Manufacturer:<br>Model Number: Serial Number: | |
| 5. Installation Date: **projected 11/2006** | 6. Performance Specification Test Date: **projected 5/2007** |
| 7. Continuous Monitor Comment:<br>**There is no rule requirement for a $NO_x$ CEM (40 CFR 60.45(b)(3)). However, a $NO_x$ CAP is requested for this boiler to avoid PSD review. This monitor is proposed to document compliance with the emissions CAP.**<br><br>**This monitor has not been selected at submittal of this construction application. The details of the selected monitor will be submitted with the Title V operating permit to follow.** | |

Continuous Monitoring System: Continuous Monitor **4** of **4**

| | |
|---|---|
| 1. Parameter Code: **FLOW** | 2. Pollutant(s): **volumetric flow rate** |
| 3. CMS Requirement: ☐ Rule **X** Other | |
| 4. Monitor Information... **See comment**<br>Manufacturer:<br>Model Number: Serial Number: | |
| 5. Installation Date: **projected 11/2006** | 6. Performance Specification Test Date: **projected 5/2007** |
| 7. Continuous Monitor Comment:<br>**There is no rule requirement for a flow monitor. However, annual CAPs for $NO_x$ and SO2 are requested for this boiler to avoid PSD review. This monitor is proposed to document compliance with the emissions CAP.**<br><br>**This monitor has not been selected at submittal of this construction application. The details of the selected monitor will be submitted with the Title V operating permit to follow.** | |

## I. EMISSIONS UNIT ADDITIONAL INFORMATION

**Additional Requirements for All Applications, Except as Otherwise Stated**

1. Process Flow Diagram (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [X] Attached, Document ID: 6 previously Submitted, Date ___

2. Fuel Analysis or Specification (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [X] Attached, Document ID: 7 [ ] Previously Submitted, Date ___

3. Detailed Description of Control Equipment (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [X] Attached, Document ID: 8 [ ] Previously Submitted, Date ___

4. Procedures for Startup and Shutdown (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [ ] Attached, Document ID: ___ [ ] Previously Submitted, Date ___
   [X] Not Applicable (construction application)

5. Operation and Maintenance Plan (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [X] Attached, Document ID: 9 [ ] Previously Submitted, Date ___
   [ ] Not Applicable

6. Compliance Demonstration Reports/Records
   [ ] Attached, Document ID: ___
   Test Date(s)/Pollutant(s) Tested: ___
   [ ] Previously Submitted, Date: ___
   Test Date(s)/Pollutant(s) Tested: ___
   [ ] To be Submitted, Date (if known): ___
   Test Date(s)/Pollutant(s) Tested: ___
   [X] Not Applicable
   Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute
   [ ] Attached, Document ID: ___ [X] Not Applicable

## EMISSIONS UNIT INFORMATION

Section[1] of [2]

**Additional Requirements for Air Construction Permit Applications**

| | |
|---|---|
| 1. Control Technology Review and Analysis (Rules 62-212.400(6) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e))<br>☐ Attached, Document ID: ___________ ☒ Not Applicable | |
| 2. Good Engineering Practice Stack Height Analysis (Rule 62-212.400(5)(h)6., F.A.C., and Rule 62-212.500(4)(f), F.A.C.)<br>☐ Attached, Document ID: ___________ ☒ Not Applicable | |
| 3. Description of Stack Sampling Facilities (Required for proposed new stack sampling facilities only)<br>☒ Attached, Document ID: 10_______ ☐ Not Applicable | |

**Additional Requirements for Title V Air Operation Permit Applications**

| | |
|---|---|
| 1. Identification of Applicable Requirements<br>☐ Attached, Document ID: _ | |
| 2. Compliance Assurance Monitoring<br>☐ Attached, Document ID: _ ☒ Not Applicable | |
| 3. Alternative Methods of Operation<br>☐ Attached, Document ID: _ ☒ Not Applicable | |
| 4. Alternative Modes of Operation (Emissions Trading)<br>☐ Attached, Document ID: _ ☒ Not Applicable | |
| 5. Acid Rain Part Application<br>☐ Certificate of Representation (EPA Form No. 7610-1)<br>☐ Copy Attached, Document ID:<br>☐ Acid Rain Part (Form No. 62-210.900(1)(a))<br>☐ Attached, Document ID:___________<br>☐ Previously Submitted, Date:________<br>☐ Repowering Extension Plan (Form No. 62-210.900(1)(a)1.)<br>☐ Attached, Document ID:___________<br>☐ Previously Submitted, Date:________<br>☐ New Unit Exemption (Form No. 62-210.900(1)(a)2.)<br>☐ Attached, Document ID:___________<br>☐ Previously Submitted, Date:________<br>☐ Retired Unit Exemption (Form No. 62-210.900(1)(a)3.)<br>☐ Attached, Document ID:___________<br>☐ Previously Submitted, Date:________<br>☐ Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.)<br>☐ Attached, Document ID:___________<br>☐ Previously Submitted, Date:________<br>☐ Phase II NOx Averaging Plan (Form No. 62-210.900(1)(a)5.)<br>☐ Attached, Document ID:___________<br>☐ Previously Submitted, Date:________<br>☒ Not Applicable | |

Additional Requirements Comment

No BACT analysis is required because this is not a PSD permit. Nevertheless, the boiler is using state of the art design in this conversion plus modern ESP and scrubbing techniques.

A GEP analysis is not required because this is not a PSD permit appplication. However, the stack does not exceed 2.5 times the height of the nearest building. It is higher than the existing stacks it is replacing. The applicant submitted modeling in 1991 to demonstrate these stacks were high enough to avoid downwash effects.

# III. EMISSIONS UNIT INFORMATION - PG

**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.

## 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.)

   [X] 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).

   [X] 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: **This emission unit is the pulping segment of the facility which is involved with the cooking wood chips and the manufacture of the cooking acid. The construction permit covers the addition of a new digester, No. 6 digester, to five existing digesters.**

3. Emissions Unit Identification Number: 005

| 4.Emissions Unit Status Code: **A** | 5. Commence Construction Date: **11/2005** | 6.Initial Startup Date: **11/2006** | 7.Emissions Unit Major Group SIC Code: **26** | 8. Acid Rain Unit? [ ] Yes [X] No |
|---|---|---|---|---|

9. Package Unit: **NA**
   Manufacturer: Model Number:

10. Generator Nameplate Rating: **NA** MW

1. Emissions Unit Comment:
**No. 6 digester was added in 1998 based on analyses and permitting at that time. That analysis was based on production and limited production to 153,210 ADMT to avoid PSD permitting. This application re-examines that analysis and seeks to change the production limit in the permit issued.**

**Emissions Unit Control Equipment**

1. Control Equipment/Method(s) Description:

**The pulping segment of the mill is required to control 2 pollutants, sulfur dioxide ($SO_2$) and methanol, a component of VOC. Sulfur dioxide is collected from digesters blow tanks, washers and cooking acid tanks and used to make or strengthen cooking liquor. Streams containing $SO_2$ that are too weak to economically or practically recover are passed through an alkaline packed scrubber prior to discharge.**

**Methanol is collected at the pulping and washing and evaporation segments of the mill and biologically destroyed in the waste water treatment plant. Methanol collection is by condensation and solution in water which is conveyed via the sewer system to the waste water treatment system. Methanol is a VOC and the condenser/scrubbers used for its collection also collect VOCs. The methanol collection system was not installed until 2001. Calculations are based on 2002 and 2003 calendar years as these were the first two years of operation under Subpart S MACT. Using older emissions would result in an inflated baseline by not accounting for more stringent emission reductions imposed by Subpart S MACT.**

2. Control Device or Method Code(s): **050, 050**

## B. EMISSIONS UNIT CAPACITY INFORMATION

**(Optional for unregulated emissions units.)**

**Emissions Unit Operating Capacity and Schedule**

| | |
|---|---|
| 1. | Maximum Process or Throughput Rate: **175,000 ADMT** |
| 2. | Maximum Production Rate: **175,000 ADMT** |
| 3. | Maximum Heat Input Rate: million Btu/hr **NA** |
| 4. | Maximum Incineration Rate: pounds/hr **NA**<br>tons/day |
| 5. | Requested Maximum Operating Schedule:<br>**8** hours/day **7** days/week<br>**52** weeks/year **8760** hours/year |
| 6. | Operating Capacity/Schedule Comment: |

## C. EMISSION POINT (STACK/VENT) INFORMATION
**(Optional for unregulated emissions units.)**

**Emission Point Description and Type**

| | | |
|---|---|---|
| 1. Identification of Point on Plot Plan or Flow Diagram: **PG** | 2. Emission Point Type Code: **3** | |
| 3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: **See Attachment 11 for Flow Sheet and Emission Unit Designations of equipment and emission points.** | | |
| 4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: **See Attachment 11** | | |
| 5. Discharge Type Code: **V** | 6. Stack Height: feet **110** | 7. Exit Diameter: feet **3** |
| 8. Exit Temperature: **122** °F | 9. Actual Volumetric Flow Rate: **28,350** acfm | 10. Water Vapor: **13**% |
| 11. Maximum Dry Standard Flow Rate: **25,400** dscfm | 12. Nonstack Emission Point Height: **NA** feet | |
| 13. Emission Point UTM Coordinates... Zone: East (km): North (km): | 14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS) | |
| 15. Emission Point Comment: | | |

## D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

| | | |
|---|---|---|
| 1. Segment Description (Process/Fuel Type): **This segment is the pulp production of the facility including #6 digester.** | | |
| 2. Source Classification Code (SCC): **3070010** | 3. SCC Units: **lb/Air Dried Short Ton Unbleached Pulp** | |
| 4. Maximum Hourly Rate: **41.6** | 5. Maximum Annual Rate: **267,922** | 6.Estimated Annual Activity Factor: **NA** |
| 7. Maximum % Sulfur: **NA** | 8. Maximum % Ash: **NA** | 9. Million Btu per SCC Unit: **NA** |
| 10. Segment Comment: **175,000 ADMT/yr x 1.1023 ST/MT x 1.3889 UB/B = 267,922 ADSTUP (air dry short ton unbleached pulp)** | | |

**Segment Description and Rate:** Segment __ of __

| | | |
|---|---|---|
| 1. Segment Description (Process/Fuel Type): | | |
| 2. Source Classification Code (SCC): | 3. SCC Units: | |
| 4. Maximum Hourly Rate: | 5. Maximum Annual Rate: | 6. Estimated Annual Activity Factor: |
| 7. Maximum % Sulfur: | 8. Maximum % Ash: | 9. Million Btu per SCC Unit: |
| 10. Segment Comment: | | |

## *D. SEGMENT (PROCESS/FUEL) INFORMATION (CONTINUED)*

**Segment Description and Rate:** Segment __ of __

| | | |
|---|---|---|
| 1. Segment Description (Process/Fuel Type): | | |
| 2. Source Classification Code (SCC): | 3. SCC Units: | |
| 4. Maximum Hourly Rate: | 5. Maximum Annual Rate: | 6. Estimated Annual Activity Factor: |
| 7. Maximum % Sulfur: | 8. Maximum % Ash: | 9. Million Btu per SCC Unit: |
| 10. Segment Comment: | | |

**Segment Description and Rate:** Segment __ of __

| | | |
|---|---|---|
| 1. Segment Description (Process/Fuel Type): | | |
| 2. Source Classification Code (SCC): | 3. SCC Units: | |
| 4. Maximum Hourly Rate: | 5. Maximum Annual Rate: | 6. Estimated Annual Activity Factor: |
| 7. Maximum % Sulfur: | 8. Maximum % Ash: | 9. Million Btu per SCC Unit: |
| 10. Segment Comment: | | |

## *E. EMISSIONS UNIT POLLUTANTS*

**List of Pollutants Emitted by Emissions Unit**

| 1. Pollutant Emitted | 2. Primary Control Device Code | 3. Secondary Control Device Code | 4. Pollutant Regulatory Code |
|---|---|---|---|
| SO2 | 050 | | EL |
| VOC | 050 | | EL |
| | | | |
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## *F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –*

### POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

**(Optional for unregulated emissions units.)**

<u>Potential/Estimated Fugitive Emissions</u>

**Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.**

| | |
|---|---|
| 1. Pollutant Emitted: **SO2** | 2. Total Percent Efficiency of Control: **estimated 95%** |
| 3.Potential Emissions: **61.0** lb/hour **267.00** tons/year | 4. Synthetically Limited? ☐ Yes ☒ No |
| 5. Range of Estimated Fugitive Emissions (as applicable): **NA** to tons/year | |
| 6. Emission Factor: **250 ppm** Reference: **CEM** | 7. Emissions Method Code: **1** |
| 8. Calculation of Emissions: **hourly** **250 ppm/10^6 x 25,400 dscfm x 60 x 0.0025 mole $SO_2$/dscf x 64 lb/mole = 61.0 lbs/hr** **annual** **61.0 lb/hr x 8760/2000 = 267.00 TPY** | |
| 9. Pollutant Potential/Estimated Fugitive Emissions Comment: | |

## *F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -*

### ALLOWABLE EMISSIONS

**Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.**

Allowable Emissions Allowable Emissions **1** of **1**

| | |
|---|---|
| 1. Basis for Allowable Emissions Code: **RULE** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **250 ppm volume** | 4. Equivalent Allowable Emissions: **61.0** lb/hour **267.00** tons/year |
| 5. Method of Compliance: **Alkaline Scrubber and Continuous Stack Monitor** | |
| 6. Allowable Emissions Comment (Description of Operating Method): | |

Allowable Emissions Allowable Emissions __ of ___

| | |
|---|---|
| 1. Basis for Allowable Emissions Code: | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: | 4. Equivalent Allowable Emissions: lb/hour tons/year |
| 5. Method of Compliance: | |
| 6. Allowable Emissions Comment (Description of Operating Method): | |

Allowable Emissions Allowable Emissions __ of ___

| | |
|---|---|
| 1. Basis for Allowable Emissions Code: | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: | 4. Equivalent Allowable Emissions: lb/hour tons/year |
| 5. Method of Compliance: | |
| 6. Allowable Emissions Comment (Description of Operating Method): | |

## *F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –*

**POTENTIAL/ESTIMATED FUGITIVE EMISSIONS**

**(Optional for unregulated emissions units.)**

**Potential/Estimated Fugitive Emissions**

**Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.**

| | |
|---|---|
| 1. Pollutant Emitted: **Methanol** | 2. Total Percent Efficiency of Control: **estimated 95%** |
| 3. Potential Emissions: **60.56** lb/hour **265.24** tons/year | 4. Synthetically Limited? ☐ Yes ☒ No |
| 5. Range of Estimated Fugitive Emissions (as applicable): **NA** to tons/year | |
| 6. Emission Factor: Reference: **40 CFR 63.444** | 7. Emissions Method Code: **1** |

8. Calculation of Emissions:

**annual**
**2.2 lb/ODSTUP X 267,922 ADSTUP x 0.9 OD/AD x 1 T/ 2000 LB = 265.24 TPY**

**hourly**
**265.24 T/yr x 2000 lb/T x 1 yr/365 op days x 1 day / 24 hr = 60.56 lb/hr**

9. Pollutant Potential/Estimated Fugitive Emissions Comment:
**40 CFR 63.444 limits this emission unit plus the evaporator emissions plus emissions from the wastewater treatment system to 2.2 lb methanol per oven dry unbleached short ton. The actual emissions from this source could vary as long as the total is not exceeded. This provision is all ready part of theTitle V permit and no change to it is being requested.**

## *F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -*
### ALLOWABLE EMISSIONS

**Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.**

**Allowable Emissions** Allowable Emissions **1** of **1**

| | |
|---|---|
| 1. Basis for Allowable Emissions Code: **RULE** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **2.2 lb/oven dry unbleached short ton** | 4. Equivalent Allowable Emissions: lb/hour **265.24** tons/year |
| 5. Method of Compliance: **Continuous Monitoring System** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **175,000 ADMT x 0.992 OD/ADMT / 0.72 UB/B x 2.2 lb/ton / 2000 = 265.24 TPY** | |

**Allowable Emissions** Allowable Emissions __ of __

| | |
|---|---|
| 1. Basis for Allowable Emissions Code: | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: | 4. Equivalent Allowable Emissions: lb/hour tons/year |
| 5. Method of Compliance: | |
| 6. Allowable Emissions Comment (Description of Operating Method): | |

**Allowable Emissions** Allowable Emissions __ of __

| | |
|---|---|
| 1. Basis for Allowable Emissions Code: | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: | 4. Equivalent Allowable Emissions: lb/hour tons/year |
| 5. Method of Compliance: | |
| 6. Allowable Emissions Comment (Description of Operating Method): | |

## G. VISIBLE EMISSIONS INFORMATION

**Complete if this emissions unit is or would be subject to a unit-specific visible emissions limitation.**

**Visible Emissions Limitation:** Visible Emissions Limitation 1_ of 1

| | |
|---|---|
| 1. Visible Emissions Subtype: VE | 2. Basis for Allowable Opacity: [X] Rule [ ] Other |
| 3. Allowable Opacity: Normal Conditions: 30 % Exceptional Conditions: 40% Maximum Period of Excess Opacity Allowed: 2 min/hour | |
| 4. Method of Compliance: Method 9 | |
| Visible Emissions Comment: FAC 62-296.320(4)(b)(1) This is wet stack on a process that does not produce particulate emissions. | |

**Visible Emissions Limitation:** Visible Emissions Limitation ___ of __

| | |
|---|---|
| 1. Visible Emissions Subtype: | 2. Basis for Allowable Opacity: [ ] Rule [ ] Other |
| 3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour | |
| 4. Method of Compliance: | |
| 5. Visible Emissions Comment: | |

## *H. CONTINUOUS MONITOR INFORMATION*

**Complete if this emissions unit is or would be subject to continuous monitoring.**

Continuous Monitoring System: Continuous Monitor **1** of **1**

| | |
|---|---|
| 1. Parameter Code: **EM** | 2. Pollutant(s): **SO2** |
| 3. CMS Requirement: ☐ Rule ☒ Other | |
| 4. Monitor Information...<br>Manufacturer: **Siemens**<br>Model Number: **Ultramat SE:SSN-EN-40** Serial Number: | |
| 5. Installation Date: **March 23, 1995** | 6. Performance Specification Test Date: **June 16, 1995** |
| 7. Continuous Monitor Comment:<br>**Continuous emission monitor required by condition 6 of air operating permit AO45-182645.** | |

**Continuous Monitoring System:** Continuous Monitor ___ of ___

| | |
|---|---|
| 1. Parameter Code: | 2. Pollutant(s): |
| 3. CMS Requirement: ☐ Rule ☐ Other | |
| 4. Monitor Information...<br>Manufacturer:<br>Model Number: Serial Number: | |
| 5. Installation Date: | 6. Performance Specification Test Date: |
| 7. Continuous Monitor Comment: | |

## *H. CONTINUOUS MONITOR INFORMATION (CONTINUED)*

**Complete if this emissions unit is or would be subject to continuous monitoring.**

**Continuous Monitoring System:** Continuous Monitor ___ of ___

| | |
|---|---|
| 1. Parameter Code: | 2. Pollutant(s): |
| 3. CMS Requirement: | ☐ Rule ☐ Other |
| 4. Monitor Information...<br>Manufacturer:<br>Model Number: | Serial Number: |
| 5. Installation Date: | 6. Performance Specification Test Date: |
| 7. Continuous Monitor Comment: | |

**Continuous Monitoring System:** Continuous Monitor ___ of ___

| | |
|---|---|
| 1. Parameter Code: | 2. Pollutant(s): |
| 3. CMS Requirement: | ☐ Rule ☐ Other |
| 4. Monitor Information...<br>Manufacturer:<br>Model Number: | Serial Number: |
| 5. Installation Date: | 6. Performance Specification Test Date: |
| 7. Continuous Monitor Comment: | |

## I. EMISSIONS UNIT ADDITIONAL INFORMATION

**Additional Requirements for All Applications, Except as Otherwise Stated**

1. Process Flow Diagram (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [X] Attached, Document ID: 11 [ ] Previously Submitted, Date ____

2. Fuel Analysis or Specification (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [ ] Attached, Document ID: _ [ ] Previously Submitted, Date ____

3. Detailed Description of Control Equipment (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [X] Attached, Document ID: 12 [ ] Previously Submitted, Date ____

4. Procedures for Startup and Shutdown (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [ ] Attached, Document ID: _ [ ] Previously Submitted, Date ____
   [X] Not Applicable (construction application)

5. Operation and Maintenance Plan (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [X] Attached, Document ID: 13 [ ] Previously Submitted, Date ____
   [ ] Not Applicable

| |
|---|
| 6. Compliance Demonstration Reports/Records<br>☐ Attached, Document ID: ______<br>Test Date(s)/Pollutant(s) Tested: ______<br>☐ Previously Submitted, Date: ______<br>Test Date(s)/Pollutant(s) Tested: ______<br>☐ To be Submitted, Date (if known): ______<br>Test Date(s)/Pollutant(s) Tested: ______<br>☒ Not Applicable<br>Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application. |
| 7. Other Information Required by Rule or Statute<br>☐ Attached, Document ID: ______ ☒ Not Applicable |

**Additional Requirements for Air Construction Permit Applications**

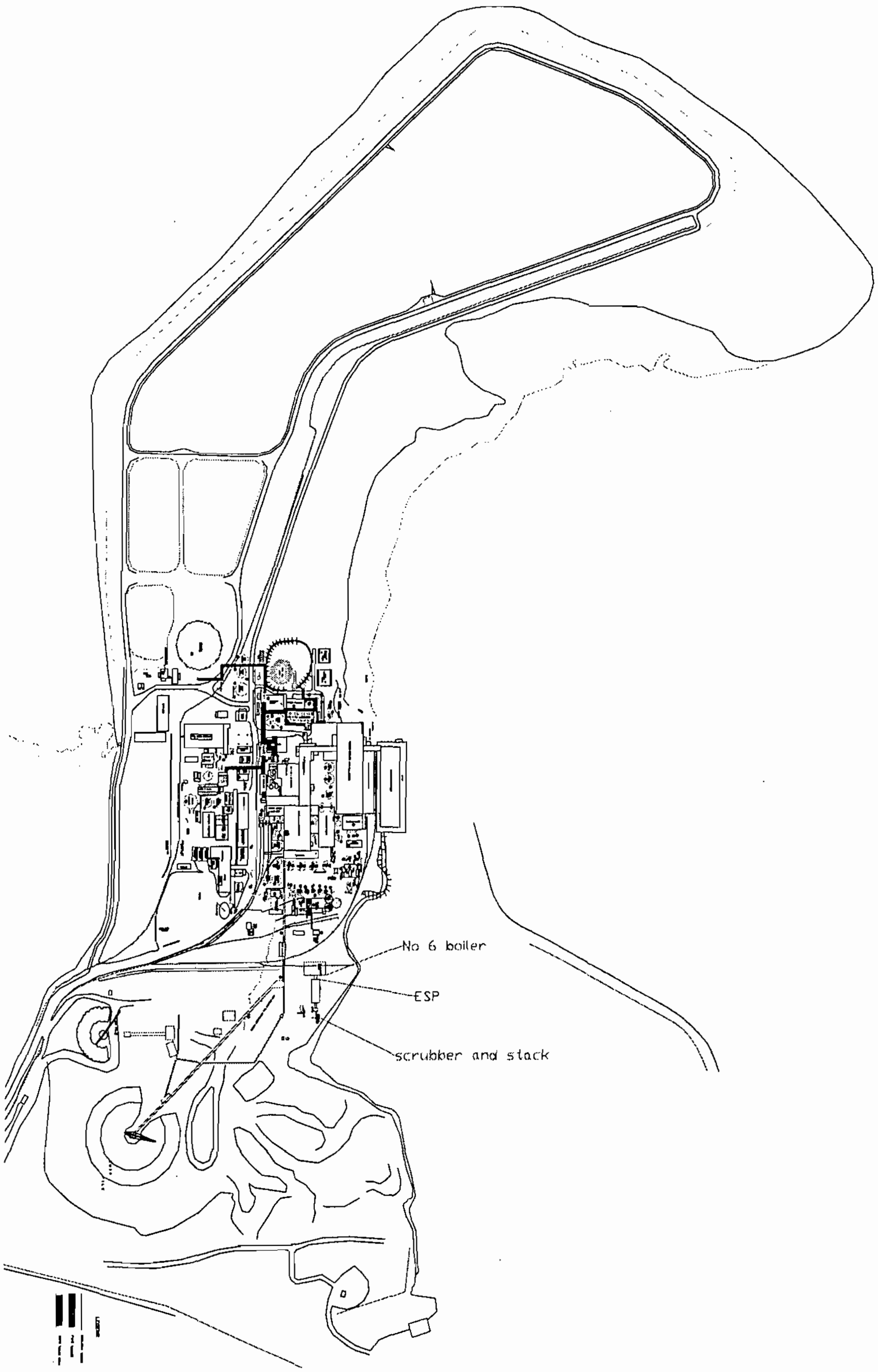
| | |
|---|---|
| 1. Control Technology Review and Analysis (Rules 62-212.400(6) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e))<br>☐ Attached, Document ID: ___________ | ☒ Not Applicable |
| 2. Good Engineering Practice Stack Height Analysis (Rule 62-212.400(5)(h)6., F.A.C., and Rule 62-212.500(4)(f), F.A.C.)<br>☐ Attached, Document ID: ___________ | ☒ Not Applicable |
| 3. Description of Stack Sampling Facilities (Required for proposed new stack sampling facilities only)<br>☐ Attached, Document ID: ___________ | ☒ Not Applicable |

**Additional Requirements for Title V Air Operation Permit Applications**

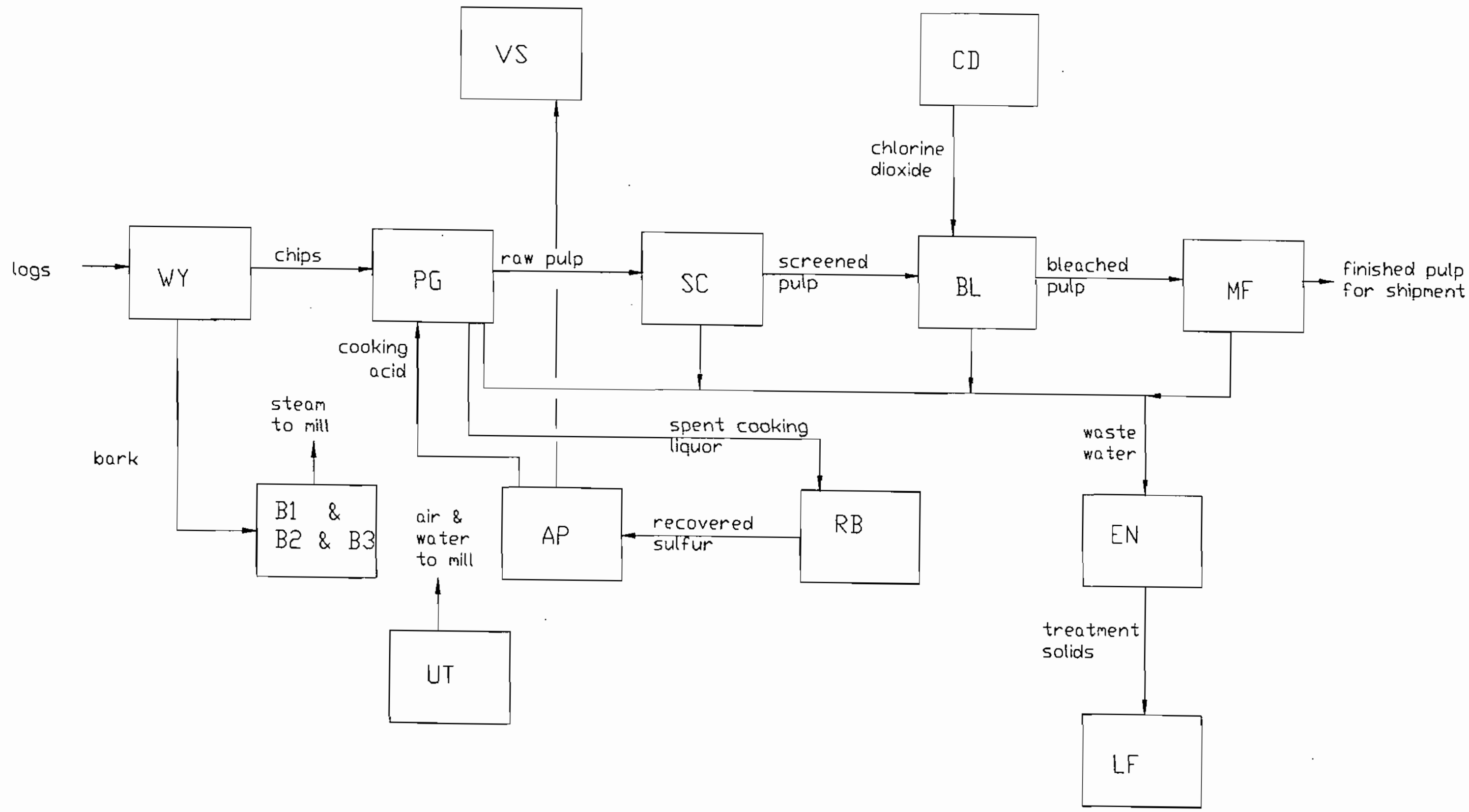
| | |
|---|---|
| 1. Identification of Applicable Requirements<br>☐ Attached, Document ID: _ | |
| 2. Compliance Assurance Monitoring<br>☐ Attached, Document ID: _ | ☒ Not Applicable |
| 3. Alternative Methods of Operation<br>☐ Attached, Document ID: _ | ☒ Not Applicable |
| 4. Alternative Modes of Operation (Emissions Trading)<br>☐ Attached, Document ID: _ | ☒ Not Applicable |
| 5. Acid Rain Part Application<br>☐ Certificate of Representation (EPA Form No. 7610-1)<br>☐ Copy Attached, Document ID:<br>☐ Acid Rain Part (Form No. 62-210.900(1)(a))<br>☐ Attached, Document ID:___________<br>☐ Previously Submitted, Date:_________<br>☐ Repowering Extension Plan (Form No. 62-210.900(1)(a)1.)<br>☐ Attached, Document ID:___________<br>☐ Previously Submitted, Date:_________<br>☐ New Unit Exemption (Form No. 62-210.900(1)(a)2.)<br>☐ Attached, Document ID:___________<br>☐ Previously Submitted, Date:_________<br>☐ Retired Unit Exemption (Form No. 62-210.900(1)(a)3.)<br>☐ Attached, Document ID:___________<br>☐ Previously Submitted, Date:_________<br>☐ Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.)<br>☐ Attached, Document ID:___________<br>☐ Previously Submitted, Date:_________<br>☐ Phase II NOx Averaging Plan (Form No. 62-210.900(1)(a)5.)<br>☐ Attached, Document ID:___________<br>☐ Previously Submitted, Date:_________<br>☒ Not Applicable | |

**Additional Requirements Comment**

# ATTACHMENT 1 - Facility Plot Plan



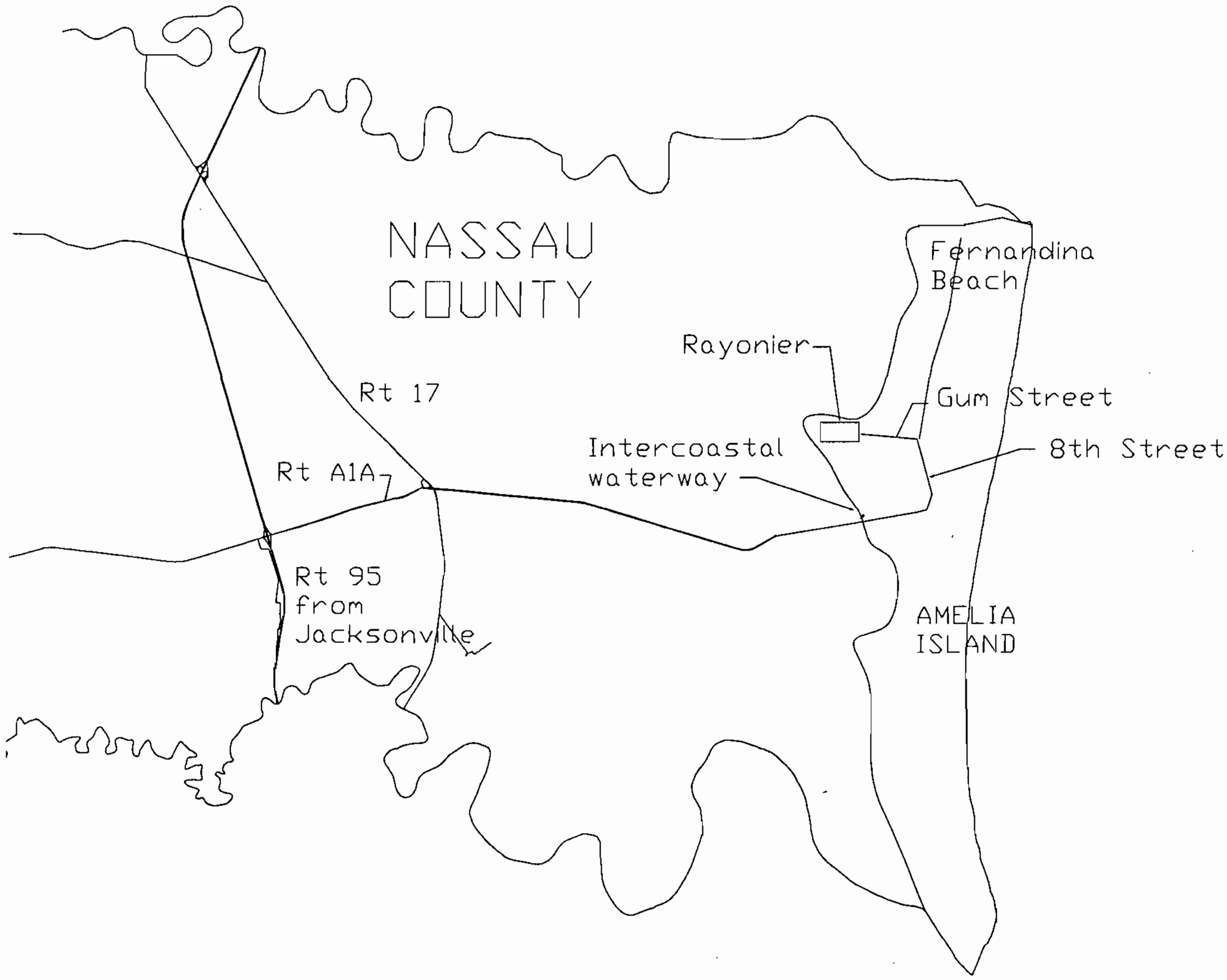
# ATTACHMENT 2 - Facility Flow Diagram



# ATTACHMENT 3 - List of Pollutants Emitted by Facility

| | | | |
|---|---|---|---|
| PM10 | (Particles) | A | N |
| SO2 | (Sulfur Dioixde) | A | N |
| NOx | (Nitrogen Dioxide) | A | Y |
| CO | (Carbon Monoxide) | A | N |
| VOC | (Volatile Organic Compounds) | A | N |
| HAPS | (Total Hazardous Air Pollutant) | A | N |
| H115 | (Methanol) | A | N |
| H038 | (Chlorine) | A | N |
| H043 | (Chloroform) | A | N |
| PB | (Lead) | B | N |
| H047 | (Cobalt) | B | N |
| H120 | (MEK) | A | N |
| H001 | (Acetaldehyde) | A | N |
| H106 | (HCl) | B | N |
| H095 | (Formaldehyde) | B | N |
| H006 | (Acrolein) | B | N |
| H118 | (Chloromethane) | B | N |
| H163 | (Styrene) | B | N |
| CFC | (totalCFCs) | B | N |
| H128 | (Methylene chloride) | B | N |
| H033 | (Carbon Tetrachloride) | B | N |
| H017 | (Benzene) | B | N |
| H123 | (Methyl Isobutyl Ketone) | B | N |
| H169 | (Toluene) | B | N |
| H041 | (Chlorobenzene) | B | N |
| H085 | (Ethyl benzene) | B | N |
| H187 | (Xylene) | B | N |
| H166 | (1,1,2,2-tetrachloroethane) | B | N |
| H061 | (1,4, dichlorobenzene) | B | N |
| H174 | (1,2,4-trichlorobenzene) | B | N |
| H165 | (TCDD) | B | N |
| H2S | (Hydrogen sulfide) | B | N |
| H167 | (Tetrachloroethene) | B | N |
| H176 | (Trichloroethylene) | B | N |
| H119 | (1,1,1-trichloroethane) | B | N |
| H104 | (Hexane) | B | N |
| H0323 | (Carbon disulfide) | B | N |
| H117 | (Bromomethane) | B | N |
| | (Chlorine dioxide) | A | N |
| H113 | (Manganese) | B | N |
| H114 | (Mercury) | B | N |
| H133 | (Nickel) | B | N |
| H148 | (Phosphorous) | B | N |

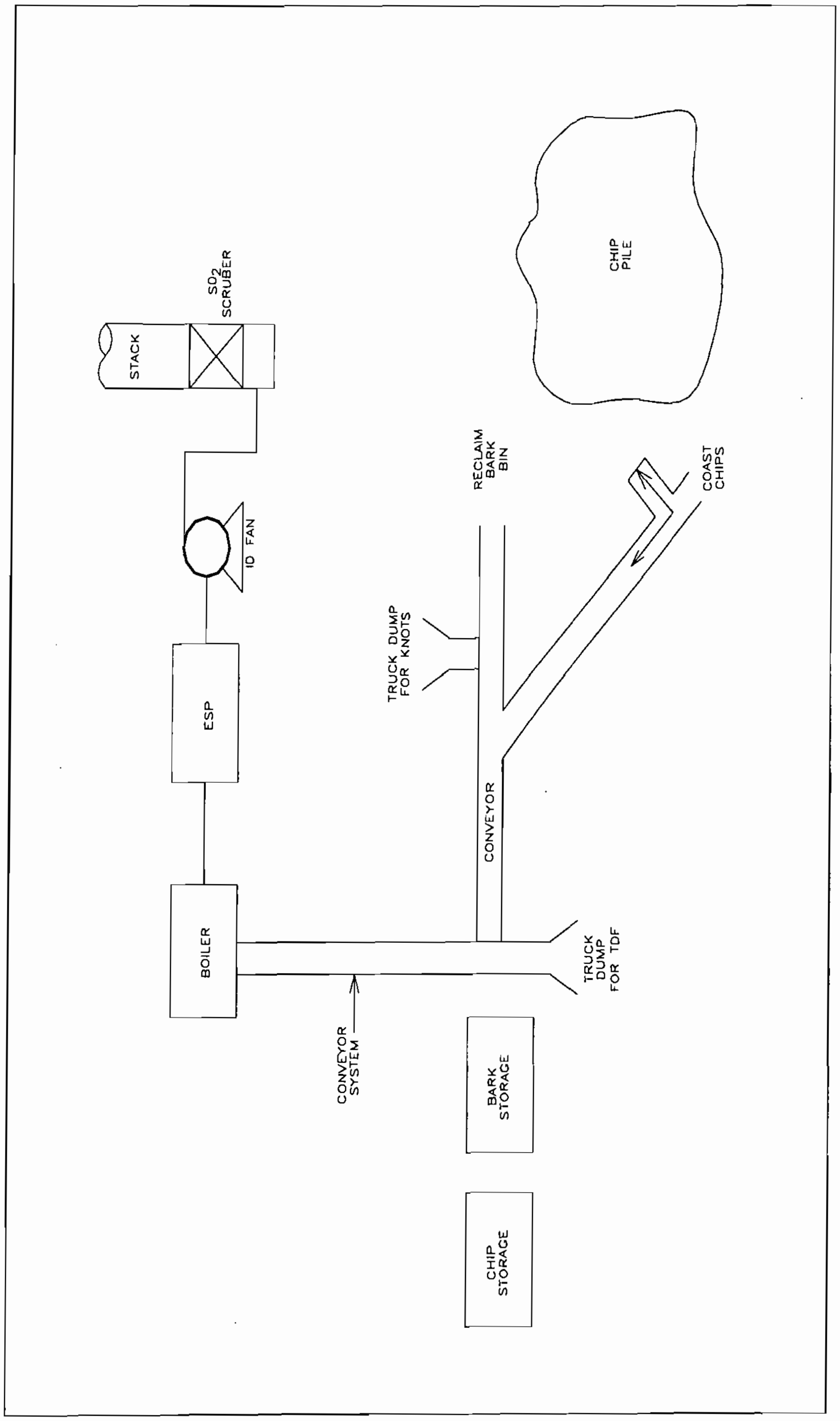
# ATTACHMENT 4 - Area Map



# ATTACHMENT 5 - Description Of Construction and Rule Applicability Analysis

See Separate Document

# ATTACHMENT 6 - PB06 Process Flow Diagram



# ATTACHMENT 7 - PB06 Fuel Analysis

Four main fuels will be fired in power boiler No. 6: bark, oil, knots, landscape waste and Tire Derived Fuel. The proximate and ultimate analyses for each is given below.

| Fuel | Bark | Knots | TDF | #6 Fuel Oil |
|---|---|---|---|---|
| **Proximate Analysis** | | | | |
| Fixed Carbon | 9.95 | 4.94 | 27.5 | |
| Volatiles | 40.19 | 27.71 | 65.5 | |
| Sulfur | 0.03 | 0.40 | 1.85 | |
| Ash | 2.27 | 0.41 | 4.78 | |
| Moisture | 47.59 | 66.94 | 0.37 | |
| | | | | |
| **Ultimate Analysis** | | | | |
| Carbon | 28.07 | 19.49 | 83.00 | 85.70 |
| Hydrogen | 3.00 | 2.10 | 7.50 | 10.50 |
| Oxygen | 18.82 | 10.49 | 0.50 | 0.92 |
| Nitrogen | 0.22 | 0.17 | 0.37 | 0.92 |
| Chlorine | 0.01 | 0.01 | | |
| Sulfur | 0.03 | 0.4 | 1.85 | 2.50 |
| Ash | 2.27 | 0.41 | 4.78 | 0.08 |
| Moisture | 47.59 | 66.94 | 2.00 | |

# ATTACHMENT 8 - PB06 Detailed Description of Control Equipment

PARTICULATE EMISSION CONTROL EQUIPMENT

Ash Hopper. There will be a settling chamber ahead of the electrostatic precipitator. This piece of equipment is referred to as the ash hopper. It will allow large particles to settle and reduce the ash and grain loading to the ESP. This hopper will have a screw conveyor bottom to remove this ash for disposal.

Electrostatic Precipitator. This unit will be a rigid electrode and collector plate design having four fields with a dedicated transformer/rectifier (T/R) set for each field. To minimize reintrainment each field will have its own ash-hopper with a screw conveyor discharge.

An opacity monitor is not required by rule, but one will be installed following the electrostatic precipitator and before the scrubber. This will be used to control boiler operation in addition to other control instruments and equipment. This monitor will not be monitoring the emissions as they exit the stack because there is a wet scrubber prior to stack top exhaust. The opacity monitor can not operate in a saturated gas stream.

SULFUR DIOXIDE EMISSION CONTROL EQUIPMENT

Alkaline Wet Scrubber. After the Induced Draft Fan will be an $SO_2$ gas scrubber. A spray of 4,000 gpm of recirculated alkaline water will cascade from showers over chevrons and louvre type packings. This type scrubber has a low pressure drop of about 2 inches WG. It is expected to remove 90% or more of the $SO_2$ in the inlet. The alkalinity of the wood ash is expected to also achieve some SO2 capture.

NITROGEN OXIDES EMISSION CONTROL EQUIPMENT

Initially no collection equipment will be installed, however, provision will be made to install this control equipment. The boiler furnace will be lengthened to increase residence time allowing a lower flame temperature through staged combustion which decreases $NO_x$ formation. Also flame temperature and the rate of oxidation will be controlled through flue gas recirculation. Should it be necessary the boiler will also be capable of receiving a SNCR. Installation.

# ATTACHMENT 9 - PB06 Operation and Maintenance Plan

**Number 6 Power Boiler**
**Rayonier Performance Fibers, LLC.**
**Fernandina Mill**

## Brief Description of the Boiler

No. 6 power boiler is a reconstruction of the Smurfit Jacksonville Mill No. 10 Combustion Engineering [CE VU-40] power boiler originally built in 1982, modified to burn high moisture fuels. No. 6 power boiler has a nominal steam production capacity of 265,000 lb/hr at 900 psig and 875°F. Routinely the boiler burns bark and wood waste. It is capable of supplementing with No. 6 fuel oil to a maximum capability of 310,000 lb/hr steam production when the recovery boiler is out of service. The combustion is accomplished in a Bubbling Fluidized Bed [BFB]. It has the capability of burning bark, wood waste, reject knots, tire derived fuel [TDF] and the mill's on-specification used oil.

In addition to the very efficient BFB combustion, No. 6 power boiler is equipped with a new electrostactic precipitator, a relocated scrubber and the nozzles for a selective non-catalytic reduction [SNCR] system. The SNCR system will not be installed nor operated unless the nitrogen oxide emissions are higher than expected. A new continuous emissions monitoring system [CEMS] is installed to measure opacity, carbon monoxide, sulfur dioxide, nitrogen dioxides and oxygen.

### Maintenance and Inspection

All systems and equipment are set up for routine preventative maintenance inspections and or calibrations.
Operators inspect all critical equipment for any type of defect on a daily basis.
Deficiencies that cannot be corrected by the operator are to be appropriately recorded and reported so that necessary repairs may be made in a timely manner.
A complete inspection of all aspects of the boiler will be made during each maintenance repair shutdown.

The results of the inspections will:
Identify and analyze potentially unsafe conditions during simulated inspections
Recommend corrective action
Detect hidden hazardous conditions during inspections
Communicate findings effectively, both verbally and in writing
The inspections involve ensuring the safe operation of the boiler by performing periodic inspections and by close monitoring of all repair work. The boiler to be installed will be built to a standardized nationwide construction code, the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code.
The inspections will be performed by an inspector commissioned by the National Board of Boiler and Pressure Vessel Inspectors

**Monitoring of Operations and Records**

Records of the duration and occurrence of startups, shutdowns, and malfunctions of the boiler and associated air emission control systems and any period during which the continuous monitoring system is inoperative shall be recorded and the record maintained for a period of five years. A record of boiler downtime due to any maintenance activity shall be maintained.

The continuous emissions monitoring system shall be continuously monitored. When an excursion of a parameter is indicated, corrective action will be immediately initiated.

The daily feed rate of bark & wood waste, No. 6 fuel oil, knots and any other fuel shall be measured and recorded.

# Sulfur Dioxide Emissions Control Systems

**Brief Description of the System**

The oxides of sulfur found in the flue gases are removed with a wet scrubber. The wet scrubber is a venturi type device. Flue gas is accelerated through a nozzle and deluged with a scrubbing liquid. The scrubbing liquid is a solution of caustic soda.

Spray nozzles are arranged in the tower to spray the scrubbing liquor into the flue gas. The spray nozzles are full cone non-clogging nozzles.
When the scrubbing liquor comes in contact with sulfur dioxide in the flue gas, the sulfur dioxide is converted and then removed from the aqueous stream.
The scrubber features a high amount of active surface area with random dumped packing. The packing material breaks the liquid streams into multiple, even surface films that create intimate gas/liquid contact at a low-pressure drop. The Scrubber is expected to remove greater than 90% of the Sulfur Dioxide entering the vessel.

**Maintenance and Inspection**

All systems and equipment are set up for routine preventative maintenance inspections and or calibrations.
Operators inspect all critical equipment for any type of defect on a daily basis.
Deficiencies that cannot be corrected by the operator are to be appropriately recorded and reported so that necessary repairs may be made in a timely manner.
A complete inspection of all aspects of the scrubber will be made during each maintenance repair shutdown.
Scrubber spray chambers and nozzles will be inspected regularly to ensure they are not plugged.
The packing section will be inspected often to ensure against solids buildup that would plug portions of the pack.
The scrubber mist eliminator will also be inspected on a regular basis. The catchment on a chevron baffle can become filled with solids, rendering it ineffective.
The scrubber recirculation system will be kept reasonably clean to ensure the solution is capable of gas absorption; to minimize buildup of solids in packed and mist eliminator sections; and to prevent plugging of spray chambers and nozzles.
A continuous addition of water, up to five pct of the total recirculation rate will be added to the recirculation tank and simultaneously overflowed to waste treatment.
The recirculation tank will also be kept clean of sediment. These solids are easily stirred up and will inevitably contribute to plugging of spray nozzles, packing sections and the mist eliminator section.

**Monitoring of Operations and Records**

A log will be maintained of all observations, deviations and corrective actions taken for a period of five years.

The wet scrubber will be equipped with devices to continuously measure the scrubber water flow rate and the differential pressure drop across the scrubber demister pads. The wet scrubber monitoring devices used to continuously measure the scrubber water flow rate and the differential pressure drop across the scrubber demister pads shall be observed with a frequency of not less than once per day.

Each monitoring device will be installed, maintained, calibrated and operated in accordance with approved procedures which shall include, as a minimum, the manufacturer's written requirements or recommendations. If the manufacturer's written requirements or recommendations are not available, Rayonier will establish the written procedures.

Each monitoring device shall be provided with adequate access for inspection and shall be in operation when the control device is operating.

# Nitrogen Dioxide Emissions Control Systems

## Selective Non-Catalytic Reduction

Brief Description of the System

The design of the bubbling fluidized bed combustor minimizes nitrogen oxide formation. However, nozzle ports for an SNCR [selective non-catalytic reduction] system are provided on the boiler in case the NOX emissions are higher than expected. The remainder of the SNCR system will be installed only if there are unforeseen problems with NOX emissions.

Maintenance and Inspection

None planned.

Monitoring of Operations and Records

A CEM for nitrogen compounds is installed on the boiler's final emissions. Records of the duration and occurrence of startups, shutdowns, and malfunctions of the boiler and associated air emission control systems and any period during which the continuous monitoring system is inoperative shall be recorded and the record maintained for a period of five years. A record of SNCR downtime due to any maintenance activity shall be maintained if installed.

The continuous emission monitoring system (CEMS) will be installed for the determination of a gas or particulate matter concentration or emission rate using pollutant analyzer measurements and a conversion equation, graph, and computer program to produce results in units of the applicable emission limitation or standard. The system will measure emissions of NOx, SO2, CO2, oxygen and opacity.

The CEM system will comply with all Federal and State requirements that may apply. Specifically, the system complies with 40CFR60. The CEM system will meet all monitoring and reporting requirements outlined in the Title V Permit.

Performance Specifications will be used for evaluating the acceptability of the CEMS at the time of or soon after installation and whenever specified in the regulations. All performance tests must be completed within 30 days after the emission source has begun operation. These reports should contain all pertinent data regarding performance testing.

Quality assurance procedures will be used to evaluate the effectiveness of quality control (QC) and quality assurance (QA) procedures and the quality of data produced by the CEM that will be used for determining compliance with the emission standards on a continuous basis as specified in the applicable regulation.

# Particulate Control Devices

## Electrostatic Precipitator

### Brief Description of the System

The dust laden gases are drawn into one side of the Electrostatic Precipitator Chamber where high voltage electrodes impart a negative charge to the particles entrained in the gas. These negatively charged particles are then attracted to a grounded collecting surface, which is positively charged. The gas then leaves the box up to 99 % cleaner than when it entered.
Inside the Electrostatic Precipitator Chamber , the particles from the continuing flow of dust build up on the collecting plates. At periodic intervals, the plates are rapped, causing the particles to fall into hoppers. The particles are then removed from the hoppers, by a rotary screw arrangement. The Design Basis for the Electrostatic Precipitator is listed in the table below:

| | |
|---|---|
| Volume (ACFM) | 240,000 |
| Temperature (°F) | 400 |
| H2O in flue gas (% by vol.) | 15 |
| Inlet to precipitator (gr/dscf) | 2.5 |
| Emission Rate (lbs/MMBTU) | 0.025 |
| Heat Input ( MMBTU/hr) | 450 |

### Maintenance and Inspection

The air emission Electrostatic Precipitator system, and the collection systems are to be inspected daily for leakage, for defects which would affect operation, and for potential defects which would affect operation.

A daily inspection will be performed for the following:

Inspection of rapper operation
Inspection of T-R set operation
Inspection of ash removal system operation

Corrective action measures will be implemented on the occurrence of an abnormal condition. Abnormal conditions will include the following: a T-R set failure, rapper system failure, ash transport system failure, and high ash hopper level.

Each Major Unit Overhaul

Check and correct plate electrode alignment
Inspect for collection surface fouling
Inspect T-R set mechanical condition
Inspect internal structural components

Corrective action measures will be devised and implemented on the occurrence of an abnormal condition. The appropriate measures for remediation will be implemented in a timely manner.

## Monitoring of Operations and Records

The operator has a graphic display for continuous monitoring of the system and trends of those operating parameter. Appropriate alarms are provided for out of range operations. All meters are set up on the mill's preventative maintenance system for transmitter calibrations. The operator has instantaneous and averaged readouts.

We will maintain a written or electronic record of all inspections and any action resulting from the inspection. Maintenance and inspection records will be kept for five (5) years and available upon request.

An audible Precipitator Malfunction Alarm is available for the operator. The precipitator malfunction alarm will continuously monitor T-R set failure and rapper control malfunction. Corrective action measures will be implemented on the occurrence of a precipitator malfunction alarm. The appropriate measures for remediation will be implemented in a timely manner.

Approximately once each month the data is automatically down loaded, consolidated into 15-minute averages and stored in the mill's data management system. The 15-minute averages are stored for 5 years

# ATTACHMENT 10 - PB06 – Description of Stack Sampling Facilities

The Stack and Sampling Platforms and Ports have been designed at the submittal of this application. However, the stack sampling facilities will meet the Requirements of Appendix SS1 to the Title V Permit. The applicable portions of that document are referenced below.

---

1. Sampling facilities include sampling ports, work platforms, access to work platforms, electrical power, and sampling equipment support. Emissions units must provide these facilities at their expense. All stack sampling facilities must meet any Occupational Safety and Health Administration (OSHA) Safety and Health Standards described in 29 CFR Part 1910, Subparts D and E. A permanent stack sampling facility will be installed and maintained.

2. Sampling Ports.

a. All sampling ports will have a minimum inside diameter of 3 inches.

b. The ports shall be capable of being sealed when not in use.

c. The sampling ports will be located in the stack at least 2 stack diameters or equivalent diameters downstream and at least 0.5 stack diameter or equivalent diameter upstream from any fan, bend, constriction or other flow disturbance.

3. At least two sampling ports, 90 degrees apart, will be installed at each sampling location on all circular stacks that have an outside diameter of 10 feet or less. For stacks with larger diameters, four sampling ports, each 90 degrees apart, will be installed. On horizontal circular ducts, the ports will be located so that the probe can enter the stack vertically, horizontally or at a 45 degree angle.

4. On rectangular ducts, the cross sectional area will be divided into the number of equal areas in accordance with EPA Method 1. Sampling ports will be provided which allow access to each sampling point. The ports will be located so that the probe can be inserted perpendicular to the gas flow.

5 Work Platforms.

a. Minimum size of the working platform will be 24 square feet in area. Platforms will be at least 3 feet wide.

b. On circular stacks with 2 sampling ports, the platform will extend at least 110 degrees around the stack.

c. On circular stacks with more than two sampling ports, the work platform will extend 360 degrees around the stack.

d. All platforms will be equipped with an adequate safety rail (ropes are not acceptable), toeboard, and hinged floor-opening cover if ladder access is used to reach the platform. The safety rail directly in line with the sampling ports willl be removable so that no obstruction exists in an area 14 inches below each sample port and 6 inches on either side of the sampling port.

6. Access to Work Platform.

a. Ladders to the work platform exceeding 15 feet in length will have safety cages or fall arresters with a minimum of 3 compatible safety belts available for use by sampling personnel.

b. Walkways over free-fall areas will be equipped with safety rails and toeboards.

7. Electrical Power.

a. A minimum of two 120-volt AC, 20-amp outlets will be provided at the sampling platform within 20 feet of each sampling port.

b. If extension cords are used to provide the electrical power, they will be kept on the plant's property and be available immediately upon request by sampling personnel.

8. Sampling Equipment Support.

a. A three-quarter inch eyebolt and an angle bracket will be attached directly above each port on vertical stacks and above each row of sampling ports on the sides of horizontal ducts.

i.. The bracket will be a standard 3 inch x 3 inch x one-quarter inch equal-legs bracket which is 1 and one-half inches wide. A hole that is one-half inch in diameter will be drilled through the exact center of the horizontal portion of the bracket. The horizontal portion of the bracket will be located 14 inches above the centerline of the sampling port.

ii. A three-eighth inch bolt which protrudes 2 inches from the stack may be substituted for the required bracket. The bolt will be located 15 and one-half inches above the centerline of the sampling port.

iii. The three-quarter inch eyebolt will be capable of supporting a 500 pound working load. For stacks that are less than 12 feet in diameter, the eyebolt will be located 48 inches above the horizontal portion of the angle bracket. For stacks that are greater than or equal to 12 feet in diameter, the eyebolt will be located 60 inches above the horizontal portion of the angle bracket. If the eyebolt is more than 120 inches above the platform, a length of chain will be attached to it to bring the free end of the chain to within safe reach from the platform.

b. A complete monorail or dualrail arrangement may be substituted for the eyebolt and bracket.

c. When the sample ports are located in the top of a horizontal duct, a frame will be provided above the port to allow the sample probe to be secured during the test.
[Rule 62-297.310(6), F.A.C.]

# ATTACHMENT 11 - PG Process Flow Diagram

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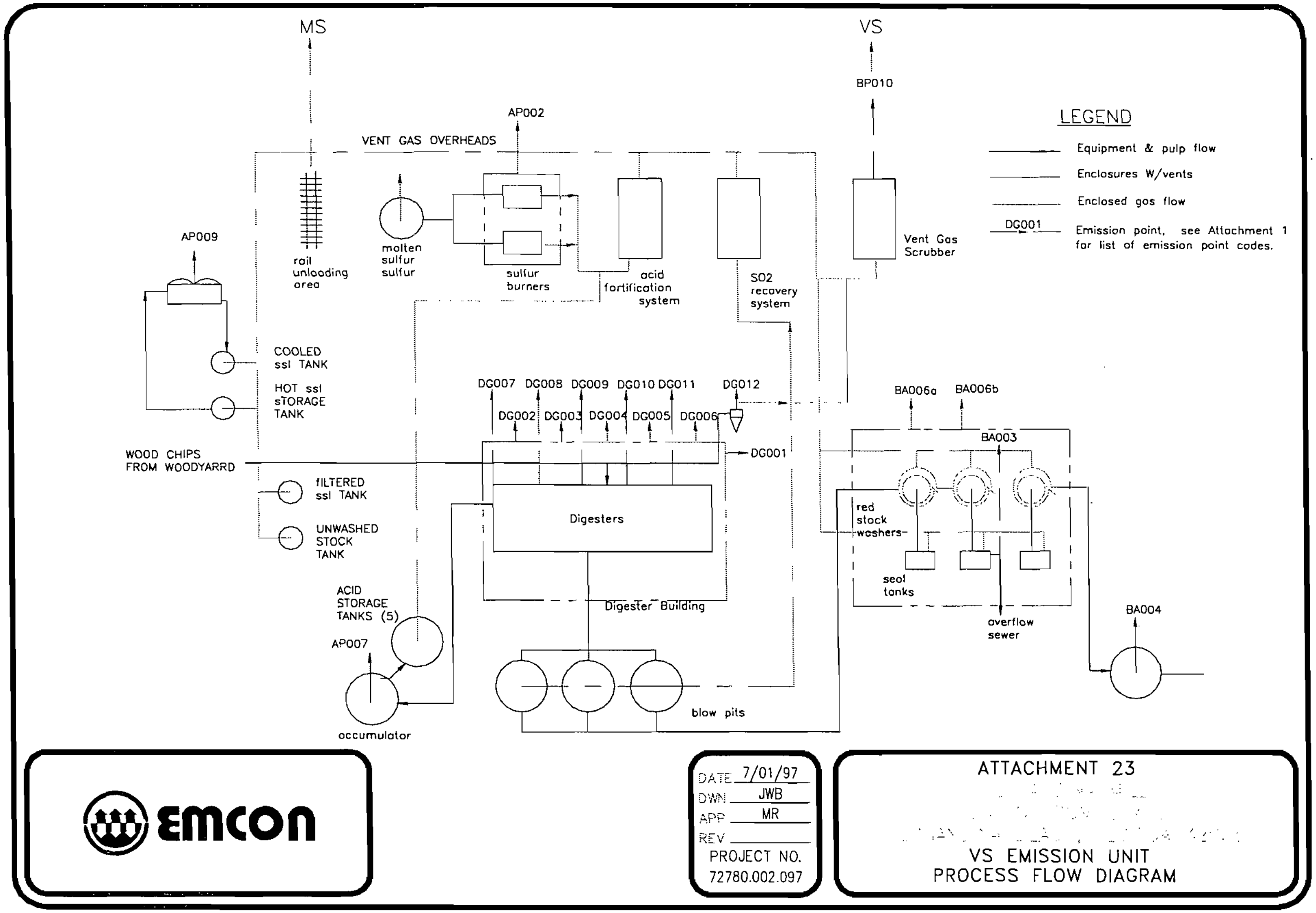

# ATTACHMENT 12 - PG Detailed Description of Control Equipment

## VENT GAS SCRUBBER STACK - Digester and Washing Systems Vents

### Sulfur Dioxide Control

Emissions from the cooking acid plant, the red stock washers, the unwashed stock tank, and the spent sulfite liquor tanks are collected and scrubbed in the vent gas scrubber. The vent gas scrubber consists of a packed tower containing 6 feet of poured packing. Gas flows upward through the packing. Absorbate is sprayed onto the top of the packing and continues a tortuous path downward through the packing to the bottom of the tower. Sodium bisulfite/sulfite absorbate is pumped from the tower sump to the sodium bisulfite storage tank. The loop is completed when the absorbate is pumped from the storage tank back to the top tray of the vent gas scrubber with a pH control addition of fresh caustic soda.

The liquid level in the tower sump is controlled by a PID type instrument in the acid plant distributive control system (DCS). A continuous sample of absorbate from the bottom of the tower is pumped to a pH instrument. The pH signal in the DCS controls the addition of fresh 7 percent caustic soda solution or 9 percent soda ash solution into the absorbate stream entering the top tray. The controller set point is normally pH 6.5. The pH set point may be increased to respond to an unusually high gas loading into the vent gas scrubber. The sulfur dioxide concentration in the stack is measured with a continuous emission monitor. The DCS calculates one hour, three hour and 24 hour running averages of the sulfur dioxide concentration.

### Methanol Control

A trap-out ring is installed at the top of the bottom section of this tower to separate the lower sulfur dioxide scrubber from the new after condenser above. A new section containing 6 feet of packing functions as a direct contact condenser using fresh raw water. A shower distributes the fresh water over the packing. The flow of water must be once through to maintain a low enough concentration of methanol in the liquid to assure that it does not return to the gas phase. The liquid is sent directly to the sewer system and on to secondary treatment. The water addition is controlled to assure the exit gas temperature from the tower is maintained at a specified set point. This assures adequate capture of methanol by the condenser.

# ATTACHMENT 5 TO APPLICATION

# PROJECT DESCRIPTION
# AND
# RULE APPLICABILITY ANALYSIS

# FOR

# SIP CONSTRUCTION PERMIT FOR A NEW NUMBER 6 BUBBLING BED BOILER REPLACING ALL EXISTING POWER BOILERS,

# AND

# RE-EVALUATION OF THE INSTALLATION OF No. 6 DIGESTER WITH A PRODUCTION INCREASE TO 175,000 ADMT

## RAYONIER PERFORMANCE FIBERS LLC
## FERNANDINA BEACH DISSOLVING SULFITE MILL

**Submitted**
**August 30, 2005**

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# 1.0 APPLICATION DESCRIPTION

## 1.1 Boiler Project Description

Rayonier is planning to replace three existing power boilers at its Fernandina Beach dissolving sulfite pulp mill with one bubbling bed boiler. Self produced bark will provide most of the fuel, but knots, landscape waste and possibly a small amount of tire derived fuel will be fired at times. Minimal oil will be fired, mostly during periods when the solid fuel feed system is down. The mill has three small power boilers, all were installed prior to 1962, and therefore are not BART or NSPS eligible, nor are there NSR concerns with these boilers. Power Boiler No. 1, Title V Emission Unit PB01, is fired with residual oil only and has a heat input of 185mmBtu/hr. Power Boiler No. 2, Title V Emission Unit PB02, is fired with bark and residual oil and has a heat input of 218 mmBtu/hr. Power Boiler No. 3, Title V Emission Unit PB03, is fired with bark and residual oil and has a heat input of 245 mmBtu/hr. These boilers are aging and maintenance costs have escalated to the point where replacement is cost effective. They will be decommissioned and therefore the emissions from these boilers will be used to offset the emissions from the replacement boiler. The replacement boiler will be designated PB06.

A used traveling grate boiler will be purchased which will be converted into a bubbling bed boiler equipped with an ESP followed by an alkaline scrubber. Provisions will be made to install Selective Non-Catalytic Reduction ("SNCR") for NOX control should it be necessary to meet the emission limit proposed. It should not be needed to meet the NSPS limits as the boiler remains subject to the pre 1983 Subpart D standard as described in Section 2.0 below.

A similar conversion as successfully accomplished at Interstate Paper Company in Riceboro, Georgia. The boiler will be sized for 265,000 lbs of 900 psi steam per hour at 850 degrees Fahrenheit resulting in an annual average heat input of 450 mmBtu/hr. Occasionally heat inputs could be 525 mmBtu to partially compensate for outages of the recovery boiler, the only other steam generator at the facility. However an annual emission limit based on 450 mmBtu/hr is requested.

It will be located adjacent to the digesters east of the mill. A mill plot plan is included as Attachment 1 to the Construction Permit Application Form. Once constructed and fully operational, it will be connected to the mill steam headers. It and the recovery boiler will be the sole steam producers used by the mill. Eventually the existing boilers will be dismantled.

A newer boiler will reduce most emissions because it will have to meet more stringent New Source Performance Standards ("NSPS"), (40 CFR Part 60 Subpart D) and the recently promulgated Maximum Available Control Technology Standards ("Boiler MACT", 40 CFR Part 63, Subpart DDDDD for existing power boilers). The boiler being purchased was originally constructed in 1983. In Section 2.1 of this narrative a reconstruction analysis demonstrates this boiler has not been reconstructed. Therefore, it remains subject to the Subpart D standard, the NSPS promulgated at the time the boiler was constructed, and not Subpart Db, which applies to boilers constructed or reconstructed after July 9, 1989. Not being reconstructed also means the boiler is regarded as an existing boiler under Boiler MACT. These two rules will be discussed in greater detail in Sections 2.2 and 2.3 below.

A large electrostatic precipitator (ESP) for the removal of particulate matter followed by an alkali scrubber for the removal of $SO_2$ will be installed to enable the boiler to meet the new emission limits. The technology used in the boiler and its new large pollution control devices will enable compliance with the new regulations referenced above and will allow a greater percentage of bark and possibly other solid fuels such as Tire Derived Fuel (TDF) in the fuel mix.

Continuous $NO_x$, $SO_2$, flow CO, $O_2$ and opacity monitors are proposed for the new boiler. The monitoring to be included with this project is fully described in section 2.5.

## 1.2 Production Increase Project Description

This permit application also includes a production increase to accommodate the full production enabled by the installation of no. 6 digester in 1998. An industry-wide effort to inspect, repair and upgrade digesters was begun in the late 1990's following an explosion of a digester at the Stone Container Mill in Panama City, FL, now owned by Smurfit. Rayonier undertook a program to entirely reline each of its existing 5 digesters with new refractory and replace any weakened or corroded metal while it was exposed. To accomplish this Rayonier rotated a digester out of production for an extended period of time. In order to avoid lost production for orders previously taken an additional (no. 6) digester was added. Permitting of no. 6 digester was facilitated by inclusion of a production limit on the Title V operating permit of 153,205 ADMT per year. This application revisits that production limit and seeks to increase that limit to the full production capability of No.6 digester. This permitting action is more fully described in Chapter 3.0.

No changes to the mill layout are needed to achieve the production increase. Minimal additional equipment will be needed to achieve the modest production increase requested in this application. Instead of adding evaporators and the energy to run them the existing evaporators can be unloaded by concentrating some streams with non-emitting nanofiltration technology. Some additional drying capacity will be needed on the dryer section of the pulp machine. These modifications and equipment additions will take place over 5 to 10 years. Commencing construction in 18 months or 2 years is no longer a requirement as none of the changes required PSD permits which have the limit on when construction must commence. To ensure VOC emissions increases are less than the PSD Significance Level the mill will undertake a project to capture blow heat from one of the bleach plant stages that is the most significant VOC emissions source. In capturing this heat the VOCs will also be captured and sent to the biological wastewater treatment system for destruction.

## 1.3 Construction Permit Application Organization

Applicable regulations for each project are analyzed separately in the following two sections of this narrative statement. Because a Construction Permit can be issued faster than the simultaneous Construction and Title V permit and onsite construction must begin by November 2005, this is only a SIP construction application. After issuance of the Construction Permit, a Title V operating permit application will follow.

### 1.4 Schedule

Options have been secured on an existing boiler, presently configured for coal firing. Rayonier has begun engineering studies on relocating the boiler and the ancillary equipment to the Fernandina Beach mill site and replacing the coal firing equipment with a new fluidized bed for biomass fuel. These studies are expected to approach completion in September 2005. On-site work will begin late third quarter or early fourth quarter of 2005. Total installation time is expected to be about 18 months. Startup is planned for early 2007.

# 2.0 No. 6 BOILER PROJECT

## *2.1 RECONSTRUCTION ANALYSIS*

In the regulatory analysis that follows it is important to determine if the boiler is considered new or existing as different emission limits apply. Simply moving the boiler does not automatically make the boiler a new boiler under either NSPS or MACT. A facility must either be constructed or modified or reconstructed to become subject to NSPS and the new source provisions under MACT. Both Title 40 Parts 60 and 63 have similar definitions of affected source and reconstruction.

Because Rayonier will invest capital to modify and replace certain boiler internals as well as move the boiler from Jacksonville to Fernandina Beach, a reconstruction analysis was performed to determine if the fixed capital costs being invested in this boiler exceeds 50 percent of the cost of a comparable entirely new facility. If reconstructed the boiler will lose its status as an existing boiler and be considered a new boiler for purposes of NSPS and Boiler MACT.

### 2.1.1 Reconstruction Analysis Guidance

Reconstruction is defined as the replacement of components that exceeds 50 percent of the fixed capital cost that would be required to construct a comparable entirely new facility. Both NSPS and Boiler MACT have similar definitions of reconstruction, thus only one Reconstruction Analysis is presented. The reconstruction question in the applicability requirement for both NSPS in Section 2.2 and MACT in Section 2.3 will refer back to this analysis.

EPA Applicability Determinations Index Numbers NA12, 0200048 and NB28 provide guidance for completing a Reconstruction Analysis. According to the definition one compares the fixed capital assets being invested to the fixed capital assets required for a "comparable entirely new facility" (See Reconstruction Definition 40 CFR 60.15). However, not all fixed capital assets are included in the analysis. Applicability Index NB28 states that stacks, site preparation, demolition, boiler cranes, station piping, water purification equipment, water supply systems, air cleaning systems and cooling systems and almost anything to do with a turbogenerator are excluded from the analysis. It further states that air pollution control equipment is only included if it is needed as part of the manufacturing/operating process. It would not be possible today to permit the proposed boiler without the scrubbers, ESP and stack, but this equipment is not needed for the operation of the boiler and has been excluded from the analysis. Ash handling equipment was excluded after the ash discharge valves to the ash hopper. Labor and engineering cost have been included per Applicability Determination Index Number 0200048. As Applicability Determination Index Number NB28 suggests, the units constituting the facility which are in or out of the analysis may be best represented in a diagram. Such a diagram is included in Figure 1 below.

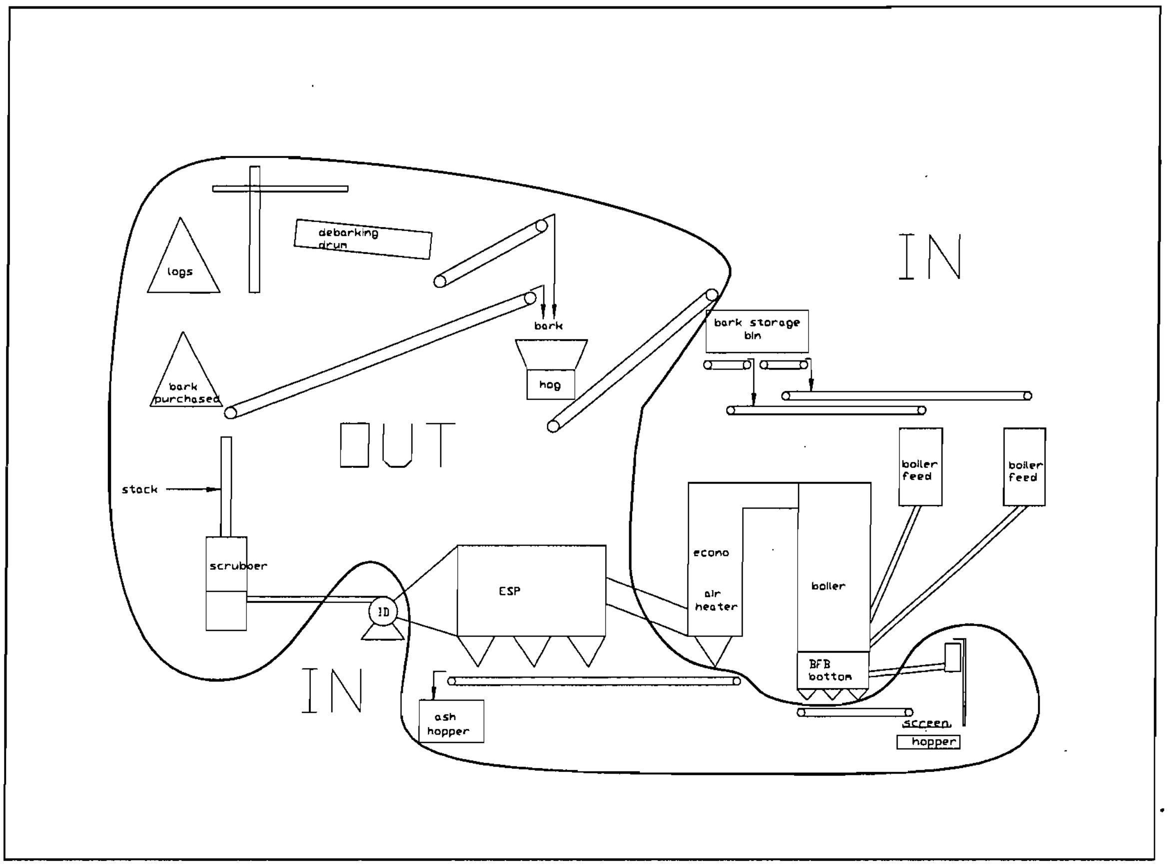


**Figure 1: Extent of Reconstruction Analysis**

Two approaches to estimating the cost for a comparable, entirely new facility were used. First, Rayonier was fortunate to acquire the original records for the boiler purchase and installation. These records were used to estimate the cost at the time of construction which was adjusted for those items included in and excluded from the analysis as described by EPA Guidance referenced above. These costs were then escalated to present day dollars. To this was added the new parts needed for the conversion from coal to bubbling fluidized bed.

Second, a quote for a boiler and equipment was obtained from a vendor. The quote was augmented by our engineering firm to include the foundations, buildings etc. needed to service the boiler but excluded from the vendor's quote. Both analyses are presented below.

### 2.1.2 Rayonier Projected fixed Capital Spending on this Project

Table 1 is Rayonier's budget for this project that has been adjusted to remove those items that are excluded from a Reconstruction Analysis according to the EPA Guidance referenced above. Total Fixed Capital Costs being invested in this project are then $13,882.000.

**Table 1. No. 6 Boiler Reconstruction Analysis Fixed Capital Costs**

| | |
|---|---|
| Foundation | $ 454,000 |
| Dismantling and Freight Costs | $ 680,000 |
| Building Retrofitting/Re-Erection | $ 2,141,000 |
| Boiler Pressure Parts & Installation | $ 2,459,000 |
| Feedwater System | $ 253,000 |
| Pressure-Part Trim | $ 250,000 |
| Heat Exchangers | $ 1,150,000 |
| BFB Bottom Unit | $ 1,600,000 |
| Oil Burner Systems | $ 375,000 |
| Sand Reclaim & Recirculation System | $ 563,000 |
| Furnace Trim | $ 510,000 |
| Fluidizing Air System | $ 282,000 |
| Over-Fire Air system | $ 328,000 |
| Gas Stream | $ 404,000 |
| Bark Feed System | $ 401,000 |
| Electrical | $ 1,335,000 |
| Controls/ Instrumentation | $ 325,000 |
| DCS | $ 200,000 |
| Misc. Project Services | $ 172,000 |
| **TOTAL** | **$ 13,882,000** |

This reconstruction cost must be compared to the fixed capital costs for a comparable entirely new facility.

### 2.1.3 New Facility Cost Based on Escalated 1983 Costs

Rayonier was fortunate to obtain the original 1983 installation records for the used boiler being purchased. This cost information was adjusted to remove the coal burning and ash handling equipment, the pollution control equipment and the stack per EPA Applicability Determination Index No. NB28. This cost in 1983 dollars was then escalated to 2004 dollars using the Chemical Engineering Plant Cost Index ratio for the period of 1983 to 2004 of 1.40. To this cost was added the cost of the new bark handling equipment and a BFB bottom design in 2005 dollars. This analysis is presented in Table 2 below which indicates $ 39,155,000 as the cost for a comparable entirely new facility in 2004 dollars.

**Table 2. Cost of a Comparable Entirely New Facility in 2005 adjusted from 1935**

| | | |
|---|---|---|
| 1983 | 1983 Capital Estimate | $ 29,334,000 |
| - | Coal Handling System | $ (1,831,000) |
| - | Stoker Bottom System | $ (713,000) |
| - | Scrubber Stack | $ (974,000) |
| - | Dust Collector | $ (43,000) |
| 1983 | Total Boiler Cost | $ 25,773,000 |
| 2004 | Adjusted Cost (Chemical Eng Plant Cost Index) | $ 36,126,000 |
| + | Bark Storage Bin/Live Bottoms/VF Drives | $ 1,170,000 |
| + | BFB | $ 1,600,000 |
| + | Fluidizing Air System | $ 259,000 |
| | COMPARABLE NEW PROJECT ESTIMATE | $ 39,155,000 |

Percent reconstructed = $13,882,000 / $39,155,000 = 35%

This analysis indicates that only 35 percent of a comparable entirely new facility is being spent on this project and thus it is not a reconstructed facility. Therefore, the boiler maintains its status as an existing facility as of 1983.

### 2.1.4 New Facility Cost Based on Recent Quote

As an alternative to the analysis presented above, the Kaverner Corporation was approached for a quote on a new comparable boiler. Their quote included air pollution control systems and stack and a complete ash system. Their quote did not include foundations, buildings, piping and electrical nor any installation costs. Projects for Industry, Rayonier's engineer for the project, then estimated, or acquired quotes for, the missing capital costs not included in the Kaverner Quote and subtracted those items not to be included per the applicability guidance sited above.

| | |
|---|---|
| Kaverner Corp bid proposal | $ 21,136,000 |
| Plus | |
| Boiler vendor erection costs | $ 11,438,000 |
| Foundations | $ 454,000 |
| Bark Delivery | $ 435,000 |
| Boiler Building Steel | $ 3,100.000 |
| Concrete Floors/Buildings | $ 670,000 |
| Fire Protection | $ 160,000 |
| Boiler Utilities Piping | $ 260,000 |
| Electrical | $ 2,400,000 |
| DCS System | $ 650,000 |
| Engineering | $ 1,500,000 |
| Site Services | $ 172,000 |
| Minus | |
| ESP | $ 1,930,000 |
| 150 foot stack | $ 180,000 |
| Ash system | $ 186,000 |
| SNCR equipment in vendor quote | $ 265,000 |
| **Grand Total Comparable Entirely New** | **$ 39,814,000** |

Estimated Cost of project from Table 1 $13,882,000

Percent reconstructed = $ 13,882,000 / $39,814,000 = 35%

### 2.1.5 Rule of Thumb Estimation of New Boiler Costs

Boiler manufacturers through experience have developed 'rules of thumb' for estimating costs for new boilers. Generally $150,000 per 1000 pounds per hour of steam capacity is used for estimating the capital cost of similar high pressure boilers. Using this method a similar all new boiler would cost $39,750,000 which compares favorably with the estimates arrived at by the two specific methods above.

It must be remembered that all three of these approaches represent estimates only. Generally the estimates are high to allow for some unforeseen difficulty such as equipment defects, weather delays, delays in delivery of needed parts etc.

## *2.2 BOILER NEW SOURCE PERFORMANCE STANDARDS*

### 2.2.1 40 CFR Part 60 Subpart D, Da and Db Boiler Applicability

The Federal New Source Performance Standards (NSPS) authorized by Section 111 of the Federal Clean Air Act are found in 40 CFR Part 60. Subpart D of Part 60 applies to steam generators (boilers, especially those using fossil fuel) and was adopted in June 14, 1974 applying to boilers constructed or reconstructed after August 17, 1971. (NSPS is somewhat unique in that it begins applying to sources when proposed and not beginning with final promulgation.) Subpart D was in effect at the time this boiler was constructed and applied to this boiler when constructed.

Somewhat later in June 11, 1979 Subpart Da, was adopted and applied to electric utility steam generators constructed or reconstructed after September 18, 1978. An electric utility steam generator is defined as one selling more than 25 megawatts or one third of the electrical power generated. The mill has the ability to sell electricity to the grid, but Rayonier will not sell more than 25 megawatts nor will it sell one third of the generating capacity of the mill or about 15 megawatts. Subpart Da does not apply to this project.

Subpart Db applies to Industrial, Commercial and Institutional boilers having greater than 100 mmBtu/hr heat input constructed or reconstructed after June 19, 1984 and was adopted in December 16, 1989. This boiler was constructed before June 19, 1984 therefore Subpart Db does not apply, unless the boiler is considered reconstructed or modified. If the boiler were considered reconstructed or modified Subpart Db would apply and not Subpart D.

### 2.2.2 Is the Boiler Reconstructed Under NSPS?

The Reconstruction Analysis presented in Section 2.0 demonstrated that the work planned by Rayonier does not trigger reconstruction.

### 2.2.3 Is the Boiler Modified Under NSPS?

The 40 CFR Part 60 regulations define modification as any action resulting in any increase for any pollutant for which there is a standard. As the new owner Rayonier has no knowledge of previous emissions of this boiler. Therefore, its emissions have been estimated at the previous permit limits. It is reasonable to expect this boiler was operated close to its limits as pollutant removal equipment as was used to achieve them. Pollution control equipment enables close control of ultimate emissions and it is reasonable to expect that those controlled emissions were close to the limits. Indeed 40 CFR 60.8 requires operation at the maximum rate of production before a compliance test for NSPS can be run. This maximum rate of operation is limited by NSPS.

The emission limits imposed by the 40 CFR Part 60, Subpart D in 1983 are presented in Table 3 below. Table 3 also presents the expected new limits. All of the new limits are equal to or less than the old limits. Therefore the relocation and reengineering of this boiler is not considered a modification.

The mandatory scrubbing of $SO_2$ to achieve an additional 90% reduction had not been adopted in 1983. However, because this boiler burned coal, scrubbing for $SO_2$ and for $NO_x$ was mandatory to meet the NSPS limits. Scrubbing is not mandatory to meet the limits when the fuel consists mostly of bark with some liquid fossil fuel (No. 6 oil).

**Table 3. 40 CFR Part 60 Subpart D limits in 1983**

| Pollutant | Limit in lbs/mmBtu unless indicated | Expected New Limit in lbs/mmBtu unless indicated |
|---|---|---|
| PM | 0.1 | 0.07 |
| Opacity | =<20% except 6/hour<27% | =<20% except 6/hr<27% |
| SO2 solid fossil fuel | 1.2 | NA |
| SO2 liquid fossil fuel | 0.8 | 0.8 |
| NOx | 0.3 | 0.3[1] |

[1]For NSR purposes the facility will be accepting a lower limit for $NO_x$.

Emissions from the boiler after installation will not be greater than those before this project as listed in Table 3. Therefore no modification has taken place and the boiler maintains its classification as an existing boiler under 40 CFR Part 60 subpart Db and constructed after June 14, 1974 and before June 19, 1984 and remains subject to the limits in Subpart D.

## 2.3 BOILER MACT STANDARD APPLICABILITY

### 2.3.1 40 CFR Part 63, Subpart DDDDD

EPA promulgated 40 CFR Part 63, Subpart DDDDD in the September 14, 2005 Federal Register with a compliance date of September 13, 2007 for existing boilers and upon startup for new boilers. This rule imposes MACT (Maximum Achievable Control Technology) limits for Hazardous Air Pollutants (HAPs). Particulate Matter is used as a surrogate for the 8 metal HAPs that are the target of the standard. An alternative standard is provided allowing a facility to choose whether it is to be limited by total particulates or a limit for the 8 metal HAPs. Boiler MACT also limits mercury and hydrogen chlorine emissions from all boilers and carbon monoxide emissions are limited from new boilers only. See Table 4 below.

**Table 4. 40 CFR Part 63, Subpart DDDDD Limits For Existing Boilers**

| Pollutant | Limit - Existing |
|---|---|
| Particulate | 0.07 lb/mmBtu |
| 8 metal HAPs | 0.001 lb/mmBtu |
| Hydrogen Chloride | 0.09 lb/mmBtu |
| Mercury | 0.000009 lb/mmBtu |
| Carbon Monoxide7 | None |
| Opacity | None if wet scrubber<br>Use ESP parameters |

### 2.3.2 Is No. 6 Boiler Reconstructed Under Boiler MACT

If sufficient capital is invested in changes to an emission unit it may be reconstructed. Similar to NSPS, if reconstructed, it is considered new. Part 63 (MACT) and Part 60 (NSPS) use the same definition for reconstruction. The General Provisions of Part 63 were amended on April 5, 2002 to clarify that relocated existing sources retain their existing source status (absent reconstruction) and do not become subject to new source MACT.

The reconstruction analysis for the boiler was presented in section 2.0 above. This boiler has not been reconstructed. It was originally constructed in 1983 and unless considered modified is subject to the existing boiler Subpart DDDDD standards.

### 2.3.3 Is No. 6 Boiler Modified Under Boiler MACT

The MACT standards do not define a modification. A facility is constructed or is reconstructed after promulgation and therefore it is a new source, otherwise it is an existing source. The boiler is not reconstructed (See Section 2.0) The MACT limits for existing boilers apply to this boiler.

### 2.3.4 Will No. 6 Boiler meet new Boiler MACT Limits

An existing boiler must comply with the limits in Table 5 by September 13, 2007. The facility then has 180 days to prove compliance by testing. At least 60 days prior to the compliance performance test, a Site Specific Monitoring Plan must be submitted. The Site Specific Monitoring Plan must state the limits, how the facility will demonstrate compliance with the limits and how they will be monitored on an on-going basis. It is early to provide such a Monitoring Plan as there is no experience with the reconfigured boiler. It is not required at this time because this is regarded as an existing boiler. A Monitoring Plan will be provided prior to May 2008, six months following the compliance date. This boiler is not scheduled to commence operation until early 2007.

The ESP is designed to meet the particulate limit of 0.07 lbs./mmBtu with some margin of safety. Since there is a wet alkali scrubber following the ESP prior to the stack, the opacity limits do not apply.

An attempt will be made to use the fuel analysis option to demonstrate ongoing compliance as allowed by the rule. In this option a facility is allowed to demonstrate that it meets the rule if all selected metals listed in the rule found in a worse case fuel mix are assumed to be emitted at a rate less than the limit. At the very minimum the fuel analysis option will be used for mercury and hydrogen chloride compliance. If the fuel analysis option is used, a Fuel Analysis Plan is required to be submitted at least 60 days prior to beginning the fuel analysis. Anticipated emissions are given in Table 5 below along with the limits for existing boilers. The analysis of available data from the literature for mercury and chlorine in fuels is included in Table 6 below. This demonstrates that even with Tire Derived Fuel, the Fuel Analysis Option will demonstrate compliance with the mercury and hydrogen chloride limits.

**Table 5. Boiler MACT and Expected Emissions from No. 6 Boiler**

| Pollutant | Boiler MACT Limits | Predicted Emissions Boiler MACT Pollutants |
|---|---|---|
| Particulate | 0.07 lb/mmBtu | 0.07 lb/mmBtu |
| 8 metal HAPs | 0.001 lb/mmBtu | unknown |
| Hydrogen Chloride | 0.090 lb/mmBtu | 0.019 lb/mmBtu |
| Mercury | 0.0000090 lb/mmBtu | 0.0000016 lb/mmBtu |
| Carbon Monoxide | None | <400 ppm @ 7% $O_2$ 30 day average |
| Opacity | None if wet scrubber<br>Use ESP parameters | None – wet scrubber |

**Table 6. Boiler MACT Analysis for HCl and Hg Compliance.**

| BOILER MACT FUEL ANALYSIS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | % | Ton/hr | Btu/lb | HCl (lb/mmBTU) | mmBTU/hr | lb. HCl/hr | Hg (lb/mmBTU) | lb. Hg/hr |
| Bark | 70 | 36.0 | 5,100 | 0.0103 | 367.2 | 3.78210 | 0.000001420 | 0.000521424 |
| TDF | 10 | 2.5 | 15,500 | 0.0730 | 77.5 | 5.65750 | 0.000003720 | 0.000288300 |
| #6 Oil | | | 18,000 | 0.0075 | 0.0 | 0.00000 | | 0.000000000 |
| Lndscp Wst | 10 | 5.0 | 5,100 | 0.0070 | 51.0 | 0.35700 | 0.000000451 | 0.000023001 |
| Knots | 10 | 3.5 | 4,300 | 0.0070 | 30.1 | 0.21070 | 0.000000451 | 0.000013580 |
| **TOTAL** | | | | | 525.8 | 10.00736 | | 0.000846300 |
| | | | | | | | | |
| | | | | HCl | | | Mercury | |
| **Actual** | | | | 0.0190 lb/mmBTU | | | 0.0000016 lb/mmBtu | |
| **Limit** | | | | 0.0900 | | | 0.0000090 | |

If the option for the alternate limit for selected metals cannot be used, ESP field parameters ranges will be developed during initial compliance testing and will be used as surrogate parameters to monitor compliance. A wet alkali scrubber, installed primarily for sulfur dioxide control, will also capture hydrogen chloride.

## *2.4 NSR APPLICABILITY TO THE BOILER PROJECT*

### 2.4.1 Existing Emissions

Except for NOx emissions, Table 7 below presents the latest five years of annual emissions as reported in the Annual Operating Report ("AOR") submitted to the Department annually every March 1. Over the years the basis for calculating emissions has changed for some pollutants and those changes are documented in Appendix A. Baseline periods comprising two consecutive years are averaged for each pollutant. Generally the two consecutive years of maximum production have been averaged to determine baseline emissions, as we believe these years are most representative of normal operations. However, a 2004 test for CO indicated lower emissions than predicted from emissions factors and thus a later 2003-2004 baseline is used. The SO2, NOx and VOC baseline was selected to reflect the maximum oil usage as it is the major source of these emissions. The $NO_x$ emissions have been changed from the AOR as further described below. Baseline years have been selected to reflect what the facility actually emitted in the recent past using the best data available. The facility makes many different grades of pulp, each having its own emission characteristics. Generally the highest emissions are selected so that the facility will not be restricted as to the grade of pulp it can manufacture.

**Table 7. TPY Emission of Boiler Relevant Regulated Pollutants last 5 years**

| Year | 2004 TPY | 2003 TPY | 2002 TPY | 2001 TPY | 2000 TPY | Baseline years | Avg. Baseline years |
|---|---|---|---|---|---|---|---|
| PM | 220.29 | 176.39 | 258.35 | 235.14 | 316.98 | 00-01 | 276.06 |
| PM 10 | 195.37 | 156.24 | 228.95 | 208.40 | 276.56 | 00-01 | 242.48 |
| $SO_2$ | 99.33 | 130.31 | 171.21 | 192.70 | 162.73 | 01-02 | 181.96 |
| $NO_x$ | 298.80 | 328.75 | 336.91 | 345.00 | * | 01-02 | 340.95 |
| CO | 647.14 | 734.35 | 780.72 | 805.89 | 855.46 | 03-04 | 690.75 |
| VOC | 42.78 | 48.66 | 51.58 | 53.21 | 23.97 | 01-02 | 52.40 |

*A steam measurement for this year was not available for calculating annual NOx emissions.

In previous AORs the $NO_x$ emission was calculated using AP42 Emission Factors. These factors indicate NOx varies with oil fired as well as other boiler characteristics. The mill has two boiler stacks each equipped with a venturi scrubber. Power boiler Nos. 1 and 2 both vent to the stack and venturi scrubber designated A. Power boiler No. 3 vents to stack and scrubber B. A total of 14 tests for $NO_x$ have been conducted on the 2 stacks. Figure 2 demonstrates the relationship between oil fired and $NO_x$ emissions. Stack tests of both boiler stacks determined there were fewer $NO_x$ emissions than reported in the AOR.

No. 1 boiler is fired with oil only. Nos. 2 and 3 boilers are fired with a mixture of oil and waste wood, generally bark. Most stack tests are focused on particulate emissions and thus are run with a minimum of oil and a maximum of bark, which minimizes the $NO_x$ emissions. Numbers 1 and 2 power boilers are always fired with a high percentage of oil because Number 1 power boiler is only oil fired. Fuel records show that on an annual average about 62 percent of the heat input is from oil for No. 1 and 2 boilers and 17 percent for No. 3 boiler. From Figure 2, the NOx emission rates for the A stack are 0.2 lbs/mmBtu based on recent tests and for B stack is 0.1623 lb $NO_x$/mmBtu.

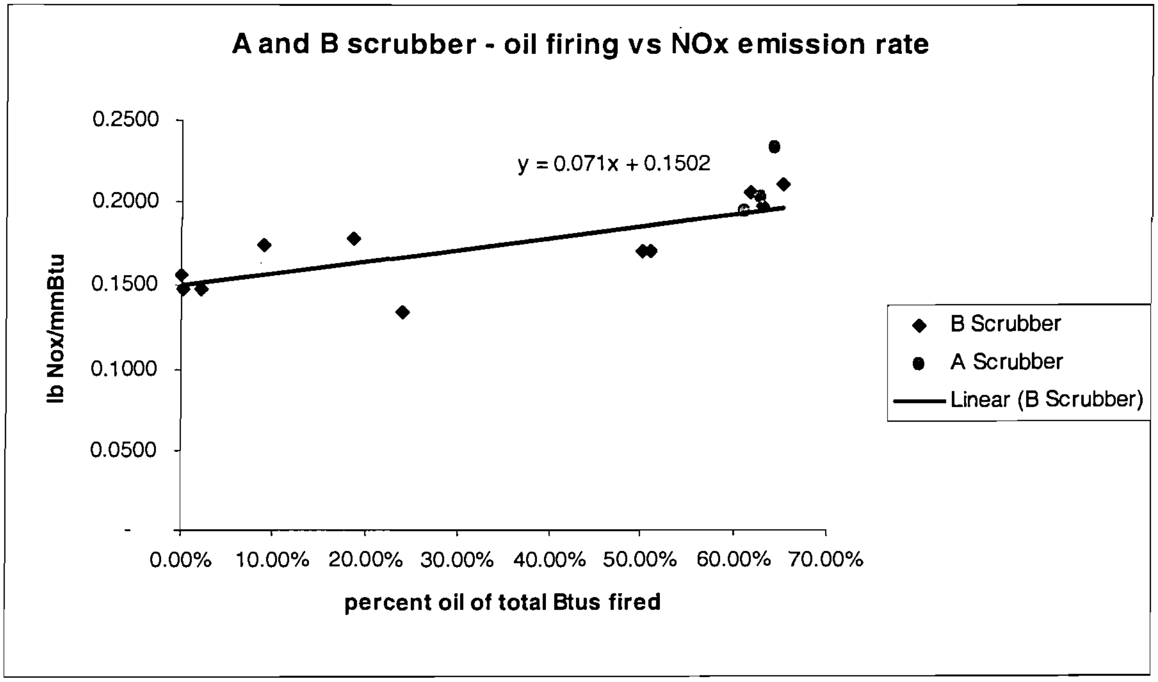


**Figure 2 Tested $NO_x$ Emissions versus Percent Oil in Fuel Fired**

Efficiencies for each boiler during the fourteen tests for $NO_x$ presented above were examined. Annual steam production for each boiler from 2001 through 2004 was also examined. Heat inputs were calculated from F-factors as were $NO_x$ emission rates. Table 8 presents the steam made during each test and the heat input so that an efficiency is calculated. This efficiency is used to calculate the heat input for annual steam production, and using the $NO_x$ emission rates from Figure 2 annual $NOx_x$ emissions are calculated for each year for which there are accurate steam measurements – 2001through 2004. The adjusted $NO_x$ baseline of 340.95 is presented in Table 7 and in Table 9 as the average of emissions in years 2001 and 2002, the two consecutive highest years.

**Table 8. Efficiency of Boiler during Test**

| Date | Test Run | Time Begin | Time End | Scrubber | Heat in Steam Produced during Test mmBtu/hr | Heat Input from F-Factor mmBtu/hr | Efficiency | Average Efficiency |
|---|---|---|---|---|---|---|---|---|
| 6/10/2004 | 1 | 12:00 | 13:00 | A | 176.00 | 270.42 | 65% | |
| 6/10/2004 | 2 | 14:41 | 15:41 | A | 170.46 | 265.42 | 64% | |
| 6/10/2004 | 3 | 17:34 | 18:34 | A | 169.91 | 252.65 | 67% | 66% |
| 6/9/2004 | 1 | 12:27 | 13:56 | B | 126.07 | 278.62 | 45% | |
| 6/9/2004 | 2 | 15:00 | 16:39 | B | 122.52 | 228.92 | 54% | |
| 6/9/2004 | 3 | 17:51 | 18:51 | B | 113.52 | 232.76 | 49% | |
| 7/8/2005 | 1 | 8:59 | 9:59 | B | 112.28 | 216.55 | 52% | |
| 7/8/2005 | 2 | 10:22 | 11:22 | B | 110.28 | 214.80 | 51% | |
| 7/8/2005 | 3 | 11:38 | 12:38 | B | 110.14 | 227.54 | 48% | |
| 7/8/2005 | 4 | 13:58 | 14:58 | B | 134.81 | 254.76 | 53% | |
| 7/8/2005 | 5 | 15:09 | 16:11 | B | 136.07 | 261.30 | 52% | |
| 7/14/2005 | 1 | 9:00 | 10:00 | B | 123.39 | 236.25 | 52% | |
| 7/14/2005 | 2 | 10:17 | 11:17 | B | 119.18 | 223.11 | 53% | |
| 7/14/2005 | 3 | 11:37 | 12:37 | B | 133.69 | 238.51 | 56% | 51% |

The average efficiency for A stack, Nos. 1 and 2 boilers, is 66% and for B stack, No. 3 boiler, is 51%.

**Table 9. Annual $NO_x$ Emissions Recalculated**

| Boiler | Energy in Steam Produced mmBtu/yr | Efficiency | Annual Heat Input mmBtu/yr | $NO_x$ Emissions |
|---|---|---|---|---|
| | | 2001 | | |
| | | | | TPY |
| A | 1,284,146.99 | 66% | 1,959,978.25 | 196.00 |
| B | 944,517.56 | 51% | 1,836,189.02 | 149.01 |
| **Total** | | | | **345.00** |
| | | 2002 | | |
| A | 1,284,167.28 | 66% | 1,960,009.22 | 196.00 |
| B | 893,189.45 | 51% | 1,736,404.63 | 140.91 |
| **Total** | | | | **336.91** |
| | | 2003 | | |
| A | 1,189,099.78 | 66% | 1,814,908.83 | 181.49 |
| B | 933,427.43 | 51% | 1,814,629.26 | 147.26 |
| **Total** | | | | **328.75** |
| | | 2004 | | |
| A | 1,121,154.39 | 66% | 1,711,204.59 | 171.12 |
| B | 809,314.27 | 51% | 1,573,347.12 | 127.68 |
| **Total** | | | | **298.80** |

## 2.4.2 Emission Increases/Decreases due to No. 6 Boiler

Section 2.2 discussed the applicability of the Federal New Source Performance Standards (NSPS) that apply to the boiler, found at 40 CFR Part 60 Subpart D. Table 3 presented the applicable emission limits. Section 2.3 discussed the Boiler MACT Standards found at 40 CFR Part 63, Subpart DDDDD. Table 4 presented the applicable emission limits of this standard.

In reviewing the projected emission rates based on the two applicable emission standards, NSPS and Boiler MACT, and comparing potential emissions to the baseline emission in Table 7 it was determined that $NO_x$ and $SO_2$ annual emissions will exceed the PSD Significance Levels. Annual emissions from all other pollutants will decrease. In order for this project to avoid PSD permitting the facility is willing to accept a $NO_x$ emission limit of 379.95 tons per year annual average and a $SO_2$ emission limit of 220.95 tons per year annual average. This emission rate is based on 8760 hours per year operation.

**Table 10. No. 6 Power Boiler Emissions**

| Pollutant | Source of limit | Emission rate lb/mmBTU | Potential Emission ton/year | Baseline Emissions ton/yr | Emission Change ton/yr | PSD Significance Level |
|---|---|---|---|---|---|---|
| PM | Boiler MACT | 0.07 | 138 | 276.06 | (138) | 25 |
| PM10 | PM as PM10 | 0.07 | 138 | 242.48 | (105) | 15 |
| $SO_2$ | ESCPSD | 0.1121 ann. avg. | 220.95 | 181.96 | 39 | 40 |
| $NO_x$ | NSPS | 0.1928 ann. avg. | 379.95 | 340.95 | 39 | 40 |
| CO | None | - 0.2 - | 99 | 690.75 | (591) | 100 |
| VOC | None | - 0 - | - 1 - | 52.40 | (45) | 40 |

## 2.5 *EMISSION MONITORING FOR No. 6 BOILER*

### 2.5.1 Emission Monitoring Required by NSPS

40 CFR 60.45, the specific regulation requiring monitors for boilers subject to Subpart D requires the installation of Opacity, $SO_2$ and NOx monitors along with either $O_2$ or CO monitors and the capability of converting the continuous emissions monitoring data to lb/mmBtu units. The boiler will be equipped with CEMs for $SO_2$ and $NO_x$ meeting Performance Specifications 2 and 3 found in Appendix B of that Part. Both an oxygen monitor and a carbon monoxide monitor will be used, though the carbon monoxide monitor is not required. Because this boiler will have a final alkali scrubber just before the stack, the opacity monitor will be installed after the ESP and before the scrubber. How this will effect compliance determinations is yet to be determined.

### 2.5.2 Emission Monitoring Required by Boiler MACT

Boiler MACT requires opacity monitors on a dry stack, but this boiler will be equipped with a final alkaline scrubber, making a wet plume on which opacity monitors can not be used. As stated above, an opacity monitor will be located between the ESP and the scrubber. However, provisions will also be made for continuous monitoring of the field amperage and voltage on the ESP and pressure drop and flow on the final scrubber should it be required because the fuel analysis option in boiler MACT is not available.

### 2.5.3 Monitoring Required to Track NSR Requirements

The mill is proposing a CAP on $NO_x$ and $SO_2$ emissions less than the limit allowed by NSPS. This CAP is on an annual basis, not to exceed an annual average $NO_x$ emission of 394.74 tons per year and an annual average SO2 emissions of 220.95 tons per year. The $NO_x$ monitoring equipment installed to meet the NSPS requirements above will accumulate continuous $NO_x$ data on a lb/mmBtu basis. Running annual averages will be available daily. This is appropriate because the CAP is taken to avoid PSD which measures significance in terms of annual emissions. Other regulations require $NO_x$ monitors. This monitoring will also require monitoring stack gas flow. Gas flow will be monitored by an ultrasonic type flow monitor so that flow can be continuously determined to calculate annual $NO_x$ and $SO_2$ emissions.

# 3.0 PRODUCTION INCREASE FOR No 6 DIGESTER

As described in the Introduction in Chapter 1.0, the mill accepted a production cap to facilitate the installation of an additional digester. At the time, extensive inspections and maintenance was required on all digesters in the industry following the loss of a digester at another pulp and paper mill in Florida. Inspections and rebricking of each digester involved outages that would have interrupted production and delayed order delivery to customers. To avoid possibly losing customers the mill quickly added no. 6 digester to the 5 existing digesters so that one could be out-of-service and the same number still function. Thus enabling the mill to maintain the planned level of production for the year to match sales.

Soon all digesters will be repaired. Improvements in market position have created an opportunity to make use of some of the production capability the added digester enabled. Full utilization of the digester would achieve 175,000 ADMT per year or about 16.7 percent increase over that baseline 1996 production (149,957 ADMT). This production rate increase is driven mainly by an increase in market demand. Several market changes have caused an increase in demand for our product. Most importantly a major competitor has closed its mill in Mississippi and left the dissolving pulp business. Some of those customers are now buying pulp from this facility. As the price of petroleum increases there is an increase in demand for plastics from cellulose. Finally, markets for some new electronic products that use pulp produced by this facility are increasing. It is essential that the mill move now to meet this demand growth to keep its customers, meet growing foreign competition and maintain domestic jobs.

There is no New Source Performance Standard that applies to sulfite mills. 40 CFR Part 63, Subpart S, the Pulp and Paper MACT standards, does apply to sulfite mills. Under this standard there are slightly different standards for new and existing sources. Modifications are not included in the rule. Sources are either new, being constructed or reconstruction, or are existing sources. A reconstruction analysis is addressed but because one digester compared to the rest of the pulping segment is small a complete reconstruction analysis was not completed.

40 CFR 52.21(r)(4) requires that once a source has taken limit to avoid PSD permitting it must review the permit as if the construction has not occurred. Because emission reductions pursuant to Part 63, Subpart S were mandated a revised baseline of 2002/2003 was used to calculate what actual emissions increase would be as a result of the production increase. To comply with 40 CFR 52.21(r)(4) the same 1996 baseline production rate was used similar to the 1998 original digester permit but emissions rates from 2002/2003 were used and increased on a percentage basis to account for the production increase.

This production increase project is entirely separate from the power boiler project. These two projects are combined in this application to minimize application review time and eliminate duplicative application processing. As will be shown under the power boiler and recovery boiler discussion in subsection 3.3.1 and 3.3.2 below, the existing power boilers and the recovery boiler both have the ability to produce the steam needed for this production rate, and can therefore be excluded from this analysis pursuant to 40 CFR 52.21(b)(ii)(c).

## 3.1 METHOD OF OPERATION AND EQUIPMENT CHANGES

The mill will not change its method of operation. It will of course change the rate of operation of the existing equipment. All of the pulping and bleaching emissions increases and decreases are accounted for in Table 13. Although the mill can produce more pulp than the present limit without any additional equipment, some additional equipment and upgrades to existing equipment will be required to achieve the 175,000 ADMT rate. The emission increases from all of this equipment is accounted for in Table 13. The following equipment will be added in approximately the following order: numerous upgrades on the existing pulp machine (none will increase emissions and most involve increasing the steam pressure in the drying section and increasing the lineal machine speed), an additional post HCE washer, installation of nanofiltration of certain streams to recover caustic and relieve the evaporators of evaporating the caustic liquors so they can be dedicated to evaporating red liquor, a new HCE cell in addition to the 8 existing cells (this will be controlled as part of the HCE blow heat recovery system), a new pre HCE thickner and possibly a new $ClO_2$ tower.

The production increase will increase VOC emissions, most of which come from the HCE blow gases. This production increase includes a project to install heat recovery of the hot gases blown from the HCE cells. These are similar to kraft digesters but do not use sulfur compounds in the reaction process and therefore do not have the TRS gases. Emissions are steam and VOCs, mostly methanol. Blow heat recovery will cool these gases until most of the VOCs condense. The heat will be used elsewhere in the process and the captured VOCs will end up in the wastewater treatment system. Predicting the exact capture at the HCE blow heat recovery system and the escape using WATER9, at the treatment system is extremely difficult. More than 75% of the bleach plant emissions come from this source. This analysis conservatively assumes that only 50% of those emissions will be captured and destroyed in the wastewater treatment system.

## 3.2 RECONSTRUCTION ANALYSIS

A detailed reconstruction analysis similar to that presented for No. 6 boiler is not needed. No. 6 digester is part of a very large digester system that includes blow tanks, heat exchangers, and columns for the capture and reuse of $SO_2$. Only the digester itself is new, but it cannot function without the rest of the system. Furthermore, The Subpart S MACT standards apply to the entire pulping and washer lines, in fact to the whole mill. It should be immediately obvious that the capital cost of adding one digester does not approach 50% of the cost of replacing the entire pulping line let alone the mill.

## 3.3 DIGESTER NEW SOURCE PERFORMANCE STANDARDS

There are no NSPS standards that apply to sulfite mills.

### 3.4 PULPING MACT 40 CFR PART 63 SUBPART S

EPA promulgated 40 CFR Part 63, Subpart S in the April 15, 1998 Federal Register with an effective date of April 15, 2001. This rule applies to kraft, sulfite and other wood pulping processes and establishes a limit on the VOC HAPs from digester systems, pulp washing systems and liquor recovery systems, and waste water treatment systems (if used as the method to achieve the limits). Methanol is used as a surrogate. For sulfite mills total methanol emissions may not exceed 2.2 pounds per oven dry unbleached short ton of chemical pulp produced.

The existing digester system at this facility was required to meet the limits in 40 CFR Part 63, Subpart S by April 15, 2001. Rayonier Fernandina Beach Mill chose to install direct contact methanol condensers on the emission point venting the combined digester and washing systems, on the vent for the evaporator non-condensables and to use biological treatment to destroy the VOC HAPs (methanol) collected in the water used in the condensers. Reported elsewhere are the results of numerous annual tests demonstrating that the mill meets the Subpart S MACT standards.

Both the digester/washer system condenser and the evaporator system condenser are sized to operate at full capacity of both systems. Both condensers are capable of handling the increased methanol loading and maintaining present methanol emission levels. The recovery boiler, the largest source, has tested in compliance at the increased production operating rate. More condenser water may be used and that has not been finally quantified. At the higher production rate new parameter curves will be produced and submitted as part of the continuing Compliance Methodology, now part of the renewed Title V permit for the mill.

In any event the mill will remain subject to the Subpart S MACT limit of 2.2 lbs of methanol per Oven Dry Unbleached Short Ton of pulp produced. The point is that no changes to the existing control equipment will be necessary to maintain compliance.

## 3.5 NSR APPLICABILITY

Because the addition of No. 6 digester avoided PSD in 1998 by accepting a production limit as a surrogate to limiting emissions, 40 CFR 52.21(r)(4) applies and requires a review of PSD as if the No. 6 digester has not yet been installed.

> (4) At such time that a particular source or modification becomes a major stationary source or major modification solely by virtue of a relaxation in any enforceable limitation which was established after August 7, 1980, on the capacity of the source or modification otherwise to emit a pollutant, such as a restriction on hours of operation, then the requirements or paragraphs (j) through (s) of this section shall apply to the source or modification as though construction had not yet commenced on the source or modification.

To satisfy the 40 CFR 52.21(r)(4) requirement, this analysis used the same baseline production used in 1998 for the original PSD analysis for No. 6 digester. The baseline production for No. 6 digester analysis was the 1996 net production of 149,957 ADMT. A production increase to 175,000 ADMT/yr represents a 16.70 percent increase. Emission changes are calculated as a percentage of the increase in production over that used for the analysis for No.6 digester. Each relevant pollutant for each emitting mill segment has baseline emissions determined based on 2002/2003 emissions and those emissions are increased by 16.70 percent. The increase is compared to the Significance Level. If the increase is less than the Significance Level no PSD review is required for that pollutant.

Baseline emissions have been taken from the Annual Operation Report and are presented in Table 11 below. Previous reported emissions for VOCs, except for 2002, contain emissions now required to be controlled and therefore were not used to develop the baseline. The MACT Subpart S standards were complied with in April 2001. Reported emissions after this point include the required emission reductions.

There are five mill segments that have emissions, the power boilers, the recovery boiler, the pulping system vent (vent gas scrubber), the bleach plant vents and the evaporator system vent. As will be demonstrated below the existing power boilers and recovery boiler have the capability to achieve and have achieved operation rates consistent with the 175,000 ADMT production rate and will not only be increasing their rate of operation and thus are exempt from the this PSD review. The pulping segment, the bleach plant and the evaporators are being debottlenecked and these segments are analyzed for emissions increases.

### 3.5.1 Recovery Boiler

The recovery boiler is permitted at an operating rate of firing 70,000 lb of red liquor solids per hour. It has operated at this rate from time to time and has been repeatedly tested at this rate. It has therefore shown itself capable of operating at this rate. It does not on average operate at this rate because of market conditions. Nevertheless, 40 CFR 52.21(b)(41)(ii)(c), recently adopted revisions to the New Source Review applicability determinations, specifically allows the exemption from projected actual emissions increases in emission that could have been accommodated.

> 40 CFR 52.21(b)(41)(ii)( c) .....Shall exclude, in calculating any increase in emissions that results from the particular project, that portion of the unit's emissions following the project that an existing unit could have accommodated during the consecutive 24-month period used to establish the baseline actual emissions under paragraph (b)(48) of this section and that are also unrelated to the particular project, including any increased utilization due to product demand growth;

It should be noted that this has been the law since the WEPCO (893 F2nd 901, 1990) which involved a utility boiler and EPA has merely recognized this by expanding the demand growth concept to cover industrial boilers in the new regulation cited above. The recovery boiler could have accommodated the operating rate of 70,000 lbs/hr. The permitted firing rate is 70,000 lbs/hr red liquor solids and it has been tested at that rate. The most recent performance tests for methanol compliance in May 2004 are presented in Table 11 below. The mill assured the methanol capture system for the evaporators was adequately designed for this rate and for each methanol compliance test both the boiler and evaporators were operated at the 70,000 lb/hr rate. No capital expenditure was needed to operate the recovery boiler at 70,000 lbs./hour, and this increase in the rate of production is purely driven by market demand. Therefore, pursuant to 40 CFR 52.21(b)(41)(ii)(c) the emission increases from the recovery boiler that will be experienced by a physical change (the added digester) will not be included in the calculation of whether any increase in emission attributable to the production increase exceeds the Significance Level.

**Table 11. Recovery Boiler and Evaporator Operating Rates During Tests**

| Test Date and Time | Solids to Recovery Boiler lb/hr | Solids to Evaporators lbs/hr | Test Date and Time | Solids to Recovery Boiler lb/hr | Solids to Evaporators lbs/hr |
|---|---|---|---|---|---|
| 9/18/1996 | 70,399 | No evaporator data recorded during these tests | 5/7/2002 | 66,375 | |
| | 68,580 | | | 64,162 | |
| | 73,411 | | | 65,192 | |
| 9/18/1996 | 71,538 | | 4/14/2003 | 62,954 | |
| | 69,905 | | | 65,603 | 66,873 |
| | 67,551 | | | 69,677 | |
| 9/8/1998 | 64,777 | | | 69,257 | |
| | 61,164 | | 4/15/2003 | 69,489 | |
| | 62,005 | | 5/20/2004 | 69,000 | 70,000 |
| 11/2/1999 | 65,697 | | | 70,000 | 69,667 70,000 |
| | 64,619 | | | 70,000 | 70,000 |
| | 64,447 | | 5/21/2004 | 68,000 | 72,000 |
| 4/5/2000 | 61,429 | | | 68,000 | 67,667 72,000 |
| | 63,299 | | | 67,000 | 69,000 |
| | 62,756 | | 5/24/2004 | 70,000 | 71,000 |
| 5/1/2001 | 65,881 | | | | |
| | 64,473 | | | | |
| | 61,706 | | | | |

2003-2004 (4) tests

68,425

68,425/70,000 = 99.14%

### 3.5.2 Power Boilers

It has already been shown from the above application regarding the new power boiler that even at full potential operating rate the boiler does not trigger PSD. Pursuant to 40 CFR 52.21)(b)(41)(ii)(c) it is necessary to demonstrate that the existing boilers as well as the boiler replacing them has the capability to support the projected market demand and need not be included in the emission increase calculus. Table 12 presents data to demonstrate that the existing power boilers have the capability as well as the rated capacity to operate at the 265,000 lbs of steam per hour rate. It is worth note that this Table also demonstrates why the two projects covered by this application are separate and completely unrelated because this table shows that the production increase could be accomplished without the installation of No. 6 boiler.

**Table 12. Annual Average Steam Production by Boiler (thousands of pounds)**

| Boiler | Capacity KLb Steam/hr | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|---|---|
| 1 | 120 | 89 | 85 | 69 | 74 | 80 | 74 | 59 |
| 2 | 120 | 82 | 107 | 74 | 80 | 80 | 76 | 69 |
| 3 | 135 | 106 | 109 | 107 | 114 | 106 | 108 | 92 |
| Total | 375 | 278 | 302 | 240 | 268 | 266 | 259 | 220 |
| | | | | | | | | |
| Production ADMT/yr | | 132,016 | 119,689 | 151,515 | 146,247 | 145,895 | 144,976 | 145,883 |

Table 12 demonstrates that not only do the existing power boilers have the permitted capacity, but have operated at rates exceeding the rate being permitted in Power Boiler Number 6. It also demonstrates the successful efforts made by the facility to improve the energy efficiency as more pulp is made with less energy. One of the benefits of the project to capture the HCE blow gas heat, in addition to the reduction in VOC emissions, will be to capture more lost heat to further improve energy efficiency.

### 3.5.3 Pulping System Vent (Vent Gas Scrubber)

Sulfur dioxide and VOCs are the two pollutants having applicable PSD significance levels emitted from this collection of emission units associated with pulping and washing.
Table 13 below presents annual sulfur dioxide and VOC baseline emissions and the calculated increase from the production increase.

### 3.5.4 Bleaching System Vent

Both VOCs and Carbon Monoxide (CO) from the use of ClO2 bleaching are emitted from this source. The VOC emissions have been taken from the Annual Operating Report. The CO emissions have been calculated using NCASI Technical Bulletins No. 701 Compilation of Air Toxic and Total Hydrocarbon Emissions for Sources at Chemical Wood Pulp Mills, and No. 760, "Carbon Monoxide Emissions from Oxygen Delignification and Chlorine Dioxide Bleaching of Wood Pulp".

VOC emissions have been calculated using testing of certain high VOC emitting stages and trade association emission factors. Over 80% of bleach plant VOCs come from one specific stage and most of this is methanol. This stage involves a cooking process, after which the pulp is blown to a tank that is vented to atmosphere. The heat is wasted. This application involves the installation of a blow heat recovery system that will also capture methanol other VOCs with similar or higher boiler points. It is estimated that 50% of the methanol would be captured by this project. Other methanol control systems using similar processes, direct contact condensation and closed conveyance systems achieve much greater reductions, so this estimate is considered conservative.

A production increase to 175,000 ADMT would cause VOC emissions to increase more than the PSD Significance Level. However, a production increase to 162,000 would clearly not as it is only an 8% increase and the 8% increases of all related emissions does not cause the total emissions increase to exceed the PSD Significance Level This is shown on Table 13 as the 8% increase. However, with the above mentioned project VOC emissions will decrease even with the production increase to 175,000 ADMT/yr. This application is requesting that the production increase be limited to 162,000 ADMT per year until the installation of the HCE blow heat recovery system.

Carbon monoxide emissions have been estimated using the NCASI Technical Bulletins referenced above. There are no emission factors that separate out chlorine stages from chlorine dioxide stages. The facility uses both. Chlorine stages produce little to no CO. $ClO_2$ stages produce a maximum depending on the lignin content of the entering pulp and the $ClO_2$ charged, but only up to a certain point. Technical Bulletin 760 indicates that CO emissions remained fairly constant between 0.59 and 0.73 kg/ODMTUB when increasing $ClO_2$ substitution. This is equilivent to 1.606 lb/ODMTUP. At 175,000 ADMT finished pulp is equivalent to 218,750 ODMTUP. As a conservative analysis this application used 1.606 lbCO/ODMTUP and determined that CO emissions would increase by 25.12 tons per year. This is less than the PSD Significance Level of 100 tons per year.

### 3.5.5 Evaporator System Vent

The emissions from this source are based on the required methanol performance tests. They have been increased by 16.70 percent to account for the production increase.

### 3.5.6 Wastewater Treatment System Emissions

The emissions from the wastewater treatment system have been taken from the annual report. These emissions are determined using WATER9 similar to its use to determine compliance with the Subpart S MACT rule. They have been increased by 16.70 percent to account for the production increase.

**Table 13. Pulping, Bleaching, Evaporation, Wastewater Systems $SO_2$ and VOC Emissions in TPY from 16.70% Production Increase**

| Year | VOC | | $SO_2$ | | CO | |
|---|---|---|---|---|---|---|
| **Pulping Systems (VGS)** | | | | | | |
| 2000 | | | 79.00 | | 0 | |
| 2001 | | | 51.84 | | 0 | |
| 2002 | | | 21.36 | | 0 | |
| 2003 | 26.72 | | 13.34 | 12.295 | 0 | |
| 2004 | 46.52 | | 11.25 | | 0 | |
| Baseline | 36.62 | | 65.42 | | NA | |
| Increase 8% | | 2.930 | | 10.925 | | 0 |
| Increase 16.70% | | 6.116 | | 10.925 | | |
| **Bleaching Systems** | | | | 2105 | | |
| 2003 | 178.17 | | 0 | | | |
| 2004 | 177.84 | | 0 | | | |
| Baseline | 178.00 | | NA | | | |
| HCE blow heat recovey | (71.20) | | | | | |
| Increase 8% no heat recovery project | | 14.24 | | | | |
| Increase 16.70% and recovery project | | (41.47) | | | | 25.12 |
| Increase 16.70% and no RB project | | 29.726 | | | | |
| **Evaporators** | | | | | | |
| 2003 | 50.72 | | 0 | | 0 | |
| 2004 | 56.72 | | 0 | | 0 | |
| Baseline | 53.72 | | NA | | NA | |
| Increase 8% | | 4.297 | | 0 | | 0 |
| Increase 16.70% | | 8.971 | | | | |
| **Wastewater Treatment System** | | | | | | |
| 2003 | 76.89 | | 0 | | 0 | |
| 2004 | 55.64 | | 0 | | 0 | |
| Baseline | 66.26 | | NA | | NA | |
| Increase 8% | | 5.301 | | 0 | | 0 |
| Increase 16.70% | | 11.065 | | | | |
| Grand Total at 8% increase and no heat recovery project | | 26.77 | | 10.925 | | |
| Grand Total at 16.70% increase and heat recovery project / no RB project | | (15.318) / 44.813 | | | | 25.12 |
| Significance Level | | 40 | | 40 | | 100 |

?

44,813 ↑ VOC

From Table 13 it can be determined that the proposed increase in production will not cause an increase in applicable pollutants beyond the Significance Level. Therefore, this PSD analysis of the installation of No. 6 digester along with a production increase from 149,947 ADMT per year to 175,000 ADMT per year will not require a PSD permit.

The production increase is included in the construction permit application.

## APPENDIX A

| Emissions Source | Fuel Type | Parameter | Source of Annual Operating Report Emissions for 2004 | Any variances from the 2004 source in preceding years. |
|---|---|---|---|---|
| No. 1 PB | Oil | CO | AP 42 emissions factor. | Same source for preceding years. |
| No. 1 PB | Oil | NOX | AP 42 emissions factor. | Same source for preceding years. |
| No. 1 PB | Oil | SO2 | Calculated from actual oil burned, % sulfur analyses and the scrubber SO2 removal efficiency. | Same source for preceding years. |
| No. 1 PB | Oil | PM | 1999 special testing determined the ratio of PM from No. 1 PB to the total PM measured during the A-scrubber stack test. A-scrubber receives flue gas from No. 1 and No. 2 PB. This ratio and the actual A-scrubber PM emissions are used to calculate the No. 1 PB emissions in pounds/hr. This value is then multiplied by the actual hours operated for No. 1 PB. | Same source for preceding years. |
| No. 1 PB | Oil | PM10 | The AP42 ratio of PM10 to PM is multiplied by the PM emissions. | Same source for preceding years. |
| No. 1 PB | Oil | VOC | AP42 emissions factor. | Same source for preceding years. |
| No. 1 PB | Oil | MeOH | Methanol was tested from all three power boilers in 1991 at 0.75 lb/hr. This value is prorated by the fuel type, heat input rate and actual operating hours to each boiler. The source of the methanol is likely the recycled mill process water used in the scrubber. | Same for 2001-2003. No estimates for methanol were made for 2000. |
| No. 2 PB | Oil | CO | AP 42 emissions factor. | Same source for preceding years. |
| No. 2 PB | Oil | NOX | AP 42 emissions factor. | Same source for preceding years. |
| No. 2 PB | Oil | SO2 | Calculated from actual oil burned, % sulfur analyses and the scrubber SO2 removal efficiency. | Same source for preceding years. |
| No. 2 PB | Oil | PM | AP42 emissions factor multiplied by the A-Scrubber PM removal efficiency. | Same source for preceding years. |
| No. 2 PB | Oil | PM10 | AP42 emissions factor multiplied by the A-Scrubber PM removal efficiency. | Same source for preceding years. |
| No. 2 PB | Oil | VOC | AP42 emissions factor. | Same source for preceding years. |

| Emissions Source | Fuel Type | Parameter | Source of Annual Operating Report Emissions for 2004 | Any variances from the 2004 source in preceding years. |
|---|---|---|---|---|
| No. 2 PB | Oil | MeOH | Methanol was tested from all three power boilers in 1991 at 0.75 lb/hr. This value is prorated by the fuel type, heat input rate and actual operating hours to each boiler. The source of the methanol is likely the recycled mill process water used in the scrubber. | Same for 2001-2003. No estimates for methanol were made for 2000. |
| No. 2 PB | Bark | CO | 2004 test of A- Scrubber minus the CO from oil burning calculated for No. 1 and No. 2 boilers. | 2000 – 2003 by AP42 emissions factor. |
| No. 2 PB | Bark | NOX | 2004 test of A- Scrubber minus the NOX from oil burning calculated for No. 1 and No. 2 boilers. | 2000 – 2003 by AP42 emissions factor. |
| No. 2 PB | Bark | SO2 | AP42 emissions factor times the SO2 removal efficiency of the A-Scrubber. | Same source for preceding years. |
| No. 2 PB | Bark | PM | Actual A-scrubber PM test emissions multiplied by the actual operating hours minus No. 1 and No. 2 PB oil PM emissions. | Same source for preceding years. |
| No. 2 PB | Bark | PM10 | The AP42 ratio of PM10 to PM is multiplied by the PM emissions. | Same source for preceding years. |
| No. 2 PB | Bark | VOC | AP42 emissions factor. | Same source for preceding years. |
| No. 2 PB | Bark | MeOH | Methanol was tested from all three power boilers in 1991 at 0.75 lb/hr. This value is prorated by the fuel type, heat input rate and actual operating hours to each boiler. The source of the methanol is likely the recycled mill process water used in the scrubber. | Same for 2001-2003. No estimates for methanol were made for 2000. |

| Emissions Source | Fuel Type | Parameter | Source of Annual Operating Report Emissions for 2004 | Any variances from the 2004 source in preceding years. |
|---|---|---|---|---|
| No. 3 PB | Oil | CO | AP 42 emissions factor. | Same source for preceding years. |
| No. 3 PB | Oil | NOX | AP 42 emissions factor. | Same source for preceding years. |
| No. 3 PB | Oil | SO2 | Calculated from actual oil burned, % sulfur analyses and the scrubber SO2 removal efficiency. | Same source for preceding years. |
| No. 3 PB | Oil | PM | AP42 emissions factor multiplied by the B-scrubber PM removal efficiency. | Same source for preceding years. |
| No. 3 PB | Oil | PM10 | AP42 emissions factor multiplied by the B-scrubber PM removal efficiency. | Same source for preceding years. |
| No. 3 PB | Oil | VOC | AP42 emissions factor. | Same source for preceding years. |
| No. 3 PB | Oil | MeOH | Methanol was tested from all three power boilers in 1991 at 0.75 lb/hr. This value is prorated by the fuel type, heat input rate and actual operating hours to each boiler. The source of the methanol is likely the recycled mill process water used in the scrubber. | Same for 2001-2003. No estimates for methanol were made for 2000. |
| No. 3 PB | Bark | CO | 2004 test of B- Scrubber minus the CO from oil burning calculated for No. 3 boiler. | 2000 – 2003 by AP42 emissions factor. |
| No. 3 PB | Bark | NOX | 2004 test of B- Scrubber minus the NOX from oil burning calculated for No. 3 boiler. | 2000 – 2003 by AP42 emissions factor. |
| No. 3 PB | Bark | SO2 | AP42 emissions factor times the SO2 removal efficiency of the A-Scrubber. | Same source for preceding years. |
| No. 3 PB | Bark | PM | Actual B-scrubber PM test emissions multiplied by the actual operating hours minus No. 3 oil PM emissions. | Same source for preceding years. |
| No. 3 PB | Bark | PM10 | The AP42 ratio of PM10 to PM is multiplied by the PM emissions. | Same source for preceding years. |
| No. 3 PB | Bark | VOC | AP42 emissions factor. | Same source for preceding years. |

| Emissions Source | Fuel Type | Parameter | Source of Annual Operating Report Emissions for 2004 | Any variances from the 2004 source in preceding years. |
|---|---|---|---|---|
| No. 3 PB | Bark | MeOH | Methanol was tested from all three power boilers in 1991 at 0.75 lb/hr. This value is prorated by the fuel type, heat input rate and actual operating hours to each boiler. The source of the methanol is likely the recycled mill process water used in the scrubber. | Same for 2001-2003. No estimates for methanol were made for 2000. |
| Rec. Boil. | Oil | CO | AP42 emissions factor. | Same source for preceding years. |
| Rec. Boil. | Oil | NOX | AP42 emissions factor. | Same source for preceding years. |
| Rec. Boil. | Oil | SO2 | Calculated from actual oil burned, % sulfur analyses and the scrubber SO2 removal efficiency. | Same source for preceding years. |
| Rec. Boil. | Oil | PM | AP42 emissions factor multiplied by the recovery scrubber PM removal efficiency. | Same source for preceding years. |
| Rec. Boil. | Oil | PM10 | AP42 emissions factor multiplied by the recovery scrubber PM removal efficiency. | Same source for preceding years. |
| Rec. Boil. | Oil | VOC | AP42 emissions factor. | Same source for preceding years. |
| Rec. Boil. | Oil | MeOH | Assumed to be zero from oil burning. | |
| Rec. Boil. | SSLS | CO | Actual ppmV CO readings from the boiler's CO CMS & annual stack test flue gas volume flow rate are used to calculate the tons CO/yr. Then the oil burning CO is subtracted from this value. | 2003 same as 2004. 2000-2002 used 1995 tests for CO ppmV. |
| Rec. Boil. | SSLS | NOX | 2004 testing ppmV NOX readings and annual stack test flue gas volume flow rate are used to calculate the tons NOX/yr. Then the oil burning NOX is subtracted from this value. | 2000-2003: 1995 test data used for NOX ppmV. |
| Rec. Boil. | SSLS | SO2 | Actual ppmV SO2 reading from the boiler's SO2 CEM & annual stack test flue gas volume flow rate are used to calculate the tons SO2/yr. Then the oil burning SO2 is subtracted from this value. | Same source for preceding years. |

| Emissions Source | Fuel Type | Parameter | Source of Annual Operating Report Emissions for 2004 | Any variances from the 2004 source in preceding years. |
|---|---|---|---|---|
| Rec. Boil. | SSLS | PM | Annual stack test PM lb/hr and actual operating hours are used along with a ratio of the annual average liquor burning rate to the stack test liquor burning rate. | Same 2002 & 2003. For 2000-2001 the stack test liquor burning rate was used; no compensation for annual average burn rate. |
| Rec. Boil. | SSLS | PM10 | Utilized bark burning AP42 ration of PM10 to PM and the actual PM emissions. | Same source for preceding years. |
| Rec. Boil. | SSLS | VOC | Measured methanol emissions divided by a literature based ration of methanol to VOC for spent sulfite liquor evaporators of 0.95. | 2003 same as 2004. 2000-2002 by AP42 emissions factor. |
| Rec. Boil. | SSLS | MeOH | Annual methanol emissions test in lb/ODUBT pulp multiplied by actual ODUBT/yr. These emissions are actually from the evaporator methanol condenser discharge, which is piped to the recovery boiler scrubber. | Same for 2002 & 2003. 2000-2001 based on an average of 1991- report year testing for lb MeOH/ODUBT. |
| Pulping | Pulp Prod. | SO2 | Actual ppmV SO2 reading from the vent gas scrubber SO2 CEM & flue gas volume flow rate from previous testing [from constant flow fan] are used to calculate the tons SO2/yr. | Same source for preceding years. |
| Pulping | Pulp Prod. | MeOH | Annual methanol emissions test in lb/ODUBT pulp multiplied by actual ODUBT/yr. | Same for 2002 & 2003. 2000-2001 based on an average of 1991- report year testing for lb MeOH/ODUBT. |
| Pulping | Pulp Prod. | VOC | Sum of all HAPs for which there are test data or emissions factors and are included as VOC under FAC 62.24.200 using actual pulp production or liquor burned values. | Same 2001 – 2003. For 2000, VOC assumed to equal methanol divided by a literature MeOH/VOC ratio. |
| Bleaching | Pulp Prod. | VOC | VOC is assumed to be equal to methanol in the bleach plant. | Same for 2003. No bleaching VOC estimate for 2000-2002. |

| Emissions Source | Fuel Type | Parameter | Source of Annual Operating Report Emissions for 2004 | Any variances from the 2004 source in preceding years. |
|---|---|---|---|---|
| Bleaching | Pulp Prod. | MeOH | 2000 special testing in the bleach plant resulted in a lb MeOH/ODUBT value which is multiplied by the actual annual tonnage. | Same 2001 - 2003. |
| Evaporators | Pulp Prod. | VOC | VOC is assumed to be equal to methanol emissions. | Same for 2003. No evaporators VOC estimate for 1999-2002. |
| Evaporators | Pulp Prod. | MeOH | 1999 test data summary provided a lbMeOH/ODUBT value for the evaporator area. This value is multiplied by the actual pulp production for the year. | Same 2001 – 2003. |
| Waste Water | Pulp Prod. | VOC | Sum of all HAPs for which there are test data or emissions factors for waste water and are included as VOC under FAC 62.24.200 using actual pulp production or waste water flow values. | Same for 2003. No wastewater VOC estimates for 1999-2002. |
| Waste Water | Pulp Prod. | MeOH | Methanol is based on the annual water 9 model results, which accompanies the annual stack testing for methanol. The model calculation provides a lb MeOH/ODUBT for the waste water treatment system. This value is multiplied by the actual pulp production for the year. | Same 2002 & 2003. 2001 used the water 8 model. |

# EMISSION TEST REPORT
# FOR
# SULFITE RECOVERY BOILER
# AND
# A & B SCRUBBERS WITH
# POWER BOILERS 1, 2, & 3
# AT
# RAYONIER
# FERNANDINA BEACH, FLORIDA

**Prepared for:**

**RAYONIER**
**P.O. Box 2002**
**Foot of Gum Street**
**Fernandina Beach, Florida 32034**

**Prepared by:**

**Source Testing And Consulting Services, Inc.**
**1100 Purple Glory Drive**
**Apex, North Carolina 27502**

**June 2005**

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# 1.0 INTRODUCTION

# 1.0 INTRODUCTION

Under contract to Rayonier, Source Testing And Consulting Services, Inc. (STACS) performed a series of emission tests at Rayonier's Fernandina Beach, Florida facility. Emissions testing was performed for the Sulfite Recovery Boiler and for Power Boilers #1, #2, and #3. The purpose of the tests was to demonstrate ongoing compliance with the emissions limits for particulate matter and for visible emissions for the units.

Two venturi-wet scrubbers (A and B) control emissions from the three power boilers. Emissions from Power Boilers #1 and #2 were routed through "A" Scrubber while Power Boiler #3 was routed through "B" Scrubber during the testing. Power Boiler #1 was operated on residual (No. 6 fuel oil) oil and Power Boilers #2 and #3 were operated burning bark supplemented by fuel oil as required to maintain load. Emissions from the Recovery Boiler are controlled through good combustion practices and the use of a Katzan Wet Scrubber/Brinks Demister.

All testing followed the procedures and quality control guidelines given in EPA Method 5 (40 CFR Pt 60, Appendix A). EPA Methods 1 through 4 were used in support of EPA Method 5. EPA Method 9 was used to determine visible emissions.

Sampling was performed on June 9, 2005 for the B-Scrubber, on June 10, 2005 for A-Scrubber and on June 8, 2005 for the Recovery Boiler.

Section 2.0 of this report provides a brief process description and a diagram of the sample point locations. Section 3.0 presents the test results. Section 4.0 outlines the procedures and test methods used and Section 5.0 discusses the quality assurance/quality control measures followed during sampling and analysis. Field data sheets, laboratory data, sample calculations, calibration data, process data, and a list of project participants are included in the Appendices to this report.

# 2.0 PROCESS DESCRIPTION AND SAMPLE POINT LOCATIONS

# 2.0 PROCESS DESCRIPTION AND SAMPLE POINT LOCATIONS

## 2.1 POWER BOILERS 1, 2 & 3 WITH SCRUBBERS A AND B

Particulate matter emissions from Power Boilers 1, 2, and 3 are controlled by one of two venturi type scrubbers with entrained water demisters downstream of the venturi. Power Boilers 2 and 3 are furnace type boilers capable of burning bark or Number 6 fuel oil. During the test series, Power Boilers 2 and 3 were fired with bark supplemented by oil to maintain load as required. Power Boiler 1 is a furnace type boiler that burns only Number 6 fuel oil.

The maximum allowable particulate emission for Power Boiler 3 through "B" Scrubber is 50.6 lb/hr while burning Hog fuel (pine bark and wood refuse), and 16.7 lb/hr when burning oil. Boiler #1 is limited to a maximum of 16.0 lb/hr particulate matter emissions burning oil. Boiler #2 is limited to 50.6 lb/hr of particulate matter on Hog fuel. Therefore, "A" Scrubber with Power Boilers 1 & 2 in operation has a maximum combined limit of 66.6 lb/hr of particulate matter.

The FDEP permit also requires that the units be operated at 90% or greater of full load during emissions testing. Copies of the process operating data collected during testing are included in Appendix D to document load conditions.

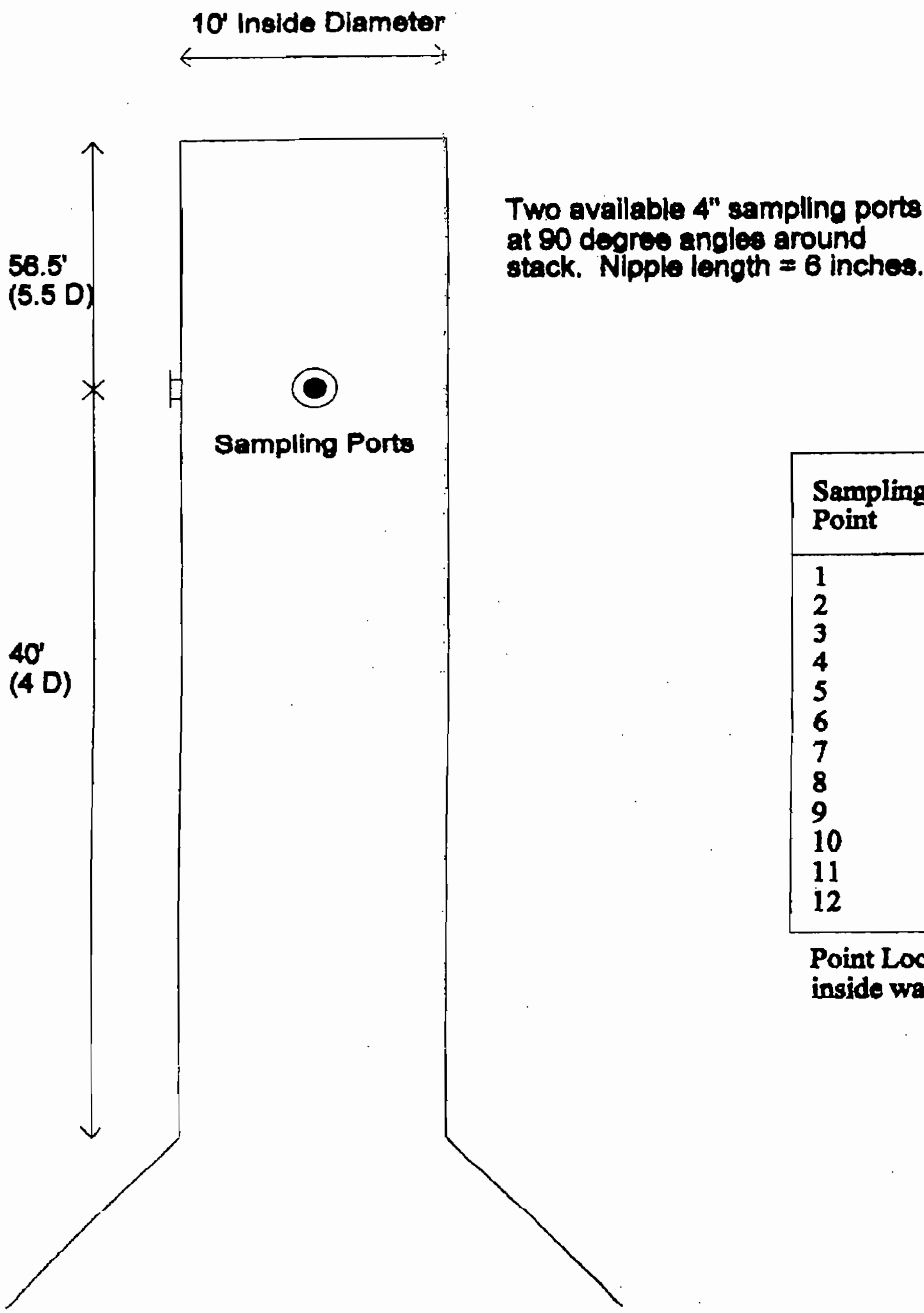
The identical scrubber stacks are 10' in inside diameter and are sampled through two ports 90° apart around the circumference of the stack. The nearest downstream disturbance from the sampling location was the atmospheric exhaust which was located one duct diameter away from the test ports. The nearest upstream disturbance was the top of the scrubber which was four diameters away from the ports. Using this criteria and EPA Method 1 guidelines, 12 sample points per traverse diameter were used, for a total of 24 points. A schematic diagram typical of the stack sampling location is included in Figure 2-1.

## 2.2 SULFITE RECOVERY BOILER

The Sulfite Recovery Boiler produces steam by the combustion of spent sulfite liquor (SSL). Particulate matter emissions from the unit are controlled by venting the effluent gases through a Katzen wet scrubber followed by venting the effluent gases through a series of Brinks mist filters.

The maximum allowable particulate mass emission rate for the sulfite recovery boiler is 67.5 lb/hr. The FDEP permit also requires that the units be operated at 90% or greater of full load during emissions testing. Copies of the process operating data collected during testing are included in Appendix D to document load conditions.

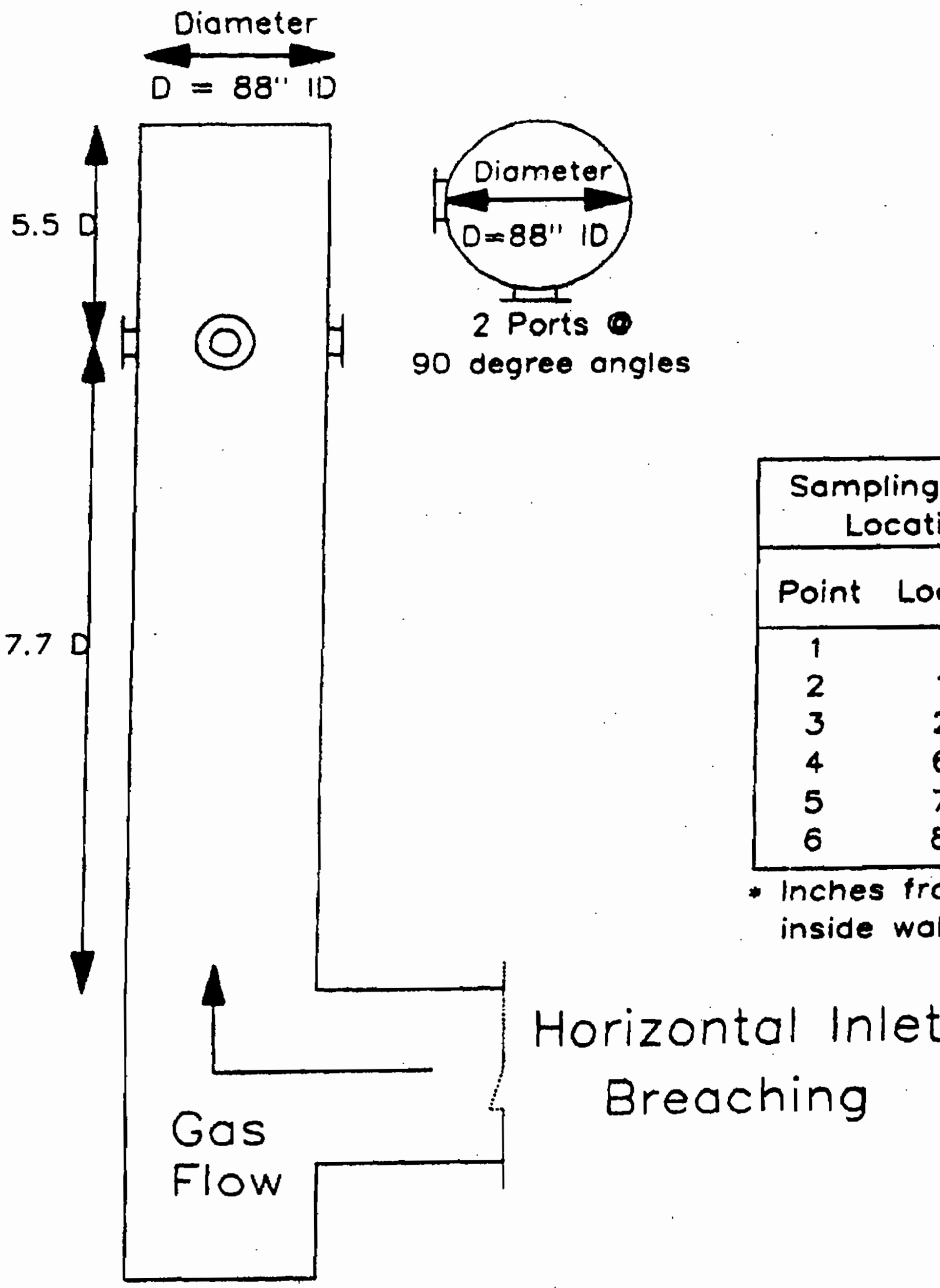
Figure 2-2 presents a schematic diagram of the emissions sampling location. Based on EPA Method 1 criteria, the location requires 12 sampling points (6 on each diameter).




| Sampling Point | Point Location |
|---|---|
| 1 | 2.52 |
| 2 | 8.04 |
| 3 | 14.20 |
| 4 | 21.24 |
| 5 | 30.00 |
| 6 | 42.70 |
| 7 | 77.30 |
| 8 | 90.00 |
| 9 | 98.80 |
| 10 | 105.80 |
| 11 | 111.96 |
| 12 | 117.48 |

Point Locations are inches from inside wall.

Figure 2-1. A & B Scrubber Stack Schematic Diagram




| Sampling Point Location | |
|---|---|
| Point | Location * |
| 1 | 3.87 |
| 2 | 12.85 |
| 3 | 26.00 |
| 4 | 61.95 |
| 5 | 75.15 |
| 6 | 84.13 |

* Inches from inside wall.

**Figure 2-2. Sulfite Recovery Boiler Stack Schematic Diagram**

# 3.0 PARTICULATE TEST RESULTS

# 3.0 PARTICULATE TEST RESULTS

## 3.1 POWER BOILERS 1, 2 & 3 WITH SCRUBBERS A AND B

Emissions testing for the "A" Scrubber was conducted on June 10, 2005. The tests for "B" Scrubber were conducted on June 9, 2005. The results of the EPA Method 5 particulate matter tests are given in Table 3-1 for the "A" Scrubber stack and in Table 3-2 for the "B" Scrubber stack. The highest observed six-minute average opacity for the two units are also included in the tables.

The average particulate mass emission rate from the "A" Scrubber stack with Power Boiler #1 burning residual fuel oil and Power Boiler #2 burning bark was 26.38 lb/hr during the tests with a range of 22.59 lb/hr to 31.51 lb/hr. The combined emission limit for the two units is 66.6 b/hr (50.6 lb/hr for Unit #2 and 16 lb/hr for Unit #1). The average particulate matter concentration in the gas stream for the "A "stack during the tests was .0300 grains per dry standard cubic foot (gr/dscf).

Particulate matter emissions from the "B" Scrubber stack with Power Boiler #3 burning bark averaged 26.92 lb/hr and varied from 22.18 lb/hr to 31.03 lb/hr. The emission limit for Power Boiler #3 is 50.6 lb/hr. The average particulate matter concentration was .0344 gr/dscf.

## 3.2 SULFITE RECOVERY BOILER

Emissions testing for the Sulfite Recovery Boiler was conducted on June 8, 2005. The results of the EPA Method 5 particulate matter tests for the Sulfite Recovery Boiler are given in Table 3-3. The highest observed six-minute average opacity for the unit is also included in the table.

The average particulate mass emission rate from the recovery boiler during the tests was 21.86 lb/hr with a range of 12.37 lb/hr to 28.72 lb/hr. The average particulate matter concentration in the gas stream for the recovery boiler during the tests was 38.93 milligrams per dry standard cubic meter (mg/dscm) corrected to 8% oxygen.

Field data sheets for all sampling are included in Appendix B. Sample calculations and run summaries are given in Appendix A. Calibration and Quality Assurance data are given in Appendix C.

Table 3-1. **Summary of Emissions Testing Data - Total Solid Particulate Matter - Scrubber A**
**Rayonier**
**Scrubber A**

| **Parameter** | **Units** | | | | | |
|---|---|---|---|---|---|---|
| | | Run # | 1-A | 2-A | 3-A | AVERAGE |
| | | Date: | 10-Jun-05 | 10-Jun-05 | 10-Jun-05 | |
| | | Start Time: | 9:50 | 12:35 | 15:08 | |
| | | Stop Time: | 11:23 | 13:37 | 16:09 | |
| **Sampling Train & Analytical Parameters:** | | | | | | |
| Total Solid Particulate Matter: | g | | 0.0942 | 0.0775 | 0.0658 | 0.0792 |
| Metered Volume: | dscf | | 41.894 | 41.145 | 38.765 | 40.601 |
| Gas Stream Volumetric Flowrate: | dscfm | | 105956.0 | 100442.3 | 100608.9 | 102335.8 |
| Oxygen: | %V, dry | | 10.8 | 11.7 | 12.1 | 11.5 |
| Carbon Dioxide: | %V, dry | | 9.8 | 9.2 | 8.2 | 9.1 |
| **Total Solid Particulate (TSP) Matter Emissions:** | | | | | | |
| TSP Concentration: | gr/dscf | | 0.03470 | 0.02907 | 0.02620 | 0.02999 |
| TSP Mass Emission Rate: | lb/hr | | 31.514 | 25.026 | 22.590 | 26.377 |
| TSP Mass Emission Rate: | mg/dscm | | 79.40 | 66.51 | 59.94 | 68.61 |
| TSP Mass Emission Rate @8% O2: | mg/dscm | | 101.41 | 93.26 | 87.86 | 94.18 |
| Visible Emissions - Six Minute Average | | | | | | 9.6 |

**Table 3-2.** **Summary of Emissions Testing Data - Total Solid Particulate Matter - Scrubber B**
**Rayonier**
**Scrubber B**

| **Parameter** | **Units** | | 1-B | 2-B | 3-B | AVERAGE |
|---|---|---|---|---|---|---|
| | | Run # | 1-B | 2-B | 3-B | AVERAGE |
| | | Date: | 9-Jun-05 | 9-Jun-05 | 9-Jun-05 | |
| | | Start Time: | 11:08 | 13:00 | 14:51 | |
| | | Stop Time: | 12:14 | 14:02 | 15:52 | |
| **Sampling Train & Analytical Parameters:** | | | | | | |
| Total Solid Particulate Matter: | g | | 0.0802 | 0.0635 | 0.0924 | 0.0787 |
| Metered Volume: | dscf | | 35.619 | 35.120 | 35.042 | 35.260 |
| Gas Stream Volumetric Flowrate: | dscfm | | 92473.8 | 92719.3 | 88975.4 | 91389.5 |
| Oxygen: | %V, dry | | 11.2 | 11.5 | 11.5 | 11.4 |
| Carbon Dioxide: | %V, dry | | 8.6 | 8.6 | 8.0 | 8.4 |
| **Total Solid Particulate (TSP) Matter Emissions:** | | | | | | |
| TSP Concentration: | gr/dscf | | 0.03475 | 0.02790 | 0.04069 | 0.03445 |
| TSP Mass Emission Rate: | lb/hr | | 27.542 | 22.176 | 31.034 | 26.917 |
| TSP Mass Emission Rate: | mg/dscm | | 79.5054 | 63.8455 | 93.1086 | 78.8199 |
| TSP Mass Emission Rate @8% O2: | mg/dscm | | 105.7340 | 87.6178 | 127.7767 | 107.0428 |
| Visible Emissions - Six Minute Average | | | | | | 7.7 |

**Table 3-3.** **Summary of Emissions Testing Data - Total Solid Particulate Matter - Sulfite Recovery Boiler**
**Rayonier**
**Sulfite Recovery Boiler**

| **Parameter** | **Units** | | | | | |
|---|---|---|---|---|---|---|
| | | Run # | 1 | 2 | 3 | AVERAGE |
| | | Date: | 8-Jun-05 | 8-Jun-05 | 8-Jun-05 | |
| | | Start Time: | 9:00 | 11:05 | 12:48 | |
| | | Stop Time: | 10:05 | 12:08 | 13:50 | |
| **Sampling Train & Analytical Parameters:** | | | | | | |
| Total Solid Particulate Matter: | g | | 0.0438 | 0.1016 | 0.0881 | 0.0778 |
| Metered Volume: | dscf | | 52.249 | 55.648 | 56.999 | 54.965 |
| Gas Stream Volumetric Flowrate: | dscfm | | 111539.3 | 118935.2 | 119743.1 | 116739.2 |
| Oxygen: | %V, dry | | 4.5 | 4.1 | 4.9 | 4.5 |
| Carbon Dioxide: | %V, dry | | 14.5 | 14.8 | 14.2 | 14.5 |
| **Total Solid Particulate (TSP) Matter Emissions:** | | | | | | |
| TSP Concentration: | gr/dscf | | 0.01294 | 0.02818 | 0.02385 | 0.02166 |
| TSP Mass Emission Rate: | lb/hr | | 12.368 | 28.724 | 24.482 | 21.858 |
| TSP Mass Emission Rate: | mg/dscm | | 29.60 | 64.47 | 54.58 | 49.55 |
| TSP Mass Emission Rate @8% O2: | mg/dscm | | 23.28 | 49.50 | 44.00 | 38.93 |
| Visible Emissions - Highest Six Minute Average | | | | | | 19.6 |

# 4.0 FIELD AND ANALYTICAL PROCEDURES

# 4.0 FIELD AND ANALYTICAL PROCEDURES

## 4.1 EPA METHOD 5 - PARTICULATE SAMPLING AND ANALYSIS

The sampling and analytical procedures used follow the procedures as outlined in EPA Method 5, in the Code of Federal Regulations, Chapter I, Title 40, Part 60, Appendix A, Method 5, revised as of July 1, 1991. The sampling equipment consisted of the following:

1. Sample Probe Assembly
   a. Nozzle--Stainless steel with a sharp, tapered leading edge.
   b. Probe--Stainless steel (S.S.) sheath with a 2-inch diameter glass insert wrapped with nichrome wire; rheostat controlled and capable of maintaining a temperature of 248 +/-25 degrees Fahrenheit ($^oF$).
   c. Pitot--Type "S" constructed and attached to probe according to specifications outlined in the Code of Federal Regulations, Chapter I, Title 40, Part 60, Appendix A, Method 2.
   d. Orsat Probe--Stainless steel 1/4 inch tubing attached to pitot tube in an interference-free arrangement.
   e. Thermocouple--Type "K" attached to the pitot tube such that the tip has no contact with metal and does not interfere with the pitot tube face openings.
2. Filter Holder--Glass with fritted glass filter support.
3. Filter Heating Assembly--Controlled heating element in aluminum module attached to end of probe; capable of maintaining 248 +/-25$^oF$.
4. Impingers--Four impingers connected in series with glass ball/socket joint fittings and placed in an ice bath. A Greenburg-Smith impinger standard

tip configuration is used for the second impinger. The first, third, and fourth impingers are the modified Greenburg-Smith design with a 0.5 in. ID glass tube extending to about 0.5 in. from the bottom of the flask. Final gas exit temperature is measured to within +/-2°F with a type "K" thermocouple immersed in the gas stream.

5. Control Box--Model containing vacuum gauge, external leak-free pump, thermocouples capable of measuring temperature to within +/-2°F, dry gas meter with a minimum of 2 percent accuracy, valves and related equipment as required to maintain an isokinetic sampling rate, and to determine sample volume.

Prior to leaving the laboratory, glass fiber filters were numbered for identification, heated for 2 hours at 105 degrees C, desiccated for 2 hours, and pre-weighed to the nearest 0.1 mg. Silica gel (indicating type, 6-16 Mesh) was also pre-weighed to 200 grams after oven drying for 24 hours.

Upon arrival at the sampling site, the control box was leak-checked from pump to orifice at 5 to 7 inches of water.

The sample train was prepared in the following manner: 100 mL of $H_20$ was added to the first and second impingers. The third impinger was left empty, and a pre-weighed quantity of silica gel was added to the fourth impinger for final moisture removal. After assembling the train with the pitot tube as shown in the schematic (Figure 4-1), the system was leak-checked by plugging the inlet to the probe nozzle and pulling a vacuum of at least 15 inches of mercury (Hg). A leakage rate not in excess of 0.02 cfm is considered acceptable. The pitot tube system was also leak-checked at 2 to 3 inches of water, and any leaks found were corrected.

The inside dimensions of each stack were measured and recorded. The number of sampling points and the location of these points on a traverse were determined by the guidelines set forth in the Code of Federal Regulations, Chapter I, Title 40, Part 60, Appendix A, Method 1. These points were then marked on the probe for easy visibility.

A preliminary traverse was conducted to determine the range of velocity head and the pressure of the stack. An approximate stack temperature was obtained during the same traverse, and an approximate moisture content was estimated based on knowledge of the emission source type and attendant characteristics and prior testing experience. From these data, the correct nozzle size and isokinetic K- factor were determined.

The probe was attached and the heater was adjusted to provide a gas temperature of approximately 250°F. The filter heating system was turned on, and crushed ice was placed around the impingers. After a suitable warm-up period, the nozzle was placed at the first traverse point with the tip pointing directly into the gas stream. The pump was started and the sampling rate was adjusted to isokinetic conditions. After the required time interval had elapsed, the probe was repositioned to the next traverse point, and isokinetic sampling was re-established. This was done for each point on the traverse until the run was completed. Readings were taken at least every 5 minutes or when significant changes in stack conditions necessitated additional adjustments in flow rate. At the conclusion of each run, the pump was turned off and the final readings were recorded. A final leak-check of the system was performed as previously described at the highest vacuum encountered during testing, and a leak-check of the pitot system was repeated.

### 4.1.1 SAMPLE RECOVERY

The collection train was carefully moved to a convenient sample recovery area in order to minimize the loss of collected sample or the gain of extraneous particulate matter. The volume of condensate in the first three impingers was measured and recorded on the field data sheet. The probe, nozzle, and all sample-exposed surfaces were rinsed with reagent grade acetone and put into a clean sample bottle marked "pre-filter". A brush was used to loosen any adhering particulate matter, and subsequent rinses were put into the "pre-filter" container. The filter was carefully removed from the fritted glass support and placed in its original container. The silica gel was removed from the fourth impinger and transferred to its original container. A sample of the acetone used in washing the probe was saved for a blank laboratory analysis.

### 4.1.2 ANALYTICAL PROCEDURES

The filter and any loose particulate matter were transferred from the sample container to a clean, tared glass weighing dish. The filter was placed in an oven at 105EC for 2 hours, desiccated for 2 hours, and then weighed. The original weight of the filter was deducted, and the weight gain was recorded to the nearest 0.1 mg.

The "pre-filter" and blank solutions were transferred to clean, tared beakers, then evaporated to dryness and desiccated to a constant weight. The blank correction was made, and the weight gain was recorded to the nearest 0.1 mg. The silica gel was weighed, and the weight gain was recorded to the nearest 0.1 gram.

## 4.2 EPA METHOD 3--ORSAT SAMPLING AND ANALYSIS

Carbon dioxide ($CO_2$) and oxygen ($O_2$) samples were collected by an integrated bag system. The Orsat sampling system consisted of a stainless steel probe, sample line from probe to a condenser, a small vacuum pump with a rotameter, and a Tedlar bag.

The Orsat sampling procedure consists of the following leak-check and sampling techniques. Prior to sampling, the bag was leak-checked at 2 to 4 inches of water. The inlet to the condenser was plugged, and a vacuum of 10 inches of Hg was pulled. The outlet of the pump was then plugged and the pump shut off. The vacuum held steady for at least 30 seconds. The sample line was then purged with stack gas and the bag was connected. Sampling was conducted at the appropriate points and for the same length of time as the pollutant sampling. At the conclusion of the run, the pump was shut off and the bag secured.

After leak-checking the Orsat gas analyzer, an average value for each gas was determined. The gas was measured until three values were obtained that fell within the specified variance of the gas tested. Data were recorded on the field data sheet, and the bag was evacuated for the next sample run.

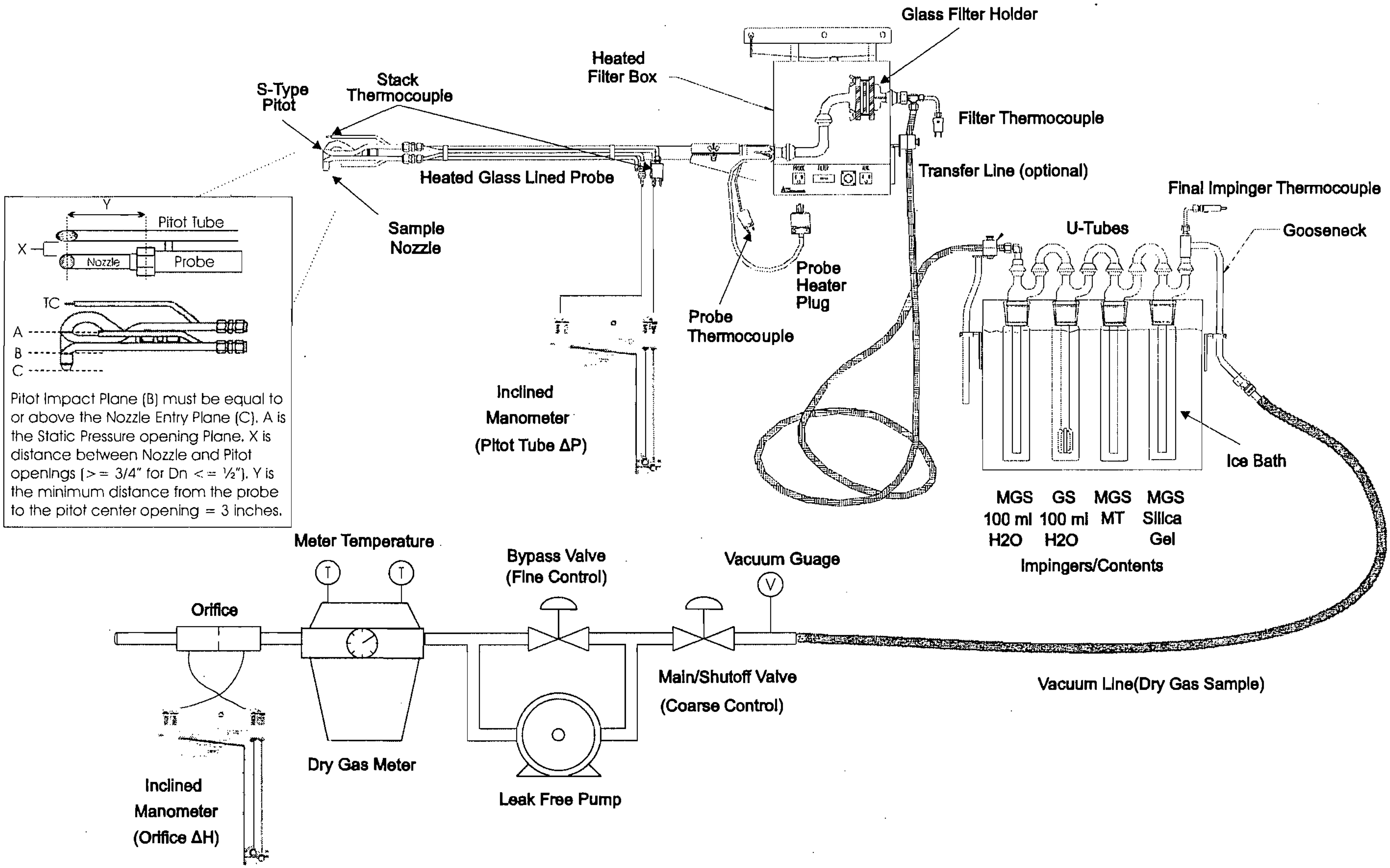



Figure 4-1. Schematic Diagram of EPA Method 5 Sampling Train

# 5.0 QUALITY ASSURANCE/QUALITY CONTROL

## 5.0 QUALITY ASSURANCE/QUALITY CONTROL

Strict Quality Assurance/Quality Control (QA/QC) measures were observed for all sampling and analysis performed for the Rayonier test program. The STACS QA/QC program is designed to provide the highest quality data in terms of the accuracy and precision of the measurements as well as the representativeness and comparability of the results.

The STACS QA/QC program for this test series includes all of the QA/QC guidelines given in EPA Methods 1-5 (40 CFR Pt 60, Appendix A) in addition to internal QA/QC standards. Primary components of the QA/QC program are listed below:

- Equipment Calibrations - including meter boxes, thermocouples, pitot tubes and analytical balance
- Equipment Leak Checks - including pre- and post-test sample train leak checks, meter and pump leak checks, pitot leak checks and ORSAT system leak checks
- Careful monitoring and documentation of sample train critical parameters including temperatures and meter pressure.
- Preliminary measurements to aid in calculating the sampling K-factor used to determine isokinetic sampling rate.
- Maintaining an isokinetic sampling rate so that the velocity through the sampling nozzle matches the surrounding flue gas stream velocity to within +/- 10%

All sampling train leak rates were less than the maximum acceptable leak rate of 0.02 cubic feet per minute. Sample train leak checks were performed at a vacuum of at least 5" Hg greater than the highest observed vacuum observed during sampling. All sample trains met the +/- 10% criterion for isokinetic sampling. All samples were desiccated and replicate analyses were performed until agreement of 0.5 mg between weighings that were six hours apart.

# APPENDIX A

## EMISSION DATA & SAMPLE CALCULATIONS

SUMMARY OF EMISSIONS SAMPLING DATA

| Plant: Rayonier   Location: Scrubber A | | Run # | 1-A | 2-A | 3-A | AVERAGE |
|---|---|---|---|---|---|---|
| Condition: Normal | | Date: | 10-Jun-05 | 10-Jun-05 | 10-Jun-05 | |
| Unit: Scrubber A   Method: Method 5 | | Start Time: | 9:50 | 12:35 | 15:08 | |
| Parameter | Units | Stop Time: | 11:23 | 13:37 | 16:09 | |
| *Sampling Time* | *min.* | | 60 | 60 | 60 | 60 |
| **AMBIENT DATA:** | | | | | | |
| Ambient Temperature | deg. F | | 77 | 83 | 80 | 80.00 |
| Location Height above Pbar reading | feet | | 0 | 0 | 0 | 0 |
| Barometric Pressure | in. Hg | | 29.85 | 29.80 | 29.80 | 29.82 |
| Corrected Barometric Pressure (to location) | in. Hg | | 29.85 | 29.80 | 29.80 | 29.82 |
| **GAS METER DATA:** | | | | | | |
| Dry Gas Meter Correction Factor (gamma) | Dimensionless | | 1.0153 | 1.0153 | 1.0153 | 1.0153 |
| Average Meter Differential Pressure | in. H2O | | 1.5900 | 1.4700 | 1.4175 | 1.4925 |
| Absolute Meter Pressure | in. Hg | | 29.97 | 29.91 | 29.90 | 29.93 |
| Average Meter Temperature | degrees F | | 85.4 | 87.0 | 85.1 | 85.9 |
| Metered Dry Sample Gas Volume | dcf | | 42.559 | 42.000 | 39.440 | 41.333 |
| Average Sampling Rate | dscfm | | 0.698 | 0.686 | 0.646 | 0.677 |
| Standard Metered Volume | dscf | | 41.894 | 41.145 | 38.765 | 40.601 |
| Standard Metered Volume | dscm | | 1.1864 | 1.1652 | 1.0978 | 1.1498 |
| **MOISTURE DATA:** | | | | | | |
| Moisture Determination Technique: | | | Gravimetric | Gravimetric | Gravimetric | |
| Relative Humidity:. | %RH | | #N/A | #N/A | #N/A | #N/A |
| Saturated Vapor Pressure of Water: | inches Hg | | 5.5253 | 5.8435 | 5.4304 | 5.5997 |
| Vapor Phase Moisture Content at Saturation: | % Volume | | 18.52 | 19.62 | 18.23 | 18.79 |
| Total Condensate Collected | grams H20 | | 220 | 251 | 222.6 | 231.20 |
| Standard Volume of Water Vapor | scf | | 10.373 | 11.835 | 10.496 | 10.901 |
| Measured Moisture Content | mole fraction | | 0.1985 | 0.2234 | 0.2131 | 0.2116 |
| Measured Moisture Content | % Volume | | 19.85 | 22.34 | 21.31 | 21.16 |
| Gas Stream Vapor Phase Moisture (Bs): | % Volume | | 18.52 | 19.62 | 18.23 | 18.79 |
| **FIXED GAS DATA:** | | | | | | |
| Oxygen Concentration, Dry Basis | % Volume | | 10.8 | 11.7 | 12.1 | 11.5 |
| Carbon Dioxide Concentration, Dry Basis | % Volume | | 9.8 | 9.2 | 8.2 | 9.1 |
| Carbon Monoxide Concentration, Dry Basis | % Volume | | 0.0 | 0.0 | 0.0 | 0.0 |
| Other Primary Gas Constituent, Dry Basis | % Volume | | #N/A | #N/A | #N/A | #N/A |
| Nitrogen Concentration, Dry Basis (gas balance) | % Volume | | 79.4 | 79.1 | 79.7 | 79.4 |
| Gas Molecular Weight, Dry Basis | lb/lb-mole | | 30.000 | 29.940 | 29.796 | 29.912 |
| Gas Molecular Weight, Wet Basis | lb/lb-mole | | 27.778 | 27.598 | 27.646 | 27.674 |
| Fo Calculated: | Dimensionless | | 1.031 | 1.000 | 1.073 | 1.035 |
| Excess Air: | % | | 106.12 | 127.20 | 135.09 | 122.80 |
| Ultimate CO2 | %V,d | | 20.28 | 20.90 | 19.48 | 20.22 |
| **DUCT CONFIGURATION:** | | | | | | |
| Duct Geometry (C = Circular, R = Rectangular) | | | C | C | C | |
| Duct Dimensions (Diameter) | inches | | 120 | 120 | 120 | 120 |
| Effective Duct Diameter (De) | inches | | 120 | 120 | 120 | 120 |
| Stack Cross-Sectional Area | ft2 | | 78.54 | 78.54 | 78.54 | 78.54 |
| **DUCT GAS CONDITIONS:** | | | | | | |
| Static Pressure of Gas Stream | in. H2O | | -0.150 | -0.140 | -0.130 | -0.140 |
| Absolute Duct Gas Pressure | in. Hg | | 29.839 | 29.790 | 29.790 | 29.806 |
| Gas Stream Temperature | degrees F | | 137.58 | 139.75 | 136.92 | 138.08 |
| Gas Stream Wet Bulb Temperature: | degrees F | | 0 | 0 | 0 | 0 |
| **VELOCITY DATA:** | | | | | | |
| Pitot Tube Coefficient | Dimensionless | | 0.84 | 0.84 | 0.84 | 0.84 |
| Avg. Square Root of Velocity Head | (in. H2O)^0.5 | | 0.5136 | 0.4932 | 0.4849 | 0.4972 |
| Gas Stream Velocity | ft/sec | | 31.316 | 30.251 | 29.645 | 30.404 |
| Gas Stream Velocity | ft/min | | 1878.93 | 1815.05 | 1778.73 | 1824.24 |
| Gas Stream Velocity | meters/min | | 572.70 | 553.23 | 542.16 | 556.03 |
| Gas Stream Velocity | mi/hr | | 21.353 | 20.627 | 20.214 | 20.731 |
| **FLOWRATE/ENGLISH UNITS** | | | | | | |
| Actual Volumetric Flow Rate, Wet Basis | acfm | | 147570.8 | 142553.6 | 139700.8 | 143275.1 |
| Standard Volumetric Flow Rate, Wet Basis | scfm | | 130034.4 | 124953.0 | 123036.7 | 126008.0 |
| Standard Volumetric Flow Rate, Dry Basis | dscfm | | 105956.0 | 100442.3 | 100608.9 | 102335.8 |
| Standard Volumetric Flow Rate, Wet Basis | kscfh | | 7802.06 | 7497.18 | 7382.20 | 7560.48 |
| Standard Volumetric Flow Rate, Dry Basis | kdscfh | | 6357.36 | 6026.54 | 6036.53 | 6140.15 |
| Total Mass Flow Rate (wet) | kpph | | 562.49 | 537.00 | 529.68 | 543.06 |
| **FLOWRATE/METRIC UNITS** | | | | | | |
| Actual Volumetric Flow Rate, Wet Basis | acmm | | 4179.21 | 4037.12 | 3956.33 | 4057.55 |
| Standard Volumetric Flow Rate, Wet Basis | scmm | | 3682.57 | 3538.67 | 3484.40 | 3568.55 |
| Standard Volumetric Flow Rate, Dry Basis | dscmm | | 3000.67 | 2844.53 | 2849.24 | 2898.15 |
| **ISOKINETIC SAMPLING DATA:** | | | | | | |
| Nozzle Diameter: | inches | | 0.306 | 0.306 | 0.306 | 0.306 |
| Area of Nozzle: | ft^2 | | 5.107E-04 | 5.107E-04 | 5.107E-04 | 5.107E-04 |
| Isokinetic Sampling Rate: | %I | | 101.4 | 105.1 | 98.8 | 101.8 |
| **PARTICULATE MATTER:** | | | | | | |
| Particulate Matter Collected: | grams | | 0.0942 | 0.0775 | 0.0658 | 0.0792 |
| Particulate Matter Concentration: | grams/dscm | | 0.07940 | 0.06651 | 0.05994 | 0.06861 |
| Particulate Matter Mass Emission Rate: | grams/sec | | 3.971 | 3.153 | 2.846 | 3.323 |
| Particulate Matter Concentration: | lb/dscf | | 4.96E-06 | 4.15E-06 | 3.74E-06 | 4.28E-06 |
| Particulate Matter Concentration: | grains/dscf | | 0.03470 | 0.02907 | 0.02620 | 0.02999 |
| Particulate Matter Mass Emission Rate: | lb/hr | | 31.514 | 25.026 | 22.590 | 26.377 |

SUMMARY OF EMISSIONS SAMPLING DATA

| | | | | | | |
|---|---|---|---|---|---|---|
| **Plant:** Rayonier **Location:** Scrubber B | | Run # | 1-B | 2-B | 3-B | AVERAGE |
| **Condition:** Normal | | Date: | 9-Jun-05 | 9-Jun-05 | 9-Jun-05 | |
| **Unit:** Scrubber B **Method:** Method 5 | | Start Time: | 11:08 | 13:00 | 14:51 | |
| **Parameter** | **Units** | Stop Time: | 12:14 | 14:02 | 15:52 | |
| Sampling Time | min. | | 60 | 60 | 60 | 60 |
| **AMBIENT DATA:** | | | | | | |
| Ambient Temperature | deg. F | | 85 | 90 | 85 | 86.67 |
| Location Height above Pbar reading | feet | | 0 | 0 | 0 | 0 |
| Barometric Pressure | in. Hg | | 29.80 | 29.80 | 29.80 | 29.80 |
| Corrected Barometric Pressure (to location) | in. Hg | | 29.80 | 29.80 | 29.80 | 29.80 |
| **GAS METER DATA:** | | | | | | |
| Dry Gas Meter Correction Factor (gamma) | Dimensionless | | 0.9872 | 0.9872 | 0.9872 | 0.9872 |
| Average Meter Differential Pressure | in. H2O | | 1.2100 | 1.1625 | 1.1350 | 1.1692 |
| Absolute Meter Pressure | in. Hg | | 29.89 | 29.89 | 29.88 | 29.89 |
| Average Meter Temperature | degrees F | | 88.5 | 86.5 | 84.8 | 86.6 |
| Metered Dry Sample Gas Volume | dcf | | 37.518 | 36.864 | 36.670 | 37.017 |
| Average Sampling Rate | dscfm | | 0.594 | 0.585 | 0.584 | 0.588 |
| Standard Metered Volume | dscf | | 35.619 | 35.120 | 35.042 | 35.260 |
| Standard Metered Volume | dscm | | 1.0087 | 0.9946 | 0.9924 | 0.9986 |
| **MOISTURE DATA:** | | | | | | |
| Moisture Determination Technique: | | | Gravimetric | Gravimetric | Gravimetric | |
| Relative Humidity: | %RH | | #N/A | #N/A | #N/A | #N/A |
| Saturated Vapor Pressure of Water: | inches Hg | | 5.4776 | 4.9546 | 5.7193 | 5.3839 |
| Vapor Phase Moisture Content at Saturation: | % Volume | | 18.39 | 16.63 | 19.20 | 18.07 |
| Total Condensate Collected | grams H20 | | 217 | 181.7 | 212.1 | 203.60 |
| Standard Volume of Water Vapor | scf | | 10.232 | 8.567 | 10.001 | 9.600 |
| Measured Moisture Content | mole fraction | | 0.2231 | 0.1961 | 0.2220 | 0.2138 |
| Measured Moisture Content | % Volume | | 22.31 | 19.61 | 22.20 | 21.38 |
| Gas Stream Vapor Phase Moisture (Bs): | % Volume | | 18.39 | 16.63 | 19.20 | 18.07 |
| **FIXED GAS DATA:** | | | | | | |
| Oxygen Concentration, Dry Basis | % Volume | | 11.2 | 11.5 | 11.5 | 11.4 |
| Carbon Dioxide Concentration, Dry Basis | % Volume | | 8.6 | 8.6 | 8.0 | 8.4 |
| Carbon Monoxide Concentration, Dry Basis | % Volume | | 0.0 | 0.0 | 0.0 | 0.0 |
| Other Primary Gas Constituent, Dry Basis | % Volume | | #N/A | #N/A | #N/A | #N/A |
| Nitrogen Concentration, Dry Basis (gas balance) | % Volume | | 80.2 | 79.9 | 80.5 | 80.2 |
| Gas Molecular Weight, Dry Basis | lb/lb-mole | | 29.824 | 29.836 | 29.740 | 29.800 |
| Gas Molecular Weight, Wet Basis | lb/lb-mole | | 27.650 | 27.868 | 27.486 | 27.668 |
| Fo Calculated: | Dimensionless | | 1.128 | 1.093 | 1.175 | 1.132 |
| Excess Air: | % | | 112.13 | 119.67 | 117.73 | 116.51 |
| Ultimate CO2 | %V,d | | 18.53 | 19.12 | 17.79 | 18.48 |
| **DUCT CONFIGURATION:** | | | | | | |
| Duct Geometry (C = Circular, R = Rectangular) | | | C | C | C | |
| Duct Dimensions (Diameter) | inches | | 120 | 120 | 120 | 120 |
| Effective Duct Diameter (De) | inches | | 120 | 120 | 120 | 120 |
| Stack Cross-Sectional Area | ft2 | | 78.54 | 78.54 | 78.54 | 78.54 |
| **DUCT GAS CONDITIONS:** | | | | | | |
| Static Pressure of Gas Stream | in. H2O | | -0.100 | -0.120 | -0.100 | -0.107 |
| Absolute Duct Gas Pressure | in. Hg | | 29.793 | 29.791 | 29.793 | 29.792 |
| Gas Stream Temperature | degrees F | | 137.25 | 133.42 | 138.92 | 136.53 |
| Gas Stream Wet Bulb Temperature: | degrees F | | 0 | 0 | 0 | 0 |
| **VELOCITY DATA:** | | | | | | |
| Pitot Tube Coefficient | Dimensionless | | 0.84 | 0.84 | 0.84 | 0.84 |
| Avg. Square Root of Velocity Head | (in. H2O)^0.5 | | 0.4467 | 0.4388 | 0.4334 | 0.4396 |
| Gas Stream Velocity | ft/sec | | 27.314 | 26.639 | 26.619 | 26.857 |
| Gas Stream Velocity | ft/min | | 1638.85 | 1598.37 | 1597.12 | 1611.44 |
| Gas Stream Velocity | meters/min | | 499.52 | 487.18 | 486.80 | 491.17 |
| Gas Stream Velocity | mi/hr | | 18.624 | 18.164 | 18.150 | 18.313 |
| **FLOWRATE/ENGLISH UNITS** | | | | | | |
| Actual Volumetric Flow Rate, Wet Basis | acfm | | 128714.6 | 125535.4 | 125437.6 | 126562.5 |
| Standard Volumetric Flow Rate, Wet Basis | scfm | | 113306.1 | 111215.8 | 110114.0 | 111545.3 |
| Standard Volumetric Flow Rate, Dry Basis | dscfm | | 92473.8 | 92719.3 | 88975.4 | 91389.5 |
| Standard Volumetric Flow Rate, Wet Basis | kscfh | | 6798.36 | 6672.95 | 6606.84 | 6692.72 |
| Standard Volumetric Flow Rate, Dry Basis | kdscfh | | 5548.43 | 5563.16 | 5338.52 | 5483.37 |
| Total Mass Flow Rate (wet) | kpph | | 487.87 | 482.63 | 471.31 | 480.60 |
| **FLOWRATE/METRIC UNITS** | | | | | | |
| Actual Volumetric Flow Rate, Wet Basis | acmm | | 3645.20 | 3555.16 | 3552.39 | 3584.25 |
| Standard Volumetric Flow Rate, Wet Basis | scmm | | 3208.83 | 3149.63 | 3118.43 | 3158.96 |
| Standard Volumetric Flow Rate, Dry Basis | dscmm | | 2618.86 | 2625.81 | 2519.78 | 2588.15 |
| **ISOKINETIC SAMPLING DATA:** | | | | | | |
| Nozzle Diameter: | inches | | 0.306 | 0.306 | 0.306 | 0.306 |
| Area of Nozzle: | ft^2 | | 5.107E-04 | 5.107E-04 | 5.107E-04 | 5.107E-04 |
| Isokinetic Sampling Rate: | %I | | 98.8 | 97.1 | 101.0 | 99.0 |
| **PARTICULATE MATTER:** | | | | | | |
| Particulate Matter Collected: | grams | | 0.0802 | 0.0635 | 0.0924 | 0.0787 |
| Particulate Matter Concentration: | grams/dscm | | 0.07951 | 0.06385 | 0.09311 | 0.07882 |
| Particulate Matter Mass Emission Rate: | grams/sec | | 3.470 | 2.794 | 3.910 | 3.392 |
| Particulate Matter Concentration: | lb/dscf | | 4.96E-06 | 3.99E-06 | 5.81E-06 | 4.92E-06 |
| Particulate Matter Concentration: | grains/dscf | | 0.03475 | 0.02790 | 0.04069 | 0.03445 |
| Particulate Matter Mass Emission Rate: | lb/hr | | 27.542 | 22.176 | 31.034 | 26.917 |

## SUMMARY OF EMISSIONS SAMPLING DATA

| | | | | | | |
|---|---|---|---|---|---|---|
| **Plant:** Rayonier **Location:** Sulfite Recovery Boiler | | Run # | 1 | 2 | 3 | AVERAGE |
| **Condition:** Normal | | Date: | 8-Jun-05 | 8-Jun-05 | 8-Jun-05 | |
| **Unit:** Sulfite Recovery Boilei **Method:** Method 5 | | Start Time: | 9:00 | 11:05 | 12:48 | |
| **Parameter** | **Units** | Stop Time: | 10:05 | 12:08 | 13:50 | |
| Sampling Time | min. | | 60 | 60 | 60 | 60 |
| **AMBIENT DATA:** | | | | | | |
| Ambient Temperature | deg. F | | 79 | 84 | 83 | 82.00 |
| Location Height above Pbar reading | feet | | 0 | 0 | 0 | 0 |
| Barometric Pressure | in. Hg | | 29.65 | 29.65 | 29.65 | 29.65 |
| Corrected Barometric Pressure (to location) | in. Hg | | 29.65 | 29.65 | 29.65 | 29.65 |
| **GAS METER DATA:** | | | | | | |
| Dry Gas Meter Correction Factor (gamma) | Dimensionless | | 0.9872 | 0.9872 | 0.9872 | 0.9872 |
| Average Meter Differential Pressure | in. H2O | | 2.7173 | 3.0427 | 3.1093 | 2.9564 |
| Absolute Meter Pressure | in. Hg | | 29.85 | 29.87 | 29.88 | 29.87 |
| Average Meter Temperature | degrees F | | 83.0 | 84.8 | 84.5 | 84.1 |
| Metered Dry Sample Gas Volume | dcf | | 54.558 | 58.257 | 59.625 | 57.480 |
| Average Sampling Rate | dscfm | | 0.871 | 0.927 | 0.950 | 0.916 |
| Standard Metered Volume | dscf | | 52.249 | 55.648 | 56.999 | 54.965 |
| Standard Metered Volume | dscm | | 1.4797 | 1.5760 | 1.6142 | 1.5566 |
| **MOISTURE DATA:** | | | | | | |
| Moisture Determination Technique: | | | Gravimetric | Gravimetric | Gravimetric | |
| Relative Humidity: | %RH | | #N/A | #N/A | #N/A | #N/A |
| Saturated Vapor Pressure of Water: | inches Hg | | 2.8493 | 2.9109 | 2.9316 | 2.8973 |
| Vapor Phase Moisture Content at Saturation: | % Volume | | 9.62 | 9.83 | 9.90 | 9.78 |
| Total Condensate Collected | grams H20 | | 138.1 | 121.3 | 133.7 | 131.03 |
| Standard Volume of Water Vapor | scf | | 6.511 | 5.719 | 6.304 | 6.178 |
| Measured Moisture Content | mole fraction | | 0.1108 | 0.0932 | 0.0996 | 0.1012 |
| Measured Moisture Content | % Volume | | 11.08 | 9.32 | 9.96 | 10.12 |
| Gas Stream Vapor Phase Moisture (Bs): | % Volume | | 9.62 | 9.32 | 9.90 | 9.61 |
| **FIXED GAS DATA:** | | | | | | |
| Oxygen Concentration, Dry Basis | % Volume | | 4.5 | 4.1 | 4.9 | 4.5 |
| Carbon Dioxide Concentration, Dry Basis | % Volume | | 14.5 | 14.8 | 14.2 | 14.5 |
| Carbon Monoxide Concentration, Dry Basis | % Volume | | 0.0 | 0.0 | 0.0 | 0.0 |
| Other Primary Gas Constituent, Dry Basis | % Volume | | #N/A | #N/A | #N/A | #N/A |
| Nitrogen Concentration, Dry Basis (gas balance) | % Volume | | 81.0 | 81.1 | 80.9 | 81.0 |
| Gas Molecular Weight, Dry Basis | lb/lb-mole | | 30.500 | 30.532 | 30.468 | 30.500 |
| Gas Molecular Weight, Wet Basis | lb/lb-mole | | 29.297 | 29.364 | 29.234 | 29.298 |
| Fo Calculated: | Dimensionless | | 1.131 | 1.135 | 1.127 | 1.131 |
| Excess Air: | % | | 26.63 | 23.66 | 29.74 | 26.68 |
| Ultimate CO2 | %V,d | | 18.48 | 18.41 | 18.55 | 18.48 |
| ***DUCT CONFIGURATION:*** | | | | | | |
| Duct Geometry (C = Circular, R = Rectangular) | | | C | C | C | |
| Duct Dimensions (Diameter) | inches | | 88 | 88 | 88 | 88 |
| Effective Duct Diameter (De) | inches | | 88 | 88 | 88 | 88 |
| Stack Cross-Sectional Area | ft2 | | 42.24 | 42.24 | 42.24 | 42.24 |
| **DUCT GAS CONDITIONS:** | | | | | | |
| Static Pressure of Gas Stream | in. H2O | | -0.480 | -0.700 | -0.460 | -0.547 |
| Absolute Duct Gas Pressure | in. Hg | | 29.615 | 29.599 | 29.616 | 29.610 |
| Gas Stream Temperature | degrees F | | 113.25 | 114.00 | 114.25 | 113.83 |
| Gas Stream Wet Bulb Temperature: | degrees F | | 0 | 0 | 0 | 0 |
| **VELOCITY DATA:** | | | | | | |
| Pitot Tube Coefficient | Dimensionless | | 0.84 | 0.84 | 0.84 | 0.84 |
| Avg. Square Root of Velocity Head | (in. H2O)^0.5 | | 0.9151 | 0.9746 | 0.9852 | 0.9583 |
| Gas Stream Velocity | ft/sec | | 53.417 | 56.875 | 57.620 | 55.971 |
| Gas Stream Velocity | ft/min | | 3205.04 | 3412.51 | 3457.22 | 3358.26 |
| Gas Stream Velocity | meters/min | | 976.90 | 1040.13 | 1053.76 | 1023.60 |
| Gas Stream Velocity | mi/hr | | 36.423 | 38.781 | 39.289 | 38.164 |
| **FLOWRATE/ENGLISH UNITS** | | | | | | |
| Actual Volumetric Flow Rate, Wet Basis | acfm | | 135371.2 | 144134.2 | 146022.4 | 141842.6 |
| Standard Volumetric Flow Rate, Wet Basis | scfm | | 123413.3 | 131158.9 | 132898.4 | 129156.9 |
| Standard Volumetric Flow Rate, Dry Basis | dscfm | | 111539.3 | 118935.2 | 119743.1 | 116739.2 |
| Standard Volumetric Flow Rate, Wet Basis | kscfh | | 7404.80 | 7869.53 | 7973.90 | 7749.41 |
| Standard Volumetric Flow Rate, Dry Basis | kdscfh | | 6692.36 | 7136.11 | 7184.59 | 7004.35 |
| Total Mass Flow Rate (wet) | kpph | | 563.04 | 599.74 | 605.00 | 589.26 |
| **FLOWRATE/METRIC UNITS** | | | | | | |
| Actual Volumetric Flow Rate, Wet Basis | acmm | | 3833.71 | 4081.88 | 4135.35 | 4016.98 |
| Standard Volumetric Flow Rate, Wet Basis | scmm | | 3495.07 | 3714.42 | 3763.68 | 3657.72 |
| Standard Volumetric Flow Rate, Dry Basis | dscmm | | 3158.79 | 3368.24 | 3391.13 | 3306.05 |
| **ISOKINETIC SAMPLING DATA:** | | | | | | |
| Nozzle Diameter: | inches | | 0.25 | 0.25 | 0.25 | 0.25 |
| Area of Nozzle: | ft^2 | | 3.409E-04 | 3.409E-04 | 3.409E-04 | 3.409E-04 |
| Isokinetic Sampling Rate: | %I | | 96.8 | 96.7 | 98.4 | 97.3 |
| **PARTICULATE MATTER:** | | | | | | |
| Particulate Matter Collected: | grams | | 0.0438 | 0.1016 | 0.0881 | 0.0778 |
| Particulate Matter Concentration: | grams/dscm | | 0.02960 | 0.06447 | 0.05458 | 0.04955 |
| Particulate Matter Mass Emission Rate: | grams/sec | | 1.558 | 3.619 | 3.085 | 2.754 |
| Particulate Matter Concentration: | lb/dscf | | 1.85E-06 | 4.03E-06 | 3.41E-06 | 3.09E-06 |
| Particulate Matter Concentration: | grains/dscf | | 0.01294 | 0.02818 | 0.02385 | 0.02166 |
| Particulate Matter Mass Emission Rate: | lb/hr | | 12.368 | 28.724 | 24.482 | 21.858 |

| Rayonier | Sulfite Recovery Boiler | Normal | Unit: | Sulfite Recovery Boiler |
|---|---|---|---|---|

## MOISTURE CONTENT DETERMINATION
## EPA METHOD 4 CALCULATIONS

| Parameter | Definition | Units |
|---|---|---|
| Pm - | Absolute Meter Pressure | in. Hg |
| Po - | Average Meter Differential Pressure | in. H2O |
| Ps - | Absolute Stack Gas Pressure | in. Hg |
| Pstd - | Absolute Standard Barometric Pressure (29.92) | in. Hg |
| Pb - | Absolute Barometric Pressure | in. Hg |
| K - | Standard Volume H2O Vapor/Unit Weight Liquid Constant = 0.04715 cu.ft/g | ft3/g |
| Tm - | Average Meter Temperature | degrees R |
| Tstd - | Absolute Standard Temperature (528_R) | degrees R |
| DGMC - | Dry Gas Meter Correction Factor (gamma) | Dimensionless |
| Vlcg - | Total Condensate Collected | grams H20 |
| Vm - | Metered Dry Sample Gas Volume | dcf |
| Vmstd - | Metered Volume at Standard Conditions(528_R, 1atm) | dscf |
| Vwstd - | Volume of Water Vapor Collected, at Standard Conditions (528_R, 1atm) | scf |
| W(sat) - | Vapor Pressure of H2O at Stack Temperature | in. Hg |
| Bws - | Moisture Content | mole fraction |
| Bwd - | Moisture Content | % Volume |

### TEST DATA RUN # 1

| | | | |
|---|---|---|---|
| Pb = | 29.65 | Tm = | 543 |
| Vm = | 54.558 | Po = | 2.717333 |
| Vlcg= | 138.1 | DGMC = | 0.9872 |
| W(sat)= | 2.849324 | Ps = | 29.61471 |

### MEASURED MOISTURE CALCULATIONS

Pm = Pb +(Po/13.6) = 29.65 + (2.72/13.6) = 29.850 in. Hg

$$Vmstd = \frac{(Vm)(DGMC)(Pm)(Tstd)}{(Pstd)(Tm)} = \frac{54.558*0.9872*29.85*528}{29.92*543.0} = 52.249 \text{ ft3}$$

Vwstd = (K)(Vlcg) = (0.04715)*(138.1) = 6.511 ft3

Bws = (Vwstd)/{ (Vwstd)+(Vmstd)} = 6.511/(6.511+52.249) = 0.1108 mol frac

Bwd = (Bws)*100 % = 0.1108*100% = 11.08% V

### SATURATED MOISTURE CALCULATIONS

B(sat) = W(sat)/Ps = 2.85/29.61 = 0.096213 mol frac

### VAPOR PHASE MOISTURE

Bws = 0.096213 Lower of Measured or Saturated Moisture

Bwd = (Bws)*100 % = 9.62%

| Rayonier | Sulfite Recovery Boiler | Normal | Unit: | Sulfite Recovery Boiler |
|---|---|---|---|---|

MOLECULAR WEIGHT DETERMINATION
EPA METHOD 3 CALCULATIONS

| Parameter | | Definition | Units |
|---|---|---|---|
| Md | - | Sample Gas Molecular Weight, Dry Basis | lb/lb-mole |
| Ms | - | Sample Gas Molecular Weight, Wet Basis | lb/lb-mole |
| Bws | - | Moisture Content | mole fraction |
| %CO2 | - | Carbon Dioxide Concentration, Dry Basis | % Volume |
| %CO | - | Carbon Monoxide Concentration, Dry Basis | % Volume |
| %O2 | - | Oxygen Concentration, Dry Basis | % Volume |
| %N2 | - | Nitrogen Concentration, Dry Basis (gas balance) | % Volume |
| 0.32 | - | Molecular Weight of Oxygen (O2), divided by 100% | lb/lb-mole |
| 0.28 | - | Molecular Weight of Carbon Monoxide, divided by 100% | lb/lb-mole |
| 0.28 | - | Molecular Weight of Nitrogen (N2), divided by 100% | lb/lb-mole |
| 0.44 | - | Molecular Weight of Carbon Dioxide, divided by 100% | lb/lb-mole |
| 18.0 | - | Molecular Weight of Water | lb/lb-mole |

TEST DATA RUN # 1

| | | | |
|---|---|---|---|
| Bws = | 0.0962 | %CO = | 0.00 |
| %N2 = | 81.00 | %CO2 = | 14.50 |
| %O2 = | 4.50 | | |

Md = (0.44)(%CO2) + (0.32)(%O2) + (0.28)(%N2 + %CO)

= (0.44)*14.50 + (0.32)*4.50 + (0.28)*(81.00 + 0.00)

= 30.500 lb/lb-mol

Ms = (Md)(1 - Bws) + (18.0)(Bws)

= 30.500*(1 - 0.0962) + 18.0*0.0962

= 29.297 lb/lb-mol

| | | | | |
|---|---|---|---|---|
| Rayonier | Sulfite Recovery Boiler | Normal | Unit: | Sulfite Recovery Boiler |

VELOCITY AND VOLUMETRIC FLOWRATE DETERMINATION
EPA METHOD 2 CALCULATIONS

| Parameter | | Definition | Units |
|---|---|---|---|
| Cp | - | Pitot Tube Coefficient | Dimensionless |
| Vs | - | Gas Stream Velocity | ft/sec |
| Qsd | - | Volumetric Flow Rate at Standard Conditions,Dry Basis | dscfm |
| Qact | - | Actual Volumetric Flow Rate, Wet Basis | acfm |
| Bws | - | Moisture Content | mole fraction |
| Dp | - | Avg. Sq. Root of Velocity Head | (in. H2O)^0.5 |
| Pb | - | Absolute Barometric Pressure | in. Hg |
| Kp | - | Constant = 89.49 (ft)(lb/lb-mol)(in.Hg^0.5)/(s)(_R)(in.H2O) | |
| Ts | - | Absolute Gas Stream Temperature | degrees R |
| Ms | - | Sample Gas Molecular Weight, Wet Basis | lb/lb-mole |
| Sp | - | Static Pressure of Gas Stream | in. H2O |
| 528 | - | Absolute Standard Temperature | degrees R |
| CSA | - | Stack Cross-Sectional Area | ft2 |
| Ps | - | Absolute Stack Gas Pressure | in. Hg |
| 60 | - | Conversion Factor | sec/min. |
| Pi | - | Constant Ratio ~ 3.1416 | Dimensionless |
| D | - | Duct Diameter | inches |

TEST DATA RUN # 1

| | | | |
|---|---|---|---|
| Ms = | 29.297 | Cp = | 0.84 |
| Bws = | 0.0962 | Pb = | 29.65 |
| Sp = | -0.48 | Ts = | 573.3 |
| D = | 88.00 | Dp = | 0.9151 |

Circular Duct

Ps = Pb + (Sp/13.6) = 29.65 + (-0.48/13.6) = 29.61 in.Hg

Vs = (85.49)(Cp)(Dp)*[(Ts)/(Ms*Ps)]^0.5

= 85.49*0.84*0.9151*[573.3/(29.297*29.61)]^0.5

= 53.417 ft/s 53.417 ft/s

CSA = (Pi)[(D)^2]/[(4)(144)] = 3.1416*(88.00^0.5)/(4*144)= 42.237 ft2 42.237

Qact = (Vs)*CSA*60 = 53.417*42.237*60 = 135371.2 acfm

Qsd = (Qact)(1-Bws)(528)(Ps) / (Ts)(29.92) = 135,371.2*(1 - 0.0962)*528*29.61 / 573.3*29.92

= 111539.3 dscfm 111539.3 dscfm

| Rayonier | Sulfite Recovery Boiler | Normal | Unit: | Sulfite Recovery Boiler |
|---|---|---|---|---|

ISOKINETIC SAMPLING RATE
EPA METHOD 5 CALCULATIONS

| Parameter | | Definition | Units |
|---|---|---|---|
| K4 | - | Constant = 0.09450 | |
| Ts | - | Average Stack Temperature | degrees R |
| Vmstd | - | Metered Volume at Standard Conditions(528_R, 1atm) | dscf |
| Ps | - | Absolute Stack Gas Pressure | in. Hg |
| Vs | - | Gas Stream Velocity | ft/sec |
| Bws | - | Moisture Content | mole fraction |
| t | - | Sampling Time Duration | minutes |
| Dn | - | Sample Nozzle Diameter | inches |
| An | - | Area of Nozzle | ft2 |
| %I | - | Percent of Isokinetic Sampling | % |

TEST DATA RUN # 1

| | | | |
|---|---|---|---|
| Ts = | 573.25 | Vs = | 53.41735 |
| Vmstd = | 52.24895 | Bws = | 0.096213 |
| Ps = | 29.61471 | Dn = | 0.25 |
| t = | 60 | | |

An = (Pi)[(Dn)^2]/[(4)(144)]

= 3.1416*(0.250^0.5)/(4*144)

= 3.41E-04 ft2 3.41E-04 ft2

$$\%I = \frac{K4(Ts)(Vmstd)}{(Ps)(Vs)(An)(t)(1-Bws)}$$

$$= \frac{0.09450*573.3*52.249}{29.61*53.42*0.0003409*60.0(1 - 0.096)}$$

= 96.79 % Isokinetic 96.79189 %

| | | | | |
|---|---|---|---|---|
| Rayonier | Sulfite Recovery Boiler | Normal | Unit: | Sulfite Recovery Boiler |

PARTICULATE MATTER EMISSIONS
EPA METHOD 5 CALCULATIONS

| Parameter | | Definition | Units |
|---|---|---|---|
| Mn | - | Total Mass of Particulate Matter Collected | grams |
| Vmstd | - | Metered Volume at Standard Conditions(528_R, 1atm) | dscf |
| Qsd | - | Volumetric Flow Rate at Standard Conditions,Dry Basis | dscfm |
| Cs | - | Concentration of Particulate Matter in Gas | gr/dscf |
| ER | - | Particulate Matter Emission Rate | lb/hr |
| 15.43 | - | Conversion Factor (grains/gram) | gr/g |
| 7000 | - | Conversion Factor (grains/lb) | gr/lb |
| 60 | - | Conversion Factor (minutes/hour) | min/hr |

TEST DATA RUN # 1

Mn = 0.0438
Vmstd = 52.24895
Qsd = 111539.3

Cs = (Mn)*15.43 / (Vmstd) = 0.04380*15.43 / 52.249 = 0.01294 gr/dscf

ER = (Cs)(Qsd)(60)/7000 = 0.0129*111,539.3*60/7000

= 12.36837 lb/hr 12.36837 lb/hr

| Parameter | | Definition | Units |
|---|---|---|---|
| Fd | - | Dry F Factor (gas volume to heat input ratio) | dscf/MMBtu |
| %O2 | - | Oxygen Concentration, Dry Basis | % Volume |
| E | - | Particulate Matter Emission Rate | lb/MMBtu |

E = (Cs)(Fd)(20.9) / (7000)(20.9-%O2) = #N/A / 7000*(20.9 - 4.5) = #N/A lb/MMBtu

# APPENDIX B

# FIELD DATA SHEETS

Rayonier June 2005

R=Sulfite Recovery Boiler
A= A -Scrubber
B=B Scrubber

**Source Testing and Consulting Services Inc.**
**Gravimetric Analysis Data Sheet**

| Date | | | | 6/14/05 | 6/15/05 | 6/16/05 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Time | | | | 0930 | 0830 | 0900 | | | | |
| Beaker/ Filter# | Sample ID | Volume | Tare (g) | Final Weights(g) | | | | | | |
| | | | | 1st wt. | 2nd wt. | 3rd wt. | 4th wt. | Final wt. | Net wt. | |
| 8B | R-1-A | 125 | 61.5988 | .6053 | .6052 | | | 61.6052 | .0064 | .0438 |
| 451 | R-1-F | | .4124 | .4500 | .4498 | | | .4498 | .0374 | |
| 5-4 | R-2-A | 100 | 61.4115 | .4681 | .4679 | | | 61.4679 | .0564 | .1016 |
| 457 | R-2-F | | .4231 | .4681 | .4683 | | | .4683 | .0452 | |
| 4B | R-3-A | 110 | 61.4322 | .4616 | .4608 | 4606 | | 61.4606 | .0284 | .0881 |
| 488 | R-3-F | | .4272 | .4868 | .4869 | | | .4869 | .0597 | |
| 71 | B-1-A | 120 | 69.2085 | .2470 | .2461 | .2462 | | 69.2462 | .0377 | .0802 |
| 489 | B-1-F | | .4191 | .4617 | .4616 | | | .4616 | .0425 | |
| 25 | B-2-A | 130 | 61.2346 | .2630 | .2639 | .2638 | | 61.2638 | .0292 | .0635 |
| 485 | B-2-F | | .4275 | .4618 | .4618 | | | .4618 | .0343 | |
| 404 | B-3-A | 115 | 51.0655 | .1158 | .1158 | | | 51.1158 | .0503 | .0924 |
| 486 | B-3-F | | .4236 | .4656 | .4657 | | | .4657 | .0421 | |
| 10 | A-1-A | 130 | 60.9002 | .9465 | .9465 | | | 60.9465 | .0463 | .0942 |
| 481 | A-1-F | | .4269 | .4750 | .4748 | | | .4748 | .0479 | |
| 16 | A-2-A | 120 | 62.3521 | .3747 | .3740 | .3741 | | 62.3741 | .0220 | .0775 |
| 482 | A-2-F | | .4308 | .4862 | .4863 | | | .4863 | .0555 | |
| 68 | A-3-A | 105 | 68.4364 | .4853 | .4853 | | | 68.4853 | .0289 | .0658 |
| 483 | A-3-F | | .4228 | .4595 | .4597 | | | .4597 | .0369 | |
| 102 | Ace Blk | 150 | 60.0434 | .0434 | .0434 | | | 60.0434 | — | |
| 492 | Filter Blk | | .4269 | .4268 | .4269 | | | .4269 | — | |

| Calibration | | | | | | | |
|---|---|---|---|---|---|---|---|
| 0.1g wt. | | .1000 | .1000 | .1000 | | | |
| 0.5g wt. | | .5000 | .5000 | .5000 | | | |
| 1g wt. | | 1.0000 | 1.0000 | 1.0000 | | | |
| 50g wt. | | 49.9999 | 50.0000 | 50.0001 | | | |
| 100g wt. | | 100.0000 | 100.0000 | 99.9999 | | | |

# BEST AVAILABLE COPY

STACK ISOKINETIC SAMPLING FIELD DATA SHEET

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Facility: | RAYONIER | Meter #: | A1 | Baro. Press: | 29.85 | Page #: | 1 |
| Unit: | SCRUBBER A | DH@: | 1.7093 | Ambient Temp: | 77 | Pitot LC: | ✓ |
| Location: | | DGM Factor: | 1.0153 | Nozzle Dia: | .306 | | |
| Test Type: | MS | Pitot #: | P06 | Static P: | -1.15 | | |
| Run #: | 1 | Pitot Coef: | .84 | Stack Dimensions: | 120" | | |
| Condition: | | | | Stack Height: | ~150' | | |
| Operator(s): | GWT / JBP | K-Factor: | 6.0 | Init. Leak Check: | 0.002 cfm@ 15 "Hg | | |
| Date: | 6-10-05 | Filter#: | | Final Leak Check: | 0 cfm@ 10 "Hg | | |

| Traverse Point Number | Time | Gas Meter Reading Vm(ft3) | Velocity Head ("H2O) | Orifice Press. ("H2O) | Stack Temp (F) | Probe Temp (F) | Filter Temp (F) | Impinger Temp (F) | Dry Gas Meter Temp. Inlet (F) | Dry Gas Meter Temp. Outlet (F) | Vacuum ("Hg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0950 | 32.771 | | | | | | | | | |
| A 1 | 952.5 | 34.3 | .31 | 1.86 | 134 | 246 | 251 | 65 | 82 | 80 | 7 |
| 2 | 955 | 35.8 | .30 | 1.8 | 134 | 248 | 252 | 61 | 83 | 80 | 7 |
| 3 | 957.5 | 37.3 | .27 | 1.6 | 135 | 247 | 253 | 60 | 84 | 81 | 7 |
| 4 | 1000 | 38.8 | .25 | 1.5 | 135 | 249 | 250 | 60 | 84 | 81 | 7 |
| 5 | 1002.5 | 40.3 | .23 | 1.4 | 134 | 251 | 247 | 60 | 85 | 81 | 6 |
| 6 | 1005 | 41.9 | .26 | 1.5 | 135 | 256 | 248 | 60 | 85 | 82 | 6 |
| 7 | 1007.5 | 44.0 | .27 | 1.6 | 136 | 254 | 248 | 60 | 85 | 82 | 6 |
| 8 | 1010 | 47.0 | .28 | 1.7 | 136 | 254 | 249 | 61 | 85 | 82 | 6 |
| 9 | 1012.5 | 48.6 | .27 | 1.6 | 137 | 251 | 250 | 61 | 85 | 82 | 6 |
| 10 | 1015 | 50.3 | .28 | 1.7 | 137 | 252 | 252 | 61 | 86 | 82 | 7 |
| 11 | 1017.5 | 52.1 | .24 | 1.41 | 137 | 253 | 251 | 61 | 86 | 82 | 6 |
| 12 | 1020 | 53.527 | .23 | 1.4 | 136 | 251 | 250 | 61 | 86 | 82 | 6 |
| | | | | | | | | | | | |
| | 1053 | 53.527 56 | | | | | | | | | |
| B 1 | 1055:30 | | .31 | 1.86 | 137 | 252 | 251 | 63 | 82 | 82 | 7 |
| 2 | 58 | 57.25 | .30 | 1.8 | 137 | 250 | 251 | 64 | 82 | 83 | 7 |
| 3 | | | .3 | 1.8 | 140 | 252 | 251 | 64 | 84 | 84 | 7 |
| 4 | 03 | 61.[illegible] | .31 | 1.86 | 141 | 250 | 250 | 64 | 90 | 84 | 7 |
| 5 | | | .31 | 1.86 | 141 | 250 | 253 | 64 | 90 | 87 | 7 |
| 6 | 08 | 64.88 | .28 | 1.7 | 140 | 253 | 250 | 64 | 90 | 87 | 7 |
| 7 | | | .28 | 1.7 | 140 | 250 | 250 | 64 | 90 | 87 | 7 |
| 8 | 13 | 68.59 | .25 | 1.4 | 1.40 | 251 | 252 | 64 | 91 | 88 | 7 |
| 9 | | | .22 | 1.4 | 1.40 | 251 | 252 | 64 | 91 | 88 | 7 |
| 10 | 18 | 72.06 | .20 | 1.2 | 141 | 250 | 251 | 66 | 90 | 88 | 7 |
| 11 | | | .2 | 1.2 | 140 | 250 | 250 | 66 | 90 | 88 | 7 |
| 12 | 1123 | 75.33 | .2 | 1.2 | 139 | 250 | 250 | 66 | 90 | 88 | 7 |
| | | | | | | | | | | | |
| | | | .5152 | | | | | | | | |
| | | 42.559 | | | 137.5 | | | | 85.4 | | |
| | | | | 1.585 | | | | | | | |
| | | 41.8799 | | | | Bws = | .1983 | | | | |
| Avg/Tot. | | | | | | | | | | | |

| Impinger | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Final | 360 | 110 | | 291.4 | |
| Initial | 100 | 100 | | 281.4 | |
| Total | | | | | 220 |
| ORSAT/CEM | 1 | 2 | 3 | 4 | |
| O2 | 10.8 | | | | |
| CO2 | 9.8 | | | | |

Total Traverse Point %'s

6 Point (4.4) (14.6) (29.6) (70.4) (85.4) (95.6)

12 Point (2.1)(6.7)(11.8)(17.7)(25.0)(35.6)(64.4)(75.0)(82.3)(88.2)(93.3)(97.9)

Note: Nearest upstream disturbance or exit must be 2 duct diameters away and nearest downstream disturbance must be at least 8 diameters away to use 6 points per traverse.

Q = 105,088

103.6% I

**BEST AVAILABLE COPY**

R2

STACK ISOKINETIC SAMPLING FIELD DATA SHEET

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Facility: | Seidler A | Meter #: | A1 | Baro. Press: | 28.8 | Page #: | 1 |
| Unit: | Raymin | DH@: | 1.7095 | Ambient Temp: | 83 | Pitot LC: | ✓ |
| Location: | outlet | DGM Factor: | 1.0153 | Nozzle Dia: | .306 | | |
| Test Type: | M5 | Pitot #: | | Static P: | -.14 | | |
| Run #: | 2 | Pitot Coef: | .84 | Stack Dimensions: | 12.0" | | |
| Condition: | | | | Stack Height: | 100' | | |
| Operator(s): | GI / ELB | K-Factor: | 6.0 | Init. Leak Check: | .013 | cfm@ 14 | "Hg |
| Date: | 6/10/05 | Filter#: | | Final Leak Check: | .010 | cfm@ 15 | "Hg |

| Traverse Point Number | Time | Gas Meter Reading Vm(ft3) | Velocity Head ("H2O) | Orifice Press. ("H2O) | Stack Temp (F) | Probe Temp (F) | Filter Temp (F) | Impinger Temp (F) | Dry Gas Meter Temp. Inlet (F) | Dry Gas Meter Temp. Outlet (F) | Vacuum ("Hg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 12:55 | 875.98 | | | | | | | | | |
| A1 | | 77.66 | .30 | 1.8 | 140 | 255 | 270 | 60 | 85 | 84 | 5 |
| 2 | 40 | 79.55 | .30 | 1.8 | 141 | 256 | 268 | 59 | 86 | 84 | 5 |
| 3 | | 81.81 | .28 | 1.7 | 140 | 255 | 270 | 58 | 87 | 84 | 5 |
| 4 | 45 | 83.10 | .28 | 1.7 | 140 | 255 | 270 | 58 | 87 | 84 | 5 |
| 5 | | 84.91 | .28 | 1.7 | 141 | 256 | 275 | 55 | 89 | 84 | 5 |
| 6 | 50 | 86.82 | .28 | 1.7 | 140 | 258 | 275 | 55 | 89 | 84 | 5 |
| 7 | | 88.21 | .25 | 1.5 | 139 | 258 | 274 | 55 | 90 | 85 | 5 |
| 8 | 55 | 90.40 | .24 | 1.4 | 140 | 258 | 274 | 55 | 90 | 85 | 5 |
| 9 | | 91.96 | .21 | 1.3 | 140 | 260 | 273 | 55 | 91 | 85 | 5 |
| 10 | 1300 | 93.68 | .21 | 1.3 | 140 | 261 | 273 | 56 | 91 | 85 | 4 |
| 11 | | 94.88 | .20 | 1.2 | 139 | 260 | 274 | 57 | 91 | 85 | 4 |
| 12 | 1305 | 96.85 | .20 | 1.2 | 139 | 260 | 274 | 57 | 91 | 85 | 4 |
| | | | | | | | | | | | |
| | 1307 | 96.85 | | | | | | | | | |
| B1 | | 97.66 | .2 | 1.2 | 138 | 260 | 270 | 59 | 89 | 85 | 5 |
| 2 | 12 | 99.45 | .2 | 1.2 | 138 | 260 | 271 | 60 | 90 | 85 | 5 |
| 3 | | 101.34 | .18 | 1.1 | [illegible] | 260 | 271 | 60 | 90 | 85 | 5 |
| 4 | 1317 | 103.05 | .18 | 1.1 | 140 | 260 | 271 | 60 | 90 | 85 | 5 |
| 5 | | 104.91 | .22 | 1.3 | 139 | 261 | 271 | 61 | 90 | 85 | 5 |
| 6 | 22 | 106.37 | .22 | 1.3 | 139 | 261 | 273 | 60 | 90 | 85 | 5 |
| 7 | | 108.4 | .30 | 1.8 | 140 | 261 | 273 | 61 | 91 | 85 | 4 |
| 8 | 1327 | 110.19 | .29 | 1.7 | 140 | 260 | 274 | 60 | 90 | 84 | 4 |
| 9 | | 112.3 | .3 | 1.8 | 140 | 260 | 275 | 60 | 91 | 83 | 4 |
| 10 | 13 32 | 114.08 | .25 | 1.5 | 140 | 260 | 275 | 61 | 90 | 83 | 4 |
| 11 | | 116.10 | .25 | 1.5 | 141 | 261 | 274 | 61 | 90 | 84 | 4 |
| 12 | 1337 | 117.59 | .25 | 1.5 | 140 | 261 | 274 | 61 | 90 | 85 | 5 |
| | | | | | | | | | | | |
| | | 42.000 | | | 139.7 | | | | | 87 | |
| | | | | 1.471 | | | | | | | |
| | | | .4928 | | | | | | | | |
| | | 41.1974 | | | Bws = | .2229 | | | | | |
| Avg/Tot. | | | | | | | | | | | |

| Impinger | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Final | 320 | 120 | MT | 240.3 | |
| Initial | 100 | 100 | MT | 229.3 | |
| Total | | | | | 251 |

| ORSAT/CEM | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| O2 | 11.7 | | | |
| CO2 | 9.2 | | | |

Total Traverse Point %'s

6 Point (4.4) (14.6) (29.6) (70.4) (85.4) (95.6)

12 Point (2.1)(6.7)(11.8)(17.7)(25.0)(35.6)(64.4)(75.0)(82.3)(88.2)(93.3)(97.9)

Note: Nearest upstream disturbance or exit must be 2 duct diameters away and nearest downstream disturbance must be at least 8 diameters away to use 6 points per traverse.

Q = 96,730

110.7% I


# BEST AVAILABLE COPY

B3

STACS ISOKINETIC SAMPLING FIELD DATA SHEET

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Facility: | Raymond | Meter #: | A-1 | Baro. Press: | 29.8 | Page #: | 1 |
| Unit: | Scrubber A | DH@: | 1.7095 | Ambient Temp: | 80 | Pitot LC: | ✓ |
| Location: | outlet | DGM Factor: | 1.0153 | Nozzle Dia: | .306 | | |
| Test Type: | M5 | Pitot #: | | Static P: | -.13 | | |
| Run #: | 3 | Pitot Coef: | .84 | Stack Dimensions: | 120" | | |
| Condition: | | | | Stack Height: | 100' | | |
| Operator(s): | GJ | K-Factor: | ~~6~~ 6.55 | Init. Leak Check: | .011 cfm@ 14 "Hg | | |
| Date: | 6/10/05 | Filter#: | | Final Leak Check: | .009 cfm@ 13 "Hg | | |

| Traverse Point Number | Time | Gas Meter Reading Vm(ft3) | Velocity Head ("H2O) | Orifice Press. ("H2O) | Stack Temp (F) | Probe Temp (F) | Filter Temp (F) | Impinger Temp (F) | Dry Gas Meter Temp. Inlet (F) | Dry Gas Meter Temp. Outlet (F) | Vacuum ("Hg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1508 | 17.76 | | | | | | | | | |
| B1 | | 19.10 | .22 | 1.2 | 139 | 289 | 270 | 60 | 86 | 84 | 3 |
| 2 | 13 | 20.70 | .22 | 1.2 | 140 | 260 | 270 | 57 | 88 | 84 | 3 |
| 3 | | 22.21 | .22 | 1.2 | 137 | 261 | 271 | 58 | 88 | 84 | 3 |
| 4 | 18 | 23.70 | .22 | 1.2 | 136 | 260 | 271 | 58 | 88 | 83 | 4 |
| 5 | | 25.31 | .25 | 1.4 | 137 | 261 | 271 | 58 | 88 | 84 | 4 |
| 6 | 23 | 27.150 | .26 | 1.43 | 138 | 261 | 271 | 59 | 89 | 84 | 4 |
| 7 | | 28.71 | .27 | 1.5 | 138 | 260 | 270 | 59 | 90 | 84 | 4 |
| 8 | 28 | 30.69 | .26 | 1.43 | 137 | 260 | 271 | 59 | 90 | 84 | 4 |
| 9 | | 32.81 | .30 | 1.65 | 136 | 261 | 273 | 58 | 91 | 84 | 4 |
| 10 | 33 | 34.40 | .25 | 1.4 | 136 | 261 | 273 | 58 | 91 | 84 | 4 |
| 11 | | 36.77 | .24 | 1.4 | 136 | 261 | 270 | 58 | 90 | 84 | 4 |
| 12 | 538 | 37.84 | .24 | 1.4 | 136 | 265 | 270 | 60 | 90 | 84 | 4 |
| ~~A~~ | 1539 | 37.84 | — | — | — | — | — | — | — | — | — |
| A1 | | 39.36 | .22 | 1.2 | 136 | 261 | 270 | 61 | 90 | 84 | 4 |
| 2 | 44 | 41.47 | .22 | 1.2 | 137 | 260 | 271 | 61 | 90 | 84 | 4 |
| 3 | | 42.96 | .22 | 1.1 | 138 | 260 | 270 | 61 | 90 | 84 | 4 |
| 4 | 49 | 44.10 | .3 | 1.65 | 137 | 261 | 271 | 60 | 91 | 84 | 4 |
| 5 | | 45.10 | .3 | 1.65 | 136 | 261 | 270 | 60 | 91 | 84 | 4 |
| 6 | 54 | 47.86 | .3 | 1.65 | 136 | 261 | 270 | 60 | 90 | 84 | 4 |
| 7 | | 49.61 | .22 | 1.2 | 136 | 261 | 271 | 61 | 90 | 84 | 4 |
| 8 | 59 | 51.38 | .22 | 1.2 | 136 | 261 | 272 | 61 | 90 | 84 | 4 |
| 9 | | 52.53 | .22 | 1.2 | 138 | 262 | 272 | 61 | 90 | 84 | 4 |
| 10 | 04 | 54.10 | .20 | 1.1 | 137 | 263 | 272 | 61 | 90 | 84 | 4 |
| 11 | | 56.01 | .20 | 1.1 | 137 | 263 | 271 | 62 | 90 | 84 | 4 |
| 12 | 1609 | 57.20 | .20 | 1.1 | 138 | 263 | 270 | 62 | 90 | 84 | 4 |
| | | | | | | | | | | 86.8 | |
| | | 39.44 | | 1.3 | 136.9 | | | | | | |
| | | | .4840 | | | | | | | | |
| | | 38.677 | | | | | | | | | |
| | | | | | | | Bws = .2132 | | | | |
| Avg/Tot. | | | | | | | | | | | |

| Impinger | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Final | 290 | 120 | MT | 204.4 | |
| Initial | 120 | 110 | MT | 197.8 | |
| Total | | | | | 222.6 |

| ORSAT/CEM | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| O2 | 8.2 | | | |
| CO2 | 12.1 | | | |

Total Traverse Point %'s

6 Point (4.4) (14.6) (29.6) (70.4) (85.4) (95.6)

12 Point (2.1)(6.7)(11.8)(17.7)(25.0)(35.6)(64.4)(75.0)(82.3)(88.2)(93.3)(97.9)

Note: Nearest upstream disturbance or exit must be 2 duct diameters away and nearest downstream disturbance must be at least 8 diameters away to use 6 points per traverse.

Q = 96,983

103.6 % I

# STACS ISOKINETIC SAMPLING FIELD DATA SHEET

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Facility: | Rayonier | Meter #: | A-7 | Baro. Press: | 29.8 | Page #: | 1 |
| Unit: | Scrubber B | DH@: | 1.7103 | Ambient Temp: | 85 | Pitot LC: | ✓ |
| Location: | Stack | DGM Factor: | 0.9872 | Nozzle Dia: | .306 | | |
| Test Type: | M5 | Pitot #: | | Static P: | -.1 | | |
| Run #: | 1 | Pitot Coef: | .84 | Stack Dimensions: | 10' | | |
| Condition: | | | | Stack Height: | ~150' | | |
| Operator(s): | JBP | K-Factor: | 6.0 | Init. Leak Check: | 0.002 | cfm@ 15 | "Hg |
| Date: | 6-9-05 | Filter#: | | Final Leak Check: | 0.005 | cfm@ 12 | "Hg |

| Traverse Point Number | Time | Gas Meter Reading Vm(ft3) | Velocity Head | Orifice Press. | Stack Temp | Impinger Temp | Dry Gas Meter Temp. Inlet | Dry Gas Meter Temp. Outlet | Vacuum | ~~Angle~~ | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1108 | 27.187 | ("H2O) | ("H2O) | (F) | (F) | (F) | (F) | ("Hg) | Filter | Probe |
| A1 | 1110.5 | 28.9 | .24 | 1.44 | 136 | 67 | 88 | | 4 | 244 | 246 |
| 2 | 1113 | 30.6 | .24 | 1.44 | 136 | 65 | 88 | | 4 | 245 | 247 |
| 3 | 1115.5 | 32.1 | .23 | 1.38 | 136 | 62 | 87 | | 4 | 248 | 248 |
| 4 | 1118 | 33.7 | .23 | 1.38 | 136 | 62 | 86 | | 4 | 249 | 249 |
| 5 | 1120.5 | 35.3 | .22 | 1.32 | 135 | 62 | 88 | | 4 | 253 | 252 |
| 6 | 1123 | 36.9 | .22 | 1.32 | 135 | 62 | 88 | | 4 | 253 | 253 |
| 7 | 1125.5 | 38.7 | .20 | 1.2 | 134 | 62 | 89 | | 4 | 254 | 255 |
| 8 | 1128 | 40.5 | .18 | 1.1 | 134 | 62 | 89 | | 4 | 256 | 255 |
| 9 | 1130.5 | 42.0 | .17 | 1.0 | 142 | 61 | 89 | | 3 | 254 | 249 |
| 10 | 1133 | 43.3 | .15 | .9 | 142 | 60 | 89 | | 3 | 253 | 248 |
| 11 | 1135.5 | 44.6 | .14 | .84 | 132 | 60 | 89 | | 3 | 247 | 247 |
| 12 | 1138 | 45.824 | .14 | .84 | 132 | 60 | 89 | | 3 | 243 | 244 |
| | 1144 | 45.882 | | | | | | | | | |
| B1 | 1146.5 | 47.4 | .21 | 1.3 | 138 | 64 | 88 | | 4 | 247 | 247 |
| 2 | 1149 | 49.0 | .21 | 1.3 | 138 | 61 | 88 | | 4 | 247 | 247 |
| 3 | 1151.5 | 50.5 | .21 | 1.3 | 140 | 60 | 89 | | 4 | 246 | 246 |
| 4 | 1154 | 52.1 | .21 | 1.3 | 140 | 60 | 89 | | 4 | 245 | 246 |
| 5 | 1156.5 | 53.7 | .26 | 1.7 | 137 | 60 | 88 | | 6 | 245 | 245 |
| 6 | 1159 | 55.5 | .28 | 1.7 | 135 | 60 | 88 | | 6 | 246 | 244 |
| 7 | 1201.5 | 57.6 | .24 | 1.4 | 138 | 61 | 89 | | 5 | 247 | 247 |
| 8 | 1204 | 59.8 | .24 | 1.4 | 138 | 61 | 89 | | 5 | 248 | 248 |
| 9 | 1206.5 | 61.3 | .17 | 1.0 | 139 | 61 | 89 | | 5 | 250 | 250 |
| 10 | 1209 | 62.9 | .17 | 1.0 | 141 | 62 | 89 | | 5 | 251 | 252 |
| 11 | 1211.5 | 63.8 | .15 | .90 | 140 | 62 | 89 | | 3 | 250 | 250 |
| 12 | 1214 | 64.763 | .13 | .78 | 140 | 62 | 89 | | 3 | 250 | 251 |

Nozzle Calibration:

| Avg/Tot | | | | | ⦶ | | ⊖ | | ∅ | | |
|---|---|---|---|---|---|---|---|---|---|---|---|

| Impinger | 1 | 2 | 3 | 4 | 5 | Total |
|---|---|---|---|---|---|---|
| Final | 295 | 100 | | 229 | | |
| Initial | 100 | 100 | | 217 | | |
| Total | 195 | 0 | | 12 | 207 | |

| ORSAT/CEM | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| O2 | 11.2 | | | |
| CO2 | 8.6 | | | |

Traverse Point %'s

6 Point (4.4) (14.6) (29.6) (70.4) (85.4) (95.6)

12 Point (2.1)(6.7)(11.8)(17.7)(25.0)(35.6)(64.4)(75.0)(82.3)(88.2)(93.3)(97.9)

Note: Nearest upstream disturbance or exit must be 2 duct diameters away and nearest downstream disturbance must be at least 8 diameters away to use 6 points per traverse.

**BEST AVAILABLE COPY**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Facility: | RAYONIER | Meter #: | A7 | Baro. Press: | 29.80 | Page #: | 1 |
| Unit: | SCRUBBER B | DH@: | 1.7103 | Ambient Temp: | 90 | Pitot LC: | L |
| Location: | Stack | DGM Factor: | .9872 | Nozzle Dia: | .306 | | |
| Test Type: | MS | Pitot #: | | Static P: | -.12 | | |
| Run #: | 2 | Pitot Coef: | .84 | Stack Dimensions: | 10' | | |
| Condition: | | | | Stack Height: | 175' | | |
| Operator(s): | JBP | K-Factor: | 6.0 | Init. Leak Check: | 0.002 cfm@ 15 "Hg | | |
| Date: | 6-9-05 | Filter#: | | Final Leak Check: | 0.00 cfm@ 10 "Hg | | |

| Traverse Point Number | Time | Gas Meter Reading Vm(ft3) | Velocity Head ("H2O) | Orifice Press. ("H2O) | Stack Temp (F) | Probe Temp (F) | Filter Temp (F) | Impinger Temp (F) | Dry Gas Meter Temp. Inlet (F) | Dry Gas Meter Temp. Outlet (F) | Vacuum ("Hg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1300 | 65946 | | | | | | | | | |
| B1 | 1302.5 | 67.6 | .20 | 1.2 | 136 | 247 | 251 | 67 | 85 | | 3 |
| 2 | 1305 | 69.2 | .22 | 1.3 | 136 | 246 | 256 | 60 | 85 | | 3 |
| 3 | 1307.5 | 70.8 | .22 | 1.3 | 137 | 247 | 259 | 59 | 85 | | 3 |
| 4 | 1310 | 72.3 | .22 | 1.3 | 137 | 248 | 259 | 59 | 86 | | 3 |
| 5 | 1312.5 | 73.8 | .21 | 1.3 | 134 | 249 | 258 | 59 | 86 | | 3 |
| 6 | 1315 | 75.3 | .21 | 1.3 | 130 | 250 | 259 | 59 | 86 | | 3 |
| 7 | 1317.5 | 76.8 | .20 | 1.2 | 130 | 250 | 258 | 60 | 86 | | 3 |
| 8 | 1320 | 78.3 | .19 | 1.2 | 129 | 251 | 256 | 60 | 86 | | 3 |
| 9 | 1322.5 | 79.7 | .19 | 1.2 | 131 | 249 | 257 | 60 | 84 | | 3 |
| 10 | 1325 | 81.5 | .18 | 1.1 | 133 | 256 | 259 | 61 | 84 | | 3 |
| 11 | 1327.5 | 83.0 | .17 | 1.1 | 133 | 248 | 258 | 61 | 86 | | 3 |
| 12 | 1330 | 84.414 | .18 | 1.1 | 134 | 248 | 257 | 61 | 86 | | 3 |
| | 1332 | | | | | | | | | | |
| A1 | 1334.5 | 85.9 | .18 | 1.1 | 135 | 259 | 261 | 64 | 87 | | 3 |
| 2 | 1337 | 87.4 | .18 | 1.1 | 135 | 258 | 260 | 61 | 87 | | 3 |
| 3 | 1339.5 | 88.8 | .21 | 1.3 | 135 | 256 | 257 | 61 | 87 | | 3 |
| 4 | 1342 | 90.5 | .22 | 1.3 | 136 | 254 | 256 | 61 | 87 | | 3 |
| 5 | 1344.5 | 92.2 | .23 | 1.4 | 134 | 255 | 257 | 61 | 87 | | 3 |
| 6 | 1347 | 93.9 | .27 | 1.7 | 131 | 256 | 257 | 62 | 87 | | 3 |
| 7 | 1349.5 | 95.6 | .19 | 1.2 | 131 | 257 | 258 | 62 | 88 | | 3 |
| 8 | 1352 | 97.3 | .18 | 1.2 | 132 | 253 | 257 | 62 | 87 | | 3 |
| 9 | 1354.5 | 98.7 | .14 | .84 | 132 | 251 | 255 | 62 | 87 | | 3 |
| 10 | 1357 | 99.9 | .13 | .78 | 133 | 250 | 256 | 63 | 87 | | 3 |
| 11 | 1359.5 | 101.6 | .19 | 1.2 | 134 | 249 | 257 | 63 | 87 | | 3 |
| 12 | 1402 | 102.810 | .14 | .84 | 134 | 246 | 259 | 64 | 87 | | 3 |
| | | | | | 133.4 | | | | 86.4 | | |
| | | 36.864 | | 1.19 | | | | | | | |
| | | | .4288 | | | | | | | | |
| | | 349280 | | | | | | | | | |
| Avg/Tot. | | | | | | | | | | | |

| Impinger | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Final | 260 | 110 | | 272.2 | |
| Initial | 100 | 100 | | 255.5 | |
| Total | | | | | |
| ORSAT/CEM | 1 | 2 | 3 | 4 | |
| O2 | 11.5 | | | | |
| CO2 | 8.6 | | | | |

Total Traverse Point %'s

6 Point (4.4) (14.6) (29.6) (70.4) (85.4) (95.6)

12 Point (2.1)(6.7)(11.8)(17.7)(25.0)(35.6)(64.4)(75.0)(82.3)(88.2)(93.3)(97.9)

Note: Nearest upstream disturbance or exit must be 2 duct diameters away and nearest downstream disturbance must be at least 8 diameters away to use 6 points per traverse.

Q = 87,431

103.8% I

**BEST AVAILABLE COPY**

STACS ISOKINETIC SAMPLING FIELD DATA SHEET

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Facility: | RAYONIER | Meter #: | A-7 | Baro. Press: | 29.8 | Page #: | 1 |
| Unit: | SCRUBBER B | DH@: | 1.7103 | Ambient Temp: | 90 | Pitot LC: | ✓ |
| Location: | stack | DGM Factor: | 0.9872 | Nozzle Dia: | .306 | | |
| Test Type: | METHOD 5 | Pitot #: | P-06 | Static P: | -.1 | | |
| Run #: | 3 | Pitot Coef: | .84 | Stack Dimensions: | 60" | | |
| Condition: | | | | Stack Height: | ~150' | | |
| Operator(s): | JBP | K-Factor: | 6.6 | Init. Leak Check: | 0.001 cfm@ 15 "Hg | | |
| Date: | JUNE-9-2005 | Filter#: | | Final Leak Check: | 0.00 cfm@ 15 "Hg | | |

| Traverse Point Number | Time | Gas Meter Reading Vm(ft3) | Velocity Head ("H2O) | Orifice Press. ("H2O) | Stack Temp (F) | Probe Temp (F) | Filter Temp (F) | Impinger Temp (F) | Dry Gas Meter Temp. Inlet (F) | Dry Gas Meter Temp. Outlet (F) | Vacuum ("Hg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1451 | 03527 | | | | | | | | | |
| A 1 | 1453.5 | 4.9 | .15 | .90 | 142 | 253 | 254 | 67 | 87 | 87 | 3 |
| 2 | 1456 | 6.4 | .17 | 1.0 | 141 | 255 | 257 | 62 | 85 | 85 | 3 |
| 3 | 1458.5 | 7.9 | .19 | 1.1 | 140 | 254 | 258 | 61 | 85 | 85 | 4 |
| 4 | 1501 | 9.4 | .22 | 1.3 | 139 | 251 | 258 | 61 | 85 | 85 | 5 |
| 5 | 1503.5 | 11.1 | .24 | 1.4 | 138 | 248 | 259 | 61 | 84 | 84 | 5 |
| 6 | 1506 | 12.8 | .23 | 1.4 | 138 | 247 | 258 | 62 | 84 | 84 | 5 |
| 7 | 1508.5 | 14.5 | .20 | 1.2 | 140 | 248 | 253 | 62 | 84 | 84 | 5 |
| 8 | 1511 | 16.0 | .17 | 1.0 | 140 | 249 | 254 | 62 | 84 | 84 | 5 |
| 9 | 1513.5 | 17.4 | .18 | 1.1 | 140 | 248 | 253 | 62 | 85 | 85 | 5 |
| 10 | 1516 | 18.8 | .15 | .90 | 140 | 249 | 255 | 62 | 85 | 85 | 4 |
| 11 | 1518.5 | 20.2 | .14 | .84 | 138 | 248 | 255 | 63 | 85 | 85 | 4 |
| 12 | 1521 | 21.518 | .13 | .78 | 136 | 247 | 253 | 63 | 85 | 85 | 4 |
| | 1522 | " | | | | | | | | | |
| B 1 | 1524.5 | 22.9 | .18 | 1.1 | 139 | 248 | 250 | 66 | 85 | 85 | 5 |
| 2 | 1527 | 24.4 | .22 | 1.3 | 133 | 249 | 252 | 63 | 85 | 85 | 6 |
| 3 | 1529.5 | 25.9 | .23 | 1.4 | 134 | 248 | 251 | 58 | 85 | 85 | 6 |
| 4 | 1532 | 27.7 | .22 | 1.3 | 134 | 247 | 250 | 58 | 85 | 85 | 6 |
| 5 | 1534.5 | 29.4 | .22 | 1.3 | 138 | 243 | 251 | 59 | 85 | 85 | 6 |
| 6 | 1537 | 31.1 | .21 | 1.3 | 139 | 240 | 247 | 57 | 85 | 85 | 6 |
| 7 | 1539.5 | 32.8 | .19 | 1.1 | 141 | 243 | 251 | 59 | 85 | 85 | 6 |
| 8 | 1542 | 34.2 | .19 | 1.1 | 144 | 246 | 252 | 60 | 85 | 85 | 6 |
| 9 | 1544.5 | 35.8 | .20 | 1.2 | 141 | 252 | 251 | 60 | 85 | 85 | 6 |
| 10 | 1547 | 37.3 | .19 | 1.1 | 140 | 247 | 248 | 60 | 84 | 84 | 6 |
| 11 | 1549.5 | 38.9 | .18 | 1.1 | 141 | 241 | 246 | 60 | 84 | 84 | 6 |
| 12 | 1552 | 40.197 | .14 | .84 | 138 | 240 | 245 | 61 | 84 | 84 | 6 |
| | | | | | 138.9 | | | | | 84.8 | |
| | | 36.67 | | 1.128 | | | | | | | |
| | | | .4334 | | | | | | | | |
| | | 34.851 | | | | | | | | | |
| | | | | | | Bws = .2227 | | | | | |
| Avg/Tot. | | | | | | | | | | | |

| Impinger | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Final | 300 | 105 | | 207.1 | |
| Initial | 100 | 106 | | 200 | |
| Total | | | | | 212.1 |

| ORSAT/CEM | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| O2 | 11.5 | | | |
| CO2 | 8.0 | | | |

Total Traverse Point %'s

6 Point (4.4) (14.6) (29.6) (70.4) (85.4) (95.6)

12 Point (2.1)(6.7)(11.8)(17.7)(25.0)(35.6)(64.4)(75.0)(82.3)(88.2)(93.3)(97.9)

Note: Nearest upstream disturbance or exit must be 2 duct diameters away and nearest downstream disturbance must be at least 8 diameters away to use 6 points per traverse.

Q = 85,194

106.3% I

**BEST AVAILABLE COPY**

STACK ISOKINETIC SAMPLING FIELD DATA SHEET

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Facility: | RAYONIER | Meter #: | A-7 | Baro. Press: | 29.63 | Page #: | 1 |
| Unit: | SRB | DH@: | 1.7103 | Ambient Temp: | 79 | Pitot LC: | L |
| Location: | | DGM Factor: | 0.9872 | Nozzle Dia: | .25 | | |
| Test Type: | M5 | Pitot #: | | Static P: | -.48 | | |
| Run #: | 1 | Pitot Coef: | .84 | Stack Dimensions: | 88" | | |
| Condition: | | | | Stack Height: | ~306' | | |
| Operator(s): | JBP | K-Factor: | 3.3 | Init. Leak Check: | 0.006 cfm@ 15 "Hg | | |
| Date: | 06-09-2005 | Filter#: | 451 | Final Leak Check: | 0.004 cfm@ 10 "Hg | | |

| Traverse Point Number | Time | Gas Meter Reading Vm(ft3) | Velocity Head ("H2O) | Orifice Press. ("H2O) | Stack Temp (F) | Probe Temp (F) | Filter Temp (F) | Impinger Temp (F) | Dry Gas Meter Temp. Inlet (F) | Dry Gas Meter Temp. Outlet (F) | Vacuum ("Hg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0900 | 34.006 | | | | | | | | | |
| A-1 | 905 | 38.9 | 1.0 | 3.3 | 112 | 253 | 261 | 63 | 78 | 78 | 7 |
| 2 | 910 | 43.5 | 1.0 | 3.3 | 114 | 251 | 262 | 62 | 79 | 79 | 7 |
| 3 | 915 | 48.1 | 1.05 | 3.4 | 116 | 250 | 263 | 60 | 81 | 81 | 7 |
| 4 | 920 | 52.8 | 1.05 | 3.4 | 113 | 247 | 264 | 60 | 82 | 82 | 7 |
| 5 | 925 | 57.9 | 1.0 | 3.3 | 113 | 259 | 265 | 60 | 82 | 82 | 7 |
| 6 | 930 | 63.476 | 1.1 | 3.6 | 113 | 257 | 262 | 61 | 84 | 84 | 7 |
| STOP | 935 | 63.476 | | | | | | | | | |
| B-1 | 940 | 67.4 | .55 | 1.8 | 113 | 253 | 261 | 64 | 84 | 84 | 4 |
| 2 | 945 | 71.2 | .58 | 1.9 | 113 | 256 | 262 | 61 | 84 | 84 | 4 |
| 3 | 950 | 75.8 | .64 | 2.2 | 113 | 252 | 260 | 58 | 85 | 85 | 5 |
| 4 | 955 | 79.9 | .70 | 2.4 | 113 | 258 | 259 | 58 | 85 | 85 | 5 |
| 5 | 1000 | 84.2 | .75 | 2.6 | 113 | 258 | 262 | 59 | 86 | 86 | 5 |
| 6 | 1005 | 88.564 | .77 | 2.7 | 113 | 257 | 257 | 60 | 86 | 86 | 6 |
| | | | | | | | | | | | |
| | | 54558 | | | | | | | | 83 | |
| | | | | | 113.3 | | | | | | |
| | | | | 2.83 | | | | | | | |
| | | | .9151 | | | | | | | | |
| | | 52.68 | | | | | | | | | |
| | | | | | | Bws | .1098 | | | | |
| | | | | | | | .8902 | | | | |
| Avg/Tot. | | | | | | | | | | | |

| Impinger | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Final | 220 | 110 | | 319.1 | |
| Initial | 100 | 100 | | 309.1 | |
| Total | | | | | 138.0 |

| ORSAT/CEM | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| O2 | 4.5 | | | |
| CO2 | 14.5 | | | |

Total Traverse Point %'s

6 Point (4.4) (14.6) (29.6) (70.4) (85.4) (95.6)

12 Point (2.1)(6.7)(11.8)(17.7)(25.0)(35.6)(64.4)(75.0)(82.3)(88.2)(93.3)(97.9)

Note: Nearest upstream disturbance or exit must be 2 duct diameters away and nearest downstream disturbance must be at least 8 diameters away to use 6 points per traverse.

Q = 109,615

100.6 % I

# BEST AVAILABLE COPY

STACK ISOKINETIC SAMPLING FIELD DATA SHEET

| | | | | | |
|---|---|---|---|---|---|
| Facility: | RAYONIER | Meter #: | A7 | Baro. Press: | 29.65 | 
| Unit: | SRB | DH@: | 1.7103 | Ambient Temp: | 84 |
| Location: | STACK | DGM Factor: | 0.9872 | Nozzle Dia: | .25 |
| Test Type: | M5 | Pitot #: | | Static P: | -.7 |
| Run #: | 2 | Pitot Coef: | .84 | Stack Dimensions: | 88" |
| Condition: | | | | Stack Height: | ~300' |
| Operator(s): | JBP | K-Factor: | 3.3 | Init. Leak Check: | 0.004 cfm@ 20 "Hg |
| Date: | 06-08-05 | Filter#: | 457 | Final Leak Check: | 0.003 cfm@ 15 "Hg |

Page #: 1 Pitot LC: ✓

| Traverse Point Number | Time | Gas Meter Reading Vm(ft3) | Velocity Head ("H2O) | Orifice Press. ("H2O) | Stack Temp (F) | Probe Temp (F) | Filter Temp (F) | Impinger Temp (F) | Dry Gas Meter Temp. Inlet (F) | Dry Gas Meter Temp. Outlet (F) | Vacuum ("Hg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1105 | 89.453 | | | | | | | | | |
| B1 | 1110 | 93.0 | 1.0 | 3.3 | 114 | 241 | 243 | 67 | 82 | 82 | 8 |
| 2 | 1115 | 98.0 | .95 | 3.1 | 114 | 245 | 254 | 61 | 83 | 83 | 8 |
| 3 | 1120 | 102.8 | 1.0 | 3.3 | 114 | 251 | 260 | 61 | 84 | 84 | 8 |
| 4 | 1125 | 107.9 | 1.0 | 3.3 | 114 | 252 | 259 | 61 | 84 | 84 | 8 |
| 5 | 1130 | 112.9 | .90 | 3.0 | 114 | 250 | 258 | 62 | 85 | 85 | 8 |
| 6 | 1135 | 118.533 | .85 | 2.9 | 114 | 251 | 260 | 62 | 85 | 85 | 8 |
| | 1138 | 118.533 | | | | | | | | | |
| A1 | 1143 | 123.4 | .92 | 3.1 | 114 | 251 | 257 | 64 | 85 | 85 | 7 |
| 2 | 1148 | 128.3 | .47 | 3.2 | 114 | 252 | 258 | 62 | 86 | 84 | 7 |
| 3 | 1153 | 133.2 | 1.0 | 3.3 | 114 | 253 | 256 | 61 | 86 | 86 | 7 |
| 4 | 1158 | 138.1 | 1.0 | 3.3 | 114 | 252 | 259 | 61 | 86 | 86 | 7 |
| 5 | 1203 | 143.0 | 1.0 | 3.3 | 114 | 250 | 261 | 62 | 86 | 86 | 7 |
| 6 | 1208 | 147.710 | .82 | 2.7 | 114 | 251 | 262 | 63 | 86 | 86 | 7 |
| | | 58.257 | | | | | | | | 84.8 | |
| | | | | 3.15 | | | | | | | |
| | | 55.6441 | .9746 | | | | | | | | |
| | | | | | | Bws | .0931 | | | | |
| | | | | | | | .9069 | | | | |
| Avg/Tot. | | | | | | | | | | | |

| Impinger | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Final | 210 | 105 | | 210.6 | |
| Initial | 100 | 100 | | 216.9 | |
| Total | 110 | 5 | | | 121.3 |
| ORSAT/CEM | 1 | 2 | 3 | 4 | |
| O2 | 4.1 | | | | |
| CO2 | 14.4 | | | | |

Total Traverse Point %'s

6 Point (4.4) (14.6) (29.6) (70.4) (85.4) (95.6)

12 Point (2.1)(6.7)(11.8)(17.7)(25.0)(35.6)(64.4)(75.0)(82.3)(88.2)(93.3)(97.9)

Note: Nearest upstream disturbance or exit must be 2 duct diameters away and nearest downstream disturbance must be at least 8 diameters away to use 6 points per traverse.

Q = 119,791

95.9 %I

# BEST AVAILABLE COPY

| | | | | | |
|---|---|---|---|---|---|
| Facility: | RAYONIER | Meter #: | A7 | Baro. Press: | 29.45 | 
| Unit: | SRB | DH@: | 1.7103 | Ambient Temp: | 83 |
| Location: | Stack | DGM Factor: | 0.9872 | Nozzle Dia: | .25 |
| Test Type: | M5 | Pitot #: | | Static P: | -.46 |
| Run #: | 3 | Pitot Coef: | .84 | Stack Dimensions: | 88" |
| Condition: | | | | Stack Height: | 275' |
| Operator(s): | JBP | K-Factor: | 3.3 | Init. Leak Check: | 0.004 cfm@ 15 "Hg |
| Date: | 06-08-05 | Filter#: | 488 | Final Leak Check: | 0.011 cfm@ 12 "Hg |

Page #: 1
Pitot LC: ✓

| Traverse Point Number | Time | Gas Meter Reading Vm(ft3) | Velocity Head ("H2O) | Orifice Press. ("H2O) | Stack Temp (F) | Probe Temp (F) | Filter Temp (F) | Impinger Temp (F) | Dry Gas Meter Temp. Inlet (F) | Dry Gas Meter Temp. Outlet (F) | Vacuum ("Hg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1248 | 46.118 | | | | | | | | | |
| A1 | 1253 | 53.2 | 1.1 | 3.6 | 115 | 257 | 259 | 45 | 83 | 83 | 7 |
| 2 | 1258 | 58.4 | 1.0 | 3.3 | 115 | 254 | 260 | 62 | 84 | 84 | 7 |
| 3 | 1303 | 63.4 | 1.0 | 3.3 | 115 | 255 | 260 | 60 | 84 | 84 | 7 |
| 4 | 1308 | 68.4 | .98 | .32 | 114 | 252 | 255 | 60 | 85 | 85 | 7 |
| 5 | 1313 | 73.4 | .96 | 3.2 | 114 | 253 | 253 | 61 | 85 | 85 | 7 |
| 6 | 1318 | 78.423 | .85 | 2.7 | 114 | 252 | 256 | 62 | 85 | 85 | 7 |
| | 1320 | " | | | | | | | | | |
| B1 | 1325 | 82.9 | .95 | 3.1 | 114 | 250 | 256 | 44 | 84 | 84 | 6 |
| 2 | 1330 | 87.8 | .97 | 3.2 | 114 | 249 | 257 | 61 | 84 | 84 | 6 |
| 3 | 1335 | 92.8 | 1.0 | 3.3 | 114 | 251 | 257 | 61 | 85 | 85 | 7 |
| 4 | 1340 | 97.7 | 1.0 | 3.3 | 114 | 253 | 255 | 62 | 85 | 85 | 7 |
| 5 | 1345 | 103.2 | .98 | 3.2 | 114 | 251 | 256 | 63 | 85 | 85 | 7 |
| 6 | 1350 | 107.743 | .87 | 2.7 | 114 | 253 | 258 | 63 | 85 | 85 | 7 |
| | | 59.652 | .9852 | | | | | | 84.5 | | |
| | | | | | 114.3 | | | | | | |
| | | 57.0144 | | 3.175 | | | | | | | |
| | | | | | | Bws | .0994 | | | | |
| | | | | | | | .9006 | | | | |
| Avg/Tot. | | | | | | | | | | | |

| Impinger | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Final | 210 | 110 | | 207 | |
| Initial | 160 | 100 | | 220.7 | |
| Total | | | | | 133.7 |
| ORSAT/CEM | 1 | 2 | 3 | 4 | |
| O2 | 4.7 | ind | | | |
| CO2 | 14.2 | | | | |

| Total | Traverse Point %'s |
|---|---|
| 6 Point | (4.4) (14.6) (29.6) (70.4) (85.4) (95.6) |
| 12 Point | (2.1)(6.7)(11.8)(17.7)(25.0)(35.6)(64.4)(75.0)(82.3)(88.2)(93.3)(97.9) |

Note: Nearest upstream disturbance or exit must be 2 duct diameters away and nearest downstream disturbance must be at least 8 diameters away to use 6 points per traverse.

Q = 119,281

98.8% I

Visible Emission Observation Form

SOURCE NAME Rayonier

ADDRESS Foot of Gum St.

CITY Fernandina Beach STATE FL ZIP

PHONE SOURCE ID NUMBER

PROCESS EQUIPMENT A-Bark Boiler OPERATING MODE

CONTROL EQUIPMENT Wet Scrubber OPERATING MODE

DESCRIBE EMISSION POINT
START White stack STOP

HEIGHT ABOVE GROUND LEVEL START ~175' STOP ✓ | HEIGHT RELATIVE TO OBSERVER START 175' STOP ✓

DISTANCE FROM OBSERVER START 800' STOP ✓ | DIRECTION FROM OBSERVER START 255° STOP ✓

DESCRIBE EMISSIONS
START lofting plume STOP ✓

EMISSION COLOR START black STOP ✓ | PLUME TYPE CONTINUOUS ☒ FUGITIVE ☐ INTERMITTENT ☐

WATER DROPLETS PRESENT NO ☐ YES ☒ | IF WATER DROPLET PLUME ATTACHED ☒ DETACHED ☐

POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED
START ~50' above STOP ✓

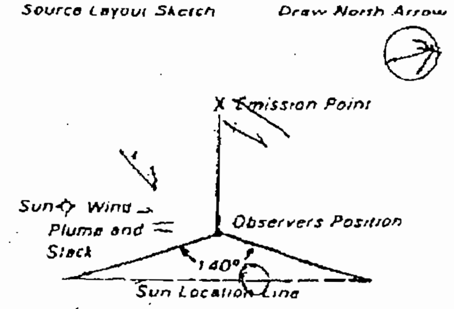
DESCRIBE BACKGROUND
START sky STOP ✓

BACKGROUND COLOR START gray STOP ✓ | SKY CONDITIONS START overcast STOP ✓

WIND SPEED START 4-7 STOP ✓ | WIND DIRECTION START SE STOP ✓

AMBIENT TEMP START 82 STOP 82 | WET BULB TEMP 77 | RH, percent 90

Source Layout Sketch Draw North Arrow




COMMENTS

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS
SIGNATURE
TITLE DATE

OBSERVATION DATE 6/10/05 START TIME 0950 STOP TIME 1050

| MIN \ SEC | 0 | 15 | 30 | 45 |
|---|---|---|---|---|
| 1 | 5 | 5 | 5 | 10 |
| 2 | 10 | 5 | 5 | 5 |
| 3 | 5 | 5 | 5 | 5 |
| 4 | 5 | 5 | 5 | 5 |
| 5 | 10 | 5 | 10 | 10 |
| 6 | 10 | 5 | 5 | 5 |
| 7 | 5 | 10 | 5 | 10 |
| 8 | 10 | 10 | 5 | 5 |
| 9 | 5 | 5 | 5 | 5 |
| 10 | 5 | 5 | 5 | 5 |
| 11 | 5 | 10 | 5 | 10 |
| 12 | 5 | 10 | 5 | 5 |
| 13 | 5 | 5 | 5 | 5 |
| 14 | 5 | 5 | 10 | 5 |
| 15 | 10 | 5 | 5 | 5 |
| 16 | 5 | 5 | 5 | 5 |
| 17 | 5 | 5 | 5 | 5 |
| 18 | 5 | 5 | 5 | 5 |
| 19 | 5 | 5 | 5 | 5 |
| 20 | 5 | 10 | 5 | 5 |
| 21 | 5 | 5 | 5 | 5 |
| 22 | 5 | 5 | 10 | 5 |
| 23 | 5 | 5 | 5 | 5 |
| 24 | 10 | 10 | 5 | 5 |
| 25 | 5 | 5 | 5 | 5 |
| 26 | 5 | 5 | 5 | 5 |
| 27 | 5 | 10 | 5 | 10 |
| 28 | 5 | 5 | 5 | 5 |
| 29 | 5 | 5 | 5 | 5 |
| 30 | 5 | 5 | 5 | 5 |

| MIN \ SEC | 0 | 15 | 30 | 45 |
|---|---|---|---|---|
| 31 | 5 | 5 | 5 | 5 |
| 32 | 5 | 5 | 5 | 5 |
| 33 | 10 | 5 | 10 | 5 |
| 34 | 5 | 10 | 15 | 15 |
| 35 | 20 | 20 | 20 | 15 |
| 36 | 10 | 5 | 5 | 5 |
| 37 | 10 | 15 | 5 | 5 |
| 38 | 5 | 5 | 5 | 5 |
| 39 | 5 | 5 | 5 | 5 |
| 40 | 5 | 5 | 5 | 5 |
| 41 | 5 | 5 | 5 | 5 |
| 42 | 5 | 5 | 5 | 5 |
| 43 | 5 | 5 | 5 | 5 |
| 44 | 5 | 5 | 5 | 5 |
| 45 | 5 | 5 | 5 | 5 |
| 46 | 5 | 5 | 5 | 5 |
| 47 | 5 | 5 | 5 | 5 |
| 48 | 10 | 10 | 15 | 10 |
| 49 | 10 | 5 | 5 | 5 |
| 50 | 5 | 5 | 5 | 5 |
| 51 | 10 | 10 | 5 | 5 |
| 52 | 5 | 5 | 5 | 5 |
| 53 | 5 | 5 | 5 | 5 |
| 54 | 10 | 5 | 5 | 5 |
| 55 | 5 | 5 | 5 | 5 |
| 56 | 5 | 5 | 5 | 5 |
| 57 | 5 | 10 | 5 | 5 |
| 58 | 5 | 5 | 5 | 5 |
| 59 | 5 | 5 | 5 | 5 |
| 60 | 5 | 5 | 5 | 5 |

9.6

AVERAGE OPACITY FOR HIGHEST PERIOD | NUMBER OF READINGS ABOVE % WERE

RANGE OF OPACITY READINGS MINIMUM MAXIMUM

OBSERVER'S NAME (PRINT) F. Lee Garcia

OBSERVER'S SIGNATURE F. Lee Garcia DATE 6/10/05

ORGANIZATION STACS

CERTIFIED BY ETA DATE

VERIFIED BY DATE

B



Visible Emission Observation Form

SOURCE NAME: Rayonier

ADDRESS: Foot of Gum St.

CITY: Fernandina Beach | STATE: FL | ZIP:

PHONE: | SOURCE ID NUMBER:

PROCESS EQUIPMENT: B - Bark Boiler | OPERATING MODE:

CONTROL EQUIPMENT: Wet Scrubber | OPERATING MODE:

DESCRIBE EMISSION POINT: START White stack STOP ✓

HEIGHT ABOVE GROUND LEVEL: START ~175 STOP ✓ | HEIGHT RELATIVE TO OBSERVER: START 175' STOP ✓

DISTANCE FROM OBSERVER: START 800' STOP ✓ | DIRECTION FROM OBSERVER: START 260° STOP ✓

DESCRIBE EMISSIONS: START lofting plume STOP ✓

EMISSION COLOR: START black STOP ✓ | PLUME TYPE: CONTINUOUS ☒ FUGITIVE ☐ INTERMITTENT ☐

WATER DROPLETS PRESENT: NO ☐ YES ☒ | IF WATER DROPLET PLUME: ATTACHED ☒ DETACHED ☐

POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED: START ~50' above STOP ✓

DESCRIBE BACKGROUND: START Sky STOP ✓

BACKGROUND COLOR: START blue/white STOP ✓ | SKY CONDITIONS: START PC STOP ✓

WIND SPEED: START 4-7 STOP ✓ | WIND DIRECTION: START SE STOP ✓

AMBIENT TEMP: START 86 STOP 86 | WET BULB TEMP: 76 | RH, percent: 63

Source Layout Sketch — Draw North Arrow

X Emission Point

Sun ✧ Wind → Plume and Stack =

Observers Position

140°

Sun Location Line

OBSERVATION DATE: 6/9/05 | START TIME: 1108 | STOP TIME: 1208

| MIN \ SEC | 0 | 15 | 30 | 45 | MIN \ SEC | 0 | 15 | 30 | 45 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 5 | 5 | 5 | 5 | 31 | 5 | 5 | 5 | 5 |
| 2 | 5 | 10 | 10 | 5 | 32 | 5 | 5 | 5 | 5 |
| 3 | 5 | 5 | 10 | 5 | 33 | 5 | 10 | 5 | 10 |
| 4 | 5 | 5 | 5 | 5 | 34 | [illegible] | 5 | 5 | 5 |
| 5 | 5 | 5 | 5 | 5 | 35 | 5 | 5 | 5 | 5 |
| 6 | 5 | 5 | 10 | 5 | 36 | 5 | 10 | 5 | 10 |
| 7 | 5 | 10 | 5 | 10 | 37 | 10 | 10 | 5 | 10 |
| 8 | 5 | 10 | 15 | 15 | 38 | 5 | 5 | 5 | 5 |
| 9 | 10 | 5 | 5 | 5 | 39 | 5 | 5 | 5 | 5 |
| 10 | 10 | 15 | 10 | 5 | 40 | 5 | 5 | 5 | 5 |
| 11 | 5 | 5 | 5 | 5 | 41 | 5 | 10 | 5 | 5 |
| 12 | 5 | 5 | 5 | 5 | 42 | 5 | 5 | 5 | 5 |
| 13 | 5 | 10 | 10 | 10 | 43 | 5 | 5 | 10 | 5 |
| 14 | 5 | 10 | 5 | 10 | 44 | 10 | 5 | 5 | 5 |
| 15 | 10 | 10 | 10 | 5 | 45 | 5 | 5 | 5 | 5 |
| 16 | 5 | 5 | 5 | 5 | 46 | 5 | 5 | 5 | 5 |
| 17 | 5 | 10 | 5 | 10 | 47 | 5 | 5 | 10 | 10 |
| 18 | 10 | 5 | 10 | 10 | 48 | 5 | 5 | 5 | 5 |
| 19 | 10 | 10 | 5 | 10 | 49 | 5 | 5 | 5 | 5 |
| 20 | 5 | 5 | 5 | 5 | 50 | 5 | 5 | 10 | 5 |
| 21 | 5 | 5 | 5 | 10 | 51 | 5 | 10 | 5 | 10 |
| 22 | 5 | 10 | 10 | 5 | 52 | 10 | 10 | 10 | 10 |
| 23 | 5 | 5 | 5 | 5 | 53 | 5 | 5 | 10 | 5 |
| 24 | 5 | 5 | 5 | 5 | 54 | 5 | 5 | 5 | 5 |
| 26 | 5 | 10 | 10 | 10 | 55 | 5 | 5 | 5 | 10 |
| 26 | 10 | 15 | 5 | 5 | 56 | 5 | 5 | 10 | 5 |
| 27 | 5 | 10 | 10 | 5 | 57 | 5 | 5 | 10 | 10 |
| 28 | 10 | 5 | 5 | 5 | 58 | 5 | 5 | 5 | 5 |
| 29 | 5 | 10 | 5 | 5 | 59 | 10 | 5 | 5 | 5 |
| 30 | 5 | 10 | 10 | 5 | 60 | 5 | 5 | 5 | 5 |

7.7

36

AVERAGE OPACITY FOR HIGHEST PERIOD: | NUMBER OF READINGS ABOVE % WERE:

RANGE OF OPACITY READINGS: MINIMUM | MAXIMUM

OBSERVER'S NAME (PRINT): F. Lee Garcia

OBSERVER'S SIGNATURE: F. Lee Garcia | DATE: 6/9/05

ORGANIZATION: STACS

CERTIFIED BY: ETA | DATE:

VERIFIED BY: | DATE:

COMMENTS:

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS

SIGNATURE

TITLE | DATE

SRB



## Visible Emission Observation Form

**SOURCE NAME:** Raynnier

**ADDRESS:** Foot of Gum St.

**CITY:** Fernandina Beach **STATE:** FL **ZIP:**

**PHONE:**

**SOURCE ID NUMBER:**

**PROCESS EQUIPMENT:** Sulfite Recovery Boiler **OPERATING MODE:**

**CONTROL EQUIPMENT:** Brinks Scrubbers **OPERATING MODE:**

**DESCRIBE EMISSION POINT**
START White Stack STOP ✓

**HEIGHT ABOVE GROUND LEVEL**
START ~275' STOP ✓

**HEIGHT RELATIVE TO OBSERVER**
START 275' STOP ✓

**DISTANCE FROM OBSERVER**
START 1000' STOP ✓

**DIRECTION FROM OBSERVER**
START 265° STOP ✓

**DESCRIBE EMISSIONS**
START lofting STOP ✓

**EMISSION COLOR**
START white STOP ✓

**PLUME TYPE:** CONTINUOUS ☒ FUGITIVE ☐ INTERMITTENT ☐

**WATER DROPLETS PRESENT:** NO ☐ YES ☒

**IF WATER DROPLET PLUME:** ATTACHED ☒ DETACHED ☐

**POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED**
START ~50' above STOP ✓

**DESCRIBE BACKGROUND**
START Sky STOP ✓

**BACKGROUND COLOR**
START blue/white STOP ✓

**SKY CONDITIONS**
START PC STOP ✓

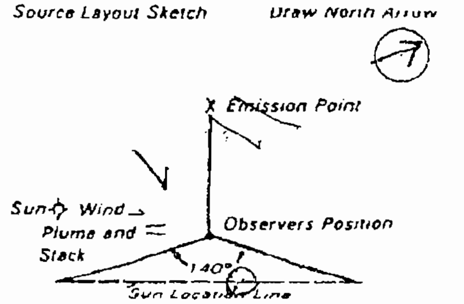
**WIND SPEED**
START 4~7 STOP ✓

**WIND DIRECTION**
START SE STOP ✓

**AMBIENT TEMP**
START 83 STOP 83

**WET BULB TEMP:** 79 **RH, percent:**

Source Layout Sketch — Draw North Arrow




**OBSERVATION DATE:** 6/8/05 **START TIME:** 0900 **STOP TIME:**

| MIN \ SEC | 0 | 15 | 30 | 45 | MIN \ SEC | 0 | 15 | 30 | 45 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 10 | 10 | 15 | 15 | 31 | 15 | 15 | 15 | 20 |
| 2 | 10 | 15 | 10 | 10 | 32 | 15 | 20 | 15 | 15 |
| 3 | 15 | 15 | 15 | 10 | 33 | 15 | 15 | 10 | 15 |
| 4 | 10 | 10 | 15 | 15 | 34 | 15 | 15 | 15 | 15 |
| 5 | 20 | 20 | 20 | 20 | 35 | 20 | 15 | 20 | 20 |
| 6 | 20 | 15 | 15 | 15 | 36 | 20 | 20 | 20 | 15 |
| 7 | 20 | 20 | 15 | 15 | 37 | 15 | 20 | 20 | 20 |
| 8 | 15 | 15 | 20 | 20 | 38 | 20 | 20 | 15 | 20 |
| 9 | 20 | 20 | 20 | 15 | 39 | 20 | 20 | 15 | 15 |
| 10 | 15 | 15 | 15 | 15 | 40 | 15 | 20 | 20 | 20 |
| 11 | 20 | 15 | 15 | 15 | 41 | 15 | 15 | 20 | 20 |
| 12 | 20 | 15 | 15 | 15 | 42 | 20 | 20 | 20 | 15 |
| 13 | 20 | 15 | 15 | 15 | 43 | 20 | 20 | 20 | 20 |
| 14 | 15 | 15 | 15 | 20 | 44 | 20 | 15 | 20 | 20 |
| 15 | 20 | 20 | 15 | 15 | 45 | 15 | 15 | 20 | 20 |
| 16 | 15 | 15 | 20 | 15 | 46 | 20 | 20 | 20 | 20 |
| 17 | 15 | 10 | 15 | 15 | 47 | 20 | 15 | 15 | 20 |
| 18 | 15 | 10 | 10 | 15 | 48 | 20 | 20 | 20 | 20 |
| 19 | 15 | 15 | 15 | 15 | 49 | 15 | 15 | 20 | 20 |
| 20 | 15 | 15 | 20 | 20 | 50 | 20 | 15 | 15 | 20 |
| 21 | 15 | 15 | 15 | 20 | 51 | 20 | 20 | 20 | 20 |
| 22 | 20 | 20 | 15 | 15 | 52 | 20 | 20 | 20 | 15 |
| 23 | 15 | 15 | 15 | 15 | 53 | 20 | 20 | 20 | 20 |
| 24 | 15 | 20 | 15 | 20 | 54 | 20 | 20 | 20 | 20 |
| 25 | 20 | 15 | 15 | 15 | 55 | 20 | 20 | 20 | 20 |
| 26 | 15 | 20 | 20 | 15 | 56 | 20 | 15 | 20 | 20 |
| 27 | 15 | 15 | 15 | 20 | 57 | 20 | 20 | 20 | 20 |
| 28 | 15 | 20 | 20 | 20 | 58 | 20 | 20 | 15 | 20 |
| 29 | 15 | 20 | 20 | 20 | 59 | 20 | 20 | 20 | 15 |
| 30 | 15 | 15 | 20 | 15 | 60 | 20 | 20 | 15 | 20 |

19.6

**AVERAGE OPACITY FOR HIGHEST PERIOD:**

**NUMBER OF READINGS ABOVE % WERE:**

**RANGE OF OPACITY READINGS** MINIMUM MAXIMUM

**OBSERVER'S NAME (PRINT):** F. Lee Garcia

**OBSERVER'S SIGNATURE:** F. Lee Garcia **DATE:** 6/8/05

**ORGANIZATION:** STACS

**CERTIFIED BY:** ETA **DATE:**

**VERIFIED BY:** **DATE:**

**COMMENTS:**

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS
SIGNATURE
TITLE DATE

# APPENDIX C
# CALIBRATION DATA

Source Testing And Consulting Services
Meter Box Calibration

Calibration Date: 8/31/2004
Meter Box: A-7
Technician: MAD

| Orifice ID | Y Calibration | Delta H @ Cal. | Vac |
|---|---|---|---|
| 40 | pass | pass | pass |
| 73 | pass | pass | pass |
| 48 | pass | pass | pass |
| 55 | pass | pass | pass |
| 63 | pass | pass | pass |

PART 1: Orifice Calibration

Calibration Orifice Set: D1 Critical Vacuum: 13.9

Barometric Pressure ( in. Hg ): 29.890

Collected Data

| Orifice ID | Run # | Delta H | Initial Meter Volume ( cu ft ) | Final Meter Volume ( cu ft ) | Init Meter Temp ( F ) | Final Meter Temp ( F ) | Init Amb Temp ( F ) | Final Amb Temp ( F ) | Run Time min | sec | K Factor | Vac |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 40 | 1 | 0.27 | 40.806 | 46.422 | 81.00 | 81.00 | 80.00 | 81.00 | 17 | 30 | 0.2401 | 24 |
| 40 | 2 | 0.27 | 46.422 | 52.038 | 81.00 | 81.00 | 80.00 | 80.00 | 17 | 30 | 0.2401 | 24 |
| 73 | 1 | 3.50 | 52.038 | 62.851 | 81.00 | 81.00 | 80.00 | 80.00 | 10 | 0 | 0.8166 | 15 |
| 73 | 2 | 3.50 | 62.851 | 72.048 | 81.00 | 82.00 | 80.00 | 80.00 | 8 | 30 | 0.8166 | 15 |
| 48 | 1 | 0.62 | 72.048 | 77.873 | 82.00 | 81.00 | 80.00 | 80.00 | 12 | 30 | 0.3483 | 22 |
| 48 | 2 | 0.62 | 77.873 | 82.541 | 81.00 | 81.00 | 80.00 | 79.00 | 10 | 0 | 0.3483 | 22 |
| 55 | 1 | 1.10 | 82.541 | 89.594 | 81.00 | 81.00 | 79.00 | 79.00 | 11 | 30 | 0.4604 | 21 |
| 55 | 2 | 1.10 | 89.594 | 95.732 | 81.00 | 80.00 | 79.00 | 79.00 | 10 | 0 | 0.4604 | 21 |
| 63 | 1 | 1.90 | 95.732 | 103.619 | 80.00 | 81.00 | 79.00 | 79.00 | 10 | 0 | 0.5935 | 19 |
| 63 | 2 | 1.90 | 103.619 | 109.151 | 81.00 | 81.00 | 79.00 | 79.00 | 7 | 0 | 0.5935 | 19 |

Calculated Data

| Orifice ID | Run # | Meter Volume ( cu ft ) | Meter Volume ( std cu ft ) | Corrected Meter Volume ( std cu ft ) | Ave Meter Temp ( F ) | Ave Amb Temp ( F ) | Y | Delta H @ |
|---|---|---|---|---|---|---|---|---|
| 40 | 1 | 5.616 | 5.47700 | 5.40205 | 81 | 80.5 | 0.9863 | 1.5560 |
| 40 | 2 | 5.616 | 5.47700 | 5.40455 | 81 | 80 | 0.9868 | 1.5546 |
| | AVE | | | | | | 0.9865 | 1.5553 |
| 73 | 1 | 10.813 | 10.62911 | 10.50361 | 81 | 80 | 0.9882 | 1.7699 |
| 73 | 2 | 9.197 | 9.03224 | 8.92806 | 81.5 | 80 | 0.9885 | 1.7683 |
| | AVE | | | | | | 0.9883 | 1.7691 |
| 48 | 1 | 5.825 | 5.68046 | 5.60006 | 81.5 | 80 | 0.9858 | 1.6977 |
| 48 | 2 | 4.668 | 4.55638 | 4.48212 | 81 | 79.5 | 0.9837 | 1.6977 |
| | AVE | | | | | | 0.9848 | 1.6977 |
| 55 | 1 | 7.053 | 6.89247 | 6.81655 | 81 | 79 | 0.9890 | 1.7263 |
| 55 | 2 | 6.138 | 6.00384 | 5.92744 | 80.5 | 79 | 0.9873 | 1.7279 |
| | AVE | | | | | | 0.9881 | 1.7271 |
| 63 | 1 | 7.887 | 7.72976 | 7.64104 | 80.5 | 79 | 0.9885 | 1.8031 |
| 63 | 2 | 5.532 | 5.41670 | 5.34873 | 81 | 79 | 0.9875 | 1.8014 |
| | AVE | | | | | | 0.9880 | 1.8023 |
| | | | | Average for All Runs | | | 0.9872 | 1.7103 |

Source Testing And Consulting Services
Meter Box Calibration

Calibration Date: 8/31/2004
Meter Box: A-7
Technician: MAD

PART 2: Thermocouple Calibration

T/C Calibrator Make: Tegam T/C Calibrator Model: 840A

| Calibrator Output ( F ) | Meter Reading ( F ) | Error ( F ) | Allowable Error ( F ) | Result |
|---|---|---|---|---|
| 0.0 | 0 | 0 | 9.24 | pass |
| 32.0 | 30 | -2 | 9.88 | pass |
| 70.0 | 67 | -3 | 10.64 | pass |
| 100.0 | 97 | -3 | 11.24 | pass |
| 200.0 | 199 | -1 | 13.24 | pass |
| 500.0 | 498 | -2 | 19.24 | pass |
| 1200.0 | 1200 | 0 | 33.24 | pass |
| 1995.0 | 1998 | 3 | 49.24 | pass |

Source Testing And Consulting Services
Meter Box Calibration

| Calibration Date: 9/1/2004 | Orifice ID | Y Calibration | Delta H @ Cal. | Vac |
|---|---|---|---|---|
| Meter Box: A1 | 73 | pass | pass | pass |
| Technician: MAD | 40 | pass | pass | pass |
| | 48 | pass | pass | pass |
| | 55 | pass | pass | pass |
| | 63 | pass | pass | pass |

PART 1: Orifice Calibration

Calibration Orifice Set: Critical Vacuum: 13.9

Barometric Pressure ( in. Hg ): 29.920

Collected Data

| Orifice ID | Run # | Delta H | Initial Meter Volume ( cu ft ) | Final Meter Volume ( cu ft ) | Init Meter Temp ( F ) | Final Meter Temp ( F ) | Init Amb Temp ( F ) | Final Amb Temp ( F ) | Run Time min | Run Time sec | K Factor | Vac |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73 | 1 | 3.50 | 72.102 | 78.396 | 78.00 | 78.00 | 76.00 | 77.00 | 6 | 0 | 0.8166 | 18 |
| 73 | 2 | 3.50 | 78.396 | 84.687 | 78.00 | 79.00 | 77.00 | 77.00 | 6 | 0 | 0.8166 | 18 |
| 40 | 1 | 0.28 | 84.687 | 89.804 | 79.00 | 79.00 | 76.00 | 77.00 | 16 | 30 | 0.2401 | 24 |
| 40 | 2 | 0.28 | 89.804 | 94.780 | 79.00 | 79.00 | 77.00 | 77.00 | 16 | 0 | 0.2401 | 24 |
| 48 | 1 | 0.62 | 94.795 | 99.319 | 78.00 | 78.00 | 76.00 | 77.00 | 10 | 0 | 0.3483 | 23 |
| 48 | 2 | 0.62 | 99.319 | 103.840 | 78.00 | 78.00 | 77.00 | 77.00 | 10 | 0 | 0.3483 | 23 |
| 55 | 1 | 1.10 | 103.840 | 109.210 | 79.00 | 79.00 | 77.00 | 77.00 | 9 | 0 | 0.4604 | 21 |
| 55 | 2 | 1.10 | 109.210 | 115.174 | 79.00 | 79.00 | 77.00 | 77.00 | 10 | 0 | 0.4604 | 21 |
| 63 | 1 | 1.85 | 115.174 | 121.320 | 79.00 | 80.00 | 78.00 | 78.00 | 8 | 0 | 0.5935 | 20 |
| 63 | 2 | 1.85 | 121.320 | 127.476 | 80.00 | 80.00 | 78.00 | 78.00 | 8 | 0 | 0.5935 | 20 |

Calculated Data

| Orifice ID | Run # | Meter Volume ( cu ft ) | Meter Volume ( std cu ft ) | Corrected Meter Volume ( std cu ft ) | Ave Meter Temp ( F ) | Ave Amb Temp ( F ) | Y | Delta H @ |
|---|---|---|---|---|---|---|---|---|
| 73 | 1 | 6.294 | 6.22765 | 6.32903 | 78 | 76.5 | 1.0163 | 1.7665 |
| 73 | 2 | 6.291 | 6.21890 | 6.32609 | 78.5 | 77 | 1.0172 | 1.7665 |
| | AVE | | | | | | 1.0168 | 1.7665 |
| 40 | 1 | 5.117 | 5.01401 | 5.11744 | 79 | 76.5 | 1.0206 | 1.6061 |
| 40 | 2 | 4.976 | 4.87585 | 4.96006 | 79 | 77 | 1.0173 | 1.6076 |
| | AVE | | | | | | 1.0189 | 1.6069 |
| 48 | 1 | 4.524 | 4.44490 | 4.49915 | 78 | 76.5 | 1.0122 | 1.6960 |
| 48 | 2 | 4.521 | 4.44195 | 4.49705 | 78 | 77 | 1.0124 | 1.6976 |
| | AVE | | | | | | 1.0123 | 1.6968 |
| 55 | 1 | 5.37 | 5.27252 | 5.34998 | 79 | 77 | 1.0147 | 1.7246 |
| 55 | 2 | 5.964 | 5.85574 | 5.94442 | 79 | 77 | 1.0151 | 1.7246 |
| | AVE | | | | | | 1.0149 | 1.7246 |
| 63 | 1 | 6.146 | 6.03992 | 6.12465 | 79.5 | 78 | 1.0140 | 1.7534 |
| 63 | 2 | 6.156 | 6.04415 | 6.12465 | 80 | 78 | 1.0133 | 1.7518 |
| | AVE | | | | | | 1.0137 | 1.7526 |
| | | | | | Average for All Runs | | 1.0153 | 1.7095 |

Source Testing And Consulting Services
Meter Box Calibration

Calibration Date: 9/1/2004

Meter Box: A1

Technician: MAD

PART 2: Thermocouple Calibration

T/C Calibrator Make: Tegam T/C Calibrator Model: 840A

| Calibrator Output ( F ) | Meter Reading ( F ) | Error ( F ) | Allowable Error ( F ) | Result |
|---|---|---|---|---|
| 0.0 | 0 | 0 | 9.24 | pass |
| 32.0 | 30 | -2 | 9.88 | pass |
| 70.0 | 68 | -2 | 10.64 | pass |
| 100.0 | 98 | -2 | 11.24 | pass |
| 200.0 | 198 | -2 | 13.24 | pass |
| 500.0 | 497 | -3 | 19.24 | pass |
| 1200.0 | 1200 | 0 | 33.24 | pass |
| 1995.0 | 1996 | 1 | 49.24 | pass |

# Type S Pitot Tube Inspection Data Form

Source Testing and Consulting Services, Inc
1100 Purple Glory Drive
Apex, NC 27502
PH(919)-367-2200/FAX(919)-367-2222

| | | | |
|---|---|---|---|
| **Pitot Tube I.D. #** | P006 | **Date** | 06-Jun-05 |
| **Location** | Rayonier | **Tech.** | JBP |

**Quick Connects Attached & Leak Free?** y
**Pitot Tube Assembly Level?** y

| Parameter | Value | Acceptance Criteria | Results | Meets Criteria? |
|---|---|---|---|---|
| $\alpha_1$ = | 0 ° | $\alpha_1$ < 10 ° | 0 ° | TRUE |
| $\alpha_2$ = | 1 ° | $\alpha_2$ < 10 ° | 1 ° | TRUE |
| $\beta_1$ = | 0 ° | $\beta_1$ < 5 ° | 0 ° | TRUE |
| $\beta_2$ = | 2 ° | $\beta_2$ < 5 ° | 2 ° | TRUE |
| $\gamma$ = | 0 ° | | | |
| $\theta$ = | 0 ° | | | |
| A = | 0.729 " | | | |
| z = A sin $\gamma$ = | 0.000 " | z < .125 in. | 0.000 " | TRUE |
| w = A sin $\theta$ = | 0.000 " | w < 0.03125 in. | 0.000 " | TRUE |
| $P_A$ = | 0.364 " | 1.05 Dt < $P_A$ < 1.5 Dt | 0.364 " | TRUE |
| $P_b$ = | 0.362 " | 1.05 Dt < $P_b$ < 1.5 Dt | 0.362 " | TRUE |
| $D_t$ = | 0.260 " | 0.18750" <= Dt <= 0.3750" | 0.260 " | TRUE |
| | | $P_A$ = $P_b$ +/- 0.0630" | 0.002 " | TRUE |

**Pitot Tube Acceptable ?........................................................................................ TRUE**

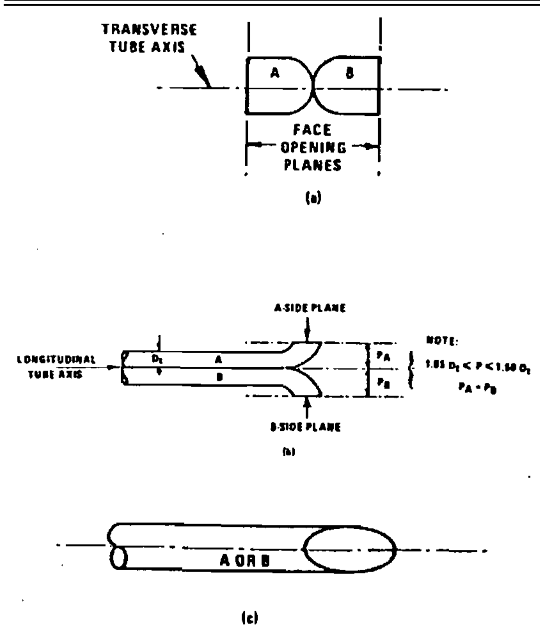



Figure 2-2. Properly constructed Type S pitot tube, shown in: (a) end view; face opening planes perpendicular to transverse axis; (b) top view; face opening planes parallel to longitudinal axis; (c) side view; both legs of equal length and centerlines coincident, when viewed from both sides. Baseline coefficient values of 0.84 may be assigned to pitot tubes constructed this way.

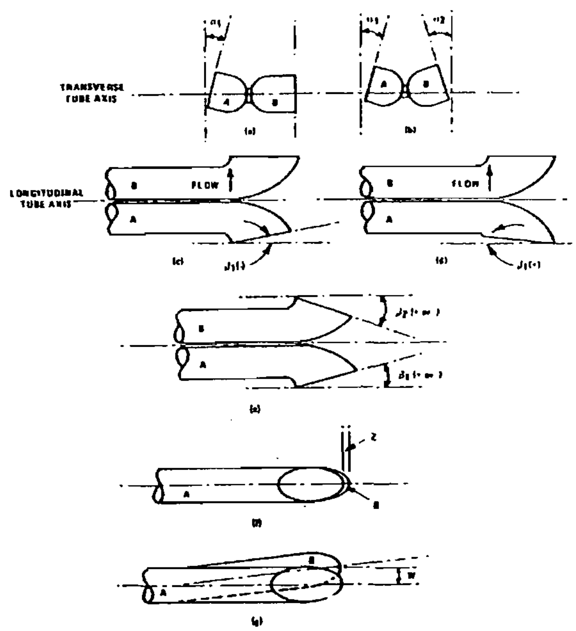


Figure 2-3. Types of face-opening misalignment that can result from field use or improper construction of Type S pitot tubes. These will not affect the baseline value of Cp(s) so long as α1 and α2 10°, β1 and β2 5°, z 0.32 cm (1/8 in.) and w 0.08 cm (1/32 in.) (citation 11 in Section 6).

# Type S Pitot Tube Inspection Data Form

**Source Testing and Consulting Services, Inc**
**1100 Purple Glory Drive**
**Apex, NC 27502**
**PH(919)-367-2200/FAX(919)-367-2222**

| | | | |
|---|---|---|---|
| **Pitot Tube I.D. #** | P009 | **Date** | 14-Aug-04 |
| **Location** | AEP | **Tech.** | MAD |

**Quick Connects Attached & Leak Free?** y
**Pitot Tube Assembly Level?** y

| Parameter | Value | Acceptance Criteria | Results | Meets Criteria? |
|---|---|---|---|---|
| $\alpha_1$ = | 1 ° | $\alpha_1$ < 10 ° | 1 ° | TRUE |
| $\alpha_2$ = | 2 ° | $\alpha_2$ < 10 ° | 2 ° | TRUE |
| $\beta_1$ = | 0 ° | $\beta_1$ < 5 ° | 0 ° | TRUE |
| $\beta_2$ = | 1 ° | $\beta_2$ < 5 ° | 1 ° | TRUE |
| $\gamma$ = | 1 ° | | | |
| $\theta$ = | 0 ° | | | |
| A = | 0.743 " | | | |
| z = A sin $\gamma$ = | 0.013 " | z < .125 in. | 0.013 " | TRUE |
| w = A sin $\theta$ = | 0.000 " | w < 0.03125 in. | 0.000 " | TRUE |
| $P_A$ = | 0.341 " | 1.05 Dt < $P_A$ < 1.5 Dt | 0.341 " | TRUE |
| $P_b$ = | 0.374 " | 1.05 Dt < $P_b$ < 1.5 Dt | 0.374 " | TRUE |
| $D_t$ = | 0.255 " | 0.18750" <= Dt <= 0.3750" | 0.255 " | TRUE |
| | | $P_A = P_b$ +/- 0.0630" | 0.033 " | TRUE |

**Pitot Tube Acceptable ?** ........................................................................................ **TRUE**

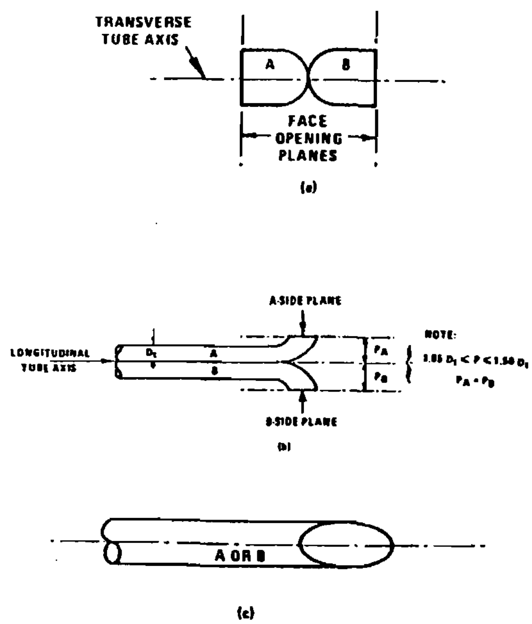



Figure 2-2. Properly constructed Type S pitot tube, shown in: (a) end view; face opening planes perpendicular to transverse axis; (b) top view; face opening planes parallel to longitudinal axis; (c) side view; both legs of equal length and centerlines coincident, when viewed from both sides. Baseline coefficient values of 0.84 may be assigned to pitot tubes constructed this way.

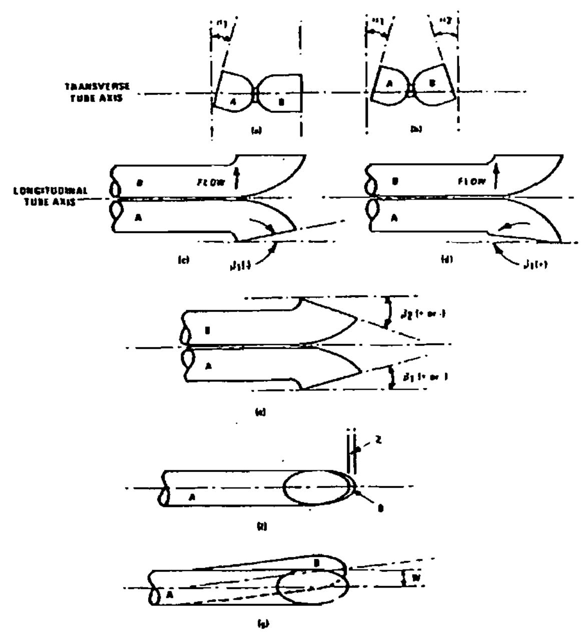



Figure 2-3. Types of face-opening misalignment that can result from field use or improper construction of Type S pitot tubes. These will not affect the baseline value of Cp(s) so long as α1 and α2 10°, β1 and β2 5°, z 0.32 cm (1/8 in.) and w 0.08 cm (1/32 in.) (citation 11 in Section 6).

## POST TEST METER CALIBRATION DATA - EMC APPROVED ALTERNATIVE METHOD (ALT - 009)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Plant:** | Rayonier | **Location:** | Scrubber A | | Run # | 1-A | 2-A | 3-A | AVERAGE |
| **Condition:** | Normal | **Meter #:** | **A-1** | | Date: | 6/10/05 | 6/10/05 | 6/10/05 | |
| **Unit:** | Scrubber A | **Method:** | Method 5 | | Start Time: | 9:50 | 12:35 | 15:08 | |
| **Parameter** | | | | **Units** | Stop Time: | 11:23 | 13:37 | 16:09 | |
| Sampling Time | | | | min. | | 60.00 | 60.00 | 60.00 | **60.0** |
| **GAS METER DATA:** | | | | | | | | | |
| Average Meter Differential Pressure | | | | in. H2O | | 1.59 | 1.47 | 1.42 | **1.49** |
| Absolute Meter Pressure | | | | in. Hg | | 29.97 | 29.91 | 29.90 | **29.93** |
| Average Meter Temperature | | | | degrees F | | 85.4375 | 87 | 85.13 | **85.85** |
| Metered Dry Sample Gas Volume | | | | dcf | | 42.559 | 42 | 39.44 | **41.33** |
| Gas Molecular Weight, Dry Basis | | | | lb/lb-mole | | 30.00 | 29.94 | 29.80 | **29.91** |
| **Pre Test Calibration Factors** | | | | | | | | | |
| DeltaH@ | | | | in. H2O | | 1.7095 | 1.7095 | 1.7095 | **1.710** |
| Dry Gas Meter Correction Factor (gamma) | | | | Dimensionless | | 1.0153 | 1.0153 | 1.0153 | **1.0153** |
| **Post Test Data** | | | | | | | | | |
| Calculated Meter Correction Factor (Yqa) | | | | Dimensionless | | **1.0186** | **0.9958** | **1.0422** | **1.0189** |
| Difference (Post Test and Pretest Y - Maximum Allowed 5%) | | | | % | | **0.33%** | **-1.92%** | **2.65%** | **0.35%** |

## POST TEST METER CALIBRATION DATA - EMC APPROVED ALTERNATIVE METHOD (ALT - 009)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Plant:** | Rayonier | **Location:** | Scrubber B | | Run # | 1-B | 2-B | 3-B | AVERAGE |
| **Condition:** | Normal | **Meter #:** | **A-7** | | Date: | 6/9/05 | 6/9/05 | 6/9/05 | |
| **Unit:** | Scrubber B | **Method:** | Method 5 | | Start Time: | 11:08 | 13:00 | 14:51 | |
| **Parameter** | | | | **Units** | Stop Time: | 12:14 | 14:02 | 15:52 | |
| Sampling Time | | | | min. | | 60.00 | 60.00 | 60.00 | **60.0** |
| **GAS METER DATA:** | | | | | | | | | |
| Average Meter Differential Pressure | | | | in. H2O | | 1.21 | 1.1625 | 1.14 | **1.17** |
| Absolute Meter Pressure | | | | in. Hg | | 29.89 | 29.89 | 29.88 | **29.89** |
| Average Meter Temperature | | | | degrees F | | 88.46 | 86.5 | 84.79 | **86.58** |
| Metered Dry Sample Gas Volume | | | | dcf | | 37.518 | 36.864 | 36.67 | **37.02** |
| Gas Molecular Weight, Dry Basis | | | | lb/lb-mole | | 29.82 | 29.84 | 29.74 | **29.80** |
| **Pre Test Calibration Factors** | | | | | | | | | |
| DeltaH@ | | | | in. H2O | | 1.7103 | 1.7103 | 1.7103 | **1.710** |
| Dry Gas Meter Correction Factor (gamma) | | | | Dimensionless | | 0.9872 | 0.9872 | 0.9872 | **0.9872** |
| **Post Test Data** | | | | | | | | | |
| Calculated Meter Correction Factor (Yqa) | | | | Dimensionless | | **1.0148** | **1.0104** | **1.0038** | **1.0097** |
| Difference (Post Test and Pretest Y - Maximum Allowed 5%) | | | | % | | **2.80%** | **2.35%** | **1.68%** | **2.28%** |

## POST TEST METER CALIBRATION DATA - EMC APPROVED ALTERNATIVE METHOD (ALT - 009)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Plant:** | Rayonier | **Location:** | ulfite Recovery Boiler | | Run # | 1 | 2 | 3 | AVERAGE |
| **Condition:** | Normal | **Meter #:** | A-7 | | Date: | 6/8/05 | 6/8/05 | 6/8/05 | |
| **Unit:** | Sulfite Recovery Boilei | **Method:** | Method 5 | | Start Time: | 9:00 | 11:05 | 12:48 | |
| **Parameter** | | | | **Units** | Stop Time: | 10:05 | 12:08 | 13:50 | |
| Sampling Time | | | | min. | | 60.00 | 60.00 | 60.00 | **60.0** |
| **GAS METER DATA:** | | | | | | | | | |
| Average Meter Differential Pressure | | | | in. H2O | | 2.72 | 3.04 | 3.11 | **2.96** |
| Absolute Meter Pressure | | | | in. Hg | | 29.85 | 29.87 | 29.88 | **29.87** |
| Average Meter Temperature | | | | degrees F | | 83.00 | 84.83 | 84.50 | **84.11** |
| Metered Dry Sample Gas Volume | | | | dcf | | 54.558 | 58.257 | 59.625 | **57.48** |
| Gas Molecular Weight, Dry Basis | | | | lb/lb-mole | | 30.50 | 30.53 | 30.47 | **30.50** |
| **Pre Test Calibration Factors** | | | | | | | | | |
| DeltaH@ | | | | in. H2O | | 1.7103 | 1.7103 | 1.7103 | **1.710** |
| Dry Gas Meter Correction Factor (gamma) | | | | Dimensionless | | 0.9872 | 0.9872 | 0.9872 | **0.9872** |
| **Post Test Data** | | | | | | | | | |
| Calculated Meter Correction Factor (Yqa) | | | | Dimensionless | | **1.0297** | **1.0212** | **1.0093** | **1.0200** |
| Difference (Post Test and Pretest Y - Maximum Allowed 5%) | | | | % | | **4.30%** | **3.44%** | **2.24%** | **3.33%** |

# VISIBLE EMISSIONS EVALUATOR

This is to certify that

*Fernando Garcia*

met the specifications of Federal Reference Method 9 and qualified as a visible emissions evaluator. Maximum deviation on white and black smoke did not exceed 7.5% opacity and no single error exceeding 15% opacity was incurred during the certification test conducted by Eastern Technical Associates of Raleigh, North Carolina. This certificate is valid for six months from date of issue.

| 326848 | Raleigh, North Carolina | March 4, 2005 |
|---|---|---|
| Certificate Number | Location | Date of Issue |

Thomas Hoil
President

Michael W. Lunsford
Director of Training

# APPENDIX D
# PROCESS DATA

**Rayonier**

**Fernandina Mill**

**Power Boilers Scrubber Test**

*Power Boiler Scrubber* "A"
*Date* 6/10/2005
*Run #* *A #* 1

| | Start of Test hours | min | End of Test hours | min | Totals min | Time Corrected | |
|---|---|---|---|---|---|---|---|
| *Time* | 9 | 50 | 11 | 23 | 93 | 0.64516 | |
| ***Boiler No. 1*** | | | | | | | |
| *Steam Flow Integrator (x 1000)* | 282.8 | | 435.6 | | 152800 | 98580.6 | lb/hr |
| *Steam Temperature (° F)* | 757.9 | | 787.3 | | 772.6 | | |
| *Drum Pressure (psig.)* | 435.5 | | 351.4 | | 393.45 | | |
| *Oil Flow Intergrator (bbls.)* | 62.6 | | 91.7 | | 29.1 | 789 | gal/hr |
| *Steam Flow (lb/hr x 1000)* | 118.2 | | 104.6 | | 111.4 | | |
| *Oil Flow (gpm)* | 14.4 | | 13.2 | | 13.8 | | |
| ***Boiler No. 2*** | | | | | | | |
| *Steam Flow Integrator (x 1000)* | 242.7 | | 395.5 | | 152800 | 98580.6 | lb/hr |
| *Steam Temperature (° F)* | 695.4 | | 716.7 | | 706.05 | | |
| *Drum Pressure (psig.)* | 418.6 | | 348.3 | | 383.45 | | |
| *Oil Flow Intergrator (bbls.)* | 9 | | 9 | | 0 | 0 | gal/hr |
| *Steam Flow (lb/hr x 1000)* | 84 | | 107.9 | | 95950 | | |
| *Oil Flow (gpm)* | 0 | | 0 | | 0 | 0 | gal/hr |
| ***Bark Integrator*** | 67.5 | | 111.3 | | 43.8 | 28 | wet/tons/hr |
| *Bark to Boiler:* Num.(s) 2 And / or 3 | | | | | | | |
| *Scrubber "A" pH* | 5.2 | | 5.4 | | 5.3 | | |

**Rayonier**

**Fernandina Mill**

**Power Boilers Scrubber Test**

*Power Boiler Scrubber* "A"
*Date* 6/10/2005
*Run #* 2

| | Start of Test | | End of Test | | Totals | Time | |
|---|---|---|---|---|---|---|---|
| | hours | min | hours | min | min | Corrected | |
| *Time* | 12 | 35 | 13 | 39 | 64 | 0.9375 | |
| ***Boiler No. 1*** | | | | | | | |
| *Steam Flow Integrator (x 1000)* | 515.6 | | 629.1 | | 113500 | 106406 | lb/hr |
| *Steam Temperature (° F)* | 773.5 | | 778.9 | | 776.2 | | |
| *Drum Pressure (psig.)* | 441.2 | | 330.1 | | 385.65 | | |
| *Oil Flow Intergrator (bbls.)* | 109.9 | | 130.7 | | 20.8 | 819 | gal/hr |
| *Steam Flow (lb/hr x 1000)* | 108.9 | | 110 | | 109.45 | | |
| *Oil Flow (gpm)* | 15.3 | | 12.9 | | 14.1 | | |
| ***Boiler No. 2*** | | | | | | | |
| *Steam Flow Integrator (x 1000)* | 496.9 | | 618.7 | | 121800 | 114188 | lb/hr |
| *Steam Temperature (° F)* | 699.8 | | 701.3 | | 700.55 | | |
| *Drum Pressure (psig.)* | 439.8 | | 325 | | 382.4 | | |
| *Oil Flow Intergrator (bbls.)* | 11.8 | | 15.3 | | 3.5 | 138 | gal/hr |
| *Steam Flow (lb/hr x 1000)* | 116.3 | | 107.1 | | 111700 | | |
| *Oil Flow (gpm)* | 2.5 | | 0 | | 1.25 | 75 | gal/hr |
| ***Bark Integrator*** | 146.8 | | 177.2 | | 30.4 | 29 | wet/tons/hr |
| *Bark to Boiler:* | Num.(s) 2 And / or 3 | | | | | | |
| *Scrubber "A" pH* | 5.3 | | 5.4 | | 5.4 | | |

## Rayonier

### Fernandina Mill

**Power Boilers Scrubber Test**

| | |
|---|---|
| *Power Boiler Scrubber* | "A" |
| *Date* | 6/10/2005 |
| *Run #* | 3 |

| | Start of Test hours | min | End of Test hours | min | Totals min | Time Corrected | |
|---|---|---|---|---|---|---|---|
| *Time* | 3 | 07 | 4 | 09 | 62 | 0.96774 | |
| **Boiler No. 1** | | | | | | | |
| *Steam Flow Integrator (x 1000)* | 746.5 | | 859.1 | | 112600 | 108968 | lb/hr |
| *Steam Temperature (° F)* | 766.8 | | 777.5 | | 772.15 | | |
| *Drum Pressure (psig.)* | 408.3 | | 314.3 | | 361.3 | | |
| *Oil Flow Intergrator (bbls.)* | 156.7 | | 176.4 | | 19.7 | 801 | gal/hr |
| *Steam Flow (lb/hr x 1000)* | 111.7 | | 95.4 | | 103.55 | | |
| *Oil Flow (gpm)* | 14 | | 12.7 | | 13.35 | | |
| **Boiler No. 2** | | | | | | | |
| *Steam Flow Integrator (x 1000)* | 721.1 | | 850 | | 128900 | 124742 | lb/hr |
| *Steam Temperature (° F)* | 678.7 | | 698.8 | | 688.75 | | |
| *Drum Pressure (psig.)* | 401.6 | | 310.2 | | 355.9 | | |
| *Oil Flow Intergrator (bbls.)* | 18.1 | | 23.5 | | 5.4 | 219 | gal/hr |
| *Steam Flow (lb/hr x 1000)* | 106.2 | | 98.2 | | 102200 | | |
| *Oil Flow (gpm)* | 4.5 | | 2.5 | | 3.5 | 210 | gal/hr |
| ***Bark Integrator*** | 206.8 | | 225.5 | | 18.7 | 18 | wet/tons/hr |
| *Bark to Boiler:* Num.(s) 2 And / or 3 | | | | | | | |
| *Scrubber "A" pH* | 4.9 | | 5.0 | | 5.0 | | |

**Rayonier**

**Fernandina Mill**

**"A" SCRUBBER STACK TEST ANALYSIS** for 10-Jun-05

**Steam Output from No. 1 & No. 2 Power Boilers**

| Run Number | Steam Production [1000 lb./hr. of 1000 BTU/lb. Steam] Power Boiler No. 1 | Power Boiler No. 2 | Total |
|---|---|---|---|
| 1 | 99 | 99 | 197 |
| Average | 99 | 99 | 197 |
| Capacity | 120 | 120 | 240 |

A Scrubber Actual Total % of Capacity = 82%

**Oil Input to Boilers**

| Run Number | Power Boiler No. 1 Gal. Oil | Test Min. | BTU/gal | MMBTU/hr from Oil | Power Boiler No. 2 Gal. Oil | Test Min. | BTU/gal | MMBTU/hr from Oil |
|---|---|---|---|---|---|---|---|---|
| 1 | 1222.2 | 93 | 158,104 | 125 | 0 | 93 | 158,104 | 0 |
| Average | 1,222 | 93 | 158,104 | 125 | 0 | 93 | 158,104 | 0 |
| Permit Maximum | [ mmBTU/hr ] | | | 185 | | | | 184 |

**Allowable Particulate Emissions Calculation**

| | | | | |
|---|---|---|---|---|
| Test total BTU Input from Oil for A Scrubber | 125 | MM BTU/hr. | | |
| Maximum Steam Output from 1 & 2 PB | 240,000 | lb./hr. [1000 BTU Steam] | | |
| Test Operating Rate | 82% | | | |
| Test Steam Output Rate | 197,161 | lb./hr. [240,000 x test operating rate] | | |
| Boiler Efficiency on Oil | 65% | | | |
| Test Steam from Oil | 81,034 | lb./hr. [total input from oil x Eff. on oil] | | |
| Test Steam from Bark [by difference] | 116,127 | lb./hr. | | |
| Boiler Efficiency on Bark | 55% | Permit Max. | | |
| Test Heat Input from Bark | 211 | mmBTU/hr. 218 | Maximum By Permit | |
| Emissions Factor for Bark | 0.23 | lb. PM/MMBTU | | |
| Emissions Factor for Oil | 0.086 | lb. PM/MMBTU | | |
| Allowable Emissions from Bark | 48.6 | lb. PM/hr [emissions factor x heat input] | 50.6 | #2 Bark Only |
| Allowable Emissions from Oil | 10.7 | lb. PM/hr [emissions factor x heat input] | 15.2 | #2 Oil Only |
| Total Allowable Emissions for A Scrubber | 59.3 | lb. PM/hr. (Including Oil Emissions) | 16.0 | #1 Oil Only |
| Total Allowable Emissions for A Scrubber | 59.3 | lb. PM/hr. ( By Oil Emissions Factor or Permit) | | |
| Actual emissions for A Scrubt Jun 2005 test] | **31.5** | lb. PM/hr. | | |

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**Rayonier**

**Fernandina Mill**

**"A" SCRUBBER STACK TEST ANALYSIS** for 10-Jun-05

**Steam Output from No. 1 & No. 2 Power Boilers**

| Run Number | Steam Production [1000 lb./hr. of 1000 BTU/lb. Steam] Power Boiler No. 1 | Power Boiler No. 2 | Total |
|---|---|---|---|
| 2 | 106 | 114 | 221 |
| Average | 106 | 114 | 221 |
| Capacity | 120 | 120 | 240 |

A Scrubber Actual Total % of Capacity = 92%

**Oil Input to Boilers**

| Run Number | Power Boiler No. 1 Gal. Oil | Test Min. | BTU/gal | MMBTU/hr from Oil | Power Boiler No. 2 Gal. Oil | Test Min. | BTU/gal | MMBTU/hr from Oil |
|---|---|---|---|---|---|---|---|---|
| 2 | 873.6 | 64 | 158,104 | 129 | 147 | 64 | 158,104 | 22 |
| Average | 874 | 64 | 158,104 | 129 | 147 | 64 | 158,104 | 22 |
| Permit Maximum | [ mmBTU/hr ] | | | 185 | | | | 184 |

**Allowable Particulate Emissions Calculation**

| | | | | | |
|---|---|---|---|---|---|
| Test total BTU Input from Oil for A Scrubber | 151 | MM BTU/hr. | | | |
| Maximum Steam Output from 1 & 2 PB | 240,000 | lb./hr. [1000 BTU Steam] | | | |
| Test Operating Rate | 92% | | | | |
| Test Steam Output Rate | 220,594 | lb./hr. [240,000 x test operating rate] | | | |
| Boiler Efficiency on Oil | 65% | | | | |
| Test Steam from Oil | 98,329 | lb./hr. [total input from oil x Eff. on oil] | | | |
| Test Steam from Bark [by difference] | 122,264 | lb./hr. | | | |
| Boiler Efficiency on Bark | 55% | | Permit Max. | | |
| Test Heat Input from Bark | 222 | mmBTU/hr. | 218 | Maximum | |
| Emissions Factor for Bark | 0.23 | lb. PM/MMBTU | | By | |
| Emissions Factor for Oil | 0.086 | lb. PM/MMBTU | | Permit | |
| Allowable Emissions from Bark | 51.1 | lb. PM/hr [emissions factor x heat input] | | 50.6 | #2 Bark Only |
| Allowable Emissions from Oil | 13.0 | lb. PM/hr [emissions factor x heat input] | | 15.2 | #2 Oil Only |
| Total Allowable Emissions for A Scrubber | 64.1 | lb. PM/hr. | (Including Oil Emissions) | 16.0 | #1 Oil Only |
| Total Allowable Emissions for A Scrubber | 64.1 | lb. PM/hr. | ( By Oil Emissions Factor or Permit) | | |
| Actual emissions for A Scrubt Jun 2005 test] | 25.0 | lb. PM/hr. | | | |

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## Rayonier

### Fernandina Mill

**"A" SCRUBBER STACK TEST ANALYSIS** for 10-Jun-05

**Steam Output from No. 1 & No. 2 Power Boilers**

| Run Number | Steam Production [1000 lb./hr. of 1000 BTU/lb. Steam] Power Boiler No. 1 | Power Boiler No. 2 | Total |
|---|---|---|---|
| 3 | 109 | 125 | 234 |
| Average | 109 | 125 | 234 |
| Capacity | 120 | 120 | 240 |

A Scrubber Actual Total % of Capacity = 97%

**Oil Input to Boilers**

| Run Number | Power Boiler No. 1 Gal. Oil | Test Min. | BTU/gal | MMBTU/hr from Oil | Power Boiler No. 2 Gal. Oil | Test Min. | BTU/gal | MMBTU/hr from Oil |
|---|---|---|---|---|---|---|---|---|
| 3 | 827.4 | 62 | 158,104 | 127 | 227 | 62 | 158,104 | 35 |
| Average | 827 | 62 | 158,104 | 127 | 227 | 62 | 158,104 | 35 |
| Permit Maximum | [ mmBTU/hr ] | | | 185 | | | | 184 |

**Allowable Particulate Emissions Calculation**

| | | | | |
|---|---|---|---|---|
| Test total BTU Input from Oil for A Scrubber | 161 | MM BTU/hr. | | |
| Maximum Steam Output from 1 & 2 PB | 240,000 | lb./hr. [1000 BTU Steam] | | |
| Test Operating Rate | 97% | | | |
| Test Steam Output Rate | 233,710 | lb./hr. [240,000 x test operating rate] | | |
| Boiler Efficiency on Oil | 65% | | | |
| Test Steam from Oil | 104,843 | lb./hr. [total input from oil x Eff. on oil] | | |
| Test Steam from Bark [by difference] | 128,867 | lb./hr. | | |
| Boiler Efficiency on Bark | 55% | Permit Max. | | |
| Test Heat Input from Bark | 234 | mmBTU/hr. 218 | Maximum By Permit | |
| Emissions Factor for Bark | 0.23 | lb. PM/MMBTU | | |
| Emissions Factor for Oil | 0.086 | lb. PM/MMBTU | | |
| Allowable Emissions from Bark | 53.9 | lb. PM/hr [emissions factor x heat input] | 50.6 | #2 Bark Only |
| Allowable Emissions from Oil | 13.9 | lb. PM/hr [emissions factor x heat input] | 15.2 | #2 Oil Only |
| Total Allowable Emissions for A Scrubber | 67.8 | lb. PM/hr. (Including Oil Emissions) | 16.0 | #1 Oil Only |
| Total Allowable Emissions for A Scrubber | 67.8 | lb. PM/hr. ( By Oil Emissions Factor or Permit) | | |
| Actual emissions for A Scrubt Jun 2005 test] | 22.6 | lb. PM/hr. | | |

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**Rayonier**

**Fernandina Mill**

**"A" SCRUBBER STACK TEST ANALYSIS** for 10-Jun-05

**Steam Output from No. 2 Power Boiler**

| Run Number | Steam Production [1000 lb./hr. of 1000 BTU/lb. Steam] Power Boiler No. 1 | Power Boiler No. 2 | Total |
|---|---|---|---|
| 1 | 99 | 99 | 197 |
| 2 | 106 | 114 | 221 |
| 3 | 109 | 125 | 234 |
| Average | 102 | 106 | 209 |
| Capacity | 120 | 120 | 240 |
| A Scrubber Actual Total % of Capacity = | | | 87% |

**Oil Input to Boiler**

| Run Number | Power Boiler No. 1 Gal. Oil | Test Min. | BTU/gal | MMBTU/hr from Oil | Power Boiler No. 2 Gal. Oil | Test Min. | BTU/gal | MMBTU/hr from Oil | Test Result per Stack test |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1222 | 93 | 158,104 | 125 | 0 | 93 | 158104 | 0.0 | 31.51 |
| 2 | 874 | 64 | 158104 | 129 | 147 | 64 | 158104 | 21.8 | 25.03 |
| 3 | 827 | 62 | 158,104 | 127 | 227 | 62 | 158,104 | 34.7 | 22.59 |
| Average | 1048 | 79 | 158,104 | 127 | 74 | 79 | 158,104 | 11 | 26.4 |
| Permit Maximum | [ mmBTU/hr ] | | | 185 | | | | 184 | |

**Allowable Particulate Emissions Calculation**

| | | | | |
|---|---|---|---|---|
| Test total BTU Input from Oil for B Scrubber | 138 | MM BTU/hr. | | |
| Maximum Steam Output from 1 & 2 PB | 240,000 | lb./hr. [1000 BTU Steam] | | |
| Test Operating Rate | 87% | | | |
| Test Steam Output Rate | 208,878 | lb./hr. [135,000 x test operating rate] | | |
| Boiler Efficiency on Oil | 65% | | | |
| Test Steam from Oil | 89,682 | lb./hr. [total input from oil x Eff. on oil] | | |
| Test Steam from Bark [by difference] | 119,196 | lb./hr. | | |
| Boiler Efficiency on Bark | 55% | Permit Max. | | |
| Test Heat Input from Bark | 217 | mmBTU/hr. 218 | Maximum By Permit | |
| Emissions Factor for Bark | 0.23 | lb. PM/MMBTU | | |
| Emissions Factor for Oil | 0.086 | lb. PM/MMBTU | | |
| Allowable Emissions from Bark | 49.8 | lb. PM/hr [emissions factor x heat input] | 50.6 | #2 Bark Only |
| Allowable Emissions from Oil | 11.9 | lb. PM/hr [emissions factor x heat input] | 15.2 | #2 Oil Only |
| Total Allowable Emissions for A Scrubber | 61.7 | lb. PM/hr. (Including Oil Emissions) | 16.0 | #1 Oil Only |
| Total Allowable Emissions for A Scrubber | 61.7 | lb. PM/hr. ( By Oil Emissions Factor or Permit) | | |
| Actual emissions for A Scrubber 10-Jun-05 Test | 26.4 | lb. PM/hr. | | |

**Power Boilers Scrubber Test**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | *Power Boiler Scrubber* | | | "B" | | | | |
| | *Date* | | | 09-Jun-05 | | | | |
| | *Run #* | | B # | 1 | | | | |
| | *Start of Test* | | *End of Test* | | *Totals* | *Time* | | |
| | hours | min | hours | min | min | *corrected* | | |
| *Time* | 11 | 08 | 12 | 14 | 66 | 0.90909 | | |
| ***Boiler No. 3*** | | | | | | | | |
| *Steam Flow Integrator (x 1000)* | 455.1 | | 574 | | 118900 | 108091 | lb/hr | |
| *Steam Temperature (° F)___* | 751.5 | | 718.6 | | 735.05 | | | |
| *Drum Pressure (psig.)_____* | 542.6 | | 321.3 | | 431.95 | | | |
| *Oil Flow Intergrator (bbl.)__* | 2.2 | | 2.3 | | 0.1 | 3.81818 | gal/hr | |
| *Steam Flow (lb/hr x 1000)_* | 108.4 | | 121.8 | | 115100 | | | |
| *Oil Flow (gpm)__________* | 0 | | 0 | | 0 | | | |
| ***Bark Integrator*** | 137.1 | | 162.7 | | 25.6 | 23 | wet/tons/hr | |
| *Bark to Boiler:* Num.(s) | 2 | | And / or | 3 | | | | |
| *Scrubber "B" pH* | 7.7 | | 7.8 | | 7.8 | | | |

**Power Boilers Scrubber Test**

| | | |
|---|---|---|
| *Power Boiler Scrubber* | | **"B"** |
| *Date* | | 09-Jun-05 |
| *Run #* | B # | 2 |

| | Start of Test | | End of Test | | Totals | Time corrected | |
|---|---|---|---|---|---|---|---|
| | hours | min | hours | min | min | | |
| *Time* | 1 | 00 | 2 | 03 | 63 | 0.95238 | |
| ***Boiler No. 3*** | | | | | | | |
| *Steam Flow Integrator (x 1000)* | 650.6 | | 781.1 | | 130500 | 124286 | lb/hr |
| *Steam Temperature (° F)___* | 744.6 | | 724.1 | | 734.35 | | |
| *Drum Pressure (psig.)_____* | 535.4 | | 403.2 | | 469.3 | | |
| *Oil Flow Intergrator (bbl.)__* | 4.2 | | 23.5 | | 19.3 | 772 | gal/hr |
| *Steam Flow (lb/hr x 1000)_* | 122.5 | | 141.1 | | 131800 | | |
| *Oil Flow (gpm)__________* | 12.4 | | 13.3 | | 12.85 | | |
| ***Bark Integrator*** | 186.3 | | 209.3 | | 23 | 22 | wet/tons/hr |
| *Bark to Boiler:* | Num.(s) | 2 | And / or | 3 | | | |
| *Scrubber "B" pH* | 7.6 | | 5.9 | | 6.8 | | |

**Power Boilers Scrubber Test**

| | | |
|---|---|---|
| *Power Boiler Scrubber* | | "B" |
| *Date* | | 09-Jun-05 |
| *Run #* | B # | 3 |

| | Start of Test | | End of Test | | Totals | Time | |
|---|---|---|---|---|---|---|---|
| | hours | min | hours | min | min | corrected | |
| *Time* | 2 | 50 | 3 | 52 | 62 | 0.96774 | |
| ***Boiler No. 3*** | | | | | | | |
| *Steam Flow Integrator (x 1000)* | 849.8 | | 966.5 | | 116700 | 112935 | lb/hr |
| *Steam Temperature (° F)___* | 787.9 | | 721 | | 754.45 | | |
| *Drum Pressure (psig.)_____* | 509.5 | | 399 | | 454.25 | | |
| *Oil Flow Intergrator (bbl.)__* | 28.6 | | 28.9 | | 0.3 | 12.1935 | gal/hr |
| *Steam Flow (lb/hr x 1000)_* | 131 | | 140 | | 135500 | | |
| *Oil Flow (gpm)_________* | 0 | | 0 | | 0 | | |
| ***Bark Integrator*** | 228.8 | | 259.7 | | 30.9 | 30 | wet/tons/hr |
| *Bark to Boiler:* Num.(s) | 2 | | 3 | | | | |
| *Scrubber "B" pH* | 6.3 | | 7.4 | | 6.85 | | |

## "B" SCRUBBER STACK TEST ANALYSIS for 9-Jun-05

### Steam Output from No. 3 Power Boiler

| Run Number | Steam Production [1000 lb./hr. of 1000 BTU/lb. Steam] Power Boiler No. 3 |
|---|---|
| 1 | 108 |
| Average | 108 |
| Capacity | 135 |

B Scrubber Actual Total % of Capacity = 80%

### Oil Input to Boiler

| | Power Boiler No. 3 | | | |
|---|---|---|---|---|
| Run Number | Gal. Oil | Test Min. | BTU/gal | MMBTU/hr from Oil |
| 1 | 4.2 | 66 | 158,104 | 1 |
| Average | 4 | 66 | 158,104 | 1 |

| | | |
|---|---|---|
| Permit Maximum on Oil | [mmBtu/hr] | 207 |
| Permit Maximum on Bark | [mmBtu/hr] | 245 |

### Allowable Particulate Emissions Calculation

| | | | | |
|---|---|---|---|---|
| Test total BTU Input from Oil for B Scrubber | 1 | MM BTU/hr. | | |
| Maximum Steam Output from 3 PB | 135,000 | lb./hr. [1000 BTU Steam] | | |
| Test Operating Rate | 80% | | | |
| Test Steam Output Rate | 108,091 | lb./hr. [135,000 x test operating rate] | | |
| Boiler Efficiency on Oil | 65% | | | |
| Test Steam from Oil | 392 | lb./hr. [total input from oil x Eff. on oil] | | |
| Test Steam from Bark [by difference] | 107,699 | lb./hr. | | |
| Boiler Efficiency on Bark | 55% | Permit Max. | | |
| Test Heat Input from Bark | 196 | mmBTU/hr. **245** | | |
| Emissions Factor for Bark | 0.207 | lb. PM/MMBTU | Permit | |
| Emissions Factor for Oil | 0.086 | lb. PM/MMBTU | Maximum | |
| Allowable Emissions from Bark | 40.5 | lb. PM/hr [emissions factor x heat input] | 50.6 | #3Bark Only |
| Allowable Emissions from Oil | 0.1 | lb. PM/hr [emissions factor x heat input] | 16.7 | #3 Oil Only |
| Total Allowable Emissions for B Scrubber | 40.6 | lb. PM/hr. (Including Oil Emissions) | | |
| Total Allowable Emissions for B Scrubber | 40.6 | lb. PM/hr. ( By Oil Emissions Factor or Permit) | | |
| Actual emissions for B Scrubber 9-Jun-05 Test | 27.5 | lb. PM/hr. | | |

**"B" SCRUBBER STACK TEST ANALYSIS** for 9-Jun-05

**Steam Output from No. 3 Power Boiler**

| Run Number | Steam Production [1000 lb./hr. of 1000 BTU/lb. Steam] Power Boiler No. 3 |
|---|---|
| 2 | 124 |
| | |
| Average | 124 |
| Capacity | 135 |

B Scrubber Actual Total % of Capacity = 92%

**Oil Input to Boiler**

| | Power Boiler No. 3 | | | |
|---|---|---|---|---|
| Run Number | Gal. Oil | Test Min. | BTU/gal | MMBTU/hr from Oil |
| 2 | 810.6 | 63 | 158,104 | 122 |
| Average | 811 | 63 | 158,104 | 122 |

| | | |
|---|---|---|
| Permit Maximum on Oil | [mmBtu/hr] | 207 |
| Permit Maximum on Bark | [mmBtu/hr] | 245 |

**Allowable Particulate Emissions Calculation**

| | | | | |
|---|---|---|---|---|
| Test total BTU Input from Oil for B Scrubber | 122 | MM BTU/hr. | | |
| Maximum Steam Output from 3 PB | 135,000 | lb./hr. [1000 BTU Steam] | | |
| Test Operating Rate | 92% | | | |
| Test Steam Output Rate | 124,286 | lb./hr. [135,000 x test operating rate] | | |
| Boiler Efficiency on Oil | 65% | | | |
| Test Steam from Oil | 79,337 | lb./hr. [total input from oil x Eff. on oil] | | |
| Test Steam from Bark [by difference] | 44,949 | lb./hr. | | |
| Boiler Efficiency on Bark | 55% | Permit Max. | | |
| Test Heat Input from Bark | 82 | mmBTU/hr. **245** | | |
| Emissions Factor for Bark | 0.207 | lb. PM/MMBTU | Permit Maximum | |
| Emissions Factor for Oil | 0.086 | lb. PM/MMBTU | | |
| Allowable Emissions from Bark | 16.9 | lb. PM/hr [emissions factor x heat input] | 50.6 | #3Bark Only |
| Allowable Emissions from Oil | 10.5 | lb. PM/hr [emissions factor x heat input] | 16.7 | #3 Oil Only |
| Total Allowable Emissions for B Scrubber | 27.4 | lb. PM/hr. | (Including Oil Emissions) | |
| Total Allowable Emissions for B Scrubber | 27.4 | lb. PM/hr. | ( By Oil Emissions Factor or Permit) | |
| Actual emissions for B Scrubber 9-Jun-05 Test | 22.2 | lb. PM/hr. | | |

**"B" SCRUBBER STACK TEST ANALYSIS** for 9-Jun-05

**Steam Output from No. 3 Power Boiler**

| Run Number | Steam Production [1000 lb./hr. of 1000 BTU/lb. Steam] Power Boiler No. 3 |
|---|---|
| 3 | 113 |
| Average | 113 |
| Capacity | 135 |

B Scrubber Actual Total % of Capacity = 84%

**Oil Input to Boiler**

| | Power Boiler No. 3 | | | |
|---|---|---|---|---|
| Run Number | Gal. Oil | Test Min. | BTU/gal | MMBTU/hr from Oil |
| 3 | 13 | 62 | 158,104 | 2 |
| Average | 13 | 62 | 158,104 | 2 |

| | | |
|---|---|---|
| Permit Maximum on Oil | [mmBtu/hr] | 207 |
| Permit Maximum on Bark | [mmBtu/hr] | 245 |

**Allowable Particulate Emissions Calculation**

| | | | | |
|---|---|---|---|---|
| Test total BTU Input from Oil for B Scrubber | 2 | MM BTU/hr. | | |
| Maximum Steam Output from 3 PB | 135,000 | lb./hr. [1000 BTU Steam] | | |
| Test Operating Rate | 84% | | | |
| Test Steam Output Rate | 112,935 | lb./hr. [135,000 x test operating rate] | | |
| Boiler Efficiency on Oil | 65% | | | |
| Test Steam from Oil | 1,253 | lb./hr. [total input from oil x Eff. on oil] | | |
| Test Steam from Bark [by difference] | 111,682 | lb./hr. | | |
| Boiler Efficiency on Bark | 55% | Permit Max. | | |
| Test Heat Input from Bark | 203 | mmBTU/hr. **245** | | |
| Emissions Factor for Bark | 0.207 | lb. PM/MMBTU | Permit Maximum | |
| Emissions Factor for Oil | 0.086 | lb. PM/MMBTU | | |
| Allowable Emissions from Bark | 42.0 | lb. PM/hr [emissions factor x heat input] | 50.6 | #3Bark Only |
| Allowable Emissions from Oil | 0.2 | lb. PM/hr [emissions factor x heat input] | 16.7 | #3 Oil Only |
| Total Allowable Emissions for B Scrubber | 42.2 | lb. PM/hr. | (Including Oil Emissions) | |
| Total Allowable Emissions for B Scrubber | 42.2 | lb. PM/hr. | ( By Oil Emissions Factor or Permit) | |
| Actual emissions for B Scrubber 9-Jun-05 Test | 31.9 | lb. PM/hr. | | |

## "B" SCRUBBER STACK TEST ANALYSIS for 9-Jun-05

### Steam Output from No. 3 Power Boiler

| Run Number | Steam Production [1000 lb./hr. of 1000 BTU/lb. Steam] Power Boiler No. 3 |
|---|---|
| 1 | 108 |
| 2 | 124 |
| 3 | 113 |
| Average | 115 |
| Capacity | 135 |

B Scrubber Actual Total % of Capacity = 85%

### Oil Input to Boiler

| Power Boiler No. 3 | | | | | |
|---|---|---|---|---|---|
| Run Number | Gal. Oil | Test Min. | BTU/gal | MMBTU/hr from Oil | Test Result per Stack test |
| 1 | 4.2 | 66 | 158,104 | 1 | 27.54 |
| 2 | 810.6 | 63 | 158,104 | 122 | 22.18 |
| 3 | 12.6 | 62 | 158,104 | 2 | 31.92 |
| Average | 276 | 64 | 158,104 | 42 | 27.21 |
| Permit Maximum | [mmBtu/hr] | | | 207 | |

### Allowable Particulate Emissions Calculation

| | | | Permit Maximum |
|---|---|---|---|
| Test total BTU Input from Oil for B Scrubber | 42 | MM BTU/hr. | |
| Maximum Steam Output from 3 PB | 135,000 | lb./hr. [1000 BTU Steam] | |
| Test Operating Rate | 85% | | |
| Test Steam Output Rate | 115,104 | lb./hr. [135,000 x test operating rate] | |
| Boiler Efficiency on Oil | 65% | | |
| Test Steam from Oil | 26,994 | lb./hr. [total input from oil x Eff. on oil] | |
| Test Steam from Bark [by difference] | 88,110 | lb./hr. | |
| Boiler Efficiency on Bark | 55% | Permit Max. | |
| Test Heat Input from Bark | 160 | mmBTU/hr **245** | |
| Emissions Factor for Bark | 0.207 | lb. PM/MMBTU | |
| Emissions Factor for Oil | 0.086 | lb. PM/MMBTU | |
| Allowable Emissions from Bark | 33.2 | lb. PM/hr [emissions factor x heat input] | 50.6 |
| Allowable Emissions from Oil | 3.6 | lb. PM/hr [emissions factor x heat input] | 16.7 |
| Total Allowable Emissions for B Scrubber | 36.7 | lb. PM/hr. (Including Oil Emissions) | |
| Total Allowable Emissions for B Scrubber | 36.7 | lb. PM/hr. ( By Oil Emissions Factor or Permit) | |
| Actual emissions for B Scrubber 9-Jun-05 Test | 27.2 | lb. PM/hr. | |

## Recovery Boiler Compliance Test

Date: 8-Jun-05

Run: # 1

| | Start of Test hour | min | End of Test hour | min | Difference | %of hour | |
|---|---|---|---|---|---|---|---|
| Time | 9 | 02 | 10 | 02 | 60 | 1 | |
| "B" Liquor Flow, gallons | 25747.5 | | 36240.6 | | 10493.1 | 10493.1 | gph |
| Liquor Flow, gpm meter | 176 | | 174 | | 175 | 10500 | gph |
| Liquor Temperature, deg F | 193 | | 194 | | 193.5 | | |
| Liquor Hydrometer Reading | 1.25 | | 1.245 | | 1.2475 | | |
| Liquor solids, % OD | 59 | | 58.3 | | 58.65 | | |
| No. of Liquor guns | 10 | | 10 | | 10 | | |
| No. of oil guns | 0 | | 0 | | 0 | | |
| No. of oil guns @ pressure | 0 | | 0 | | 0 | | |
| Steam load, lbs/hr chart x 1000 | 372 | | 376 | | 374 | | |
| Steam Flow Integrator x 1000, lb | 935.5 | | 1309.7 | | 374200 | 374200 | lb/hr |
| Steam Temperature, deg F | 875 | | 876 | | 875.5 | | |
| Steam Pressure, psi | 992 | | 993 | | 992.5 | | |
| SO2, ppm | 147.969 | | 242.566 | | 195.2675 | | |

| | | | |
|---|---|---|---|
| Liquor Flow Calculation | (gph)(8.345)(sp.gr.)(%OD) | 64109.77 | lb/hr |
| Integrator Calculation: | TSP Mass Emission Rate results: | 12.37 | lb/hr |

(End of test value - Start of test value)(60 min./hr / Test time, min.) = Units/hr

## Recovery Boiler Compliance Test

Date: 8-Jun-05

Run: # 2

| | Start of Test hour | min | End of Test hour | min | Difference | %of hour | |
|---|---|---|---|---|---|---|---|
| Time | 11 | 06 | 12 | 11 | 65 | 0.923077 | |
| "B" Liquor Flow, gallons | 49546.6 | | 58766 | | 9219.4 | 8510.215 | gph |
| Liquor Flow, gpm meter | 175 | | 175 | | 175 | 10500 | gph |
| Liquor Temperature, deg F | 194 | | 194 | | 194 | | |
| Liquor Hydrometer Reading | 1.26 | | 1.255 | | 1.2575 | | |
| Liquor solids, % OD | 60.9 | | 60.1 | | 60.5 | | |
| No. of Liquor guns | 10 | | 10 | | 10 | | |
| No. of oil guns | 0 | | 0 | | 0 | | |
| No. of oil guns @ pressure | 0 | | 0 | | 0 | | |
| Steam load, lbs/hr chart x 1000 | 379 | | 378 | | 378.5 | | |
| Steam Flow Integrator x 1000, lb | 1787.3 | | 2122.1 | | 334800 | 309046.2 | lb/hr |
| Steam Temperature, deg F | 876 | | 876 | | 876 | | |
| Steam Pressure, psi | 993 | | 996 | | 994.5 | | |
| SO2, ppm | 117.874 | | 113.084 | | 115.479 | | |

| | | |
|---|---|---|
| Liquor Flow Calculation | (gph)(8.345)(sp.gr.)(%OD) | 66662.10 lb/hr |

Integrator Calculation: TSP Mass Emission Rate results: 28.72 lb/hr

(End of test value - Start of test value)(60 min./hr / Test time, min.) = Units/hr

## Recovery Boiler Compliance Test

Date: 8-Jun-05

Run: # 3

| | Start of Test hour | min | End of Test hour | min | Difference | %of hour | |
|---|---|---|---|---|---|---|---|
| Time | 12 | 48 | 13 | 49 | 61 | 0.983607 | |
| "B" Liquor Flow, gallons | 65760.8 | | 75671 | | 9910.2 | 9747.738 | gph |
| Liquor Flow, gpm meter | 175 | | 172 | | 173.5 | 10410 | gph |
| Liquor Temperature, deg F | 194 | | 194 | | 194 | | |
| Liquor Hydrometer Reading | 1.255 | | 1.255 | | 1.255 | | |
| Liquor solids, % OD | 60.1 | | 60.1 | | 60.1 | | |
| No. of Liquor guns | 10 | | 10 | | 10 | | |
| No. of oil guns | 0 | | 0 | | 0 | | |
| No. of oil guns @ pressure | 0 | | 0 | | 0 | | |
| Steam load, lbs/hr chart x 1000 | 376 | | 373 | | 374.5 | | |
| Steam Flow Integrator x 1000, lb | 2376.2 | | 2734.6 | | 358400 | 352524.6 | lb/hr |
| Steam Temperature, deg F | 873 | | 869 | | 871 | | |
| Steam Pressure, psi | 987 | | 987 | | 987 | | |
| SO2, ppm | 22.804 | | 23.672 | | 23.238 | | |

| Liquor Flow Calculation | (gph)(8.345)(sp.gr.)(%OD) | 61354.78 lb/hr |
|---|---|---|

Integrator Calculation: TSP Mass Emission Rate results: 24.48 lb/hr

(End of test value - Start of test value)(60 min./hr / Test time, min.) = Units/hr

Sulfite Recovery Boiler Scrubber Stack Test Analysis for 8-Jun-05

**Steam Output from the Sulfite Recovery Boiler**

| Run Number | Steam Production [1000 lb./hr. of 1000 BTU/lb. Steam] Sulfite Recovery Boiler |
|---|---|
| 1 | 374 |
| 2 | 309 |
| 3 | 353 |
| Average | 345 |

| Oil Input to Boiler | | | | | Liquor Input to Boiler | | Test Result |
|---|---|---|---|---|---|---|---|
| Sulfite Recovery Boiler | | | | | | | Particulate |
| Run Number | Gal. Oil | Test Min. | BTU/gal | MMBTU/hr from Oil | Gal. Liquor | Liquor Flow lbs/hr. | (per Stack test) lbs/hr. |
| 1 | 0 | 60 | 158,104 | 0 | 10493 | 64,110 | 12.4 |
| 2 | 0 | 65 | 158,104 | 0 | 8510 | 66,662 | 28.7 |
| 3 | 0 | 61 | 158,104 | 0 | 9748 | 61,355 | 24.5 |
| Average | 0 | 62 | 158,104 | 0 | 9,584 | 64,042 | 21.9 |

| | | |
|---|---|---|
| Permit Maximum | [lbs/hr. SSL] | 70,000 |
| Recovery Boiler Actual Total % of Capacity = | | 91% |
| Standard Operating Max | | 63,000 |
| Percent of Standard Operating Max | | 102% |

| | | |
|---|---|---|
| Permit Maximum | (particulate) | 43.18 lbs/hr. |
| Permit Maximum | (particulate) | 43.18 lbs/hr. |
| Permit Limit | **2.5** | PM lb/ADTUP |
| Test Value | **0.80** | PM lb/ADTUP |

| | | | |
|---|---|---|---|
| | Test Value | 21.9 | PM lb/hr |
| | Test Value | 0.80 | PM lb/ADTUP |
| | Permit Limit | 2.5 | PM lb/ADTUP |
| | 64,042 | | lb SSLS/hr |
| **Entry from** | | 27 | ADTUP/hr |
| **previous operating years Data** | lb SSLS/ADTUP | 2,330 | |

# APPENDIX E
# PROJECT PARTICIPANTS

## PROJECT PARTICIPANTS

### STACS

| | |
|---|---|
| Bill Mayhew | Project Manager |
| Jon Proulx | Scientist |
| Lee Garcia | Chief Technician |
| Geoff Johnson | Scientist |
| Aaron Harden | Document Coordinator |

### RAYONIER

| | |
|---|---|
| Ronnie Moore | Coordinator |

# GASEOUS EMISSIONS TEST REPORT
# FOR
# SULFITE RECOVERY BOILER AND SCRUBBERS A & B
# AT
# RAYONIER
# FERNANDINA BEACH, FLORIDA

**Prepared for:**

**RAYONIER**
**P.O. Box 2002**
**Foot of Gum Street**
**Fernandina Beach, Florida 32034**

**Prepared by:**

**Source Testing And Consulting Services, Inc.**
**1100 Purple Glory Drive**
**Apex, North Carolina 27502**

**July 2004**

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<u>Table</u>

# 1.0 INTRODUCTION

# 1.0 INTRODUCTION

Under contract to Rayonier, Source Testing And Consulting Services, Inc. (STACS) performed a series of emission tests at Rayonier's Fernandina Beach, Florida facility. Emission testing was performed for the sulfite recovery boiler and scrubbers A & B. The purpose of the tests was to demonstrate ongoing compliance with the emissions limits for particulate matter and visible emissions, and to provide supplemental metals and gaseous emissions data for the units. This document presents the results from the gaseous emissions testing. Results from the particulate and visible emissions tests have been previously submitted.

All testing followed the procedures and quality control guidelines as prescribed in EPA Methods 3A, 6C, 10 and 7E of (40 CFR Pt 60, Appendix A). Gaseous tests were sampled concurrent with particulate testing. Testing at the sulfite recovery boiler occurred on May 25, 2004. The gaseous tests at scrubber B & A occurred on June 9th and $10^{th}$ 2004, respectively.

The test methods that were used for this test program are listed briefly below:

| | |
|---|---|
| EPA Method 3A: | Continuous determination of oxygen and/or carbon dioxide content in the flue gas. An paramagnetic analyzer is used for $O_2$ determination for this test program. |
| EPA Method 6C: | Determination of Sulfur Dioxide using continuous instrumental techniques. Analysis is by ultraviolet spectroscopy (RATAS). |
| EPA Method 7E: | Determination of nitrogen oxides using continuous emissions monitoring techniques with a chemiluminescent analyzer (RATAS). |

EPA Method 10: Determination of carbon monoxide using continuous emissions monitoring techniques with a gas filter correlation/non-dispersive infrared (GFC/NDIR)

All procedures and quality control guidelines specified in the appropriate methods, including 40CFR60 Appendix A, and in the EPA Quality Assurance Handbook for Air Pollution Measurement Systems - Volume III were strictly followed during the test program, in addition to STACS' more stringent internal quality control standards.

Section 2.0 of this report provides a brief process description and a diagram of the sample point locations. Section 3.0 presents the test results. Section 4.0 outlines the procedures and test methods used and Section 5.0 discusses the quality assurance/quality control measures followed during sampling and analysis. Field data sheets, laboratory data, sample calculations, calibration data, process data, and a list of project participants are included in the Appendices to this report.

# 2.0 PROCESS DESCRIPTION AND SAMPLE POINT LOCATIONS

## 2.1 SULFITE RECOVERY BOILER

### 2.1.1 PROCESS DESCRIPTION

The Sulfite Recovery Boiler produces steam by the combustion of spent sulfite liquor (SSL). Emissions from the unit are controlled by venting the effluent gases through a Katzen wet scrubber followed by venting the effluent gases through a series of Brinks mist filters.

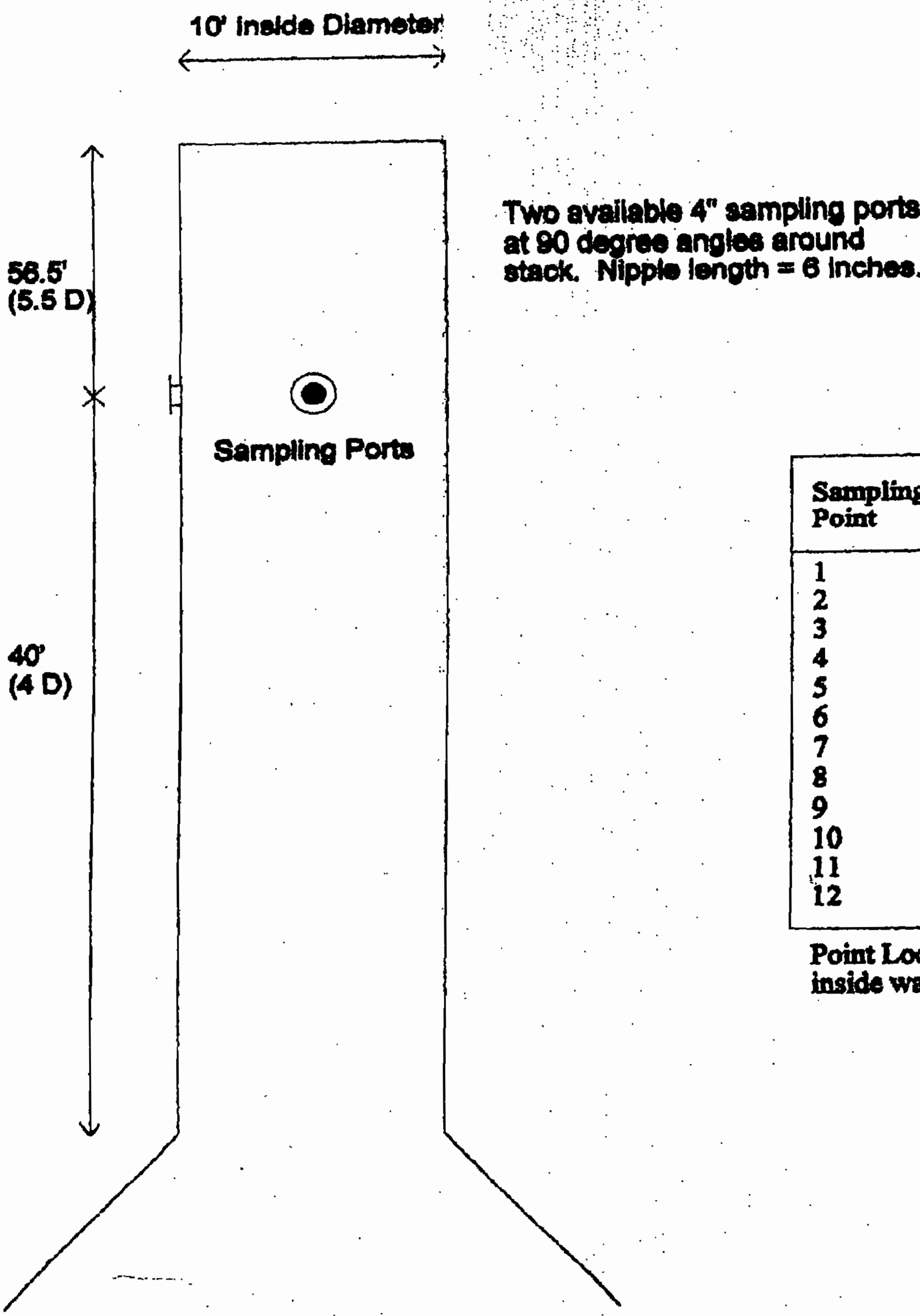
### 2.1.2 REFERENCE METHOD SAMPLING LOCATION

The reference method sampling port was located in the vicinity of the CEMs Probe in the exhaust ductwork from the unit. The ductwork is circular. Three sampling points were used for sampling the duct for each run and were located as described in PS2 Section 3.2 (40 CFR 60, Appendix B). The location is not required to meet EPA Method 1 criteria for the test methods used. A schematic diagram typical of the stack sampling location is included in Figure 2-2.

## 2.2 SCRUBBERS A & B

### 2.2.1 PROCESS DESCRIPTION AND SAMPLING LOCATION

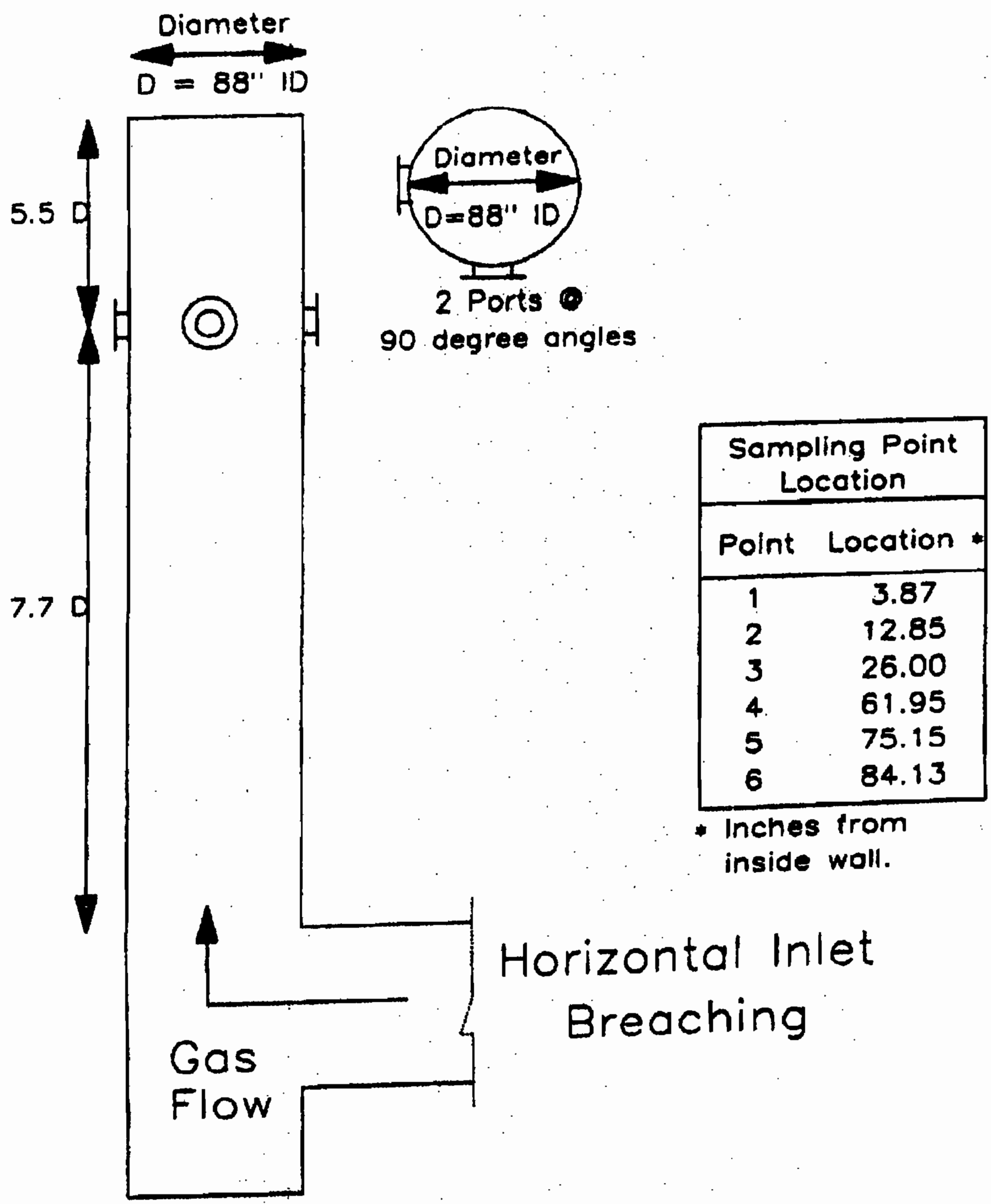
Gaseous and particulate matter emissions from scrubbers A & B are controlled by venturi type scrubbers with entrained water demisters downstream of the venturi. The scrubber stack is 10' in inside diameter and was sampled through two ports $90^{o}$ apart around the circumference of the stack. The nearest downstream disturbance from the sampling location was the atmospheric exhaust which was located one duct diameter away from the test ports. The nearest upstream disturbance was the top of the scrubber which was four diameters away from the ports. Three sampling points were used for sampling the duct for each run and were located as described in PS2 Section 3.2 (40 CFR 60, Appendix B). A schematic diagram typical of the stack sampling location is included in Figure 2-1.




| Sampling Point | Point Location |
|---|---|
| 1 | 2.52 |
| 2 | 8.04 |
| 3 | 14.20 |
| 4 | 21.24 |
| 5 | 30.00 |
| 6 | 42.70 |
| 7 | 77.30 |
| 8 | 90.00 |
| 9 | 98.80 |
| 10 | 105.80 |
| 11 | 111.96 |
| 12 | 117.48 |

Point Locations are inches from inside wall.

**Figure 2-1. A & B Scrubber Stack Schematic Diagram**




| Sampling Point Location | |
|---|---|
| Point | Location * |
| 1 | 3.87 |
| 2 | 12.85 |
| 3 | 26.00 |
| 4 | 61.95 |
| 5 | 75.15 |
| 6 | 84.13 |

* Inches from inside wall.

**Figure 2-2. Sulfite Recovery Boiler Stack Schematic Diagram**

## 3.0 EMISSION TEST RESULTS

Testing for gaseous emissions was conducted for the Rayonier's Sulfite Recovery Boiler on May 25, 2004. Gaseous tests for Scrubbers B & A were conducted on June $9^{th}$ and $10^{th}$ respectively. $SO_2$, NOx and CO emissions are presented as parts per million volume on a dry basis (ppmV, d). Oxygen (O2) is presented on a percent by volume dry basis. The raw reference data collected during the tests is included in Appendix A. Calibration and cylinder certificate are found in Appendix B.

Three points were traversed for the reference method sampling during each test. Three one hour test runs were conducted using the procedures outlined in EPA Methods 3A, 6C, 7E and 10. The sampling occurred while the units were at prescribed testing conditions for each test run.

### 3.1 SULFITE RECOVERY BOILER TEST RESULTS

The gaseous emission testing for the sulfite recovery boiler occurred on May 25, 2004. Testing was concurrent with the particulate testing and the SO2 RATA tests. The boiler process data will therefore be the same as that data presented for the particulate and RATA tests. The results of the gaseous emissions tests are presented in table 3-1. Table 3-4 presents the bias and drift calculations for each unit tested.

### 3.2 SCRUBBER A & B TEST RESULTS

The gaseous emission testing for scrubber B occurred on June 9, 2004. Testing was concurrent with the particulate testing. The boiler process data will therefore be the same as that data presented for the particulate. The results of the gaseous emissions tests are presented in table 3-2. Table 3-4 presents the bias and drift calculations for each unit tested. The gaseous emission testing for scrubber A occurred on June 10, 2004. Testing was concurrent with the particulate testing. The results of the gaseous emissions tests are presented in table 3-3. Table 3-4 presents the bias and drift calculations for each unit tested.

**TABLE 3-1**
**RAYNIER**
**Sulfite Recovery Boiler**
**Gaseous Emission Results**

| **Sulfide Recovery Boiler** | | | | |
|---|---|---|---|---|
| Date | 5/25/04 | 5/25/04 | 5/25/04 | |
| Start | 9:16 | 11:11 | 13:05 | |
| Stop | 10:35 | 12:29 | 14:21 | |
| Run | 1 | 2 | 3 | AVERAGE |
| Parameter | | | | |
| O2 (%V,dry) | 4.2 | 3.9 | 3.9 | 4.0 |
| NOX (ppmV,dry) | 595.5 | 615.8 | 604.1 | 605.1 |
| SO2 (ppmV,dry) | 195.8 | 207.8 | 219.9 | 207.8 |
| CO (ppmV,dry) | 1.3 | 1.1 | 3.2 | 1.9 |

**TABLE 3-2**
**RAYNIER**
**Scrubber B**
**Gaseous Emission Results**

| **Scrubber B** | | | | |
|---|---|---|---|---|
| Date | 6/9/04 | 6/9/04 | 6/9/04 | |
| Start | 12:27 | 15:00 | 17:51 | |
| Stop | 13:56 | 16:39 | 18:51 | |
| Run | | | | AVERAGE |
| Parameter | 1 | 2 | 3 | |
| O2 (%V,dry) | 11.5 | 12.4 | 12.4 | 12.1 |
| NOX (ppmV,dry) | 53.8 | 62.1 | 63.7 | 59.8 |
| SO2 (ppmV,dry) | 0.8 | 0.3 | 0.4 | 0.5 |
| CO (ppmV,dry) | 133.3 | 115.8 | 150.6 | 133.2 |

**TABLE 3-3**
**RAYNIER**
**Scrubber A**
**Gaseous Emission Results**

| **Scrubber A** | | | | |
|---|---|---|---|---|
| Date | 6/10/04 | 6/10/04 | 6/10/04 | |
| Start | 12:00 | 14:41 | 17:34 | |
| Stop | 13:00 | 15:41 | 18:34 | |
| Run | | | | AVERAGE |
| Parameter | 1 | 2 | 3 | |
| O2 (%V,dry) | 11.4 | 12.3 | 11.8 | 11.8 |
| NOX (ppmV,dry) | 79.7 | 86.3 | 79.4 | 81.8 |
| SO2 (ppmV,dry) | 3.7 | 4.1 | 3.7 | 3.8 |
| CO (ppmV,dry) | 255.7 | 175.7 | 248.6 | 226.7 |

TABLE 3-4
RAYNIER
**Bias/Drift Correction Calculation Spreadsheet**

| | Sulfide Recovery Boiler | | | | Scrubber B | | | | Scrubber A | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Date | 5/25/04 | 5/25/04 | 5/25/04 | Date | 6/9/04 | 6/9/04 | 6/9/04 | Date | 6/10/04 | 6/10/04 | 6/10/04 |
| | Start | 9:16 | 11:11 | 13:05 | Start | 12:27 | 15:00 | 17:51 | Start | 12:00 | 14:41 | 17:34 |
| | Stop | 10:35 | 12:29 | 14:21 | Stop | 13:56 | 16:39 | 18:51 | Stop | 13:00 | 15:41 | 18:34 |
| **REFERENCE METHOD BIAS ADJUSTED VALUES** | **PRELIM** | **1** | **2** | **3** | **PRELIM** | **1** | **2** | **3** | **PRELIM** | **1** | **2** | **3** |
| O2 (%V,dry) | #N/A | 4.2 | 3.9 | 3.9 | #N/A | 11.5 | 12.4 | 12.4 | #N/A | 11.4 | 12.3 | 11.8 |
| NOX (ppmV,dry) | #N/A | 595.5 | 615.8 | 604.1 | #N/A | 53.8 | 62.1 | 63.7 | #N/A | 79.7 | 86.3 | 79.4 |
| SO2 (ppmV,dry) | #N/A | 195.8 | 207.8 | 219.9 | #N/A | 0.8 | 0.3 | 0.4 | #N/A | 3.7 | 4.1 | 3.7 |
| CO (ppmV,dry) | #N/A | 1.3 | 1.1 | 3.2 | #N/A | 133.3 | 115.8 | 150.6 | #N/A | 255.7 | 175.7 | 248.6 |
| **RAW AVERAGES** | **PRELIM** | **1** | **2** | **3** | **PRELIM** | **1** | **2** | **3** | **PRELIM** | **1** | **2** | **3** |
| O2 (%V,dry) | #N/A | 4.20 | 3.90 | 3.90 | #N/A | 11.58 | 12.41 | 12.37 | #N/A | 11.40 | 12.28 | 11.92 |
| NOX (ppmV,dry) | #N/A | 595.3 | 615.9 | 604.6 | #N/A | 53.8 | 62.8 | 63.7 | #N/A | 79.7 | 86.4 | 79.4 |
| SO2(ppmV,dry) | #N/A | 196.6 | 209.1 | 221.1 | #N/A | 0.9 | 0.5 | 0.6 | #N/A | 4.0 | 4.4 | 4.1 |
| CO(ppmvw) | #N/A | 0.9 | 0.6 | 2.7 | #N/A | 136.6 | 118.3 | 153.2 | #N/A | 262.7 | 180.0 | 253.8 |
| **ZERO BIAS** | **PRELIM** | **1** | **2** | **3** | **PRELIM** | **1** | **2** | **3** | **PRELIM** | **1** | **2** | **3** |
| O2 (%V,dry) | 0.04 | -0.05 | -0.02 | -0.06 | 0.20 | 0.20 | 0.07 | 0.1 | 0.06 | 0.07 | 0.10 | 0.2 |
| NOX (ppmV,dry) | -0.6 | 0.2 | 0.0 | 0.9 | 0.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 |
| SO2(ppmV,dry) | 0.6 | 1.0 | 1.6 | 0.7 | 0.1 | 0.2 | 0.2 | 0.1 | 0.5 | 0.2 | 0.5 | 0.5 |
| CO(ppmvw) | -0.4 | -0.4 | -0.6 | -0.5 | 0.0 | 0.0 | 0.1 | 0.5 | 0.0 | 1.6 | 0.1 | 1.1 |
| **BIAS CHECKS** | **PRELIM** | **1** | **2** | **3** | **PRELIM** | **1** | **2** | **3** | **PRELIM** | **1** | **2** | **3** |
| O2 (%V,dry) | 12.99 | 12.95 | 12.97 | 12.94 | 13.00 | 12.99 | 12.99 | 13.0 | 13.05 | 12.97 | 12.96 | 13.1 |
| NOX (ppmV,dry) | 902.0 | 899.0 | 900.5 | 897.0 | 95.2 | 95.7 | 96.5 | 94.6 | 94.7 | 95.7 | 94.7 | 95.7 |
| SO2(ppmV,dry) | 250.0 | 249.4 | 247.3 | 247.3 | 24.7 | 24.7 | 25.1 | 25.4 | 24.8 | 24.9 | 24.9 | 24.9 |
| CO(ppmvw) | 14.4 | 15.3 | 15.3 | 15.3 | 314.0 | 313.0 | 312.0 | 310.0 | 315.0 | 313.4 | 312.3 | 312.2 |
| **BIAS VALUES** | **PRELIM** | **1** | **2** | **3** | **PRELIM** | **1** | **2** | **3** | **PRELIM** | **1** | **2** | **3** |
| O2 (%V,dry) | 12.98 | 12.98 | 12.98 | 12.98 | 12.98 | 12.98 | 12.98 | 12.98 | 12.98 | 12.98 | 12.98 | 12.98 |
| NOX (ppmV,dry) | 907.0 | 907.0 | 907.0 | 907.0 | 95.0 | 95.0 | 95.0 | 95.0 | 95.0 | 95.0 | 95.0 | 95.0 |
| SO2(ppmV,dry) | 248.0 | 248.0 | 248.0 | 248.0 | 24.9 | 24.9 | 24.9 | 24.9 | 24.9 | 24.9 | 24.9 | 24.9 |
| CO(ppmvw) | 15.6 | 15.6 | 15.6 | 15.6 | 306.0 | 306.0 | 306.0 | 306.0 | 306.0 | 306.0 | 306.0 | 306.0 |
| **ZERO Drift/Bias (% of scale)** | **SCALE** | **1** | **2** | **3** | **SCALE** | **1** | **2** | **3** | **SCALE** | **1** | **2** | **3** |
| O2 (%V,dry) | 25 | -0.36% | 0.12% | -0.16% | 25 | 0.00% | -0.52% | -0.08% | 25 | 0.04% | 0.12% | 0.40% |
| NOX (ppmV,dry) | 1000 | 0.08% | -0.02% | 0.08% | 100 | -1.03% | 0.00% | 0.00% | 100 | 0.00% | 0.00% | 0.00% |
| SO2(ppmV,dry) | 500 | 0.08% | 0.12% | -0.18% | 50 | 0.20% | 0.00% | -0.20% | 50 | -0.50% | 0.50% | -0.06% |
| CO(ppmvw) | 100 | 0.00% | -0.15% | 0.05% | 1000 | 0.00% | 0.01% | 0.04% | 1000 | 0.16% | -0.15% | 0.10% |
| **UPSCALE Drift/Bias (% of scale)** | **SCALE** | **1** | **2** | **3** | **SCALE** | **1** | **2** | **3** | **SCALE** | **1** | **2** | **3** |
| O2 (%V,dry) | 25 | -0.16% | 0.08% | -0.12% | 25 | -0.04% | 0.00% | -0.08% | 25 | -0.32% | -0.04% | 0.72% |
| NOX (ppmV,dry) | 1000 | -0.30% | 0.15% | -0.35% | 100 | 0.50% | 0.80% | -1.90% | 100 | 1.00% | -1.00% | 1.00% |
| SO2(ppmV,dry) | 500 | -0.12% | -0.42% | 0.00% | 50 | 0.00% | 0.80% | 0.60% | 50 | 0.20% | 0.00% | 0.00% |
| CO(ppmvw) | 100 | 0.90% | 0.00% | 0.00% | 1000 | -0.10% | -0.10% | -0.20% | 1000 | -0.16% | -0.11% | -0.01% |

Reference: Source Testing And Consulting Services, Inc - June 2004

# 4.0 FIELD AND ANALYTICAL PROCEDURES

## 4.1 INSTRUMENTAL REFERENCE METHODS

Stack gas emissions of oxides of nitrogen ($NO_X$), sulfur dioxide (SO2) and carbon monoxide (CO) are measured using continuous instrumental techniques. Diluent oxygen concentration is also measured using continuous instrumental techniques. These tests are performed in accordance with EPA Methods 3A for oxygen, 10 for CO, 6C for SO2 and 7E for $NO_X$ as outlined in Title 40, Part 60, Appendix A of the Code of Federal Regulations. Copies of all on-line instrumental reference method data collected during the testing are included in the Appendices to this report. Calibration records are also given with the data.

Flue gas sample is withdrawn from the stack at a constant rate via a heated stainless steel sample probe. The sample probe is equipped with an additional stainless steel line to enable probe tip calibrations. The probe is of sufficient length to allow traversing across the duct as required by the performance specifications and the applicable test methods. Extracted sample is passed from the probe through a filter and a heated teflon sample line to the moisture removal system. The moisture removal system (gas conditioner) is designed for minimal contact between condensate and sample gas in order to prevent any reaction between the moisture and the measured pollutants. All components of the sampling and gas conditioning system are fabricated from borosilicate glass, teflon, or stainless steel. The gas conditioning system consists of a continuously downward teflon condenser coil (to prevent bubbling) and two glass knockout condenser traps. Moisture is continuously removed from the traps by an external peristaltic pump. The gas conditioning system is cooled in an ice water bath to facilitate complete moisture removal. Dry gas sample from the gas conditioner is transported to the instrument enclosure via an unheated 1/4-inch O.D. teflon tube to a teflon-lined diaphragm pump, which delivers positive pressure sample to the instrument system. Flow control valves are used to deliver the gas sample at a regulated positive pressure to the reference method analytical instruments through a teflon and stainless steel manifold delivery network.

Flow and pressure to all monitors is held constant by monitoring sample and bypass rotameters. A diagram of the instrumental reference method sampling and analysis system used for the test program is given in Figure 4-1.

The sampling system is leak checked by passing known calibration gas standards up through a calibration line to the end of the probe. The gas standards are then pulled back through the sampling probe at stack pressure and subsequently through the entire sampling system to the instrument system. An oxygen analyzer response of less than or equal to 0.5% V to a zero oxygen standard is considered an acceptable leak check.

Analyzer calibration error is calculated by the difference between the known calibration gas concentration and the concentration exhibited by the analyzer. Bias checks are performed by comparing calibration responses through the entire sampling system to these exhibited at the analyzer. EPA Protocol #1, NIST traceable standard calibration gases are used to calibrate the analyzers.

Acceptable system performance checks do not exceed +/-2% calibration error, +/-5% system bias check, +/-3% zero drift, and +/- 3% upscale span drift.

Instrument response time is found by alternating zero nitrogen and upscale span gases through the bias check line and recording the upscale and down scale time. The response time of the CEM sampling system is performed to determine the length of time for the CEMs to respond to changes in the stack gas exhaust stream. Known, Protocol 1 reference gases and zero nitrogen are passed through the heated sample line, sample conditioning system and the manifold delivery network to the continuous emission monitors.

## 4.2 DATA ACQUISITION

The STACS data acquisition system (DAS) for the CEM analyzers consists of a Microlink 751 USB Data Interface and a proprietary STACS Data Acquisition program. The data are stored on disk as well as on a printed hard copy for each run. The system has 16-bit analog to digital conversion resolution (1 in 64,000) and a scan rate of approximately 1200 readings per minute. Data is averaged and reported by the DAS on a 30 second basis. The averaging time may be changed if desired. The system is capable of displaying the on line results in measured units and corrected to 15% $O_2$ as well as in lb/MMBtu. Averages are generated immediately at the end of each test run.

## 4.3 REFERENCE METHOD ANALYZER PRINCIPLES OF OPERATION

### 4.3.1 METHOD 3A: OXYGEN ANALYSIS

Flue gas sample is continuously analyzed for oxygen by a Servomex Model 1400A paramagnetic instrument. The Servomex 1400A analyzer uses electron paramagnetic resonance to detect the presence of oxygen molecules. Unlike most substances, oxygen has a triplet electron ground state, which leaves one electron unpaired, making it a paramagnetic molecule. This electron may have one of two quantum spin states ($m_s$ = +/- 2). By applying an alternating electromagnetic field of the proper frequency, the Servomex 1400A $O_2$ analyzer induces resonance between the two spin quantum states. In effect, the $O_2$ analyzer measures the electromagnetic energy absorbed by $O_2$ molecules at the resonant frequency.

### 4.3.2 METHOD 7E: OXIDES OF NITROGEN ANALYSIS

A Thermo Electron Model 10S instrument is used to analyze $NO_X$. The principle of operation of this instrument is a chemiluminescent reaction in which ozone ($O_3$) reacts with nitric oxide (NO) to form oxygen ($O_2$) and nitrogen dioxide ($NO_2$). During this reaction, a photon with a specific ultraviolet wavelength is emitted which is detected by a photomultiplier tube. The instrument is capable of analyzing total oxides of nitrogen (NO + $NO_2$) by thermally converting $NO_2$ to NO in a separate reaction chamber prior to the photomultiplier tube, if desired. The analyzer is operated in the $NO_X$ mode during sampling.

A converter efficiency test is performed on the Thermoelectron Model 10S before the test series. During this procedure, a leak-free Tedlar bag is partially filled with a Protocol 1 $NO_X$ reference gas. The Tedlar bag is then filled to capacity with a Certified Oxygen reference gas standard. The contents are well mixed and immediately connected to the sample inlet of the analyzer. The Tedlar bag is analyzed by the analyzer in the "$NO_X$" mode for at least thirty minutes. As the oxygen is exposed to the NO in the bag, the NO begins to react to form $NO_2$. A decrease in response in the $NO_X$ mode of more than 2% absolute indicates that corrective action is required.

### 4.3.3 METHOD 10: CARBON MONOXIDE ANALYSIS

A TECO 48 Gas Filter Correlation Non-Dispersive Infrared (GFC/NDIR) analyzer was used for continuous CO analysis. The principle of operation of this analyzer is similar to traditional NDIR analyzers in that it relies on selective absorption; whereby, particular bandwidths of infrared energy are absorbed by a species based on its molecular orbital structure. Gas filter correlation NDIR differs from NDIR in the detection mechanism and because the GFC/NDIR does not require a reference cell. Infrared radiation passes through a rotating filter, through the sample cell and to the detector. The chopper wheel of the GFC/NDIR is a rotating disk separated into two chambers where one half is filled with nitrogen and the other half is filled with pure CO. These partitions act as alternating gas filters for the incident IR radiation from the IR source. The CO gas filter side acts to produce a signal that cannot be further attenuated by CO in the sample cell and is used as a reference signal. The nitrogen filter allows all incident radiation to pass. Carbon monoxide in the sample cell attenuates the signal proportionally to concentration. This is considered the measure cycle. Any other gases that absorb infrared radiation are absorbed equally during both the measure and reference cycles, providing a real-time reference and minimal interferences. The detector for this analyzer is a lead-selenium photo detector.

It should be noted that EPA Method 10 prescribes the use of an ascarite trap to absorb carbon dioxide and excess moisture prior to introduction of the sample gas into the analyzer. The ascarite trap is prescribed since older technology dual cell NDIR carbon monoxide analyzers were subject to positive biases from carbon dioxide and water vapor. The single cell, gas filter correlation technology of the Teco Model 48, however, virtually eliminates this phenomenon since the sample gas itself is used as an optical attenuator during the reference cycle. Therefore, the ascarite traps were not used for this test effort.

### 4.3.4 METHOD 6C: SULFUR DIOXIDE ANALYSIS

A Western AT2 SO2 ultraviolet analyzer is used for continuous SO2 analysis. The principle of operation of this analyzer is to determine continuously the concentration of SO2 in a flowing gaseous mixture. The ultraviolet source emits a pulsed beam of light. The sample gas is introduced to the cell, and the component of interest absorbs ultraviolet energy in proportion to the concentration in the gas. The difference between the reference cell containing nitrogen and sample cell is amplified by two detectors and then linearized for a constant voltage output correlating to the SO2 absorbtion.

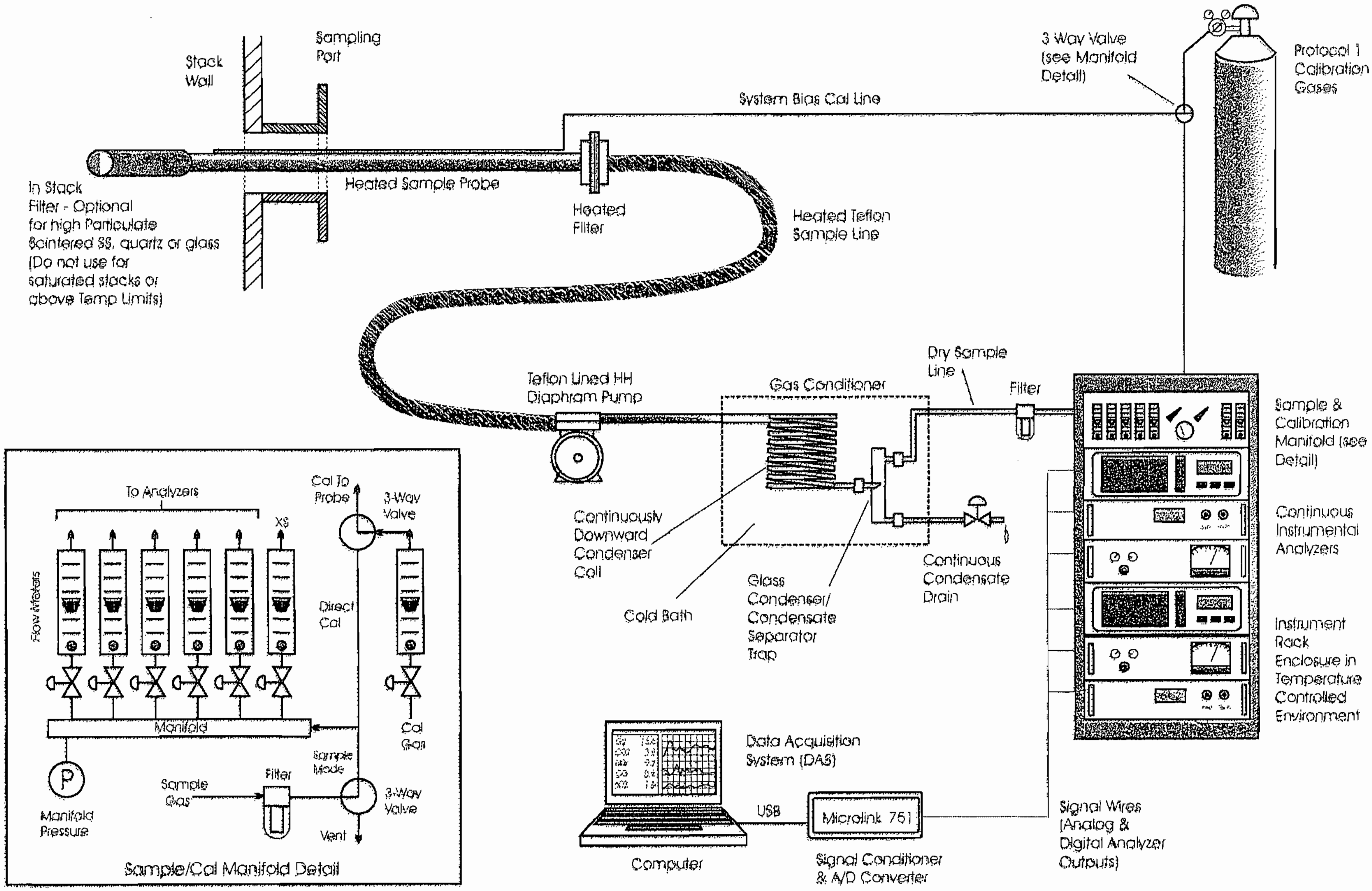



Figure 4-1. Schematic Diagram of STACS Instrumental Reference Method System

# 5.0 QUALITY ASSURANCE/QUALITY CONTROL

## 5.0 QUALITY ASSURANCE/QUALITY CONTROL

Strict Quality Assurance/Quality Control (QA/QC) measures were observed for all sampling and analysis performed for the Rayonier test program. The STACS QA/QC program is designed to provide the highest quality data in terms of the accuracy and precision of the measurements as well as the representativeness and comparability of the results.

Accuracy is the degree to which a measurement agrees to the true value or to an accepted reference value. Precision is the degree of reproducibility (or agreement) of a set of individual measurements of an identical property.

The objective of the overall QA/QC program is to provide guidelines in terms of accuracy and precision, which can be used to assess the uncertainty in the results and to substantiate the data in terms of the use of, accepted procedures. Quality Control can be defined as the use of operational techniques and activities that sustain good quality data. Adherence to accepted sampling and analytical methods and procedures (and specifically noting any aberrations or exceptions to these procedures) is an example of quality control. Quality Assurance includes all those planned and systematic activities necessary to ensure that the accuracy and precision of the results meets the needs of the testing program.

The QA program includes the activities planned by routine operators and analysts to provide an assessment of test data precision (and accuracy). Examples of implementation of QA measures include routine calibration checks to assess the bias and drift of an analyzer after each test run. The measurement system bias is an indicator of the accuracy of the system and the drift is an indication of the precision of the measurements.

The quality assurance/quality control measures for sampling and analysis included in the following documents were strictly followed during the emissions test program, except as noted below and elsewhere in this document. The procedures are incorporated by reference into the quality assurance program for this effort as they apply to the collection, analysis, and calculation of pollutant concentrations and mass emission rates from the combustion turbines:

> The Code of Federal Regulations, Title 40, Part 60, Appendix A., EPA Methods 1, 2, 3A, 4, 5,6C, 7E, 10.
>
> The Quality Assurance Handbook for Air Pollution Measurement Systems - Volume III - Stationary Source Specific Methods (EPA-600/4-77-027b) Sections 3.0-3.4.

The following sections provide a brief synopsis of the internal QA program that is used for this test program. Quality assurance documentation is included in Appendix C.

## 5.1 CALIBRATIONS AND DRIFT ASSESSMENTS

At the beginning of each test day, the EPA Reference Method 6C, 7E, 10 and 3A test equipment is calibrated, and adjusted as required, on a two-point basis. EPA Protocol #1, NIST traceable standard calibration gases are used to calibrate the analyzers. Subsequently, additional calibration standards are introduced to the analyzers to check the linearity of the instrument response. If the linearity of the instrument is within +/-2% of full scale of the calibration standard value, the calibration is accepted. Otherwise, corrective maintenance is performed, and the instrument is re-calibrated. During this time, bias checks are also performed by introducing calibration standards directly to the instrument manifold and through the entire sampling system and comparing the results.

Calibration checks are performed through the entire sampling system at the conclusion of each test run to determine calibration drift and any change in sample system bias. EPA Methods 3A, 6C and 7E require a bias/drift correction to be applied to the test data for each run based on pre-test and post-test bias and drift calibration checks, all data was bias/drift corrected for this program for consistency and in the interest of obtaining the highest quality data. The equation used for the bias corrections is provided in EPA Method 6C (Equation 6C-1).

Sampling system bias is assessed by introducing a mid-range or high-range gas through the sampling system and back to the analyzers. The maximum allowable bias is 5% of the value the analyzer read for the same gas when introduced to the probe tip as a percent of the span of the analyzer. STACS' internal QA/QC program requires that corrective action be taken if the bias exceeds 2% of the span.

Sampling system drift checks are subsequently performed at the conclusion of each test run. Corrective actions are taken if the drift checks exceed 2% of span after any test run. All calibration gases were EPA Protocol 1, NIST traceable standards with a rated accuracy of +/- 1%. Calibration gas analysis certificates are included in the test report.

## 5.2 $NO_2$ CONVERTER EFFICIENCY

Prior to the test series, an $NO_2$ to NO converter efficiency test is performed for the $NO_X$ analyzer as prescribed in EPA Method 7E and 20. The procedure used for testing the converter efficiency is given below:

- Fill a leak-free Tedlar bag approximately half full with an NO in $N_2$ blend.
- Fill the remainder of the bag with 0.1 UHP grade air.
- Immediately attach the NO/Air mixture to the inlet of the $NO_X$ monitor being used.
- Allow the monitor to sample the gas in the bag for 30 minutes.

As the $O_2$ and NO in the bag are exposed to each other a reaction occurs which changes the NO to $NO_2$. An attenuation in response over time of greater than two percent absolute indicates that the converter efficiency is unacceptable. Two $NO_X$ analyzers were used for this test program

## 5.3 INSTRUMENT RESPONSE TIME

Maximum instrument system response time is determined by alternately passing zero and span gas through the entire sampling system and noting the time required for the monitors to achieve a change of 95% of the final concentrations. Both upscale and down scale response times are recorded. The supporting data sheets and DAS printouts are included in the test report.

## 5.4 LEAK CHECKS

Since all calibration drift and bias are performed through the entire sampling system, leak-checks are incorporated before and after each run. The criterion used for this test is an oxygen response to a zero gas of less than 0.5% $O_2$. Leak checks are also incorporated into the zero and span drift checks at the end of each run since the calibration gas is passed through the entire sampling system for each post test drift check. Acceptable bias checks are therefore also an indication that leakage is not occurring in the system. In addition, STACS conducts a vacuum leak check prior to initial sampling.

# APPENDIX A
# EMISSION DATA

**Source Testing And Consulting Services, Inc.**

SRB

| 9-Jun-04 | | RAYNIER | | | 0.00 | | | Unit # | SRB | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Parameter | O2 | NOx | CO | SO2 | NOx | CO | 0.00 | 0.00 | Comments |
| | Units | %V | ppmV | ppmV | ppmV | @15%O2 | @15%O2 | 0.00 | 0.00 | |
| 25-May-04 | 7:08:12 | -0.03 | -1.08 | 0.00 | 1.48 | -0.30 | 0.00 | | | ce zero |
| 25-May-04 | 7:08:17 | -0.02 | -1.08 | -0.20 | 1.48 | -0.31 | -0.06 | | | ce zero |
| 25-May-04 | 7:08:22 | -0.04 | -1.08 | -0.20 | 1.48 | -0.30 | -0.06 | | | ce zero |
| 25-May-04 | 7:08:27 | -0.02 | -1.18 | -0.20 | 1.48 | -0.33 | -0.06 | | | ce zero |
| 25-May-04 | 7:08:32 | -0.04 | -1.18 | -0.20 | 1.48 | -0.33 | -0.06 | | | ce zero |
| 25-May-04 | 7:08:37 | -0.02 | -1.18 | -0.20 | 1.48 | -0.33 | -0.06 | | | ce zero |
| 25-May-04 | 7:08:42 | -0.04 | -1.08 | 0.00 | 1.84 | -0.30 | 0.00 | | | ce zero |
| 25-May-04 | 7:08:47 | -0.03 | -1.08 | -0.20 | 1.11 | -0.30 | -0.06 | | | ce zero |
| 25-May-04 | 7:10:07 | 19.95 | -1.18 | -0.20 | 1.48 | -7.31 | -1.22 | | | CE O2=19.98 |
| 25-May-04 | 7:10:12 | 19.96 | -1.18 | -0.39 | 1.48 | -7.42 | -2.47 | | | CE O2=19.98 |
| 25-May-04 | 7:10:17 | 19.95 | -1.08 | -0.20 | 1.11 | -6.75 | -1.23 | | | CE O2=19.98 |
| 25-May-04 | 7:10:22 | 19.97 | -1.18 | -0.20 | 1.84 | -7.46 | -1.24 | | | CE O2=19.98 |
| 25-May-04 | 7:10:27 | 19.96 | -1.08 | -0.20 | 1.84 | -6.82 | -1.24 | | | CE O2=19.98 |
| 25-May-04 | 7:10:32 | 19.97 | -1.18 | 0.00 | 1.11 | -7.50 | 0.00 | | | CE O2=19.98 |
| 25-May-04 | 7:10:37 | 19.96 | -1.08 | -0.20 | 1.48 | -6.82 | -1.24 | | | CE O2=19.98 |
| 25-May-04 | 7:10:42 | 19.97 | -1.08 | -0.20 | 1.11 | -6.88 | -1.25 | | | CE O2=19.98 |
| 25-May-04 | 7:10:47 | 19.97 | -1.08 | 0.00 | 1.48 | -6.84 | 0.00 | | | CE O2=19.98 |
| 25-May-04 | 7:10:52 | 19.98 | -1.18 | 0.00 | 1.11 | -7.56 | 0.00 | | | CE O2=19.98 |
| 25-May-04 | 7:11:07 | 19.98 | -1.28 | 0.00 | 1.48 | -8.21 | 0.00 | | | LB |
| 25-May-04 | 7:11:12 | 19.98 | -1.18 | -0.20 | 1.48 | -7.56 | -1.26 | | | LB |
| 25-May-04 | 7:11:17 | 19.97 | -1.08 | -0.20 | 1.48 | -6.89 | -1.25 | | | LB |
| 25-May-04 | 7:11:22 | 19.98 | -1.18 | -0.20 | 1.48 | -7.60 | -1.27 | | | LB |
| 25-May-04 | 7:11:27 | 19.97 | -1.08 | -0.20 | 1.48 | -6.84 | -1.24 | | | LB |
| 25-May-04 | 7:11:32 | 19.98 | -1.18 | -0.20 | 1.48 | -7.58 | -1.26 | | | LB |
| 25-May-04 | 7:11:37 | 19.97 | -1.18 | -0.20 | 1.11 | -7.52 | -1.25 | | | LB |
| 25-May-04 | 7:11:42 | 19.99 | -1.18 | -0.20 | 1.11 | -7.64 | -1.27 | | | LB |
| 25-May-04 | 7:11:47 | 19.98 | -1.18 | -0.20 | 1.48 | -7.56 | -1.26 | | | LB |
| 25-May-04 | 7:11:52 | 19.98 | -1.08 | -0.20 | 1.48 | -6.91 | -1.26 | | | LB |
| 25-May-04 | 7:13:01 | 13.00 | -1.18 | 0.59 | 1.84 | -0.88 | 0.44 | | | CE O2=12.98 |
| 25-May-04 | 7:13:06 | 12.99 | -1.18 | -0.20 | 1.48 | -0.88 | -0.15 | | | CE O2=12.98 |
| 25-May-04 | 7:13:11 | 12.99 | -1.08 | 0.00 | 1.48 | -0.81 | 0.00 | | | CE O2=12.98 |
| 25-May-04 | 7:13:16 | 12.99 | -1.08 | -0.20 | 1.48 | -0.81 | -0.15 | | | CE O2=12.98 |
| 25-May-04 | 7:13:21 | 13.00 | -1.18 | -0.20 | 1.11 | -0.88 | -0.15 | | | CE O2=12.98 |
| 25-May-04 | 7:13:26 | 12.98 | -1.08 | -0.20 | 1.84 | -0.81 | -0.15 | | | CE O2=12.98 |
| 25-May-04 | 7:13:31 | 12.99 | -1.08 | 0.00 | 1.84 | -0.81 | 0.00 | | | CE O2=12.98 |
| 25-May-04 | 7:13:36 | 12.98 | -1.18 | -0.20 | 1.48 | -0.88 | -0.15 | | | CE O2=12.98 |
| 25-May-04 | 7:13:41 | 13.00 | -1.08 | -0.20 | 1.11 | -0.81 | -0.15 | | | CE O2=12.98 |
| 25-May-04 | 7:13:46 | 12.99 | -1.18 | 0.00 | 1.11 | -0.88 | 0.00 | | | CE O2=12.98 |
| 25-May-04 | 7:13:51 | 13.00 | -1.18 | -0.20 | 1.48 | -0.88 | -0.15 | | | CE O2=12.98 |
| 25-May-04 | 7:14:02 | 12.99 | -0.98 | 0.00 | 1.11 | -0.73 | 0.00 | | | LB |
| 25-May-04 | 7:14:07 | 12.99 | -1.18 | -0.20 | 1.48 | -0.88 | -0.15 | | | LB |
| 25-May-04 | 7:14:12 | 12.99 | -1.08 | 0.00 | 1.84 | -0.81 | 0.00 | | | LB |
| 25-May-04 | 7:14:17 | 12.99 | -1.08 | -0.20 | 1.11 | -0.81 | -0.15 | | | LB |
| 25-May-04 | 7:14:22 | 12.99 | -1.08 | -0.20 | 1.11 | -0.81 | -0.15 | | | LB |
| 25-May-04 | 7:14:27 | 12.98 | -1.18 | 0.00 | 1.48 | -0.88 | 0.00 | | | LB |
| 25-May-04 | 7:14:32 | 12.99 | -1.08 | -0.20 | 1.84 | -0.81 | -0.15 | | | LB |
| 25-May-04 | 7:14:37 | 12.99 | -1.08 | -0.20 | 1.48 | -0.81 | -0.15 | | | LB |
| 25-May-04 | 7:14:42 | 12.99 | -1.08 | -0.20 | 1.84 | -0.81 | -0.15 | | | LB |
| 25-May-04 | 7:17:10 | 0.02 | 904.16 | 907.01 | 1.48 | 255.50 | 256.30 | | | CE NX=907 CO=904 |
| 25-May-04 | 7:17:15 | 0.02 | 902.68 | 919.01 | 1.18 | 255.08 | 259.69 | | | CE NX=907 CO=904 |
| 25-May-04 | 7:17:20 | 0.01 | 902.09 | 919.01 | 1.48 | 254.73 | 259.51 | | | CE NX=907 CO=904 |
| 25-May-04 | 7:17:25 | 0.02 | 901.50 | 918.02 | 1.48 | 254.78 | 259.44 | | | CE NX=907 CO=904 |
| 25-May-04 | 7:17:30 | 0.01 | 901.99 | 918.02 | 1.18 | 254.79 | 259.32 | | | CE NX=907 CO=904 |
| 25-May-04 | 7:17:35 | 0.02 | 901.01 | 911.34 | 1.18 | 254.58 | 257.49 | | | CE NX=907 CO=904 |
| 25-May-04 | 7:17:40 | 0.02 | 900.91 | 908.98 | 1.48 | 254.58 | 256.86 | | | CE NX=907 CO=904 |
| 25-May-04 | 7:17:45 | 0.02 | 900.81 | 919.01 | 1.48 | 254.55 | 259.69 | | | CE NX=907 CO=904 |

**Source Testing And Consulting Services, Inc.**

SRB

9-Jun-04 RAYNIER 0.00 Unit # SRB

| | Parameter | O2 | NOx | CO | SO2 | NOx | CO | 0.00 | 0.00 | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | @15%O2 | @15%O2 | 0.00 | 0.00 | |
| 25-May-04 | 7:17:50 | 0.02 | 899.73 | 918.81 | 1.18 | 254.27 | 259.67 | | | CE NX=907 CO=904 |
| 25-May-04 | 7:17:55 | 0.01 | 904.16 | 925.10 | 1.77 | 255.35 | 261.26 | | | CE NX=907 CO=904 |
| 25-May-04 | 7:18:00 | 0.02 | 904.06 | 925.10 | 1.48 | 255.41 | 261.35 | | | CE NX=907 CO=904 |
| 25-May-04 | 7:18:05 | 0.01 | 903.57 | 916.06 | 1.48 | 255.21 | 258.74 | | | CE NX=907 CO=904 |
| 25-May-04 | 7:18:10 | 0.02 | 902.68 | 915.86 | 1.48 | 255.05 | 258.77 | | | CE NX=907 CO=904 |
| 25-May-04 | 7:18:21 | 0.02 | 902.78 | 913.11 | 1.48 | 255.14 | 258.05 | | | LB |
| 25-May-04 | 7:18:26 | 0.01 | 903.07 | 923.14 | 1.48 | 255.10 | 260.77 | | | LB |
| 25-May-04 | 7:18:31 | 0.01 | 902.48 | 922.94 | 1.48 | 254.93 | 260.71 | | | LB |
| 25-May-04 | 7:18:36 | 0.02 | 902.48 | 922.94 | 1.48 | 254.96 | 260.74 | | | LB |
| 25-May-04 | 7:18:41 | 0.01 | 902.48 | 923.14 | 1.48 | 254.87 | 260.71 | | | LB |
| 25-May-04 | 7:18:46 | 0.01 | 901.89 | 910.94 | 1.48 | 254.77 | 257.32 | | | LB |
| 25-May-04 | 7:18:51 | 0.01 | 901.80 | 910.94 | 1.18 | 254.74 | 257.32 | | | LB |
| 25-May-04 | 7:18:56 | 0.01 | 901.70 | 909.17 | 1.48 | 254.68 | 256.79 | | | LB |
| 25-May-04 | 7:20:37 | 0.00 | 455.37 | 618.05 | 1.48 | 128.53 | 174.44 | | | CE NX=456 CO=619 |
| 25-May-04 | 7:20:42 | -0.01 | 455.67 | 618.05 | 1.48 | 128.60 | 174.42 | | | CE NX=456 CO=619 |
| 25-May-04 | 7:20:47 | -0.02 | 455.37 | 617.26 | 0.89 | 128.44 | 174.10 | | | CE NX=456 CO=619 |
| 25-May-04 | 7:20:52 | -0.01 | 455.37 | 617.06 | 1.18 | 128.47 | 174.08 | | | CE NX=456 CO=619 |
| 25-May-04 | 7:20:57 | -0.02 | 454.98 | 618.05 | 1.18 | 128.31 | 174.30 | | | CE NX=456 CO=619 |
| 25-May-04 | 7:21:02 | -0.02 | 455.37 | 618.05 | 1.18 | 128.45 | 174.34 | | | CE NX=456 CO=619 |
| 25-May-04 | 7:21:07 | -0.02 | 455.16 | 620.61 | 1.03 | 128.35 | 175.01 | | | CE NX=456 CO=619 |
| 25-May-04 | 7:21:12 | -0.02 | 454.96 | 620.61 | 1.03 | 128.31 | 175.03 | | | CE NX=456 CO=619 |
| 25-May-04 | 7:21:17 | -0.02 | 455.06 | 617.66 | 0.44 | 128.33 | 174.18 | | | CE NX=456 CO=619 |
| 25-May-04 | 7:21:22 | -0.01 | 455.06 | 617.66 | 0.74 | 128.37 | 174.24 | | | CE NX=456 CO=619 |
| 25-May-04 | 7:21:27 | -0.01 | 455.65 | 619.63 | 0.74 | 128.55 | 174.82 | | | CE NX=456 CO=619 |
| 25-May-04 | 7:21:32 | -0.02 | 455.35 | 619.63 | 0.74 | 128.44 | 174.77 | | | CE NX=456 CO=619 |
| 25-May-04 | 7:21:42 | -0.01 | 454.96 | 612.35 | 1.03 | 128.39 | 172.80 | | | LB |
| 25-May-04 | 7:21:46 | -0.02 | 454.86 | 619.63 | 1.03 | 128.27 | 174.73 | | | LB |
| 25-May-04 | 7:21:51 | -0.01 | 454.96 | 619.63 | 0.74 | 128.36 | 174.82 | | | LB |
| 25-May-04 | 7:21:56 | -0.02 | 455.26 | 616.88 | 1.03 | 128.40 | 173.98 | | | LB |
| 25-May-04 | 7:22:01 | -0.02 | 455.35 | 616.68 | 0.44 | 128.39 | 173.88 | | | LB |
| 25-May-04 | 7:22:06 | -0.02 | 455.06 | 616.68 | 0.44 | 128.36 | 173.94 | | | LB |
| 25-May-04 | 7:22:11 | -0.02 | 455.06 | 616.88 | 0.74 | 128.34 | 173.98 | | | LB |
| 25-May-04 | 7:22:16 | -0.02 | 454.96 | 619.63 | 0.74 | 128.31 | 174.75 | | | LB |
| 25-May-04 | 7:22:21 | -0.02 | 455.16 | 619.83 | 0.74 | 128.35 | 174.79 | | | LB |
| 25-May-04 | 7:22:26 | -0.02 | 455.16 | 621.60 | 0.44 | 128.38 | 175.33 | | | LB |
| 25-May-04 | 7:24:53 | -0.04 | 0.15 | -0.30 | 453.88 | 0.04 | -0.08 | | | CE SO2=452 |
| 25-May-04 | 7:24:58 | -0.04 | 0.15 | -0.30 | 453.58 | 0.04 | -0.08 | | | CE SO2=452 |
| 25-May-04 | 7:25:03 | -0.04 | 0.05 | -0.49 | 453.88 | 0.01 | -0.14 | | | CE SO2=452 |
| 25-May-04 | 7:25:08 | -0.04 | 0.05 | -0.30 | 454.17 | 0.01 | -0.08 | | | CE SO2=452 |
| 25-May-04 | 7:25:13 | -0.04 | 0.15 | -0.30 | 454.47 | 0.04 | -0.08 | | | CE SO2=452 |
| 25-May-04 | 7:25:18 | -0.04 | 0.05 | -0.30 | 454.47 | 0.01 | -0.08 | | | CE SO2=452 |
| 25-May-04 | 7:25:23 | -0.04 | -0.05 | -0.49 | 454.17 | -0.01 | -0.14 | | | CE SO2=452 |
| 25-May-04 | 7:25:28 | -0.05 | 0.05 | -0.30 | 453.88 | 0.01 | -0.08 | | | CE SO2=452 |
| 25-May-04 | 7:25:33 | -0.03 | 0.05 | -0.30 | 454.47 | 0.01 | -0.08 | | | CE SO2=452 |
| 25-May-04 | 7:25:42 | -0.04 | 0.05 | -0.49 | 454.47 | 0.01 | -0.14 | | | LB |
| 25-May-04 | 7:25:47 | -0.02 | -0.05 | -0.30 | 454.76 | -0.01 | -0.08 | | | LB |
| 25-May-04 | 7:25:52 | -0.05 | -0.05 | -0.30 | 455.06 | -0.01 | -0.08 | | | LB |
| 25-May-04 | 7:25:57 | -0.04 | -0.05 | -0.30 | 454.76 | -0.01 | -0.08 | | | LB |
| 25-May-04 | 7:26:02 | -0.03 | -0.05 | -0.30 | 454.76 | -0.01 | -0.08 | | | LB |
| 25-May-04 | 7:26:07 | -0.05 | -0.15 | -0.30 | 454.47 | -0.04 | -0.08 | | | LB |
| 25-May-04 | 7:26:12 | -0.04 | -0.05 | -0.49 | 454.47 | -0.01 | -0.14 | | | LB |
| 25-May-04 | 7:26:17 | -0.04 | -0.05 | -0.30 | 454.47 | -0.01 | -0.08 | | | LB |
| 25-May-04 | 7:26:22 | -0.03 | -0.15 | -0.30 | 454.76 | -0.04 | -0.08 | | | LB |
| 25-May-04 | 7:26:27 | -0.01 | -0.15 | -0.30 | 454.47 | -0.04 | -0.08 | | | LB |
| 25-May-04 | 7:26:32 | -0.04 | -0.25 | -0.30 | 455.06 | -0.07 | -0.08 | | | LB |
| 25-May-04 | 7:26:37 | -0.04 | -0.15 | -0.30 | 455.06 | -0.04 | -0.08 | | | LB |
| 25-May-04 | 7:26:42 | -0.03 | -0.25 | -0.49 | 455.36 | -0.07 | -0.14 | | | LB |

**Source Testing And Consulting Services, Inc.**

SRB

| 9-Jun-04 | | RAYNIER | | | 0.00 | | | Unit # | SRB | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Parameter | O2 | NOx | CO | SO2 | NOx | CO | 0.00 | 0.00 | Comments |
| | Units | %V | ppmV | ppmV | ppmV | @15%O2 | @15%O2 | 0.00 | 0.00 | |
| 25-May-04 | 7:26:47 | -0.04 | -0.15 | -0.30 | 455.06 | -0.04 | -0.08 | | | LB |
| 25-May-04 | 7:26:52 | -0.03 | -0.15 | -0.30 | 454.47 | -0.04 | -0.08 | | | LB |
| 25-May-04 | 7:26:57 | -0.04 | -0.15 | -0.30 | 454.76 | -0.04 | -0.08 | | | LB |
| 25-May-04 | 7:27:02 | -0.03 | -0.25 | -0.49 | 455.06 | -0.07 | -0.14 | | | LB |
| 25-May-04 | 7:27:07 | -0.04 | -0.15 | -0.49 | 455.06 | -0.04 | -0.14 | | | LB |
| 25-May-04 | 7:27:12 | -0.03 | -0.25 | -0.49 | 455.36 | -0.07 | -0.14 | | | LB |
| 25-May-04 | 7:27:17 | -0.04 | -0.25 | -0.30 | 454.76 | -0.07 | -0.08 | | | LB |
| 25-May-04 | 7:27:22 | -0.03 | -0.34 | -0.30 | 454.76 | -0.10 | -0.08 | | | LB |
| 25-May-04 | 7:27:27 | -0.03 | -0.25 | -0.49 | 455.06 | -0.07 | -0.14 | | | LB |
| 25-May-04 | 7:27:32 | -0.03 | -0.25 | -0.30 | 455.06 | -0.07 | -0.08 | | | LB |
| 25-May-04 | 7:27:37 | -0.05 | -0.34 | -0.30 | 455.36 | -0.10 | -0.08 | | | LB |
| 25-May-04 | 7:27:42 | -0.02 | -0.25 | -0.49 | 455.65 | -0.07 | -0.14 | | | LB |
| 25-May-04 | 7:27:47 | -0.05 | -0.34 | -0.49 | 455.36 | -0.10 | -0.14 | | | LB |
| 25-May-04 | 7:27:52 | -0.04 | -0.25 | -0.30 | 455.06 | -0.07 | -0.08 | | | LB |
| 25-May-04 | 7:27:57 | -0.04 | -0.34 | -0.30 | 455.06 | -0.10 | -0.08 | | | LB |
| 25-May-04 | 7:28:02 | -0.05 | -0.25 | -0.30 | 455.06 | -0.07 | -0.08 | | | LB |
| 25-May-04 | 7:28:07 | -0.03 | -0.25 | -0.30 | 454.76 | -0.07 | -0.08 | | | LB |
| 25-May-04 | 7:28:12 | -0.04 | -0.34 | -0.30 | 455.06 | -0.10 | -0.08 | | | LB |
| 25-May-04 | 7:28:17 | -0.04 | -0.34 | -0.49 | 455.36 | -0.10 | -0.14 | | | LB |
| 25-May-04 | 7:28:22 | -0.03 | -0.34 | -0.49 | 455.65 | -0.10 | -0.14 | | | LB |
| 25-May-04 | 7:32:20 | -0.04 | -0.44 | -0.30 | 250.32 | -0.12 | -0.08 | | | CE SO2=248 |
| 25-May-04 | 7:32:25 | -0.04 | -0.54 | -0.49 | 250.32 | -0.15 | -0.14 | | | CE SO2=248 |
| 25-May-04 | 7:32:30 | -0.05 | -0.34 | -0.30 | 250.03 | -0.10 | -0.08 | | | CE SO2=248 |
| 25-May-04 | 7:32:35 | -0.04 | -0.44 | -0.30 | 250.03 | -0.12 | -0.08 | | | CE SO2=248 |
| 25-May-04 | 7:32:40 | -0.05 | -0.34 | -0.30 | 250.32 | -0.10 | -0.08 | | | CE SO2=248 |
| 25-May-04 | 7:32:45 | -0.04 | -0.34 | -0.30 | 250.32 | -0.10 | -0.08 | | | CE SO2=248 |
| 25-May-04 | 7:32:50 | -0.05 | -0.44 | -0.49 | 250.32 | -0.12 | -0.14 | | | CE SO2=248 |
| 25-May-04 | 7:32:55 | -0.04 | -0.54 | -0.49 | 250.32 | -0.15 | -0.14 | | | CE SO2=248 |
| 25-May-04 | 7:33:00 | -0.04 | -0.44 | -0.30 | 250.62 | -0.12 | -0.08 | | | CE SO2=248 |
| 25-May-04 | 7:33:07 | -0.04 | -0.34 | -0.30 | 250.32 | -0.10 | -0.08 | | | LB |
| 25-May-04 | 7:33:12 | -0.05 | -0.44 | -0.49 | 250.03 | -0.12 | -0.14 | | | LB |
| 25-May-04 | 7:33:17 | -0.03 | -0.34 | -0.30 | 250.03 | -0.10 | -0.08 | | | LB |
| 25-May-04 | 7:33:22 | -0.04 | -0.34 | -0.30 | 250.03 | -0.10 | -0.08 | | | LB |
| 25-May-04 | 7:33:27 | -0.04 | -0.44 | -0.30 | 250.03 | -0.12 | -0.08 | | | LB |
| 25-May-04 | 7:33:32 | -0.04 | -0.34 | -0.49 | 250.03 | -0.10 | -0.14 | | | LB |
| 25-May-04 | 7:33:37 | -0.04 | -0.34 | -0.49 | 250.03 | -0.10 | -0.14 | | | LB |
| 25-May-04 | 7:33:42 | -0.04 | -0.44 | -0.30 | 249.73 | -0.12 | -0.08 | | | LB |
| 25-May-04 | 7:33:47 | -0.05 | -0.44 | -0.49 | 250.03 | -0.12 | -0.14 | | | LB |
| 25-May-04 | 7:33:52 | -0.04 | -0.44 | -0.30 | 250.32 | -0.12 | -0.08 | | | LB |
| 25-May-04 | 7:36:30 | -0.04 | 9.69 | 14.46 | 2.21 | 2.73 | 4.07 | | | CE CO=15.6 |
| 25-May-04 | 7:36:35 | -0.03 | 9.69 | 14.46 | 1.33 | 2.73 | 4.07 | | | CE CO=15.6 |
| 25-May-04 | 7:36:40 | -0.05 | 9.78 | 14.46 | 1.62 | 2.76 | 4.07 | | | CE CO=15.6 |
| 25-May-04 | 7:36:45 | -0.04 | 9.78 | 14.26 | 1.62 | 2.76 | 4.02 | | | CE CO=15.6 |
| 25-May-04 | 7:36:50 | -0.04 | 9.59 | 14.46 | 1.62 | 2.70 | 4.07 | | | CE CO=15.6 |
| 25-May-04 | 7:36:55 | -0.03 | 9.78 | 14.26 | 1.62 | 2.76 | 4.02 | | | CE CO=15.6 |
| 25-May-04 | 7:37:00 | -0.04 | 9.59 | 14.46 | 1.62 | 2.70 | 4.07 | | | CE CO=15.6 |
| 25-May-04 | 7:37:05 | -0.03 | 9.69 | 14.26 | 1.62 | 2.73 | 4.02 | | | CE CO=15.6 |
| 25-May-04 | 7:37:10 | -0.03 | 9.69 | 14.46 | 1.62 | 2.73 | 4.07 | | | CE CO=15.6 |
| 25-May-04 | 7:37:19 | -0.04 | 9.69 | 14.26 | 1.62 | 2.73 | 4.02 | | | LB |
| 25-May-04 | 7:37:23 | -0.04 | 9.69 | 14.46 | 1.62 | 2.73 | 4.07 | | | LB |
| 25-May-04 | 7:37:28 | -0.04 | 9.69 | 14.46 | 1.92 | 2.73 | 4.07 | | | LB |
| 25-May-04 | 7:37:33 | -0.05 | 9.88 | 14.46 | 1.62 | 2.78 | 4.07 | | | LB |
| 25-May-04 | 7:37:38 | -0.03 | 9.78 | 14.46 | 1.33 | 2.76 | 4.07 | | | LB |
| 25-May-04 | 7:37:43 | -0.03 | 9.78 | 14.26 | 0.74 | 2.76 | 4.02 | | | LB |
| 25-May-04 | 7:37:48 | -0.04 | 9.69 | 14.46 | 1.33 | 2.73 | 4.07 | | | LB |
| 25-May-04 | 7:37:53 | -0.04 | 9.69 | 14.46 | 1.33 | 2.73 | 4.07 | | | LB |
| 25-May-04 | 7:37:58 | -0.04 | 9.78 | 14.46 | 1.03 | 2.76 | 4.07 | | | LB |

**Source Testing And Consulting Services, Inc.**

SRB

| 9-Jun-04 | | RAYNIER | | | 0.00 | | | Unit # | SRB | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Parameter | O2 | NOx | CO | SO2 | NOx | CO | 0.00 | 0.00 | Comments |
| | Units | %V | ppmV | ppmV | ppmV | @15%O2 | @15%O2 | 0.00 | 0.00 | |
| 25-May-04 | 7:38:03 | -0.04 | 9.69 | 14.46 | 1.62 | 2.73 | 4.07 | | | LB |
| 25-May-04 | 7:38:08 | -0.03 | 9.78 | 14.46 | 1.62 | 2.76 | 4.07 | | | LB |
| 25-May-04 | 7:38:13 | -0.05 | 9.69 | 14.46 | 1.03 | 2.73 | 4.07 | | | LB |
| 25-May-04 | 7:38:18 | -0.03 | 9.78 | 14.26 | 1.03 | 2.76 | 4.02 | | | LB |
| 25-May-04 | 7:39:46 | -0.04 | 21.29 | 31.37 | 0.74 | 6.00 | 8.84 | | | CE CO=31.7 |
| 25-May-04 | 7:39:51 | -0.04 | 21.39 | 31.37 | 1.33 | 6.03 | 8.84 | | | CE CO=31.7 |
| 25-May-04 | 7:39:56 | -0.03 | 21.39 | 30.58 | 1.03 | 6.03 | 8.62 | | | CE CO=31.7 |
| 25-May-04 | 7:40:01 | -0.03 | 21.39 | 30.39 | 0.74 | 6.03 | 8.57 | | | CE CO=31.7 |
| 25-May-04 | 7:40:06 | -0.03 | 21.49 | 30.58 | 0.74 | 6.06 | 8.62 | | | CE CO=31.7 |
| 25-May-04 | 7:40:11 | -0.03 | 21.49 | 30.39 | 1.33 | 6.06 | 8.56 | | | CE CO=31.7 |
| 25-May-04 | 7:40:16 | -0.04 | 21.39 | 31.37 | 1.03 | 6.03 | 8.84 | | | CE CO=31.7 |
| 25-May-04 | 7:40:21 | -0.04 | 21.39 | 31.57 | 1.03 | 6.03 | 8.89 | | | CE CO=31.7 |
| 25-May-04 | 7:40:26 | -0.04 | 21.39 | 31.57 | 1.03 | 6.03 | 8.89 | | | CE CO=31.7 |
| 25-May-04 | 7:40:37 | -0.05 | 21.29 | 30.39 | 1.03 | 6.00 | 8.56 | | | LB |
| 25-May-04 | 7:40:42 | -0.03 | 21.49 | 30.58 | 1.33 | 6.06 | 8.62 | | | LB |
| 25-May-04 | 7:40:47 | -0.04 | 21.39 | 31.57 | 1.03 | 6.03 | 8.89 | | | LB |
| 25-May-04 | 7:40:52 | -0.05 | 21.49 | 31.57 | 1.03 | 6.05 | 8.89 | | | LB |
| 25-May-04 | 7:40:57 | -0.04 | 21.39 | 31.57 | 1.03 | 6.03 | 8.89 | | | LB |
| 25-May-04 | 7:42:36 | -0.03 | -1.18 | 61.17 | 0.89 | -0.33 | 17.24 | | | CE CO=61,7 |
| 25-May-04 | 7:42:41 | -0.04 | -1.18 | 61.37 | 0.89 | -0.33 | 17.29 | | | CE CO=61,7 |
| 25-May-04 | 7:42:46 | -0.04 | -1.18 | 61.17 | 0.89 | -0.33 | 17.23 | | | CE CO=61,7 |
| 25-May-04 | 7:42:51 | -0.04 | -1.18 | 61.17 | 0.89 | -0.33 | 17.24 | | | CE CO=61,7 |
| 25-May-04 | 7:42:56 | -0.04 | -1.18 | 61.37 | 0.59 | -0.33 | 17.29 | | | LB |
| 25-May-04 | 7:43:01 | -0.04 | -1.18 | 61.37 | 0.59 | -0.33 | 17.29 | | | LB |
| 25-May-04 | 7:43:06 | -0.05 | -1.28 | 61.17 | 0.59 | -0.36 | 17.23 | | | LB |
| 25-May-04 | 7:43:11 | -0.04 | -1.18 | 61.17 | 0.89 | -0.33 | 17.24 | | | LB |
| 25-May-04 | 7:46:59 | -0.04 | 94.70 | 97.16 | 0.59 | 26.68 | 27.38 | | | CE CO=96.8 |
| 25-May-04 | 7:47:04 | -0.04 | 94.61 | 97.16 | 0.30 | 26.66 | 27.38 | | | CE CO=96.8 |
| 25-May-04 | 7:47:09 | -0.05 | 94.70 | 97.16 | 0.89 | 26.68 | 27.37 | | | CE CO=96.8 |
| 25-May-04 | 7:47:14 | -0.03 | 94.70 | 97.16 | 0.89 | 26.70 | 27.39 | | | CE CO=96.8 |
| 25-May-04 | 7:47:19 | -0.04 | 94.70 | 97.16 | 0.89 | 26.68 | 27.37 | | | CE CO=96.8 |
| 25-May-04 | 7:47:24 | -0.03 | 94.61 | 97.36 | 0.59 | 26.67 | 27.44 | | | CE CO=96.8 |
| 25-May-04 | 7:47:29 | -0.04 | 94.70 | 97.16 | 0.59 | 26.68 | 27.37 | | | CE CO=96.8 |
| 25-May-04 | 7:47:34 | -0.03 | 94.80 | 97.36 | 0.59 | 26.72 | 27.44 | | | CE CO=96.8 |
| 25-May-04 | 7:47:39 | -0.04 | 94.61 | 97.36 | 0.89 | 26.65 | 27.43 | | | CE CO=96.8 |
| 25-May-04 | 7:47:44 | -0.04 | 94.70 | 97.16 | 0.59 | 26.68 | 27.38 | | | LB |
| 25-May-04 | 7:47:49 | -0.03 | 94.70 | 97.36 | 0.59 | 26.70 | 27.44 | | | LB |
| 25-May-04 | 7:47:54 | -0.04 | 94.61 | 97.36 | 0.59 | 26.66 | 27.44 | | | LB |
| 25-May-04 | 7:47:59 | -0.04 | 94.80 | 97.16 | 0.89 | 26.71 | 27.38 | | | LB |
| 25-May-04 | 7:48:04 | -0.03 | 94.61 | 97.36 | 0.59 | 26.67 | 27.44 | | | LB |
| 25-May-04 | 7:48:09 | -0.03 | 94.80 | 97.16 | 0.89 | 26.72 | 27.39 | | | LB |
| 25-May-04 | 7:48:14 | -0.04 | 94.90 | 97.16 | 0.30 | 26.74 | 27.38 | | | LB |
| 25-May-04 | 7:51:02 | -0.04 | 180.36 | 308.21 | 0.89 | 50.81 | 86.83 | | | CE CO=308 |
| 25-May-04 | 7:51:07 | -0.04 | 180.36 | 308.40 | 0.59 | 50.81 | 86.88 | | | CE CO=308 |
| 25-May-04 | 7:51:12 | -0.04 | 180.07 | 308.21 | 0.59 | 50.75 | 86.86 | | | CE CO=308 |
| 25-May-04 | 7:51:17 | -0.03 | 180.16 | 307.22 | 0.89 | 50.79 | 86.61 | | | CE CO=308 |
| 25-May-04 | 7:51:23 | -0.04 | 180.36 | 307.22 | 0.59 | 50.82 | 86.57 | | | LB |
| 25-May-04 | 7:51:28 | -0.04 | 180.36 | 309.19 | 0.59 | 50.83 | 87.13 | | | LB |
| 25-May-04 | 7:51:33 | -0.04 | 180.16 | 309.39 | 0.30 | 50.77 | 87.19 | | | LB |
| 25-May-04 | 7:51:38 | -0.04 | 180.26 | 308.21 | 0.89 | 50.80 | 86.86 | | | LB |
| 25-May-04 | 7:51:43 | -0.04 | 180.26 | 308.21 | 0.59 | 50.80 | 86.86 | | | LB |
| 25-May-04 | 9:16:39 | 4.16 | 588.78 | 0.39 | 190.29 | 207.54 | 0.14 | | | SRB RA R1 I START |
| 25-May-04 | 9:17:39 | 4.13 | 580.62 | 0.39 | 188.52 | 204.28 | 0.14 | | | SRB RA R1 PM R1 |
| 25-May-04 | 9:18:39 | 4.11 | 582.78 | 0.39 | 190.00 | 204.74 | 0.14 | | | SRB RA R1 PM R1 |
| 25-May-04 | 9:19:39 | 4.02 | 584.45 | 0.59 | 187.93 | 204.31 | 0.21 | | | SRB RA R1 PM R1 |
| 25-May-04 | 9:20:39 | 4.05 | 587.50 | 0.39 | 190.29 | 205.76 | 0.14 | | | SRB RA R1 PM R1 |
| 25-May-04 | 9:21:39 | 4.03 | 579.75 | 0.49 | 189.55 | 202.75 | 0.17 | | | SRB RA R1 PM R1 |

**Source Testing And Consulting Services, Inc.**

SRB

| 9-Jun-04 | | RAYNIER | | | 0.00 | | | Unit # | SRB | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Parameter | O2 | NOx | CO | SO2 | NOx | CO | 0.00 | 0.00 | Comments |
| | Units | %V | ppmV | ppmV | ppmV | @15%O2 | @15%O2 | 0.00 | 0.00 | |
| 25-May-04 | 9:22:39 | 4.07 | 588.21 | 0.49 | 189.55 | 206.25 | 0.17 | | | SRB RA R1 PM R1 |
| 25-May-04 | 9:23:39 | 4.06 | 588.70 | 0.49 | 190.43 | 206.21 | 0.17 | | | SRB RA R1 PM R1 |
| 25-May-04 | 9:24:39 | 4.17 | 589.88 | 0.69 | 192.20 | 207.99 | 0.24 | | | SRB RA R1 PM R1 |
| 25-May-04 | 9:25:39 | 4.11 | 594.90 | 0.49 | 193.68 | 209.02 | 0.17 | | | SRB RA R1 PM R1 |
| 25-May-04 | 9:26:39 | 4.13 | 588.60 | 0.49 | 195.74 | 207.02 | 0.17 | | | SRB RA R1 PM R1 |
| 25-May-04 | 9:27:39 | 4.15 | 593.62 | 0.69 | 194.56 | 209.15 | 0.24 | | | SRB RA R1 PM R1 |
| 25-May-04 | 9:28:39 | 4.25 | 601.78 | 0.49 | 195.15 | 213.22 | 0.17 | | | SRB RA R1 PM R1 |
| 25-May-04 | 9:29:39 | 4.29 | 598.93 | 0.49 | 197.22 | 212.68 | 0.17 | | | SRB RA R1 PM R1 |
| 25-May-04 | 9:30:39 | 4.24 | 601.88 | 0.69 | 198.99 | 213.10 | 0.24 | | | SRB RA R1 PM R1 |
| 25-May-04 | 9:31:39 | 4.23 | 598.44 | 0.49 | 197.51 | 211.82 | 0.17 | | | SRB RA R1 PM R1 |
| 25-May-04 | 9:32:39 | 4.18 | 594.41 | 0.69 | 197.51 | 209.77 | 0.24 | | | SRB RA R1 PM R1 |
| 25-May-04 | 9:33:39 | 4.09 | 588.60 | 0.69 | 197.22 | 206.57 | 0.24 | | | SRB RA R1 PM R1 |
| 25-May-04 | 9:34:39 | 4.08 | 588.31 | 0.49 | 195.45 | 206.34 | 0.17 | | | SRB RA R1 PM R1 |
| 25-May-04 | 9:35:39 | 4.08 | 589.00 | 0.49 | 193.68 | 206.62 | 0.17 | | | SRB RA R1 PM R1 |
| 25-May-04 | 9:36:39 | 4.10 | 589.29 | 0.49 | 194.56 | 206.96 | 0.17 | | | SRB RA R1 PM R1 |
| 25-May-04 | 9:37:39 | 4.10 | 587.23 | 0.69 | 193.38 | 206.27 | 0.24 | | | SRB RA R1 I STOP |
| 25-May-04 | 9:38:39 | 4.17 | 593.23 | 0.49 | 198.99 | 209.23 | 0.17 | | | SRB RA R1 PM R1 |
| 25-May-04 | 9:41:06 | -0.05 | 1.03 | -0.30 | 248.55 | 0.29 | -0.08 | | | POST RA R1 SO2=248 |
| 25-May-04 | 9:41:11 | -0.06 | 0.69 | -0.39 | 248.71 | 0.19 | -0.11 | | | POST RA R1 SO2=248 |
| 25-May-04 | 9:41:16 | -0.04 | 0.59 | -0.39 | 248.41 | 0.17 | -0.11 | | | POST RA R1 SO2=248 |
| 25-May-04 | 9:41:21 | -0.05 | 0.59 | -0.39 | 248.71 | 0.17 | -0.11 | | | POST RA R1 SO2=248 |
| 25-May-04 | 9:41:26 | -0.04 | 0.59 | -0.39 | 248.71 | 0.17 | -0.11 | | | POST RA R1 SO2=248 |
| 25-May-04 | 9:41:31 | -0.05 | 0.49 | -0.39 | 248.71 | 0.14 | -0.11 | | | POST RA R1 SO2=248 |
| 25-May-04 | 9:41:36 | -0.04 | 0.39 | -0.39 | 248.71 | 0.11 | -0.11 | | | POST RA R1 SO2=248 |
| 25-May-04 | 9:43:51 | 12.96 | -0.79 | -0.39 | 2.36 | -0.58 | -0.29 | | | SO2=0 |
| 25-May-04 | 9:43:56 | 12.95 | -0.79 | -0.59 | 2.07 | -0.58 | -0.44 | | | SO2=0 |
| 25-May-04 | 9:44:01 | 12.96 | -0.89 | -0.59 | 2.07 | -0.66 | -0.44 | | | SO2=0 |
| 25-May-04 | 9:44:06 | 12.96 | -0.79 | -0.39 | 1.77 | -0.58 | -0.29 | | | SO2=0 |
| 25-May-04 | 9:44:11 | 12.97 | -0.89 | -0.39 | 1.77 | -0.66 | -0.29 | | | SO2=0 |
| 25-May-04 | 9:46:20 | 4.19 | 590.25 | 0.59 | 196.19 | 208.46 | 0.21 | | | RAR2 PMR' START |
| 25-May-04 | 9:47:20 | 4.20 | 587.30 | 0.59 | 194.72 | 207.51 | 0.21 | | | RAR2 PMR1 |
| 25-May-04 | 9:48:20 | 4.21 | 586.81 | 0.39 | 196.19 | 207.43 | 0.14 | | | RAR2 PMR1 |
| 25-May-04 | 9:49:20 | 4.18 | 586.22 | 0.20 | 196.49 | 206.92 | 0.07 | | | RAR2 PMR1 |
| 25-May-04 | 9:50:20 | 4.21 | 588.29 | 0.39 | 195.60 | 207.95 | 0.14 | | | RAR2 PMR1 |
| 25-May-04 | 9:51:20 | 4.19 | 590.25 | 0.59 | 196.49 | 208.40 | 0.21 | | | RAR2 PMR1 |
| 25-May-04 | 9:52:20 | 4.18 | 588.88 | 0.20 | 196.49 | 207.85 | 0.07 | | | RAR2 PMR1 |
| 25-May-04 | 9:53:20 | 4.22 | 589.76 | 0.59 | 196.19 | 208.63 | 0.21 | | | RAR2 PMR1 |
| 25-May-04 | 9:54:20 | 4.20 | 586.32 | 0.39 | 198.55 | 207.10 | 0.14 | | | RAR2 PMR1 |
| 25-May-04 | 9:55:20 | 4.25 | 592.22 | 0.39 | 197.67 | 209.81 | 0.14 | | | RAR2 PMR1 |
| 25-May-04 | 9:56:20 | 4.24 | 593.01 | 0.39 | 197.08 | 210.05 | 0.14 | | | RAR2 PMR1 |
| 25-May-04 | 9:57:20 | 4.25 | 591.43 | 0.39 | 200.03 | 209.62 | 0.14 | | | RAR2 PMR1 |
| 25-May-04 | 9:58:20 | 4.23 | 591.43 | 0.59 | 199.14 | 209.28 | 0.21 | | | RAR2 PMR1 |
| 25-May-04 | 9:59:20 | 4.21 | 593.50 | 0.39 | 199.14 | 209.76 | 0.14 | | | RAR2 PMR1 |
| 25-May-04 | 10:00:20 | 4.18 | 586.71 | 0.39 | 200.62 | 207.06 | 0.14 | | | RAR2 PMR1 |
| 25-May-04 | 10:01:20 | 4.19 | 587.60 | 0.39 | 197.67 | 207.46 | 0.14 | | | RAR2 PMR1 |
| 25-May-04 | 10:02:20 | 4.19 | 591.34 | 0.39 | 200.03 | 208.75 | 0.14 | | | RAR2 PMR1 |
| 25-May-04 | 10:03:20 | 4.16 | 592.22 | 0.39 | 198.85 | 208.76 | 0.14 | | | RAR2 PMR1 |
| 25-May-04 | 10:04:20 | 4.14 | 595.76 | 0.59 | 199.73 | 209.76 | 0.21 | | | RAR2 PMR1 |
| 25-May-04 | 10:05:20 | 4.14 | 589.37 | 0.39 | 200.33 | 207.48 | 0.14 | | | RAR2 PMR1 |
| 25-May-04 | 10:06:20 | 4.28 | 593.20 | 0.39 | 200.03 | 210.62 | 0.14 | | | RAR2 PMR1 |
| 25-May-04 | 10:07:20 | 4.30 | 596.84 | 0.39 | 201.80 | 212.13 | 0.14 | | | RAR2 PMR' STOP |
| 25-May-04 | 10:08:58 | 12.94 | 0.20 | -0.39 | 1.77 | 0.15 | -0.29 | | | POST RA R2 SO2=0 |
| 25-May-04 | 10:09:03 | 12.94 | 0.00 | -0.59 | 1.48 | 0.00 | -0.44 | | | POST RA R2 SO2=0 |
| 25-May-04 | 10:09:08 | 12.94 | -0.20 | -0.59 | 1.18 | -0.15 | -0.44 | | | POST RA R2 SO2=0 |
| 25-May-04 | 10:09:13 | 12.96 | -0.10 | -0.59 | 0.89 | -0.07 | -0.44 | | | POST RA R2 SO2=0 |
| 25-May-04 | 10:09:18 | 12.94 | -0.10 | -0.79 | 1.18 | -0.07 | -0.58 | | | POST RA R2 SO2=0 |
| 25-May-04 | 10:09:23 | 12.95 | -0.20 | -0.59 | 1.48 | -0.15 | -0.44 | | | POST RA R2 SO2=0 |

***Source Testing And Consulting Services, Inc.***

SRB

| 9-Jun-04 | | RAYNIER | | | 0.00 | | Unit # | SRB | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Parameter | O2 | NOx | CO | SO2 | NOx | CO | 0.00 | 0.00 | Comments |
| | Units | %V | ppmV | ppmV | ppmV | @15%O2 | @15%O2 | 0.00 | 0.00 | |
| 25-May-04 | 10:12:36 | -0.03 | -0.10 | -0.39 | 248.12 | -0.03 | -0.11 | | | SO2=248 |
| 25-May-04 | 10:12:41 | -0.04 | -0.20 | -0.59 | 248.71 | -0.06 | -0.17 | | | SO2=248 |
| 25-May-04 | 10:12:46 | -0.04 | -0.30 | -0.39 | 248.71 | -0.08 | -0.11 | | | SO2=248 |
| 25-May-04 | 10:12:51 | -0.05 | -0.30 | -0.39 | 248.71 | -0.08 | -0.11 | | | SO2=248 |
| 25-May-04 | 10:12:56 | -0.04 | -0.30 | -0.39 | 248.71 | -0.08 | -0.11 | | | SO2=248 |
| 25-May-04 | 10:13:01 | -0.04 | -0.20 | -0.39 | 248.71 | -0.06 | -0.11 | | | SO2=248 |
| 25-May-04 | 10:13:06 | -0.05 | -0.30 | -0.39 | 248.71 | -0.08 | -0.11 | | | SO2=248 |
| 25-May-04 | 10:14:34 | 4.21 | 591.83 | 0.39 | 199.14 | 209.17 | 0.14 | | | RA R3 PM F START |
| 25-May-04 | 10:15:34 | 4.19 | 596.25 | 0.39 | 199.44 | 210.52 | 0.14 | | | RA R3 PM R1 |
| 25-May-04 | 10:16:34 | 4.19 | 598.32 | 0.59 | 198.55 | 211.25 | 0.21 | | | RA R3 PM R1 |
| 25-May-04 | 10:17:34 | 4.18 | 590.84 | 0.39 | 197.67 | 208.52 | 0.14 | | | RA R3 PM R1 |
| 25-May-04 | 10:18:34 | 4.16 | 592.52 | 0.59 | 198.85 | 208.86 | 0.21 | | | RA R3 PM R1 |
| 25-May-04 | 10:19:34 | 4.17 | 595.66 | 0.39 | 197.08 | 210.12 | 0.14 | | | RA R3 PM R1 |
| 25-May-04 | 10:20:34 | 4.18 | 596.35 | 0.39 | 197.96 | 210.43 | 0.14 | | | RA R3 PM R1 |
| 25-May-04 | 10:21:34 | 4.16 | 590.77 | 0.69 | 198.69 | 208.18 | 0.24 | | | RA R3 PM R1 |
| 25-May-04 | 10:22:34 | 4.14 | 593.82 | 0.49 | 198.40 | 208.98 | 0.17 | | | RA R3 PM R1 |
| 25-May-04 | 10:23:34 | 4.10 | 587.82 | 0.49 | 199.28 | 206.41 | 0.17 | | | RA R3 PM R1 |
| 25-May-04 | 10:24:34 | 4.20 | 597.06 | 0.69 | 199.28 | 210.93 | 0.24 | | | RA R3 PM R1 |
| 25-May-04 | 10:25:34 | 4.19 | 592.63 | 0.49 | 199.28 | 209.27 | 0.17 | | | RA R3 PM R1 |
| 25-May-04 | 10:26:34 | 4.18 | 601.58 | 0.49 | 201.64 | 212.27 | 0.17 | | | RA R3 PM R1 |
| 25-May-04 | 10:27:34 | 4.19 | 601.68 | 0.49 | 202.53 | 212.46 | 0.17 | | | RA R3 PM R1 |
| 25-May-04 | 10:28:34 | 4.21 | 597.26 | 0.49 | 202.53 | 211.12 | 0.17 | | | RA R3 PM R1 |
| 25-May-04 | 10:29:34 | 4.19 | 603.75 | 0.49 | 203.41 | 213.22 | 0.17 | | | RA R3 PM R1 |
| 25-May-04 | 10:30:34 | 4.23 | 591.65 | 0.49 | 202.23 | 209.38 | 0.17 | | | RA R3 PM R1 |
| 25-May-04 | 10:31:34 | 4.26 | 592.24 | 0.30 | 204.30 | 209.96 | 0.10 | | | RA R3 PM R1 |
| 25-May-04 | 10:32:34 | 4.25 | 599.81 | 0.49 | 202.23 | 212.55 | 0.17 | | | RA R3 PM R1 |
| 25-May-04 | 10:33:34 | 4.26 | 604.73 | 0.49 | 204.30 | 214.36 | 0.17 | | | RA R3 PM R1 |
| 25-May-04 | 10:34:34 | 4.25 | 597.36 | 0.49 | 205.18 | 211.62 | 0.17 | | | RA R3 PM R1 |
| 25-May-04 | 10:35:34 | 4.22 | 595.98 | 0.69 | 204.00 | 210.82 | 0.24 | | | RA R3 PM F STOP |
| 25-May-04 | 10:38:15 | -0.05 | 0.34 | -0.30 | 249.44 | 0.10 | -0.08 | | | POST RA R3 SO2=248 |
| 25-May-04 | 10:38:20 | -0.06 | 0.25 | -0.30 | 249.73 | 0.07 | -0.08 | | | POST RA R3 SO2=248 |
| 25-May-04 | 10:38:25 | -0.05 | 0.34 | -0.30 | 249.44 | 0.10 | -0.08 | | | POST RA R3 SO2=248 |
| 25-May-04 | 10:38:30 | -0.06 | 0.25 | -0.49 | 249.44 | 0.07 | -0.14 | | | POST RA R3 SO2=248 |
| 25-May-04 | 10:38:35 | -0.05 | 0.25 | -0.49 | 249.14 | 0.07 | -0.14 | | | POST RA R3 SO2=248 |
| 25-May-04 | 10:38:40 | -0.04 | 0.25 | -0.30 | 249.44 | 0.07 | -0.08 | | | POST RA R3 SO2=248 |
| 25-May-04 | 10:38:45 | -0.06 | 0.15 | -0.49 | 249.44 | 0.04 | -0.14 | | | POST RA R3 SO2=248 |
| 25-May-04 | 10:38:50 | -0.05 | 0.25 | -0.49 | 249.44 | 0.07 | -0.14 | | | POST RA R3 SO2=248 |
| 25-May-04 | 10:38:55 | -0.05 | 0.25 | -0.49 | 249.14 | 0.07 | -0.14 | | | POST RA R3 SO2=248 |
| 25-May-04 | 10:39:00 | -0.06 | 0.15 | -0.49 | 249.44 | 0.04 | -0.14 | | | POST RA R3 SO2=248 |
| 25-May-04 | 10:39:05 | -0.05 | 0.05 | -0.30 | 249.44 | 0.01 | -0.08 | | | POST RA R3 SO2=248 |
| 25-May-04 | 10:41:29 | 12.95 | -0.98 | -0.59 | 1.77 | -0.73 | -0.44 | | | O2=12.98 |
| 25-May-04 | 10:41:34 | 12.95 | -0.98 | -0.59 | 1.77 | -0.73 | -0.44 | | | O2=12.98 |
| 25-May-04 | 10:41:39 | 12.95 | -0.98 | -0.59 | 1.18 | -0.73 | -0.44 | | | O2=12.98 |
| 25-May-04 | 10:41:44 | 12.94 | -0.98 | -0.59 | 1.18 | -0.73 | -0.44 | | | O2=12.98 |
| 25-May-04 | 10:41:49 | 12.95 | -1.08 | -0.79 | 1.48 | -0.80 | -0.58 | | | O2=12.98 |
| 25-May-04 | 10:41:54 | 12.95 | -1.08 | -0.39 | 1.48 | -0.80 | -0.29 | | | O2=12.98 |
| 25-May-04 | 10:41:59 | 12.94 | -0.98 | -0.39 | 0.89 | -0.73 | -0.29 | | | O2=12.98 |
| 25-May-04 | 10:42:04 | 12.95 | -0.98 | -0.39 | 0.89 | -0.73 | -0.29 | | | O2=12.98 |
| 25-May-04 | 10:42:09 | 12.96 | -1.08 | -0.59 | 0.59 | -0.80 | -0.44 | | | O2=12.98 |
| 25-May-04 | 10:42:14 | 12.96 | -1.08 | -0.59 | 0.89 | -0.80 | -0.44 | | | O2=12.98 |
| 25-May-04 | 10:42:19 | 12.95 | -1.08 | -0.59 | 0.89 | -0.80 | -0.44 | | | O2=12.98 |
| 25-May-04 | 10:42:24 | 12.95 | -1.18 | -0.59 | 0.89 | -0.88 | -0.44 | | | O2=12.98 |
| 25-May-04 | 10:42:29 | 12.96 | -1.18 | -0.39 | 0.30 | -0.88 | -0.29 | | | O2=12.98 |
| 25-May-04 | 10:42:34 | 12.96 | -1.18 | -0.39 | 0.89 | -0.88 | -0.29 | | | O2=12.98 |
| 25-May-04 | 10:42:39 | 12.96 | -1.08 | -0.59 | 0.59 | -0.80 | -0.44 | | | O2=12.98 |
| 25-May-04 | 10:42:44 | 12.96 | -1.08 | -0.79 | 0.59 | -0.80 | -0.58 | | | O2=12.98 |
| 25-May-04 | 10:42:49 | 12.96 | -1.08 | -0.39 | 0.30 | -0.80 | -0.29 | | | O2=12.98 |

**Source Testing And Consulting Services, Inc.**

SRB

| 9-Jun-04 | | RAYNIER | | | 0.00 | | | Unit # | SRB | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Parameter | O2 | NOx | CO | SO2 | NOx | CO | 0.00 | 0.00 | Comments |
| | Units | %V | ppmV | ppmV | ppmV | @15%O2 | @15%O2 | 0.00 | 0.00 | |
| 25-May-04 | 10:42:54 | 12.96 | -1.08 | -0.59 | 0.59 | -0.80 | -0.44 | | | O2=12.98 |
| 25-May-04 | 10:46:52 | -0.01 | 899.54 | 846.14 | 0.59 | 253.80 | 238.74 | | | NX=907 |
| 25-May-04 | 10:46:57 | -0.02 | 899.05 | 846.34 | 0.59 | 253.61 | 238.74 | | | NX=907 |
| 25-May-04 | 10:47:02 | 0.00 | 898.95 | 846.14 | 0.30 | 253.79 | 238.88 | | | NX=907 |
| 25-May-04 | 10:47:07 | 0.00 | 899.35 | 853.22 | 0.59 | 253.87 | 240.85 | | | NX=907 |
| 25-May-04 | 10:47:12 | -0.02 | 899.35 | 853.42 | 0.59 | 253.69 | 240.73 | | | NX=907 |
| 25-May-04 | 10:47:17 | 0.00 | 899.54 | 845.16 | 0.59 | 253.92 | 238.57 | | | NX=907 |
| 25-May-04 | 10:47:22 | 0.00 | 899.64 | 845.36 | 0.59 | 253.92 | 238.60 | | | NX=907 |
| 25-May-04 | 10:47:27 | -0.01 | 898.95 | 853.22 | 0.59 | 253.67 | 240.76 | | | NX=907 |
| 25-May-04 | 10:47:32 | 0.00 | 899.25 | 853.22 | 0.89 | 253.84 | 240.85 | | | NX=907 |
| 25-May-04 | 10:47:37 | 0.00 | 898.36 | 842.41 | 0.59 | 253.56 | 237.77 | | | NX=907 |
| 25-May-04 | 10:47:42 | -0.01 | 898.85 | 842.41 | 0.59 | 253.58 | 237.65 | | | NX=907 |
| 25-May-04 | 10:47:47 | 0.00 | 899.94 | 852.24 | 0.89 | 254.06 | 240.60 | | | NX=907 |
| 25-May-04 | 10:47:52 | -0.01 | 899.35 | 852.44 | 0.59 | 253.72 | 240.48 | | | NX=907 |
| 25-May-04 | 10:47:57 | -0.01 | 899.15 | 851.45 | 0.59 | 253.69 | 240.24 | | | NX=907 |
| 25-May-04 | 10:48:02 | 0.00 | 898.76 | 851.26 | 0.59 | 253.70 | 240.29 | | | NX=907 |
| 25-May-04 | 10:52:19 | -0.06 | 10.33 | 15.36 | 0.30 | 2.91 | 4.33 | | | CO=15.6 |
| 25-May-04 | 10:52:24 | -0.04 | 10.23 | 15.15 | 0.30 | 2.88 | 4.27 | | | CO=15.6 |
| 25-May-04 | 10:52:29 | -0.05 | 10.23 | 15.36 | 0.30 | 2.88 | 4.33 | | | CO=15.6 |
| 25-May-04 | 10:52:34 | -0.04 | 10.13 | 15.36 | 0.30 | 2.85 | 4.33 | | | CO=15.6 |
| 25-May-04 | 10:52:39 | -0.03 | 10.33 | 15.36 | 0.30 | 2.91 | 4.33 | | | CO=15.6 |
| 25-May-04 | 10:52:44 | -0.05 | 10.13 | 15.36 | 0.00 | 2.85 | 4.33 | | | CO=15.6 |
| 25-May-04 | 11:11:30 | 4.22 | 619.76 | 0.42 | 206.23 | 219.17 | 0.15 | | | RA R4 PM F START |
| 25-May-04 | 11:12:30 | 4.22 | 636.18 | 0.42 | 208.29 | 225.05 | 0.15 | | | RA R4 PM R2 |
| 25-May-04 | 11:13:30 | 4.19 | 624.58 | 0.42 | 208.00 | 220.58 | 0.15 | | | RA R4 PM R2 |
| 25-May-04 | 11:14:30 | 4.18 | 626.44 | 0.63 | 206.52 | 221.11 | 0.22 | | | RA R4 PM R2 |
| 25-May-04 | 11:15:30 | 4.18 | 627.82 | 0.63 | 206.82 | 221.57 | 0.22 | | | RA R4 PM R2 |
| 25-May-04 | 11:16:30 | 4.20 | 625.56 | 0.63 | 207.70 | 221.03 | 0.22 | | | RA R4 PM R2 |
| 25-May-04 | 11:17:30 | 4.12 | 624.87 | 0.42 | 207.70 | 219.72 | 0.15 | | | RA R4 PM R2 |
| 25-May-04 | 11:18:30 | 4.05 | 615.04 | 0.42 | 207.41 | 215.34 | 0.15 | | | RA R4 PM R2 |
| 25-May-04 | 11:19:30 | 3.97 | 609.63 | 0.42 | 205.93 | 212.49 | 0.15 | | | RA R4 PM R2 |
| 25-May-04 | 11:20:30 | 3.94 | 598.52 | 0.42 | 204.46 | 208.25 | 0.15 | | | RA R4 PM R2 |
| 25-May-04 | 11:21:30 | 3.95 | 604.83 | 0.74 | 203.41 | 210.48 | 0.26 | | | RA R4 PM R2 |
| 25-May-04 | 11:22:30 | 3.93 | 606.80 | 0.74 | 204.59 | 210.95 | 0.26 | | | RA R4 PM R2 |
| 25-May-04 | 11:23:30 | 3.92 | 602.47 | 0.53 | 203.71 | 209.35 | 0.18 | | | RA R4 PM R2 |
| 25-May-04 | 11:24:30 | 3.93 | 615.15 | 0.53 | 202.82 | 213.85 | 0.18 | | | RA R4 PM R2 |
| 25-May-04 | 11:25:30 | 3.93 | 602.96 | 0.74 | 205.48 | 209.68 | 0.26 | | | RA R4 PM R2 |
| 25-May-04 | 11:26:30 | 3.94 | 612.70 | 0.74 | 204.00 | 213.12 | 0.26 | | | RA R4 PM R2 |
| 25-May-04 | 11:27:30 | 3.87 | 601.49 | 1.79 | 204.59 | 208.44 | 0.62 | | | RA R4 PM R2 |
| 25-May-04 | 11:28:30 | 3.85 | 601.88 | 1.58 | 204.89 | 208.33 | 0.55 | | | RA R4 PM R2 |
| 25-May-04 | 11:29:30 | 3.90 | 599.32 | 1.79 | 204.30 | 207.96 | 0.62 | | | RA R4 PM R2 |
| 25-May-04 | 11:30:30 | 3.98 | 614.56 | 0.53 | 204.00 | 214.33 | 0.18 | | | RA R4 PM R2 |
| 25-May-04 | 11:31:30 | 3.94 | 609.16 | 0.53 | 205.18 | 211.89 | 0.18 | | | RA R4 PM R2 |
| 25-May-04 | 11:32:30 | 3.85 | 601.68 | 1.58 | 206.66 | 208.27 | 0.55 | | | RA R4 PM F STOP |
| 25-May-04 | 11:34:58 | -0.05 | 10.96 | 15.26 | 1.33 | 3.09 | 4.30 | | | POST RAR4 ZERO |
| 25-May-04 | 11:35:03 | -0.05 | 10.77 | 15.26 | 1.33 | 3.03 | 4.30 | | | POST RAR4 ZERO |
| 25-May-04 | 11:35:08 | -0.05 | 10.67 | 15.26 | 0.74 | 3.00 | 4.30 | | | POST RAR4 ZERO |
| 25-May-04 | 11:35:13 | -0.04 | 10.67 | 15.26 | 1.03 | 3.01 | 4.30 | | | POST RAR4 ZERO |
| 25-May-04 | 11:35:18 | -0.05 | 10.67 | 15.26 | 1.03 | 3.00 | 4.30 | | | POST RAR4 ZERO |
| 25-May-04 | 11:35:23 | -0.04 | 10.67 | 15.26 | 0.74 | 3.01 | 4.30 | | | POST RAR4 ZERO |
| 25-May-04 | 11:35:28 | -0.05 | 10.57 | 15.26 | 1.03 | 2.98 | 4.30 | | | POST RAR4 ZERO |
| 25-May-04 | 11:37:40 | -0.05 | -0.05 | -0.53 | 247.96 | -0.01 | -0.15 | | | SO2=248 |
| 25-May-04 | 11:37:45 | -0.05 | 0.05 | -0.32 | 248.55 | 0.01 | -0.09 | | | SO2=248 |
| 25-May-04 | 11:37:50 | -0.05 | 0.05 | -0.32 | 248.55 | 0.01 | -0.09 | | | SO2=248 |
| 25-May-04 | 11:37:55 | -0.05 | -0.05 | -0.53 | 248.26 | -0.01 | -0.15 | | | SO2=248 |
| 25-May-04 | 11:38:00 | -0.04 | 0.05 | -0.32 | 248.26 | 0.01 | -0.09 | | | SO2=248 |
| 25-May-04 | 11:38:05 | -0.05 | -0.05 | -0.32 | 248.26 | -0.01 | -0.09 | | | SO2=248 |

**Source Testing And Consulting Services, Inc.**

SRB

| 9-Jun-04 | | RAYNIER | | | 0.00 | | | Unit # | SRB | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Parameter | O2 | NOx | CO | SO2 | NOx | CO | 0.00 | 0.00 | Comments |
| | Units | %V | ppmV | ppmV | ppmV | @15%O2 | @15%O2 | 0.00 | 0.00 | |
| 25-May-04 | 11:38:10 | -0.05 | -0.05 | -0.32 | 247.96 | -0.01 | -0.09 | | | SO2=248 |
| 25-May-04 | 11:39:45 | 3.85 | 614.47 | 0.53 | 205.77 | 212.69 | 0.18 | | | RAR5 PMR2 START |
| 25-May-04 | 11:40:45 | 3.86 | 605.22 | 0.53 | 207.25 | 209.55 | 0.18 | | | RAR5 PMR2 |
| 25-May-04 | 11:41:45 | 3.79 | 612.43 | 1.58 | 206.08 | 211.17 | 0.54 | | | RAR5 PMR2 |
| 25-May-04 | 11:42:45 | 3.86 | 616.36 | 1.79 | 205.49 | 213.35 | 0.62 | | | RAR5 PMR2 |
| 25-May-04 | 11:43:45 | 3.85 | 602.30 | 1.79 | 207.26 | 208.39 | 0.62 | | | RAR5 PMR2 |
| 25-May-04 | 11:44:45 | 3.81 | 598.17 | 1.79 | 208.14 | 206.46 | 0.62 | | | RAR5 PMR2 |
| 25-May-04 | 11:45:45 | 3.84 | 606.63 | 1.79 | 207.85 | 209.74 | 0.62 | | | RAR5 PMR2 |
| 25-May-04 | 11:46:45 | 3.81 | 604.86 | 1.79 | 208.44 | 208.86 | 0.62 | | | RAR5 PMR2 |
| 25-May-04 | 11:47:45 | 3.84 | 614.50 | 0.53 | 208.14 | 212.46 | 0.18 | | | RAR5 PMR2 |
| 25-May-04 | 11:48:45 | 3.90 | 610.86 | 0.74 | 208.73 | 212.06 | 0.26 | | | RAR5 PMR2 |
| 25-May-04 | 11:49:45 | 3.91 | 614.69 | 0.53 | 212.57 | 213.42 | 0.18 | | | RAR5 PMR2 |
| 25-May-04 | 11:50:45 | 3.90 | 616.17 | 0.74 | 211.09 | 213.81 | 0.26 | | | RAR5 PMR2 |
| 25-May-04 | 11:51:45 | 3.86 | 612.43 | 0.74 | 212.57 | 212.08 | 0.26 | | | RAR5 PMR2 |
| 25-May-04 | 11:52:45 | 3.89 | 624.04 | 0.53 | 211.98 | 216.41 | 0.18 | | | RAR5 PMR2 |
| 25-May-04 | 11:53:45 | 3.87 | 621.58 | 0.53 | 213.45 | 215.40 | 0.18 | | | RAR5 PMR2 |
| 25-May-04 | 11:54:45 | 3.87 | 622.17 | 0.74 | 212.86 | 215.55 | 0.26 | | | RAR5 PMR2 |
| 25-May-04 | 11:55:45 | 3.87 | 609.48 | 1.79 | 214.04 | 211.12 | 0.62 | | | RAR5 PMR2 |
| 25-May-04 | 11:56:45 | 3.91 | 614.89 | 1.79 | 215.81 | 213.49 | 0.62 | | | RAR5 PMR2 |
| 25-May-04 | 11:57:45 | 3.87 | 610.46 | 1.58 | 215.22 | 211.52 | 0.55 | | | RAR5 PMR2 |
| 25-May-04 | 11:58:45 | 3.88 | 618.33 | 0.32 | 218.76 | 214.40 | 0.11 | | | RAR5 PMR2 |
| 25-May-04 | 11:59:45 | 3.86 | 611.35 | 1.58 | 216.70 | 211.74 | 0.55 | | | RAR5 PMR2 |
| 25-May-04 | 12:00:45 | 3.86 | 611.05 | 1.58 | 217.58 | 211.54 | 0.55 | | | RAR5 PMR2 STOP |
| 25-May-04 | 12:02:50 | -0.06 | 0.93 | -0.32 | 248.26 | 0.26 | -0.09 | | | POST RAR5 SO2 248 |
| 25-May-04 | 12:02:55 | -0.05 | 0.74 | -0.32 | 248.85 | 0.21 | -0.09 | | | POST RAR5 SO2 248 |
| 25-May-04 | 12:03:00 | -0.05 | 0.64 | -0.53 | 248.85 | 0.18 | -0.15 | | | POST RAR5 SO2 248 |
| 25-May-04 | 12:03:05 | -0.06 | 0.64 | -0.53 | 248.26 | 0.18 | -0.15 | | | POST RAR5 SO2 248 |
| 25-May-04 | 12:03:10 | -0.05 | 0.44 | -0.53 | 248.85 | 0.12 | -0.15 | | | POST RAR5 SO2 248 |
| 25-May-04 | 12:03:15 | -0.05 | 0.54 | -0.53 | 248.55 | 0.15 | -0.15 | | | POST RAR5 SO2 248 |
| 25-May-04 | 12:03:20 | -0.06 | 0.44 | -0.53 | 248.55 | 0.12 | -0.15 | | | POST RAR5 SO2 248 |
| 25-May-04 | 12:05:25 | -0.05 | 9.98 | 15.26 | 1.33 | 2.81 | 4.30 | | | ZERO |
| 25-May-04 | 12:05:30 | -0.06 | 10.08 | 15.26 | 0.74 | 2.84 | 4.30 | | | ZERO |
| 25-May-04 | 12:05:35 | -0.05 | 9.98 | 15.26 | 0.74 | 2.81 | 4.30 | | | ZERO |
| 25-May-04 | 12:05:40 | -0.05 | 10.08 | 15.26 | 1.03 | 2.84 | 4.30 | | | ZERO |
| 25-May-04 | 12:05:45 | -0.05 | 9.98 | 15.26 | 1.03 | 2.81 | 4.30 | | | ZERO |
| 25-May-04 | 12:08:11 | 3.85 | 614.47 | 1.79 | 216.39 | 212.69 | 0.62 | | | RAR6 PMR: START |
| 25-May-04 | 12:09:11 | 3.93 | 619.28 | 0.53 | 214.33 | 215.32 | 0.18 | | | RAR6 PMR2 |
| 25-May-04 | 12:10:11 | 3.85 | 609.25 | 0.53 | 214.92 | 210.89 | 0.18 | | | RAR6 PMR2 |
| 25-May-04 | 12:11:11 | 3.86 | 618.99 | 1.58 | 213.15 | 214.35 | 0.55 | | | RAR6 PMR2 |
| 25-May-04 | 12:12:11 | 3.85 | 624.79 | 0.53 | 212.26 | 216.26 | 0.18 | | | RAR6 PMR2 |
| 25-May-04 | 12:13:11 | 3.86 | 618.01 | 1.58 | 211.38 | 213.95 | 0.55 | | | RAR6 PMR2 |
| 25-May-04 | 12:14:11 | 3.86 | 613.48 | 0.53 | 209.02 | 212.44 | 0.18 | | | RAR6 PMR2 |
| 25-May-04 | 12:15:11 | 3.82 | 616.33 | 1.79 | 208.43 | 212.88 | 0.62 | | | RAR6 PMR2 |
| 25-May-04 | 12:16:11 | 3.83 | 615.84 | 1.79 | 209.02 | 212.86 | 0.62 | | | RAR6 PMR2 |
| 25-May-04 | 12:17:11 | 3.83 | 613.38 | 1.58 | 207.84 | 212.01 | 0.55 | | | RAR6 PMR2 |
| 25-May-04 | 12:18:11 | 3.85 | 606.21 | 1.79 | 207.54 | 209.80 | 0.62 | | | RAR6 PMR2 |
| 25-May-04 | 12:19:11 | 3.80 | 606.99 | 1.79 | 206.66 | 209.44 | 0.62 | | | RAR6 PMR2 |
| 25-May-04 | 12:20:11 | 3.78 | 605.91 | 1.79 | 206.95 | 208.80 | 0.62 | | | RAR6 PMR2 |
| 25-May-04 | 12:21:11 | 3.77 | 604.22 | 1.68 | 208.00 | 208.11 | 0.58 | | | RAR6 PMR2 |
| 25-May-04 | 12:22:11 | 3.78 | 605.40 | 1.68 | 206.23 | 208.70 | 0.58 | | | RAR6 PMR2 |
| 25-May-04 | 12:23:11 | 3.77 | 601.76 | 1.68 | 208.88 | 207.23 | 0.58 | | | RAR6 PMR2 |
| 25-May-04 | 12:24:11 | 3.80 | 599.20 | 1.47 | 208.88 | 206.80 | 0.51 | | | RAR6 PMR2 |
| 25-May-04 | 12:25:11 | 3.78 | 595.66 | 1.47 | 209.18 | 205.31 | 0.51 | | | RAR6 PMR2 |
| 25-May-04 | 12:26:11 | 3.74 | 592.71 | 1.68 | 213.01 | 203.83 | 0.58 | | | RAR6 PMR2 |
| 25-May-04 | 12:27:11 | 3.76 | 596.45 | 1.47 | 210.36 | 205.29 | 0.51 | | | RAR6 PMR2 |
| 25-May-04 | 12:28:11 | 3.72 | 592.91 | 1.68 | 212.72 | 203.66 | 0.58 | | | RAR6 PMR2 |
| 25-May-04 | 12:29:11 | 3.78 | 593.50 | 1.68 | 214.49 | 204.57 | 0.58 | | | RAR6 PMR: STOP |

**Source Testing And Consulting Services, Inc.**

SRB

| 9-Jun-04 | | RAYNIER | | | 0.00 | | | Unit # | SRB | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Parameter | O2 | NOx | CO | SO2 | NOx | CO | 0.00 | 0.00 | Comments |
| | Units | %V | ppmV | ppmV | ppmV | @15%O2 | @15%O2 | 0.00 | 0.00 | |
| 25-May-04 | 12:30:43 | -0.05 | 10.92 | 15.36 | 1.18 | 3.07 | 4.33 | | | POST RA6 ZERO |
| 25-May-04 | 12:30:48 | -0.06 | 10.82 | 15.15 | 1.18 | 3.05 | 4.27 | | | POST RA6 ZERO |
| 25-May-04 | 12:30:53 | -0.05 | 10.62 | 15.15 | 1.48 | 2.99 | 4.27 | | | POST RA6 ZERO |
| 25-May-04 | 12:30:58 | -0.07 | 10.62 | 15.36 | 1.48 | 2.99 | 4.32 | | | POST RA6 ZERO |
| 25-May-04 | 12:31:03 | -0.05 | 10.72 | 15.36 | 1.18 | 3.02 | 4.33 | | | POST RA6 ZERO |
| 25-May-04 | 12:32:59 | -0.05 | 0.10 | -0.63 | 247.23 | 0.03 | -0.18 | | | SO=248 |
| 25-May-04 | 12:33:04 | -0.06 | 0.10 | -0.42 | 247.53 | 0.03 | -0.12 | | | SO=248 |
| 25-May-04 | 12:33:09 | -0.05 | 0.00 | -0.42 | 247.23 | 0.00 | -0.12 | | | SO=248 |
| 25-May-04 | 12:33:14 | -0.07 | 0.00 | -0.63 | 247.23 | 0.00 | -0.18 | | | SO=248 |
| 25-May-04 | 12:33:19 | -0.05 | 0.00 | -0.63 | 247.23 | 0.00 | -0.18 | | | SO=248 |
| 25-May-04 | 12:38:06 | -0.03 | 901.12 | 1,068.05 | 0.30 | 254.07 | 301.14 | | | NX=907 |
| 25-May-04 | 12:38:11 | -0.02 | 900.33 | 1,068.05 | 0.59 | 253.91 | 301.21 | | | NX=907 |
| 25-May-04 | 12:38:16 | -0.02 | 900.53 | 1,068.26 | 0.59 | 253.93 | 301.23 | | | NX=907 |
| 25-May-04 | 12:38:21 | -0.02 | 900.33 | 1,068.05 | 0.89 | 253.94 | 301.24 | | | NX=907 |
| 25-May-04 | 12:38:26 | -0.02 | 900.23 | 1,068.26 | 1.18 | 253.88 | 301.27 | | | NX=907 |
| 25-May-04 | 12:39:57 | 12.96 | 0.30 | 0.63 | 0.89 | 0.22 | 0.47 | | | O2=12.98 |
| 25-May-04 | 12:40:02 | 12.98 | 0.20 | -0.63 | 0.89 | 0.15 | -0.47 | | | O2=12.98 |
| 25-May-04 | 12:40:07 | 12.96 | 0.10 | -0.42 | 0.59 | 0.07 | -0.31 | | | O2=12.98 |
| 25-May-04 | 12:40:12 | 12.97 | 0.10 | -0.63 | 0.30 | 0.07 | -0.47 | | | O2=12.98 |
| 25-May-04 | 12:40:17 | 12.97 | 0.00 | -0.63 | 0.30 | 0.00 | -0.47 | | | O2=12.98 |
| 25-May-04 | 13:05:02 | 3.84 | 602.32 | 3.58 | 220.67 | 208.32 | 1.24 | | | RAR7 PMR: START |
| 25-May-04 | 13:06:02 | 3.90 | 600.06 | 1.68 | 218.90 | 208.23 | 0.58 | | | RAR7 PMR3 |
| 25-May-04 | 13:07:02 | 3.88 | 594.65 | 1.68 | 221.26 | 206.17 | 0.58 | | | RAR7 PMR3 |
| 25-May-04 | 13:08:02 | 3.90 | 603.30 | 1.89 | 224.51 | 209.36 | 0.66 | | | RAR7 PMR3 |
| 25-May-04 | 13:09:02 | 3.85 | 598.58 | 1.47 | 223.33 | 207.15 | 0.51 | | | RAR7 PMR3 |
| 25-May-04 | 13:10:02 | 3.87 | 594.65 | 1.68 | 222.44 | 206.03 | 0.58 | | | RAR7 PMR3 |
| 25-May-04 | 13:11:02 | 3.92 | 593.08 | 1.47 | 223.33 | 206.05 | 0.51 | | | RAR7 PMR3 |
| 25-May-04 | 13:12:02 | 3.87 | 598.58 | 3.79 | 224.21 | 207.42 | 1.31 | | | RAR7 PMR3 |
| 25-May-04 | 13:13:02 | 3.86 | 595.34 | 1.68 | 223.92 | 206.14 | 0.58 | | | RAR7 PMR3 |
| 25-May-04 | 13:14:02 | 3.82 | 592.78 | 1.68 | 224.21 | 204.82 | 0.58 | | | RAR7 PMR3 |
| 25-May-04 | 13:15:02 | 3.85 | 597.80 | 1.68 | 222.44 | 206.82 | 0.58 | | | RAR7 PMR3 |
| 25-May-04 | 13:16:02 | 3.87 | 592.68 | 2.53 | 222.44 | 205.34 | 0.87 | | | RAR7 PMR3 |
| 25-May-04 | 13:17:02 | 3.86 | 592.88 | 1.47 | 221.85 | 205.29 | 0.51 | | | RAR7 PMR3 |
| 25-May-04 | 13:18:02 | 3.89 | 593.37 | 1.68 | 223.33 | 205.79 | 0.58 | | | RAR7 PMR3 |
| 25-May-04 | 13:19:02 | 3.88 | 593.37 | 1.68 | 222.74 | 205.67 | 0.58 | | | RAR7 PMR3 |
| 25-May-04 | 13:20:02 | 3.87 | 594.16 | 1.68 | 221.56 | 205.85 | 0.58 | | | RAR7 PMR3 |
| 25-May-04 | 13:21:02 | 3.85 | 597.40 | 1.68 | 222.44 | 206.68 | 0.58 | | | RAR7 PMR3 |
| 25-May-04 | 13:22:02 | 3.88 | 602.84 | 1.47 | 223.63 | 209.02 | 0.51 | | | RAR7 PMR3 |
| 25-May-04 | 13:23:02 | 3.89 | 595.07 | 1.47 | 223.04 | 206.41 | 0.51 | | | RAR7 PMR3 |
| 25-May-04 | 13:24:02 | 3.90 | 594.19 | 1.47 | 223.63 | 206.25 | 0.51 | | | RAR7 PMR3 |
| 25-May-04 | 13:25:02 | 3.88 | 589.76 | 1.47 | 222.45 | 204.48 | 0.51 | | | RAR7 PMR3 |
| 25-May-04 | 13:26:02 | 3.89 | 591.53 | 2.53 | 223.93 | 205.13 | 0.88 | | | RAR7 PMR: STOP |
| 25-May-04 | 13:28:29 | -0.07 | 0.49 | -0.63 | 246.64 | 0.14 | -0.18 | | | SO2=248 |
| 25-May-04 | 13:28:34 | -0.07 | 0.39 | -0.63 | 246.94 | 0.11 | -0.18 | | | SO2=248 |
| 25-May-04 | 13:28:39 | -0.07 | 0.39 | -0.63 | 246.94 | 0.11 | -0.18 | | | SO2=248 |
| 25-May-04 | 13:28:44 | -0.06 | 0.30 | -0.42 | 246.94 | 0.08 | -0.12 | | | SO2=248 |
| 25-May-04 | 13:28:49 | -0.06 | 0.30 | -0.84 | 246.94 | 0.08 | -0.24 | | | SO2=248 |
| 25-May-04 | 13:28:54 | -0.06 | 0.39 | -0.63 | 246.94 | 0.11 | -0.18 | | | SO2=248 |
| 25-May-04 | 13:28:59 | -0.06 | 0.20 | -0.63 | 246.94 | 0.06 | -0.18 | | | SO2=248 |
| 25-May-04 | 13:31:11 | -0.05 | 9.64 | 15.15 | 0.59 | 2.71 | 4.27 | | | ZERO |
| 25-May-04 | 13:31:16 | -0.06 | 9.74 | 15.15 | 0.89 | 2.74 | 4.27 | | | ZERO |
| 25-May-04 | 13:31:21 | -0.07 | 9.64 | 15.15 | 0.89 | 2.71 | 4.26 | | | ZERO |
| 25-May-04 | 13:31:26 | -0.06 | 9.54 | 15.15 | 0.59 | 2.69 | 4.27 | | | ZERO |
| 25-May-04 | 13:31:31 | -0.06 | 9.64 | 15.15 | 0.59 | 2.71 | 4.27 | | | ZERO |
| 25-May-04 | 13:33:10 | 3.83 | 597.34 | 2.53 | 220.68 | 206.51 | 0.87 | | | RAR8 PMR: START |
| 25-May-04 | 13:34:10 | 3.82 | 588.68 | 2.31 | 224.22 | 203.31 | 0.80 | | | RAR8 PMR3 |
| 25-May-04 | 13:35:10 | 3.86 | 596.25 | 1.47 | 222.45 | 206.43 | 0.51 | | | RAR8 PMR3 |

**Source Testing And Consulting Services, Inc.**

SRB

| 9-Jun-04 | RAYNIER | | | | 0.00 | | Unit # | SRB | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | O2 | NOx | CO | SO2 | NOx | CO | 0.00 | 0.00 | Comments |
| Units | | %V | ppmV | ppmV | ppmV | @15%O2 | @15%O2 | 0.00 | 0.00 | |
| 25-May-04 | 13:36:10 | 3.87 | 594.78 | 1.47 | 224.81 | 206.04 | 0.51 | | | RAR8 PMR3 |
| 25-May-04 | 13:37:10 | 3.80 | 591.83 | 2.74 | 224.52 | 204.25 | 0.94 | | | RAR8 PMR3 |
| 25-May-04 | 13:38:10 | 3.88 | 598.22 | 2.31 | 223.34 | 207.32 | 0.80 | | | RAR8 PMR3 |
| 25-May-04 | 13:39:10 | 3.85 | 594.09 | 2.53 | 222.16 | 205.57 | 0.87 | | | RAR8 PMR3 |
| 25-May-04 | 13:40:10 | 3.84 | 593.40 | 1.47 | 225.40 | 205.24 | 0.51 | | | RAR8 PMR3 |
| 25-May-04 | 13:41:10 | 3.86 | 602.25 | 1.47 | 223.63 | 208.51 | 0.51 | | | RAR8 PMR3 |
| 25-May-04 | 13:42:10 | 3.89 | 596.42 | 1.47 | 223.33 | 206.83 | 0.51 | | | RAR8 PMR3 |
| 25-May-04 | 13:43:10 | 3.85 | 589.44 | 1.68 | 223.33 | 203.97 | 0.58 | | | RAR8 PMR3 |
| 25-May-04 | 13:44:10 | 3.88 | 595.73 | 1.68 | 223.92 | 206.50 | 0.58 | | | RAR8 PMR3 |
| 25-May-04 | 13:45:10 | 3.91 | 599.37 | 1.47 | 220.97 | 208.10 | 0.51 | | | RAR8 PMR3 |
| 25-May-04 | 13:46:10 | 3.89 | 600.55 | 1.68 | 223.03 | 208.26 | 0.58 | | | RAR8 PMR3 |
| 25-May-04 | 13:47:10 | 3.88 | 598.49 | 1.68 | 220.97 | 207.46 | 0.58 | | | RAR8 PMR3 |
| 25-May-04 | 13:48:10 | 3.88 | 595.24 | 1.47 | 220.97 | 206.33 | 0.51 | | | RAR8 PMR3 |
| 25-May-04 | 13:49:10 | 3.89 | 601.83 | 1.47 | 220.67 | 208.71 | 0.51 | | | RAR8 PMR3 |
| 25-May-04 | 13:50:10 | 3.89 | 600.65 | 1.47 | 220.67 | 208.36 | 0.51 | | | RAR8 PMR3 |
| 25-May-04 | 13:51:10 | 3.90 | 599.67 | 1.47 | 218.90 | 208.17 | 0.51 | | | RAR8 PMR3 |
| 25-May-04 | 13:52:10 | 3.87 | 597.40 | 1.47 | 217.13 | 206.96 | 0.51 | | | RAR8 PMR3 |
| 25-May-04 | 13:53:10 | 3.89 | 593.37 | 1.68 | 219.20 | 205.78 | 0.58 | | | RAR8 PMR3 |
| 25-May-04 | 13:54:10 | 3.84 | 600.35 | 3.58 | 213.30 | 207.60 | 1.24 | | | RAR8 PMR: STOP |
| 25-May-04 | 13:55:11 | -0.06 | 11.31 | 13.05 | 1.18 | 3.18 | 3.67 | | | Test |
| 25-May-04 | 13:55:23 | -0.07 | 10.92 | 14.31 | 0.89 | 3.07 | 4.03 | | | ZERO |
| 25-May-04 | 13:55:28 | -0.06 | 10.92 | 15.36 | 0.59 | 3.07 | 4.33 | | | ZERO |
| 25-May-04 | 13:55:33 | -0.06 | 10.82 | 15.15 | 0.59 | 3.04 | 4.26 | | | ZERO |
| 25-May-04 | 13:55:38 | -0.06 | 10.82 | 15.15 | 0.89 | 3.05 | 4.27 | | | ZERO |
| 25-May-04 | 13:55:43 | -0.06 | 10.72 | 15.15 | 0.59 | 3.02 | 4.26 | | | ZERO |
| 25-May-04 | 13:55:48 | -0.06 | 10.82 | 15.15 | 0.89 | 3.05 | 4.27 | | | ZERO |
| 25-May-04 | 13:55:53 | -0.06 | 10.62 | 15.15 | 0.59 | 2.99 | 4.26 | | | ZERO |
| 25-May-04 | 13:55:58 | -0.06 | 10.62 | 15.36 | 0.59 | 2.99 | 4.32 | | | ZERO |
| 25-May-04 | 13:57:47 | -0.06 | 0.10 | -0.63 | 246.04 | 0.03 | -0.18 | | | SO2=248 |
| 25-May-04 | 13:57:52 | -0.06 | 0.10 | -0.63 | 246.04 | 0.03 | -0.18 | | | SO2=248 |
| 25-May-04 | 13:57:57 | -0.06 | 0.10 | -0.63 | 246.34 | 0.03 | -0.18 | | | SO2=248 |
| 25-May-04 | 13:58:02 | -0.06 | 0.10 | -0.63 | 246.34 | 0.03 | -0.18 | | | SO2=248 |
| 25-May-04 | 13:58:07 | -0.06 | 0.10 | -0.42 | 246.63 | 0.03 | -0.12 | | | SO2=248 |
| 25-May-04 | 13:58:12 | -0.06 | 0.10 | -0.63 | 246.34 | 0.03 | -0.18 | | | SO2=248 |
| 25-May-04 | 13:58:17 | -0.05 | -0.10 | -0.63 | 246.34 | -0.03 | -0.18 | | | SO2=248 |
| 25-May-04 | 14:00:07 | 3.92 | 608.61 | 1.47 | 214.77 | 211.49 | 0.51 | | | RAR9 PMR: START |
| 25-May-04 | 14:01:07 | 4.00 | 621.79 | 1.68 | 215.36 | 217.04 | 0.59 | | | RAR9 PMR3 |
| 25-May-04 | 14:02:09 | 3.87 | 597.45 | 1.58 | 216.98 | 206.98 | 0.55 | | | RAR9 PMR3 |
| 25-May-04 | 14:03:09 | 3.73 | 589.29 | 2.63 | 215.80 | 202.55 | 0.90 | | | RAR9 PMR3 |
| 25-May-04 | 14:04:08 | 3.74 | 595.78 | 6.00 | 214.92 | 204.81 | 2.06 | | | RAR9 PMR3 |
| 25-May-04 | 14:05:08 | 3.75 | 594.60 | 4.73 | 212.85 | 204.58 | 1.63 | | | RAR9 PMR3 |
| 25-May-04 | 14:06:09 | 3.84 | 604.34 | 4.73 | 214.62 | 209.03 | 1.64 | | | RAR9 PMR3 |
| 25-May-04 | 14:07:09 | 3.88 | 602.17 | 2.63 | 215.21 | 208.74 | 0.91 | | | RAR9 PMR3 |
| 25-May-04 | 14:08:09 | 3.86 | 610.73 | 1.79 | 219.05 | 211.52 | 0.62 | | | RAR9 PMR3 |
| 25-May-04 | 14:09:09 | 3.85 | 599.81 | 2.42 | 219.34 | 207.59 | 0.84 | | | RAR9 PMR3 |
| 25-May-04 | 14:10:09 | 3.89 | 607.78 | 3.68 | 219.64 | 210.80 | 1.28 | | | RAR9 PMR3 |
| 25-May-04 | 14:11:09 | 3.94 | 608.27 | 1.79 | 219.93 | 211.55 | 0.62 | | | RAR9 PMR3 |
| 25-May-04 | 14:12:08 | 3.94 | 609.45 | 1.58 | 221.70 | 212.06 | 0.55 | | | RAR9 PMR3 |
| 25-May-04 | 14:13:09 | 3.93 | 604.53 | 1.58 | 220.82 | 210.16 | 0.55 | | | RAR9 PMR3 |
| 25-May-04 | 14:14:09 | 3.92 | 609.84 | 1.79 | 223.77 | 211.89 | 0.62 | | | RAR9 PMR3 |
| 25-May-04 | 14:15:08 | 3.86 | 610.43 | 1.79 | 223.18 | 211.36 | 0.62 | | | RAR9 PMR3 |
| 25-May-04 | 14:16:08 | 3.89 | 610.14 | 2.63 | 221.41 | 211.62 | 0.91 | | | RAR9 PMR3 |
| 25-May-04 | 14:17:08 | 3.83 | 610.24 | 2.84 | 222.29 | 210.92 | 0.98 | | | RAR9 PMR3 |
| 25-May-04 | 14:18:08 | 3.78 | 598.34 | 3.68 | 220.52 | 206.25 | 1.27 | | | RAR9 PMR3 |
| 25-May-04 | 14:19:08 | 3.80 | 602.86 | 6.63 | 220.23 | 207.98 | 2.29 | | | RAR9 PMR3 |
| 25-May-04 | 14:20:08 | 3.83 | 601.98 | 2.63 | 220.82 | 208.07 | 0.91 | | | RAR9 PMR3 |
| 25-May-04 | 14:21:08 | 3.84 | 604.44 | 1.79 | 219.64 | 209.04 | 0.62 | | | RAR9 PMR: STOP |

**Source Testing And Consulting Services, Inc.**

SRB

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 9-Jun-04 | | RAYNIER | | | 0.00 | | | Unit # | SRB | | |
| | Parameter | O2 | NOx | CO | SO2 | NOx | CO | 0.00 | 0.00 | Comments | |
| | Units | %V | ppmV | ppmV | ppmV | @15%O2 | @15%O2 | 0.00 | 0.00 | | |
| 25-May-04 | 14:22:54 | -0.06 | 1.13 | -0.53 | 246.78 | 0.32 | -0.15 | | | POST RAR9 | SO2=148 |
| 25-May-04 | 14:22:59 | -0.06 | 0.93 | -0.53 | 247.37 | 0.26 | -0.15 | | | POST RAR9 | SO2=148 |
| 25-May-04 | 14:23:04 | -0.06 | 0.84 | -0.32 | 247.37 | 0.24 | -0.09 | | | POST RAR9 | SO2=148 |
| 25-May-04 | 14:23:09 | -0.07 | 0.74 | -0.53 | 247.37 | 0.21 | -0.15 | | | POST RAR9 | SO2=148 |
| 25-May-04 | 14:23:14 | -0.07 | 0.74 | -0.53 | 247.37 | 0.21 | -0.15 | | | POST RAR9 | SO2=148 |
| 25-May-04 | 14:24:40 | -0.06 | 10.08 | 15.26 | 1.92 | 2.84 | 4.29 | | | CO=15.6 | |
| 25-May-04 | 14:24:45 | -0.07 | 10.08 | 15.26 | 1.33 | 2.84 | 4.29 | | | CO=15.6 | |
| 25-May-04 | 14:24:50 | -0.06 | 10.18 | 15.26 | 1.33 | 2.87 | 4.29 | | | CO=15.6 | |
| 25-May-04 | 14:24:55 | -0.06 | 10.18 | 15.26 | 0.74 | 2.86 | 4.29 | | | CO=15.6 | |
| 25-May-04 | 14:26:05 | -0.02 | 896.60 | 891.96 | 0.44 | 252.81 | 251.50 | | | NX=907 | |
| 25-May-04 | 14:26:10 | -0.03 | 896.89 | 1,068.11 | 0.44 | 252.86 | 301.13 | | | NX=907 | |
| 25-May-04 | 14:26:15 | -0.03 | 896.99 | 1,068.11 | 0.44 | 252.83 | 301.06 | | | NX=907 | |
| 25-May-04 | 14:26:20 | -0.02 | 897.19 | 1,068.32 | 0.44 | 252.98 | 301.23 | | | NX=907 | |
| 25-May-04 | 14:26:25 | -0.03 | 896.60 | 1,068.11 | 0.74 | 252.78 | 301.13 | | | NX=907 | |
| 25-May-04 | 14:26:30 | -0.02 | 896.30 | 1,068.11 | 0.74 | 252.73 | 301.17 | | | NX=907 | |
| 25-May-04 | 14:26:35 | -0.11 | 896.50 | 1,067.69 | 2.21 | 251.81 | 299.89 | | | NX=907 | |
| 25-May-04 | 14:28:15 | 12.94 | 1.03 | 14.42 | 0.15 | 0.77 | 10.68 | | | O2=12.98 | |
| 25-May-04 | 14:28:20 | 12.94 | 0.54 | 2.00 | 0.74 | 0.40 | 1.48 | | | O2=12.98 | |
| 25-May-04 | 14:28:25 | 12.95 | 0.64 | 1.58 | 0.44 | 0.47 | 1.17 | | | O2=12.98 | |
| 25-May-04 | 14:28:30 | 12.94 | 0.44 | -0.74 | 0.44 | 0.33 | -0.55 | | | O2=12.98 | |
| 25-May-04 | 14:28:35 | 12.95 | 0.34 | -0.32 | 0.15 | 0.26 | -0.23 | | | O2=12.98 | |
| 25-May-04 | 14:29:32 | 3.87 | 604.63 | 2.42 | 214.33 | 209.47 | 0.84 | | | RAR10 | START |
| 25-May-04 | 14:30:34 | 3.92 | 611.32 | 1.79 | 213.44 | 212.37 | 0.62 | | | RAR10 | |
| 25-May-04 | 14:31:32 | 3.93 | 615.06 | 1.79 | 214.03 | 213.82 | 0.62 | | | RAR10 | |
| 25-May-04 | 14:32:33 | 3.89 | 612.20 | 2.63 | 212.26 | 212.40 | 0.91 | | | RAR10 | |
| 25-May-04 | 14:33:32 | 3.89 | 613.97 | 2.42 | 211.08 | 212.98 | 0.84 | | | RAR10 | |
| 25-May-04 | 14:34:32 | 3.96 | 600.99 | 3.47 | 211.08 | 209.26 | 1.21 | | | RAR10 | |
| 25-May-04 | 14:35:32 | 4.08 | 588.50 | 4.73 | 210.79 | 206.38 | 1.66 | | | RAR10 | |
| 25-May-04 | 14:36:32 | 4.20 | 586.64 | 1.79 | 211.08 | 207.24 | 0.63 | | | RAR10 | |
| 25-May-04 | 14:37:32 | 4.29 | 583.88 | 2.63 | 213.44 | 207.37 | 0.93 | | | RAR10 | |
| 25-May-04 | 14:38:32 | 4.25 | 584.87 | 1.58 | 214.33 | 207.26 | 0.56 | | | RAR10 | |
| 25-May-04 | 14:39:32 | 4.27 | 581.62 | 1.58 | 215.51 | 206.38 | 0.56 | | | RAR10 | |
| 25-May-04 | 14:40:32 | 4.27 | 591.75 | 1.79 | 215.21 | 209.98 | 0.63 | | | RAR10 | |
| 25-May-04 | 14:41:32 | 4.34 | 584.94 | 1.47 | 216.55 | 208.44 | 0.52 | | | RAR10 | |
| 25-May-04 | 14:42:32 | 4.38 | 587.89 | 1.47 | 216.55 | 209.93 | 0.53 | | | RAR10 | |
| 25-May-04 | 14:43:32 | 4.28 | 599.20 | 1.47 | 218.62 | 212.70 | 0.52 | | | RAR10 | |
| 25-May-04 | 14:44:32 | 4.26 | 611.20 | 1.68 | 218.32 | 216.67 | 0.60 | | | RAR10 | |
| 25-May-04 | 14:45:32 | 4.16 | 615.43 | 1.47 | 219.80 | 216.86 | 0.52 | | | RAR10 | |
| 25-May-04 | 14:46:32 | 4.25 | 591.14 | 1.68 | 215.96 | 209.44 | 0.60 | | | RAR10 | |
| 25-May-04 | 14:47:32 | 4.24 | 586.42 | 2.53 | 216.55 | 207.64 | 0.89 | | | RAR10 | |
| 25-May-04 | 14:48:32 | 4.19 | 588.68 | 3.58 | 213.60 | 207.83 | 1.26 | | | RAR10 | |
| 25-May-04 | 14:49:32 | 4.23 | 589.66 | 2.53 | 217.44 | 208.64 | 0.89 | | | RAR10 | |
| 25-May-04 | 14:50:32 | 4.27 | 591.43 | 2.53 | 217.73 | 209.82 | 0.90 | | | RAR10 | STOP |
| 25-May-04 | 14:51:50 | 12.92 | 0.69 | 0.63 | 1.77 | 0.51 | 0.47 | | | SO2=0 | |
| 25-May-04 | 14:51:54 | 12.92 | 0.39 | -0.84 | 1.48 | 0.29 | -0.62 | | | SO2=0 | |
| 25-May-04 | 14:51:59 | 12.92 | 0.39 | -0.84 | 1.18 | 0.29 | -0.62 | | | SO2=0 | |
| 25-May-04 | 14:52:04 | 12.93 | 0.20 | -0.42 | 0.59 | 0.15 | -0.31 | | | SO2=0 | |
| 25-May-04 | 14:52:09 | 12.93 | 0.20 | -0.63 | 1.18 | 0.15 | -0.47 | | | SO2=0 | |
| 25-May-04 | 14:54:11 | -0.05 | 0.30 | -0.42 | 246.94 | 0.08 | -0.12 | | | SO2=248 | |
| 25-May-04 | 14:54:16 | -0.06 | 0.20 | -0.63 | 246.94 | 0.06 | -0.18 | | | SO2=248 | |
| 25-May-04 | 14:54:21 | -0.06 | 0.20 | -0.42 | 246.35 | 0.06 | -0.12 | | | SO2=248 | |
| 25-May-04 | 14:54:26 | -0.05 | 0.10 | -0.63 | 246.35 | 0.03 | -0.18 | | | SO2=248 | |
| 25-May-04 | 14:54:31 | -0.05 | 0.20 | -0.63 | 246.35 | 0.06 | -0.18 | | | SO2=248 | |
| 25-May-04 | 14:54:36 | -0.06 | 0.20 | -0.42 | 246.35 | 0.06 | -0.12 | | | SO2=248 | |

**Source Testing And Consulting Services, Inc.**

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9-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments | |
|---|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | | |
| 9-Jun-04 | 10:50:23 | 0.20 | 906.92 | 896.79 | 3.84 | | CE NX=907 CO=904 |
| 9-Jun-04 | 10:50:28 | 0.20 | 905.74 | 895.71 | 3.54 | | CE NX=907 CO=904 |
| 9-Jun-04 | 10:50:33 | 0.20 | 905.94 | 899.74 | 3.54 | | CE NX=907 CO=904 |
| 9-Jun-04 | 10:50:38 | 0.20 | 906.23 | 899.74 | 3.54 | | CE NX=907 CO=904 |
| 9-Jun-04 | 10:50:43 | 0.20 | 905.15 | 898.76 | 3.54 | | CE NX=907 CO=904 |
| 9-Jun-04 | 10:50:48 | 0.20 | 905.44 | 898.76 | 3.54 | | CE NX=907 CO=904 |
| 9-Jun-04 | 10:50:53 | 0.20 | 904.66 | 897.77 | 3.25 | | CE NX=907 CO=904 |
| 9-Jun-04 | 10:50:58 | 0.20 | 905.25 | 897.77 | 3.54 | | CE NX=907 CO=904 |
| 9-Jun-04 | 10:51:03 | 0.20 | 904.07 | 894.82 | 3.54 | | CE NX=907 CO=904 |
| 9-Jun-04 | 10:51:08 | 0.20 | 905.64 | 894.72 | 3.25 | | CE NX=907 CO=904 |
| 9-Jun-04 | 10:51:13 | 0.20 | 904.36 | 898.76 | 3.25 | | CE NX=907 CO=904 |
| 9-Jun-04 | 10:51:18 | 0.20 | 904.56 | 898.76 | 3.84 | | CE NX=907 CO=904 |
| 9-Jun-04 | 10:51:23 | 0.20 | 904.66 | 898.76 | 2.95 | | CE NX=907 CO=904 |
| 9-Jun-04 | 10:51:28 | 0.20 | 904.56 | 898.76 | 3.25 | | CE NX=907 CO=904 |
| 9-Jun-04 | 10:51:35 | 0.20 | 904.46 | 893.74 | 3.54 | | LB |
| 9-Jun-04 | 10:51:40 | 0.19 | 903.67 | 897.77 | 3.54 | | LB |
| 9-Jun-04 | 10:51:45 | 0.19 | 903.48 | 897.77 | 3.84 | | LB |
| 9-Jun-04 | 10:51:50 | 0.20 | 903.18 | 895.71 | 3.54 | | LB |
| 9-Jun-04 | 10:51:55 | 0.20 | 902.69 | 895.71 | 3.84 | | LB |
| 9-Jun-04 | 10:52:00 | 0.20 | 902.99 | 899.74 | 3.54 | | LB |
| 9-Jun-04 | 10:52:05 | 0.20 | 903.18 | 899.64 | 3.54 | | LB |
| 9-Jun-04 | 10:52:10 | 0.20 | 902.99 | 892.86 | 3.54 | | LB |
| 9-Jun-04 | 10:52:15 | 0.20 | 903.48 | 892.76 | 3.25 | | LB |
| 9-Jun-04 | 10:52:20 | 0.20 | 903.28 | 894.72 | 3.54 | | LB |
| 9-Jun-04 | 10:52:25 | 0.20 | 902.40 | 894.72 | 3.84 | | LB |
| 9-Jun-04 | 10:52:30 | 0.20 | 901.81 | 894.72 | 4.13 | | LB |
| 9-Jun-04 | 10:58:43 | 0.17 | 456.41 | 611.50 | 3.54 | | CE NX=456 CO=619 |
| 9-Jun-04 | 10:58:48 | 0.17 | 455.82 | 612.78 | 3.54 | | CE NX=456 CO=619 |
| 9-Jun-04 | 10:58:53 | 0.17 | 456.31 | 609.63 | 3.84 | | CE NX=456 CO=619 |
| 9-Jun-04 | 10:58:58 | 0.17 | 456.41 | 609.63 | 3.54 | | CE NX=456 CO=619 |
| 9-Jun-04 | 10:59:03 | 0.17 | 456.51 | 611.50 | 3.54 | | CE NX=456 CO=619 |
| 9-Jun-04 | 10:59:08 | 0.17 | 456.02 | 611.60 | 3.25 | | CE NX=456 CO=619 |
| 9-Jun-04 | 10:59:14 | 0.17 | 456.31 | 610.61 | 3.84 | | LB |
| 9-Jun-04 | 10:59:19 | 0.17 | 455.92 | 611.60 | 3.54 | | LB |
| 9-Jun-04 | 10:59:24 | 0.17 | 456.61 | 611.60 | 3.54 | | LB |
| 9-Jun-04 | 10:59:29 | 0.17 | 456.51 | 610.61 | 3.54 | | LB |
| 9-Jun-04 | 10:59:34 | 0.17 | 456.21 | 610.61 | 3.54 | | LB |
| 9-Jun-04 | 11:02:13 | 0.17 | 179.77 | 314.80 | 3.54 | | CE NX 181 CO=306 |
| 9-Jun-04 | 11:02:18 | 0.16 | 180.07 | 314.80 | 3.84 | | CE NX 181 CO=306 |
| 9-Jun-04 | 11:02:23 | 0.16 | 180.16 | 314.80 | 3.54 | | CE NX 181 CO=306 |
| 9-Jun-04 | 11:02:28 | 0.16 | 180.07 | 314.80 | 3.54 | | CE NX 181 CO=306 |
| 9-Jun-04 | 11:02:33 | 0.16 | 180.26 | 314.70 | 3.54 | | CE NX 181 CO=306 |
| 9-Jun-04 | 11:02:38 | 0.16 | 179.77 | 314.80 | 3.84 | | CE NX 181 CO=306 |

**Source Testing And Consulting Services, Inc.**

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9-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments | |
|---|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | | |
| 9-Jun-04 | 11:02:42 | 0.16 | 180.16 | 314.80 | 3.84 | | LB |
| 9-Jun-04 | 11:02:47 | 0.16 | 180.26 | 314.70 | 3.54 | | LB |
| 9-Jun-04 | 11:02:52 | 0.16 | 180.16 | 314.80 | 3.84 | | LB |
| 9-Jun-04 | 11:02:57 | 0.16 | 180.16 | 314.70 | 3.54 | | LB |
| 9-Jun-04 | 11:03:02 | 0.16 | 180.66 | 314.80 | 3.54 | | LB |
| 9-Jun-04 | 11:05:00 | 0.16 | 95.25 | 98.69 | 3.39 | | CE NX=95 CO=96 |
| 9-Jun-04 | 11:05:05 | 0.16 | 95.05 | 98.69 | 3.39 | | CE NX=95 CO=96 |
| 9-Jun-04 | 11:05:10 | 0.17 | 95.05 | 98.69 | 3.39 | | CE NX=95 CO=96 |
| 9-Jun-04 | 11:05:15 | 0.17 | 95.25 | 98.59 | 3.69 | | CE NX=95 CO=96 |
| 9-Jun-04 | 11:05:20 | 0.17 | 95.25 | 98.59 | 3.39 | | CE NX=95 CO=96 |
| 9-Jun-04 | 11:05:30 | 0.17 | 95.05 | 98.59 | 3.69 | | LB |
| 9-Jun-04 | 11:05:35 | 0.18 | 95.15 | 98.69 | 3.10 | | LB |
| 9-Jun-04 | 11:05:40 | 0.17 | 95.15 | 98.69 | 3.39 | | LB |
| 9-Jun-04 | 11:05:45 | 0.17 | 95.25 | 98.69 | 3.98 | | LB |
| 9-Jun-04 | 11:05:50 | 0.17 | 95.15 | 98.69 | 3.69 | | LB |
| 9-Jun-04 | 11:05:55 | 0.17 | 95.05 | 98.69 | 3.39 | | LB |
| 9-Jun-04 | 11:06:00 | 0.17 | 95.25 | 98.59 | 3.69 | | LB |
| 9-Jun-04 | 11:16:54 | 0.21 | 46.47 | 45.68 | 3.39 | | CE CO=46 NX=46.7 |
| 9-Jun-04 | 11:16:59 | 0.22 | 46.27 | 45.68 | 3.69 | | CE CO=46 NX=46.7 |
| 9-Jun-04 | 11:17:04 | 0.21 | 46.37 | 45.68 | 3.69 | | CE CO=46 NX=46.7 |
| 9-Jun-04 | 11:17:09 | 0.20 | 46.27 | 45.78 | 3.39 | | CE CO=46 NX=46.7 |
| 9-Jun-04 | 11:17:14 | 0.22 | 46.47 | 45.78 | 3.39 | | CE CO=46 NX=46.7 |
| 9-Jun-04 | 11:17:19 | 0.21 | 46.27 | 45.68 | 3.39 | | CE CO=46 NX=46.7 |
| 9-Jun-04 | 11:17:24 | 0.21 | 46.47 | 45.68 | 3.69 | | CE CO=46 NX=46.7 |
| 9-Jun-04 | 11:17:29 | 0.22 | 46.47 | 45.78 | 3.69 | | CE CO=46 NX=46.7 |
| 9-Jun-04 | 11:17:34 | 0.22 | 46.37 | 45.68 | 3.39 | | CE CO=46 NX=46.7 |
| 9-Jun-04 | 11:17:39 | 0.22 | 46.37 | 45.68 | 3.10 | | CE CO=46 NX=46.7 |
| 9-Jun-04 | 11:17:44 | 0.22 | 46.37 | 45.78 | 3.10 | | CE CO=46 NX=46.7 |
| 9-Jun-04 | 11:17:52 | 0.21 | 46.47 | 45.68 | 3.39 | | LB |
| 9-Jun-04 | 11:17:57 | 0.22 | 46.57 | 45.78 | 3.69 | | LB |
| 9-Jun-04 | 11:18:02 | 0.22 | 46.27 | 45.68 | 3.69 | | LB |
| 9-Jun-04 | 11:18:07 | 0.22 | 46.47 | 45.78 | 3.39 | | LB |
| 9-Jun-04 | 11:18:12 | 0.22 | 46.37 | 45.78 | 3.69 | | LB |
| 9-Jun-04 | 11:23:58 | 0.24 | 0.05 | 100.75 | 47.06 | | CE SO2=46.9 |
| 9-Jun-04 | 11:24:03 | 0.25 | 0.05 | 100.75 | 47.06 | | CE SO2=46.9 |
| 9-Jun-04 | 11:24:08 | 0.24 | 0.05 | 100.76 | 47.35 | | CE SO2=46.9 |
| 9-Jun-04 | 11:24:13 | 0.24 | 0.05 | 100.76 | 47.06 | | CE SO2=46.9 |
| 9-Jun-04 | 11:24:17 | 0.24 | 0.05 | 100.76 | 47.06 | | LB |
| 9-Jun-04 | 11:24:22 | 0.24 | 0.05 | 100.76 | 47.06 | | LB |
| 9-Jun-04 | 11:24:27 | 0.24 | -0.05 | 100.76 | 47.06 | | LB |
| 9-Jun-04 | 11:24:32 | 0.24 | 0.15 | 100.76 | 47.06 | | LB |
| 9-Jun-04 | 11:24:37 | 0.24 | -0.05 | 100.76 | 47.35 | | LB |
| 9-Jun-04 | 11:24:42 | 0.24 | 0.05 | 100.76 | 47.06 | | LB |
| 9-Jun-04 | 11:28:12 | 0.24 | -1.23 | 100.76 | 24.64 | | CE SO2=24.9 |

**Source Testing And Consulting Services, Inc.**

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9-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments | |
|---|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | | |
| 9-Jun-04 | 11:28:17 | 0.24 | -1.33 | 100.76 | 24.64 | | CE SO2=24.9 |
| 9-Jun-04 | 11:28:22 | 0.24 | -1.23 | 100.76 | 24.64 | | CE SO2=24.9 |
| 9-Jun-04 | 11:28:30 | 0.24 | -1.33 | 100.76 | 24.64 | | LB |
| 9-Jun-04 | 11:28:35 | 0.23 | -1.33 | 100.76 | 24.64 | | LB |
| 9-Jun-04 | 11:28:40 | 0.24 | -1.23 | 100.76 | 24.34 | | LB |
| 9-Jun-04 | 11:28:45 | 0.23 | -1.23 | 100.76 | 24.64 | | LB |
| 9-Jun-04 | 11:28:50 | 0.23 | -1.23 | 100.76 | 24.93 | | LB |
| 9-Jun-04 | 11:28:55 | 0.23 | -1.23 | 100.76 | 24.93 | | LB |
| 9-Jun-04 | 11:30:31 | 19.96 | -1.33 | 100.76 | 3.39 | | CE O2=19.99 |
| 9-Jun-04 | 11:30:36 | 19.97 | -1.33 | 100.76 | 3.69 | | CE O2=19.99 |
| 9-Jun-04 | 11:30:41 | 19.97 | -1.23 | 100.76 | 3.69 | | CE O2=19.99 |
| 9-Jun-04 | 11:30:46 | 19.97 | -1.33 | 100.76 | 3.69 | | CE O2=19.99 |
| 9-Jun-04 | 11:30:51 | 19.97 | -1.33 | 100.86 | 3.39 | | CE O2=19.99 |
| 9-Jun-04 | 11:30:56 | 19.97 | -1.43 | 100.76 | 3.39 | | CE O2=19.99 |
| 9-Jun-04 | 11:31:01 | 19.97 | -1.33 | 100.76 | 3.69 | | CE O2=19.99 |
| 9-Jun-04 | 11:31:06 | 19.98 | -1.33 | 100.76 | 3.39 | | CE O2=19.99 |
| 9-Jun-04 | 11:31:11 | 19.98 | -1.43 | 100.76 | 3.39 | | CE O2=19.99 |
| 9-Jun-04 | 11:31:16 | 19.98 | -1.33 | 100.76 | 3.39 | | CE O2=19.99 |
| 9-Jun-04 | 11:31:21 | 19.98 | -1.43 | 100.76 | 3.39 | | CE O2=19.99 |
| 9-Jun-04 | 11:31:26 | 19.98 | -1.33 | 100.86 | 3.39 | | CE O2=19.99 |
| 9-Jun-04 | 11:31:31 | 19.98 | -1.33 | 100.76 | 3.69 | | CE O2=19.99 |
| 9-Jun-04 | 11:31:36 | 19.98 | -1.33 | 100.76 | 3.69 | | CE O2=19.99 |
| 9-Jun-04 | 11:31:41 | 19.98 | -1.33 | 100.76 | 3.69 | | CE O2=19.99 |
| 9-Jun-04 | 11:31:46 | 19.98 | -1.43 | 100.76 | 3.10 | | CE O2=19.99 |
| 9-Jun-04 | 11:31:51 | 19.99 | -1.33 | 100.76 | 3.39 | | CE O2=19.99 |
| 9-Jun-04 | 11:31:56 | 19.92 | -1.33 | 100.76 | 3.39 | | CE O2=19.99 |
| 9-Jun-04 | 11:33:08 | 13.06 | -1.33 | -0.15 | 3.39 | | CE O2=12.97 |
| 9-Jun-04 | 11:33:13 | 13.06 | -1.43 | -0.25 | 3.39 | | CE O2=12.97 |
| 9-Jun-04 | 11:33:18 | 13.05 | -1.33 | -0.05 | 3.39 | | CE O2=12.97 |
| 9-Jun-04 | 11:33:23 | 13.05 | -1.33 | -0.15 | 3.69 | | CE O2=12.97 |
| 9-Jun-04 | 11:33:28 | 13.05 | -1.43 | -0.15 | 3.10 | | CE O2=12.97 |
| 9-Jun-04 | 11:33:33 | 13.05 | -1.43 | -0.15 | 3.39 | | CE O2=12.97 |
| 9-Jun-04 | 11:33:38 | 13.05 | -1.33 | -0.15 | 3.39 | | CE O2=12.97 |
| 9-Jun-04 | 11:33:59 | 13.05 | -1.33 | -0.15 | 3.10 | | LB |
| 9-Jun-04 | 11:34:04 | 13.06 | -1.43 | -0.15 | 3.39 | | LB |
| 9-Jun-04 | 11:34:09 | 13.05 | -1.43 | -0.15 | 3.39 | | LB |
| 9-Jun-04 | 11:34:14 | 13.06 | -1.43 | -0.15 | 3.10 | | LB |
| 9-Jun-04 | 11:34:19 | 13.06 | -1.43 | -0.15 | 3.39 | | LB |
| 9-Jun-04 | 11:34:24 | 13.07 | -1.43 | -0.15 | 3.39 | | LB |
| 9-Jun-04 | 11:36:41 | 12.13 | 70.56 | 253.00 | 3.69 | | RT |
| 9-Jun-04 | 11:36:46 | 12.29 | 69.19 | 252.90 | 3.69 | | RT |
| 9-Jun-04 | 11:39:05 | 19.85 | -1.13 | 13.82 | 3.69 | | LB O2=19.99 |
| 9-Jun-04 | 11:39:10 | 19.87 | -1.23 | -0.15 | 3.69 | | LB O2=19.99 |
| 9-Jun-04 | 11:39:15 | 19.88 | -1.13 | -0.05 | 3.39 | | LB O2=19.99 |

**Source Testing And Consulting Services, Inc.**

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9-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments | | |
|---|---|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | | | |
| 9-Jun-04 | 11:39:20 | 19.89 | -1.23 | -0.15 | 3.39 | | LB O2=19.99 | |
| 9-Jun-04 | 11:39:25 | 19.89 | -1.23 | -0.15 | 3.39 | | LB O2=19.99 | |
| 9-Jun-04 | 11:39:30 | 19.89 | -1.23 | -0.15 | 3.39 | | LB O2=19.99 | |
| 9-Jun-04 | 11:39:35 | 19.89 | -1.23 | -0.05 | 3.69 | | LB O2=19.99 | |
| 9-Jun-04 | 11:39:40 | 19.90 | -1.23 | -0.05 | 3.69 | | LB O2=19.99 | |
| 9-Jun-04 | 11:39:45 | 19.90 | -1.33 | -0.15 | 3.39 | | LB O2=19.99 | |
| 9-Jun-04 | 11:39:50 | 19.90 | -1.23 | -0.05 | 3.39 | | LB O2=19.99 | |
| 9-Jun-04 | 11:39:55 | 19.90 | -1.33 | -0.15 | 3.39 | | LB O2=19.99 | |
| 9-Jun-04 | 11:40:00 | 19.90 | -1.23 | -0.15 | 3.69 | | LB O2=19.99 | |
| 9-Jun-04 | 11:40:05 | 19.91 | -1.23 | -0.05 | 3.10 | | LB O2=19.99 | |
| 9-Jun-04 | 11:40:10 | 19.91 | -1.23 | -0.05 | 3.69 | | LB O2=19.99 | |
| 9-Jun-04 | 11:40:15 | 19.91 | -1.33 | -0.15 | 3.69 | | LB O2=19.99 | |
| 9-Jun-04 | 11:40:20 | 19.91 | -1.23 | -0.15 | 3.69 | | LB O2=19.99 | |
| 9-Jun-04 | 11:43:45 | 12.17 | 69.68 | 225.66 | 3.69 | | RT | 1 |
| 9-Jun-04 | 11:43:50 | 12.21 | 69.97 | 217.69 | 3.69 | | RT | |
| 9-Jun-04 | 11:43:55 | 12.30 | 72.33 | 217.69 | 3.69 | | RT | |
| 9-Jun-04 | 11:44:00 | 12.41 | 71.55 | 206.68 | 3.39 | | RT | |
| 9-Jun-04 | 11:44:05 | 12.35 | 72.33 | 206.58 | 3.10 | | RT | |
| 9-Jun-04 | 11:44:10 | 12.24 | 73.71 | 197.82 | 3.39 | | RT | |
| 9-Jun-04 | 11:44:15 | 12.31 | 73.81 | 197.72 | 3.69 | | RT | |
| 9-Jun-04 | 11:44:20 | 12.40 | 73.31 | 193.79 | 3.69 | | RT | |
| 9-Jun-04 | 11:44:25 | 12.42 | 72.53 | 193.79 | 3.69 | | RT | |
| 9-Jun-04 | 11:44:30 | 12.31 | 72.53 | 190.74 | 3.69 | | RT | |
| 9-Jun-04 | 11:44:35 | 12.30 | 73.22 | 190.74 | 3.69 | | RT | |
| 9-Jun-04 | 11:44:40 | 12.38 | 74.10 | 191.72 | 3.69 | | RT | |
| 9-Jun-04 | 11:44:45 | 12.57 | 74.49 | 191.72 | 4.28 | | RT | |
| 9-Jun-04 | 11:44:50 | 12.66 | 35.16 | 193.69 | 3.69 | | RT | |
| 9-Jun-04 | 11:44:55 | 12.70 | -0.15 | 193.79 | 4.28 | | RT | |
| 9-Jun-04 | 11:45:00 | 18.07 | -0.74 | 144.91 | 3.69 | | RT | |
| 9-Jun-04 | 11:45:05 | 19.60 | -1.03 | 144.91 | 3.39 | | RT | |
| 9-Jun-04 | 11:45:10 | 19.83 | -0.93 | 64.86 | 3.39 | | RT | |
| 9-Jun-04 | 11:45:15 | 19.88 | -1.03 | 64.86 | 3.39 | | RT | |
| 9-Jun-04 | 11:45:20 | 19.89 | -1.03 | 15.78 | 3.39 | | RT | |
| 9-Jun-04 | 11:45:25 | 19.90 | -1.13 | 15.69 | 3.39 | | RT | |
| 9-Jun-04 | 11:45:30 | 19.90 | -1.13 | 1.92 | 3.39 | | RT | |
| 9-Jun-04 | 11:45:35 | 19.91 | -1.23 | 1.92 | 3.69 | | RT | |
| 9-Jun-04 | 11:45:40 | 19.91 | -1.13 | -0.05 | 3.39 | | RT | |
| 9-Jun-04 | 11:45:45 | 19.92 | -1.23 | -0.05 | 3.39 | | RT | |
| 9-Jun-04 | 11:45:50 | 19.93 | -1.33 | -0.05 | 3.10 | | RT | |
| 9-Jun-04 | 11:45:55 | 19.91 | -1.13 | 0.05 | 3.39 | | RT | |
| 9-Jun-04 | 11:46:00 | 19.92 | 67.02 | 2.90 | 3.39 | | RT | |
| 9-Jun-04 | 11:46:05 | 17.55 | 71.54 | 2.90 | 3.39 | | RT | |
| 9-Jun-04 | 11:46:10 | 13.55 | 71.94 | 58.76 | 3.69 | | RT | |
| 9-Jun-04 | 11:46:15 | 12.88 | 71.05 | 58.76 | 3.39 | | RT | |

Source Testing And Consulting Services, Inc.

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9-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments | |
|---|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | | |
| 9-Jun-04 | 11:46:20 | 12.55 | 72.72 | 139.70 | 3.69 | | RT |
| 9-Jun-04 | 11:46:25 | 12.33 | 74.00 | 139.70 | 3.98 | | RT |
| 9-Jun-04 | 11:46:30 | 12.20 | 75.38 | 179.72 | 3.69 | | RT |
| 9-Jun-04 | 11:46:35 | 12.26 | 75.08 | 179.72 | 3.98 | | RT |
| 9-Jun-04 | 11:46:40 | 12.44 | 74.99 | 190.74 | 4.28 | | RT |
| 9-Jun-04 | 11:46:45 | 12.50 | 74.69 | 190.74 | 3.98 | | RT |
| 9-Jun-04 | 11:46:50 | 12.53 | 74.99 | 194.77 | 3.98 | | RT |
| 9-Jun-04 | 11:46:55 | 12.54 | 53.74 | 194.77 | 4.28 | | RT |
| 9-Jun-04 | 11:47:00 | 12.45 | 0.05 | 183.75 | 4.28 | | RT |
| 9-Jun-04 | 11:47:05 | 18.30 | -0.84 | 183.66 | 3.98 | | RT |
| 9-Jun-04 | 11:47:10 | 19.62 | -1.03 | 110.88 | 3.69 | | RT |
| 9-Jun-04 | 11:47:15 | 19.82 | -1.03 | 110.88 | 3.69 | | RT |
| 9-Jun-04 | 11:47:20 | 19.88 | -1.13 | 39.78 | 3.39 | | RT |
| 9-Jun-04 | 11:47:25 | 19.90 | -1.13 | 39.78 | 3.69 | | RT |
| 9-Jun-04 | 11:47:30 | 19.91 | -1.23 | 7.92 | 3.69 | | RT |
| 9-Jun-04 | 11:47:35 | 19.92 | -1.13 | 7.92 | 3.39 | | RT |
| 9-Jun-04 | 11:47:40 | 19.92 | -1.23 | -0.05 | 3.39 | | RT |
| 9-Jun-04 | 11:47:45 | 19.92 | -1.23 | -0.05 | 3.39 | | RT |
| 9-Jun-04 | 11:47:50 | 19.93 | -1.23 | -0.05 | 3.39 | | RT |
| 9-Jun-04 | 11:47:55 | 19.93 | -1.23 | -0.15 | 3.10 | | RT |
| 9-Jun-04 | 11:48:00 | 19.93 | -1.23 | -0.15 | 3.39 | | RT |
| 9-Jun-04 | 11:48:05 | 19.93 | -1.23 | -0.15 | 3.39 | | RT 2 |
| 9-Jun-04 | 11:48:10 | 19.93 | -1.13 | -0.05 | 3.39 | | RT |
| 9-Jun-04 | 11:48:15 | 19.94 | -1.23 | -0.05 | 3.39 | | RT |
| 9-Jun-04 | 11:48:20 | 19.94 | -1.33 | -0.05 | 3.69 | | RT |
| 9-Jun-04 | 11:48:25 | 19.94 | -1.33 | -0.05 | 3.39 | | RT |
| 9-Jun-04 | 11:48:30 | 19.94 | -1.23 | -0.15 | 3.39 | | RT |
| 9-Jun-04 | 11:48:35 | 19.94 | -1.33 | -0.05 | 3.39 | | RT |
| 9-Jun-04 | 11:48:40 | 19.94 | -1.23 | -0.05 | 3.69 | | RT |
| 9-Jun-04 | 11:48:45 | 19.94 | -1.23 | -0.05 | 1.03 | | RT |
| 9-Jun-04 | 11:48:50 | 19.94 | -1.33 | -0.05 | -0.44 | | RT |
| 9-Jun-04 | 11:48:55 | 19.94 | -1.23 | -0.05 | -0.15 | | RT |
| 9-Jun-04 | 11:49:00 | 19.94 | -1.23 | -0.15 | -0.15 | | RT |
| 9-Jun-04 | 11:49:05 | 19.95 | -1.23 | -0.05 | -0.15 | | RT |
| 9-Jun-04 | 11:49:10 | 19.93 | 58.86 | 2.90 | 0.15 | | RT |
| 9-Jun-04 | 11:49:15 | 15.76 | 64.76 | 3.00 | -0.74 | | RT |
| 9-Jun-04 | 11:49:20 | 12.18 | 68.20 | 67.71 | -0.15 | | RT |
| 9-Jun-04 | 11:49:25 | 11.77 | 69.38 | 67.71 | -0.15 | | RT |
| 9-Jun-04 | 11:49:30 | 11.77 | 70.56 | 156.81 | -0.15 | | RT |
| 9-Jun-04 | 11:49:35 | 11.90 | 71.54 | 156.91 | -0.15 | | RT |
| 9-Jun-04 | 11:49:40 | 12.03 | 72.23 | 200.67 | -0.15 | | RT |
| 9-Jun-04 | 11:49:45 | 12.13 | 72.23 | 200.67 | -0.15 | | RT |
| 9-Jun-04 | 11:49:50 | 12.10 | 72.82 | 205.59 | 0.15 | | RT |
| 9-Jun-04 | 11:49:55 | 12.09 | 73.51 | 205.68 | 0.15 | | RT |

**Source Testing And Consulting Services, Inc.**

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9-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments | |
|---|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | | |
| 9-Jun-04 | 11:50:00 | 12.19 | 73.41 | 201.65 | 0.15 | | RT |
| 9-Jun-04 | 11:50:05 | 12.18 | 75.08 | 201.65 | 0.15 | | RT |
| 9-Jun-04 | 11:50:10 | 12.17 | 75.38 | 197.82 | -0.15 | | RT |
| 9-Jun-04 | 11:50:15 | 12.17 | 74.30 | 197.82 | -0.15 | | RT |
| 9-Jun-04 | 11:50:20 | 12.13 | 74.30 | 189.75 | 0.15 | | RT |
| 9-Jun-04 | 11:50:25 | 12.13 | 74.49 | 189.75 | 0.44 | | RT |
| 9-Jun-04 | 11:50:30 | 12.25 | 72.82 | 179.72 | 0.44 | | RT |
| 9-Jun-04 | 11:50:35 | 12.41 | 5.85 | 179.72 | 0.44 | | RT |
| 9-Jun-04 | 11:50:40 | 15.12 | -0.64 | 154.84 | 0.74 | | RT |
| 9-Jun-04 | 11:50:45 | 19.20 | -0.84 | 154.74 | 0.44 | | RT |
| 9-Jun-04 | 11:50:50 | 19.78 | -1.03 | 82.66 | 0.44 | | RT 3 |
| 9-Jun-04 | 11:50:55 | 19.88 | -1.13 | 82.66 | 0.15 | | RT |
| 9-Jun-04 | 11:51:00 | 19.90 | -1.23 | 25.82 | 0.44 | | RT |
| 9-Jun-04 | 11:51:05 | 19.91 | -1.23 | 25.82 | 0.44 | | RT |
| 9-Jun-04 | 11:51:10 | 19.91 | -1.23 | 3.88 | 0.15 | | RT |
| 9-Jun-04 | 11:51:15 | 19.92 | -1.13 | 3.88 | 0.15 | | RT |
| 9-Jun-04 | 11:51:20 | 19.92 | -1.13 | -0.15 | 0.15 | | RT |
| 9-Jun-04 | 11:51:25 | 19.92 | -1.33 | -0.15 | 0.44 | | RT |
| 9-Jun-04 | 11:51:30 | 19.93 | -1.23 | -0.05 | 0.15 | | RT |
| 9-Jun-04 | 11:51:35 | 19.92 | -1.13 | -0.05 | 0.15 | | RT |
| 9-Jun-04 | 11:51:40 | 19.93 | -1.23 | 0.15 | 0.15 | | RT |
| 9-Jun-04 | 11:51:45 | 19.92 | 8.31 | -0.05 | 0.15 | | RT |
| 9-Jun-04 | 11:51:50 | 18.03 | 43.12 | 25.91 | 0.15 | | RT |
| 9-Jun-04 | 11:51:55 | 12.49 | 49.22 | 25.91 | 0.15 | | RT |
| 9-Jun-04 | 11:52:00 | 11.43 | 50.50 | 228.70 | 0.15 | | RT |
| 9-Jun-04 | 11:52:05 | 11.27 | 40.07 | 228.80 | 0.44 | | RT |
| 9-Jun-04 | 11:52:10 | 11.08 | 50.30 | 421.74 | 0.44 | | RT |
| 9-Jun-04 | 11:52:16 | 11.03 | 56.30 | 421.84 | 0.44 | | RT |
| 9-Jun-04 | 11:52:21 | 11.25 | 29.95 | 602.60 | 0.44 | | RT |
| 9-Jun-04 | 11:52:26 | 10.96 | 27.88 | 602.60 | 0.44 | | RT |
| 9-Jun-04 | 11:52:32 | 10.80 | 29.75 | 999.31 | 0.44 | | RT |
| 9-Jun-04 | 11:52:37 | 10.63 | 27.29 | 999.31 | 0.74 | | RT |
| 9-Jun-04 | 11:52:42 | 10.58 | 27.29 | 999.31 | 0.44 | | RT |
| 9-Jun-04 | 11:52:47 | 10.58 | 25.23 | 999.41 | 0.44 | | RT |
| 9-Jun-04 | 11:52:52 | 10.50 | 23.36 | 999.31 | 0.44 | | RT |
| 9-Jun-04 | 11:52:57 | 10.43 | 24.54 | 999.41 | 0.44 | | RT |
| 9-Jun-04 | 11:53:02 | 10.42 | 26.11 | 999.41 | 0.74 | | RT |
| 9-Jun-04 | 11:53:07 | 10.44 | 24.34 | 999.31 | 0.44 | | RT |
| 9-Jun-04 | 11:53:12 | 10.46 | 27.19 | 999.41 | 0.44 | | RT |
| 9-Jun-04 | 11:53:17 | 10.51 | 25.72 | 999.41 | 0.44 | | RT |
| 9-Jun-04 | 11:53:22 | 10.55 | 28.47 | 999.31 | 0.15 | | RT |
| 9-Jun-04 | 11:53:27 | 10.61 | 32.01 | 999.31 | 0.44 | | RT |
| 9-Jun-04 | 11:53:32 | 10.68 | 35.65 | 999.31 | 0.44 | | RT |
| 9-Jun-04 | 11:53:37 | 10.76 | 30.54 | 999.31 | 0.15 | | RT |

**Source Testing And Consulting Services, Inc.**

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9-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments | | |
|---|---|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | | | |
| 9-Jun-04 | 11:53:42 | 10.75 | 32.40 | 999.31 | 0.44 | | RT | |
| 9-Jun-04 | 11:53:47 | 10.72 | 31.42 | 999.31 | 0.44 | | RT | |
| 9-Jun-04 | 11:53:52 | 10.73 | 27.29 | 999.31 | 0.44 | | RT | |
| 9-Jun-04 | 11:53:57 | 10.69 | 29.85 | 999.31 | 0.74 | | RT | |
| 9-Jun-04 | 11:54:02 | 10.65 | 27.09 | 999.31 | 0.44 | | RT | |
| 9-Jun-04 | 11:54:07 | 10.62 | 26.11 | 999.31 | 0.44 | | RT | |
| 9-Jun-04 | 11:54:12 | 10.59 | 31.91 | 999.31 | 0.44 | | RT | |
| 9-Jun-04 | 11:54:17 | 10.67 | 34.27 | 999.31 | 0.44 | | RT | |
| 9-Jun-04 | 11:54:22 | 10.73 | 30.44 | 999.31 | 0.44 | | RT | |
| 9-Jun-04 | 11:54:27 | 10.66 | 37.12 | 999.41 | 0.44 | | RT | |
| 9-Jun-04 | 11:54:32 | 10.65 | 38.21 | 999.31 | 0.15 | | RT | |
| 9-Jun-04 | 11:54:37 | 10.67 | 38.01 | 999.31 | 0.15 | | RT | |
| 9-Jun-04 | 11:54:42 | 10.75 | 36.93 | 999.31 | 0.15 | | RT | |
| 9-Jun-04 | 11:54:47 | 10.78 | 36.73 | 999.31 | 0.15 | | RT | |
| 9-Jun-04 | 11:54:52 | 8.09 | 462.65 | 954.47 | 0.44 | | RT | 1 |
| 9-Jun-04 | 11:54:57 | 1.20 | 470.03 | 954.47 | 0.44 | | RT | |
| 9-Jun-04 | 11:55:02 | 0.42 | 471.80 | 771.65 | 0.44 | | RT | |
| 9-Jun-04 | 11:55:07 | 0.33 | 472.88 | 771.65 | 0.44 | | RT | |
| 9-Jun-04 | 11:55:12 | 0.32 | 473.28 | 679.60 | 0.15 | | RT | |
| 9-Jun-04 | 11:55:17 | 0.31 | 474.06 | 679.60 | 0.15 | | RT | |
| 9-Jun-04 | 11:55:22 | 0.31 | 473.37 | 632.79 | 0.44 | | RT | |
| 9-Jun-04 | 11:55:27 | 0.31 | 473.87 | 632.79 | 0.15 | | RT | |
| 9-Jun-04 | 11:55:32 | 0.30 | 473.77 | 614.59 | -0.15 | | RT | |
| 9-Jun-04 | 11:55:37 | 0.30 | 473.96 | 614.50 | 0.15 | | RT | |
| 9-Jun-04 | 11:55:42 | 0.30 | 473.87 | 609.48 | 0.15 | | RT | |
| 9-Jun-04 | 11:55:47 | 0.30 | 474.06 | 609.58 | 0.15 | | RT | |
| 9-Jun-04 | 11:55:52 | 0.30 | 473.67 | 609.58 | 0.15 | | RT | |
| 9-Jun-04 | 11:55:57 | 0.30 | 473.96 | 609.48 | 0.15 | | RT | |
| 9-Jun-04 | 11:56:02 | 0.30 | 473.47 | 611.55 | 0.15 | | RT | |
| 9-Jun-04 | 11:56:07 | 0.30 | 473.57 | 611.55 | 0.15 | | RT | |
| 9-Jun-04 | 11:56:12 | 0.30 | 473.87 | 609.58 | 0.15 | | RT | |
| 9-Jun-04 | 11:56:17 | 0.30 | 474.26 | 609.58 | 0.15 | | RT | |
| 9-Jun-04 | 11:56:22 | 0.30 | 473.67 | 610.56 | 0.15 | | RT | |
| 9-Jun-04 | 11:56:27 | 0.30 | 473.57 | 610.56 | 0.44 | | RT | |
| 9-Jun-04 | 11:56:32 | 0.30 | 473.18 | 610.56 | 0.15 | | RT | |
| 9-Jun-04 | 11:56:37 | 0.30 | 473.67 | 610.56 | 0.44 | | RT | |
| 9-Jun-04 | 11:56:42 | 0.30 | 473.77 | 611.55 | 0.44 | | RT | |
| 9-Jun-04 | 11:56:47 | 0.30 | 473.47 | 611.55 | 0.15 | | RT | |
| 9-Jun-04 | 11:56:52 | 0.29 | 473.96 | 609.48 | 0.15 | | RT | |
| 9-Jun-04 | 11:56:57 | 0.59 | 473.77 | 609.48 | 0.44 | | RT | |
| 9-Jun-04 | 11:57:02 | 0.55 | 473.18 | 613.61 | 0.15 | | RT | |
| 9-Jun-04 | 11:57:07 | 0.37 | 473.37 | 613.61 | 0.15 | | RT | |
| 9-Jun-04 | 11:57:12 | 0.31 | 463.05 | 609.58 | 0.15 | | RT | |
| 9-Jun-04 | 11:57:17 | 0.30 | 458.13 | 609.58 | 0.15 | | RT | |

**Source Testing And Consulting Services, Inc.**

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9-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments | |
|---|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | | |
| 9-Jun-04 | 11:57:22 | 0.32 | 416.04 | 612.63 | 0.15 | | RT |
| 9-Jun-04 | 11:57:27 | 0.29 | 69.87 | 612.63 | 0.15 | | RT |
| 9-Jun-04 | 11:57:32 | 0.89 | 58.27 | 548.80 | -0.15 | | RT |
| 9-Jun-04 | 11:57:37 | 8.68 | 58.66 | 548.80 | 0.15 | | RT |
| 9-Jun-04 | 11:57:42 | 11.38 | 57.68 | 381.82 | -0.15 | | RT |
| 9-Jun-04 | 11:57:47 | 11.99 | 57.28 | 381.92 | 0.15 | | RT |
| 9-Jun-04 | 11:57:52 | 12.11 | 56.20 | 259.87 | 0.44 | | RT |
| 9-Jun-04 | 11:57:57 | 12.17 | 55.32 | 259.87 | 0.15 | | RT |
| 9-Jun-04 | 11:58:02 | 12.23 | 54.83 | 211.59 | 0.74 | | RT |
| 9-Jun-04 | 11:58:07 | 12.36 | 55.51 | 211.59 | 0.44 | | RT |
| 9-Jun-04 | 11:58:12 | 12.51 | 56.69 | 203.52 | 0.15 | | RT |
| 9-Jun-04 | 11:58:17 | 12.82 | 57.58 | 203.52 | 0.15 | | RT |
| 9-Jun-04 | 11:58:22 | 13.04 | 57.68 | 211.59 | 0.44 | | RT |
| 9-Jun-04 | 11:58:27 | 13.15 | 57.38 | 211.59 | 0.15 | | RT |
| 9-Jun-04 | 11:58:32 | 13.23 | 57.97 | 225.75 | 0.74 | | RT |
| 9-Jun-04 | 11:58:37 | 13.29 | 58.27 | 225.65 | 0.44 | | RT |
| 9-Jun-04 | 11:58:42 | 13.30 | 57.78 | 238.92 | 0.44 | | RT |
| 9-Jun-04 | 11:58:47 | 13.41 | 57.97 | 238.92 | 0.44 | | RT |
| 9-Jun-04 | 11:58:52 | 13.43 | 57.78 | 246.89 | 0.74 | | RT |
| 9-Jun-04 | 11:58:57 | 13.43 | 58.07 | 246.99 | 0.74 | | RT |
| 9-Jun-04 | 11:59:02 | 13.44 | 57.68 | 246.99 | 0.44 | | RT |
| 9-Jun-04 | 11:59:07 | 12.99 | 439.25 | 246.99 | 0.44 | | RT |
| 9-Jun-04 | 11:59:12 | 3.34 | 452.62 | 263.02 | 0.15 | | RT |
| 9-Jun-04 | 11:59:17 | 0.69 | 454.39 | 262.92 | 0.15 | | RT |
| 9-Jun-04 | 11:59:22 | 0.36 | 455.08 | 401.78 | 0.44 | | RT |
| 9-Jun-04 | 11:59:27 | 0.31 | 455.97 | 401.78 | 0.44 | | RT |
| 9-Jun-04 | 11:59:32 | 0.30 | 456.07 | 527.76 | 0.44 | | RT |
| 9-Jun-04 | 11:59:37 | 0.30 | 455.77 | 527.66 | 0.44 | | RT |
| 9-Jun-04 | 11:59:42 | 0.30 | 456.16 | 592.66 | 0.15 | | RT |
| 9-Jun-04 | 11:59:47 | 0.30 | 456.26 | 592.66 | 0.44 | | RT 2 |
| 9-Jun-04 | 11:59:52 | 0.30 | 456.07 | 610.46 | 0.44 | | RT |
| 9-Jun-04 | 11:59:57 | 0.29 | 456.16 | 610.46 | 0.15 | | RT |
| 9-Jun-04 | 12:00:02 | 0.30 | 389.68 | 608.60 | 0.15 | | RT |
| 9-Jun-04 | 12:00:07 | 0.29 | 51.88 | 608.60 | 0.15 | | RT |
| 9-Jun-04 | 12:00:12 | 6.37 | 55.61 | 556.77 | 0.44 | | RT |
| 9-Jun-04 | 12:00:17 | 10.29 | 58.56 | 556.77 | 0.44 | | RT |
| 9-Jun-04 | 12:00:22 | 11.06 | 59.55 | 472.59 | 0.44 | | RT |
| 9-Jun-04 | 12:00:27 | 11.32 | 59.74 | 472.69 | 0.15 | | RT |
| 9-Jun-04 | 12:00:32 | 11.40 | 60.04 | 372.97 | 0.44 | | RT |
| 9-Jun-04 | 12:00:37 | 11.43 | 55.22 | 372.97 | 0.15 | | RT |
| 9-Jun-04 | 12:00:42 | 11.38 | 43.71 | 304.81 | 0.44 | | RT |
| 9-Jun-04 | 12:00:47 | 11.20 | 39.29 | 304.72 | 0.74 | | RT |
| 9-Jun-04 | 12:00:52 | 10.98 | 49.61 | 392.83 | 0.74 | | RT |
| 9-Jun-04 | 12:00:57 | 11.49 | 53.35 | 392.83 | 0.44 | | RT |

**Source Testing And Consulting Services, Inc.**

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9-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments | |
|---|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | | |
| 9-Jun-04 | 12:01:02 | 12.06 | 54.63 | 501.01 | 0.74 | | RT |
| 9-Jun-04 | 12:01:07 | 12.43 | 55.32 | 500.91 | 0.44 | | RT |
| 9-Jun-04 | 12:01:12 | 12.62 | 56.10 | 430.69 | 0.44 | | RT |
| 9-Jun-04 | 12:01:17 | 12.75 | 57.68 | 430.69 | 0.74 | | RT |
| 9-Jun-04 | 12:01:22 | 12.75 | 57.68 | 302.75 | 0.44 | | RT |
| 9-Jun-04 | 12:01:27 | 12.83 | 57.38 | 302.65 | 0.44 | | RT |
| 9-Jun-04 | 12:01:32 | 12.81 | 55.91 | 241.87 | 0.15 | | RT |
| 9-Jun-04 | 12:01:37 | 12.77 | 56.10 | 241.97 | 0.15 | | RT |
| 9-Jun-04 | 12:01:42 | 12.85 | 54.92 | 225.65 | 0.44 | | RT |
| 9-Jun-04 | 12:01:47 | 12.87 | 55.12 | 225.65 | 0.74 | | RT |
| 9-Jun-04 | 12:01:52 | 12.86 | 55.02 | 223.58 | 0.15 | | RT |
| 9-Jun-04 | 12:01:57 | 12.79 | 55.12 | 223.58 | 0.15 | | RT |
| 9-Jun-04 | 12:02:02 | 12.81 | 55.42 | 223.58 | 0.44 | | RT |
| 9-Jun-04 | 12:02:07 | 12.92 | 55.42 | 223.58 | 0.44 | | RT |
| 9-Jun-04 | 12:02:12 | 13.00 | 55.51 | 225.65 | 0.44 | | RT |
| 9-Jun-04 | 12:02:17 | 13.06 | 55.22 | 225.65 | 0.15 | | RT |
| 9-Jun-04 | 12:02:22 | 12.49 | 438.56 | 226.63 | 0.74 | | RT |
| 9-Jun-04 | 12:02:27 | 3.47 | 451.35 | 226.63 | 0.15 | | RT |
| 9-Jun-04 | 12:02:32 | 0.62 | 453.80 | 309.73 | 0.15 | | RT |
| 9-Jun-04 | 12:02:37 | 0.34 | 454.59 | 309.83 | -0.15 | | RT |
| 9-Jun-04 | 12:02:42 | 0.31 | 454.69 | 464.62 | 0.15 | | RT |
| 9-Jun-04 | 12:02:47 | 0.30 | 455.77 | 464.72 | 0.44 | | RT |
| 9-Jun-04 | 12:02:52 | 0.30 | 455.67 | 564.73 | 0.44 | | RT |
| 9-Jun-04 | 12:02:57 | 0.30 | 455.87 | 564.83 | 0.44 | | RT |
| 9-Jun-04 | 12:03:02 | 0.30 | 455.97 | 602.60 | 0.15 | | RT 3 |
| 9-Jun-04 | 12:03:07 | 0.29 | 456.36 | 602.50 | 0.44 | | RT |
| 9-Jun-04 | 12:03:12 | 0.29 | 456.66 | 610.46 | 0.44 | | RT |
| 9-Jun-04 | 12:03:17 | 0.29 | 456.07 | 610.56 | 0.44 | | RT |
| 9-Jun-04 | 12:03:22 | 0.29 | 456.46 | 611.55 | 0.15 | | RT |
| 9-Jun-04 | 12:03:27 | 0.29 | 456.66 | 611.45 | 0.44 | | RT |
| 9-Jun-04 | 12:03:32 | 0.29 | 456.36 | 608.60 | 0.44 | | RT |
| 9-Jun-04 | 12:03:37 | 0.29 | 456.36 | 608.60 | -0.15 | | RT |
| 9-Jun-04 | 12:03:42 | 0.29 | 456.36 | 612.63 | 0.44 | | RT |
| 9-Jun-04 | 12:03:47 | 0.29 | 456.36 | 612.63 | 0.44 | | RT |
| 9-Jun-04 | 12:03:52 | 0.29 | 456.75 | 609.58 | 0.44 | | RT |
| 9-Jun-04 | 12:03:57 | 0.29 | 456.36 | 609.58 | -0.15 | | RT |
| 9-Jun-04 | 12:04:02 | 0.29 | 456.46 | 609.58 | -0.15 | | RT |
| 9-Jun-04 | 12:04:07 | 0.29 | 456.16 | 609.58 | 0.15 | | RT |
| 9-Jun-04 | 12:04:12 | 0.29 | 456.56 | 605.55 | 0.15 | | RT |
| 9-Jun-04 | 12:04:17 | 0.30 | 167.23 | 605.55 | 0.15 | | RT |
| 9-Jun-04 | 12:04:22 | 0.31 | 68.40 | 590.50 | -0.15 | | RT |
| 9-Jun-04 | 12:04:27 | 8.02 | 65.15 | 590.50 | 0.15 | | RT |
| 9-Jun-04 | 12:04:32 | 11.58 | 63.87 | 422.73 | 0.15 | | RT |
| 9-Jun-04 | 12:04:37 | 12.29 | 63.28 | 422.83 | 0.15 | | RT |

**Source Testing And Consulting Services, Inc.**

scruuber B

9-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments | |
|---|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | | |
| 9-Jun-04 | 12:04:42 | 12.34 | 62.01 | 234.89 | 0.15 | | RT |
| 9-Jun-04 | 12:04:47 | 12.42 | 61.22 | 234.89 | 0.15 | | RT |
| 9-Jun-04 | 12:04:52 | 12.53 | 60.63 | 136.84 | 0.44 | | RT |
| 9-Jun-04 | 12:04:57 | 12.56 | 59.55 | 136.84 | 0.15 | | RT |
| 9-Jun-04 | 12:05:02 | 12.70 | 59.45 | 106.85 | 0.44 | | RT |
| 9-Jun-04 | 12:05:07 | 12.86 | 59.25 | 106.85 | 0.44 | | RT |
| 9-Jun-04 | 12:05:12 | 12.86 | 58.66 | 101.74 | 0.15 | | RT |
| 9-Jun-04 | 12:05:17 | 12.94 | 58.27 | 101.74 | 0.44 | | RT |
| 9-Jun-04 | 12:05:22 | 13.10 | 58.46 | 98.59 | 0.44 | | RT |
| 9-Jun-04 | 12:05:27 | 13.18 | 58.96 | 98.59 | 0.44 | | RT |
| 9-Jun-04 | 12:05:32 | 13.19 | 59.25 | 92.69 | 0.15 | | RT |
| 9-Jun-04 | 12:26:39 | 11.44 | 50.89 | 99.67 | 1.03 | | |
| 9-Jun-04 | 12:27:59 | 11.34 | 50.20 | 289.07 | 1.03 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 12:28:59 | 11.78 | 55.22 | 101.83 | 0.44 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 12:29:59 | 11.70 | 55.22 | 93.86 | 0.74 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 12:30:59 | 11.52 | 55.61 | 106.06 | 1.03 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 12:31:59 | 11.70 | 54.82 | 100.85 | 0.74 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 12:32:59 | 11.87 | 52.37 | 91.70 | 0.44 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 12:33:59 | 11.51 | 50.30 | 97.80 | 0.74 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 12:34:59 | 11.77 | 51.97 | 77.83 | 1.03 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 12:35:59 | 11.80 | 55.61 | 73.70 | 0.74 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 12:36:59 | 11.53 | 54.04 | 81.87 | 0.74 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 12:37:59 | 11.14 | 51.19 | 98.78 | 0.15 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 12:38:59 | 11.21 | 48.43 | 129.07 | 0.44 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 12:39:59 | 10.87 | 16.67 | 186.79 | 0.74 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 12:40:59 | 11.14 | 53.84 | 132.02 | 0.74 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 12:41:59 | 11.54 | 54.82 | 110.98 | 0.44 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 12:42:59 | 11.32 | 54.82 | 129.07 | 0.74 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 12:43:59 | 11.27 | 56.50 | 143.82 | 0.74 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 12:44:59 | 11.01 | 46.76 | 154.93 | 0.74 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 12:45:59 | 11.54 | 57.09 | 114.02 | 0.74 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 12:46:59 | 11.90 | 54.63 | 99.76 | 0.44 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 12:47:59 | 11.31 | 55.91 | 101.83 | 1.03 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 12:48:59 | 11.49 | 59.05 | 99.76 | 0.44 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 12:49:59 | 11.70 | 57.97 | 101.83 | 0.74 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 12:50:59 | 10.70 | 41.94 | 198.79 | 0.44 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 12:51:59 | 10.59 | 41.06 | 445.82 | 0.44 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 12:52:59 | 11.54 | 59.15 | 104.98 | 1.03 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 12:53:59 | 11.29 | 49.12 | 110.98 | 0.44 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 12:54:59 | 11.20 | 53.45 | 192.89 | 0.74 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 12:55:59 | 11.37 | 53.94 | 165.95 | 0.74 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 12:57:10 | 11.74 | 55.71 | 147.85 | 0.44 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 12:58:10 | 10.69 | 30.34 | 350.72 | 1.03 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 12:59:10 | 10.10 | 21.00 | 999.36 | 0.74 | | SCRUBBER B RUN 1 |

**Source Testing And Consulting Services, Inc.**

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9-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments | |
|---|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | | |
| 9-Jun-04 | 13:00:10 | 11.33 | 52.07 | 121.10 | 0.74 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 13:01:10 | 12.15 | 54.04 | 81.77 | 1.03 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 13:02:10 | 12.04 | 15.39 | 72.82 | 1.03 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 13:03:10 | 11.87 | 52.96 | 80.88 | 1.03 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 13:04:10 | 11.23 | 52.32 | 126.95 | 0.89 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 13:05:10 | 11.37 | 55.56 | 98.73 | 1.18 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 13:06:10 | 11.45 | 54.18 | 95.68 | 0.89 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 13:07:10 | 11.44 | 54.68 | 103.75 | 0.89 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 13:08:10 | 11.40 | 53.20 | 101.78 | 0.89 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 13:09:10 | 11.37 | 54.09 | 140.92 | 0.59 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 13:10:10 | 11.95 | 57.04 | 101.78 | 0.89 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 13:11:10 | 11.90 | 58.51 | 85.85 | 1.18 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 13:12:10 | 12.31 | 59.59 | 87.72 | 0.89 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 13:13:10 | 11.82 | 58.41 | 83.69 | 0.89 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 13:14:10 | 12.38 | 60.38 | 82.70 | 0.59 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 13:15:10 | 11.82 | 60.08 | 89.78 | 1.18 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 13:16:10 | 11.16 | 55.17 | 118.01 | 0.89 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 13:17:10 | 11.84 | 58.61 | 105.03 | 1.18 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 13:18:10 | 11.35 | 59.10 | 111.02 | 0.59 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 13:19:10 | 11.50 | 59.89 | 94.80 | 1.18 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 13:20:10 | 11.67 | 60.87 | 107.88 | 0.89 | | SCRUBBER B RUN 1 |
| 9-Jun-04 | 13:21:10 | 13.32 | 56.84 | 83.78 | 0.89 | | SCRUBBER STOPPED R |
| 9-Jun-04 | 13:49:28 | 11.61 | 63.63 | 112.01 | 1.77 | | Test WILL CONTI |
| 9-Jun-04 | 13:50:28 | 12.12 | 66.09 | 119.98 | 1.77 | | Test |
| 9-Jun-04 | 13:51:28 | 12.21 | 65.00 | 106.01 | 1.18 | | Test |
| 9-Jun-04 | 13:52:28 | 12.11 | 66.48 | 101.88 | 1.18 | | Test |
| 9-Jun-04 | 13:53:28 | 12.23 | 67.27 | 100.80 | 1.48 | | Test |
| 9-Jun-04 | 13:54:28 | 12.27 | 68.45 | 103.75 | 1.77 | | Test |
| 9-Jun-04 | 13:55:28 | 12.05 | 65.69 | 96.87 | 1.77 | | Test |
| 9-Jun-04 | 13:56:28 | 11.53 | 62.55 | 119.00 | 1.48 | | Test |
| 9-Jun-04 | 14:03:10 | 0.27 | 181.44 | 313.81 | 1.48 | | POST R1 CO=306 NX=18 |
| 9-Jun-04 | 14:03:15 | 0.27 | 181.44 | 313.91 | 1.77 | | POST R1 CO=306 NX=18 |
| 9-Jun-04 | 14:03:20 | 0.27 | 181.74 | 313.81 | 2.07 | | POST R1 CO=306 NX=18 |
| 9-Jun-04 | 14:03:25 | 0.27 | 181.93 | 313.81 | 1.77 | | POST R1 CO=306 NX=18 |
| 9-Jun-04 | 14:03:30 | 0.27 | 181.93 | 313.91 | 2.07 | | POST R1 CO=306 NX=18 |
| 9-Jun-04 | 14:03:35 | 0.27 | 181.84 | 313.81 | 1.77 | | POST R1 CO=306 NX=18 |
| 9-Jun-04 | 14:03:40 | 0.27 | 181.84 | 313.81 | 1.77 | | POST R1 CO=306 NX=18 |
| 9-Jun-04 | 14:03:45 | 0.27 | 181.74 | 313.81 | 1.77 | | POST R1 CO=306 NX=18 |
| 9-Jun-04 | 14:05:30 | 0.27 | 95.64 | 98.69 | 1.33 | | CO=96.8 NX=95 |
| 9-Jun-04 | 14:05:35 | 0.27 | 95.74 | 98.79 | 1.62 | | CO=96.8 NX=95 |
| 9-Jun-04 | 14:05:40 | 0.26 | 95.54 | 98.69 | 1.03 | | CO=96.8 NX=95 |
| 9-Jun-04 | 14:05:45 | 0.26 | 95.74 | 98.79 | 1.33 | | CO=96.8 NX=95 |
| 9-Jun-04 | 14:05:50 | 0.05 | 95.64 | 98.69 | 1.33 | | CO=96.8 NX=95 |
| 9-Jun-04 | 14:05:55 | 0.03 | 95.74 | 98.69 | 1.92 | | CO=96.8 NX=95 |

**Source Testing And Consulting Services, Inc.**

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9-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments | |
|---|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | | |
| 9-Jun-04 | 14:06:00 | 0.03 | 95.84 | 98.79 | 1.92 | | CO=96.8 NX=95 |
| 9-Jun-04 | 14:07:37 | 12.99 | -1.03 | 0.05 | 1.03 | | O2=12.97 |
| 9-Jun-04 | 14:07:42 | 12.99 | -1.13 | -0.05 | 1.33 | | O2=12.97 |
| 9-Jun-04 | 14:07:47 | 12.99 | -1.03 | -0.05 | 1.62 | | O2=12.97 |
| 9-Jun-04 | 14:07:52 | 12.99 | -1.03 | 0.05 | 1.92 | | O2=12.97 |
| 9-Jun-04 | 14:07:57 | 12.99 | -1.03 | -0.05 | 1.62 | | O2=12.97 |
| 9-Jun-04 | 14:08:02 | 12.99 | -1.03 | -0.05 | 2.21 | | O2=12.97 |
| 9-Jun-04 | 14:14:34 | 0.06 | -1.13 | -0.15 | 24.63 | | SO2=24.9 |
| 9-Jun-04 | 14:14:39 | 0.05 | -1.13 | -0.05 | 24.63 | | SO2=24.9 |
| 9-Jun-04 | 14:14:44 | 0.05 | -1.23 | 0.05 | 24.93 | | SO2=24.9 |
| 9-Jun-04 | 14:14:49 | 0.05 | -1.23 | 0.05 | 24.63 | | SO2=24.9 |
| 9-Jun-04 | 14:14:54 | 0.05 | -1.23 | -0.05 | 24.63 | | SO2=24.9 |
| 9-Jun-04 | 14:14:59 | 0.04 | -1.23 | -0.05 | 24.63 | | SO2=24.9 |
| 9-Jun-04 | 14:16:38 | 12.99 | -1.23 | -0.05 | 0.44 | | O2=12.97 |
| 9-Jun-04 | 14:16:42 | 12.99 | -1.33 | -0.05 | 0.15 | | O2=12.97 |
| 9-Jun-04 | 14:16:47 | 12.99 | -1.33 | -0.05 | 0.15 | | O2=12.97 |
| 9-Jun-04 | 15:00:25 | 12.89 | 0.05 | 41.94 | 0.74 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:02:27 | 13.25 | 52.85 | 101.82 | 0.74 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:03:27 | 13.37 | 53.74 | 109.99 | 0.74 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:04:27 | 13.94 | 52.62 | 91.66 | 0.59 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:05:27 | 13.40 | 54.09 | 85.76 | 0.30 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:06:27 | 13.73 | 53.50 | 92.74 | 0.59 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:07:27 | 14.10 | 54.68 | 101.79 | 0.59 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:08:27 | 14.33 | 51.63 | 101.69 | 0.30 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:09:27 | 13.93 | 53.70 | 105.92 | 0.30 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:10:27 | 14.25 | 52.12 | 110.94 | 0.30 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:11:27 | 14.14 | 54.78 | 109.95 | 0.30 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:12:27 | 13.88 | 55.76 | 110.94 | 0.00 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:13:27 | 13.22 | 55.76 | 108.97 | 0.59 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:14:27 | 12.98 | 57.93 | 90.68 | 0.00 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:15:27 | 12.93 | 58.12 | 97.76 | 0.59 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:16:27 | 13.02 | 57.83 | 96.77 | 0.30 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:17:27 | 13.03 | 57.53 | 88.81 | 0.00 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:18:27 | 12.83 | 57.73 | 89.69 | 0.30 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:19:27 | 12.48 | 59.21 | 99.72 | 0.59 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:20:27 | 12.55 | 62.94 | 114.87 | 0.30 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:21:27 | 11.35 | 54.29 | 129.03 | 0.30 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:22:27 | 10.65 | 48.09 | 432.83 | 0.00 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:23:27 | 11.51 | 64.52 | 348.84 | 0.59 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:24:27 | 10.87 | 62.10 | 412.99 | 0.74 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:25:27 | 11.18 | 55.91 | 178.84 | 0.15 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:26:27 | 11.49 | 65.84 | 121.01 | 0.44 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:27:27 | 11.67 | 62.60 | 107.93 | 0.15 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:28:27 | 11.90 | 63.97 | 111.96 | 0.44 | | SCRUBBER B RUN 2 |

**Source Testing And Consulting Services, Inc.**

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9-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments | |
|---|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | | |
| 9-Jun-04 | 15:29:27 | 12.07 | 64.37 | 101.74 | 0.44 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:30:27 | 12.22 | 63.58 | 110.98 | 0.44 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:31:27 | 12.12 | 63.38 | 110.98 | 0.44 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:32:27 | 12.61 | 63.28 | 104.98 | 0.44 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:33:27 | 12.43 | 65.74 | 92.79 | 0.44 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:34:27 | 12.57 | 65.55 | 103.70 | 0.15 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:35:27 | 12.33 | 66.92 | 107.05 | 0.44 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:36:27 | 13.00 | 61.71 | 110.98 | 0.74 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:37:27 | 12.36 | 66.73 | 103.80 | 0.15 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:38:27 | 12.49 | 64.96 | 105.96 | 0.44 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:39:27 | 12.74 | 66.04 | 121.11 | 0.44 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:40:27 | 12.39 | 68.59 | 111.96 | 0.74 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:41:27 | 12.14 | 67.61 | 105.96 | 0.44 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:42:27 | 11.94 | 67.32 | 102.82 | 1.03 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:43:27 | 11.96 | 68.69 | 104.98 | 0.15 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:44:27 | 11.36 | 69.03 | 110.04 | 0.30 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:45:27 | 11.87 | 69.03 | 99.81 | 0.59 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:46:27 | 11.33 | 67.66 | 110.04 | 0.59 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:47:27 | 11.38 | 67.85 | 117.12 | 0.59 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:48:27 | 11.34 | 67.95 | 106.01 | 0.59 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:49:27 | 11.16 | 64.31 | 130.99 | 0.59 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:50:27 | 10.82 | 63.13 | 196.97 | 0.59 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:51:27 | 11.47 | 67.95 | 111.02 | 0.89 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:52:27 | 11.34 | 68.44 | 106.99 | 0.30 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:53:27 | 11.51 | 69.53 | 100.90 | 0.30 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:54:27 | 11.93 | 68.54 | 105.03 | 0.30 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:55:27 | 11.22 | 66.87 | 106.99 | 0.30 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 15:56:27 | 11.32 | 69.43 | 139.94 | 0.30 | | SCRUBBER B RUN 2 |
| 9-Jun-04 | 16:12:48 | 11.79 | 69.87 | 88.85 | 0.74 | | RUN 2 CON'T |
| 9-Jun-04 | 16:13:48 | 11.97 | 69.28 | 92.88 | 0.74 | | RUN 2 CON'T |
| 9-Jun-04 | 16:14:49 | 12.04 | 68.79 | 103.80 | 0.44 | | RUN 2 CON'T |
| 9-Jun-04 | 16:15:48 | 11.92 | 68.30 | 91.80 | 0.74 | | RUN 2 CON'T |
| 9-Jun-04 | 16:16:49 | 11.78 | 68.59 | 96.92 | 0.44 | | RUN 2 CON'T |
| 9-Jun-04 | 16:17:49 | 11.87 | 68.30 | 95.84 | 0.44 | | RUN 2 CON'T |
| 9-Jun-04 | 16:18:49 | 11.94 | 68.30 | 106.06 | 0.44 | | RUN 2 CON'T |
| 9-Jun-04 | 16:19:48 | 11.89 | 69.28 | 97.90 | 0.44 | | RUN 2 CON'T |
| 9-Jun-04 | 16:20:48 | 11.30 | 68.69 | 173.92 | 1.03 | | RUN 2 CON'T |
| 9-Jun-04 | 16:21:48 | 12.62 | 68.59 | 95.74 | 0.44 | | RUN 2 CON'T |
| 9-Jun-04 | 16:22:48 | 13.15 | 67.12 | 87.77 | 1.03 | | RUN 2 CON'T |
| 9-Jun-04 | 16:23:48 | 12.41 | 69.77 | 93.87 | 0.74 | | RUN 2 CON'T |
| 9-Jun-04 | 16:24:48 | 12.16 | 69.28 | 90.82 | 0.74 | | RUN 2 CON'T |
| 9-Jun-04 | 16:25:48 | 12.53 | 68.20 | 75.77 | 0.44 | | RUN 2 CON'T |
| 9-Jun-04 | 16:26:48 | 11.88 | 68.59 | 96.92 | 0.44 | | RUN 2 CON'T |
| 9-Jun-04 | 16:27:48 | 11.96 | 67.12 | 97.90 | 0.44 | | RUN 2 CON'T |

**Source Testing And Consulting Services, Inc.**

scruuber B

9-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments | |
|---|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | | |
| 9-Jun-04 | 16:28:48 | 11.24 | 67.22 | 146.97 | 0.74 | | RUN 2 CON'T |
| 9-Jun-04 | 16:29:48 | 10.88 | 64.95 | 222.77 | 0.15 | | RUN 2 CON'T |
| 9-Jun-04 | 16:30:48 | 10.96 | 62.88 | 198.88 | 0.74 | | RUN 2 CON'T |
| 9-Jun-04 | 16:31:48 | 12.04 | 65.15 | 110.08 | 0.44 | | RUN 2 CON'T |
| 9-Jun-04 | 16:32:48 | 11.76 | 65.44 | 83.73 | 0.74 | | RUN 2 CON'T |
| 9-Jun-04 | 16:33:48 | 12.67 | 64.36 | 77.83 | 0.74 | | RUN 2 CON'T |
| 9-Jun-04 | 16:34:48 | 13.87 | 59.25 | 80.88 | 0.44 | | RUN 2 CON'T |
| 9-Jun-04 | 16:35:48 | 14.00 | 58.16 | 85.89 | 0.74 | | RUN 2 CON'T |
| 9-Jun-04 | 16:36:48 | 14.30 | 53.05 | 74.78 | 0.44 | | RUN 2 CON'T |
| 9-Jun-04 | 16:37:48 | 14.76 | 51.87 | 84.91 | 0.74 | | RUN 2 CON'T |
| 9-Jun-04 | 16:38:48 | 15.33 | 45.77 | 85.80 | 0.74 | | RUN 2 CON'T |
| 9-Jun-04 | 16:39:48 | 14.96 | 54.23 | 85.89 | 0.74 | | RUN 2 CON'T |
| 9-Jun-04 | 16:42:28 | 12.98 | -1.03 | 2.11 | 0.74 | | post run 2 o2-12.97 |
| 9-Jun-04 | 16:42:33 | 12.98 | -1.03 | 0.15 | 1.03 | | post run 2 o2-12.97 |
| 9-Jun-04 | 16:42:38 | 12.98 | -1.13 | 0.15 | 0.74 | | post run 2 o2-12.97 |
| 9-Jun-04 | 16:42:43 | 12.98 | -0.93 | 0.15 | 0.15 | | post run 2 o2-12.97 |
| 9-Jun-04 | 16:42:48 | 12.98 | -1.13 | 0.05 | 0.15 | | post run 2 o2-12.97 |
| 9-Jun-04 | 16:42:53 | 12.99 | -1.13 | 0.15 | 0.44 | | post run 2 o2-12.97 |
| 9-Jun-04 | 16:42:58 | 12.99 | -1.23 | 0.15 | 0.44 | | post run 2 o2-12.97 |
| 9-Jun-04 | 16:43:03 | 12.99 | -1.03 | 0.15 | 0.44 | | post run 2 o2-12.97 |
| 9-Jun-04 | 16:43:08 | 12.99 | -1.33 | -0.05 | 0.44 | | post run 2 o2-12.97 |
| 9-Jun-04 | 16:43:13 | 12.99 | -1.13 | 0.05 | 0.74 | | post run 2 o2-12.97 |
| 9-Jun-04 | 16:43:18 | 12.99 | -1.03 | 0.15 | 0.44 | | post run 2 o2-12.97 |
| 9-Jun-04 | 16:43:23 | 12.99 | -1.13 | 0.15 | 0.15 | | post run 2 o2-12.97 |
| 9-Jun-04 | 16:43:28 | 12.99 | -1.23 | 0.15 | 0.44 | | post run 2 o2-12.97 |
| 9-Jun-04 | 16:43:33 | 12.99 | -1.13 | 0.15 | 0.44 | | post run 2 o2-12.97 |
| 9-Jun-04 | 16:43:38 | 12.99 | -1.03 | 0.15 | 0.44 | | post run 2 o2-12.97 |
| 9-Jun-04 | 16:43:43 | 12.99 | -1.23 | 0.05 | 0.44 | | post run 2 o2-12.97 |
| 9-Jun-04 | 16:43:48 | 12.99 | -1.13 | 0.15 | 0.74 | | post run 2 o2-12.97 |
| 9-Jun-04 | 16:43:53 | 12.99 | -1.03 | 0.15 | 0.44 | | post run 2 o2-12.97 |
| 9-Jun-04 | 16:43:58 | 12.99 | -1.13 | 0.25 | 0.44 | | post run 2 o2-12.97 |
| 9-Jun-04 | 16:44:03 | 12.99 | -1.13 | 0.05 | 0.74 | | post run 2 o2-12.97 |
| 9-Jun-04 | 16:44:08 | 12.99 | -1.13 | 0.15 | 0.74 | | post run 2 o2-12.97 |
| 9-Jun-04 | 16:44:13 | 12.99 | -1.03 | 0.15 | 0.15 | | post run 2 o2-12.97 |
| 9-Jun-04 | 16:44:18 | 12.99 | -1.13 | 0.15 | 0.15 | | post run 2 o2-12.97 |
| 9-Jun-04 | 16:44:23 | 12.99 | -1.13 | 0.15 | 0.44 | | post run 2 o2-12.97 |
| 9-Jun-04 | 16:44:28 | 12.99 | -1.13 | 0.15 | 0.44 | | post run 2 o2-12.97 |
| 9-Jun-04 | 16:44:33 | 12.99 | -1.13 | 0.15 | 0.44 | | post run 2 o2-12.97 |
| 9-Jun-04 | 16:44:38 | 12.99 | -1.13 | 0.15 | 0.74 | | post run 2 o2-12.97 |
| 9-Jun-04 | 16:44:43 | 13.00 | -1.03 | 0.15 | 0.74 | | post run 2 o2-12.97 |
| 9-Jun-04 | 16:44:48 | 12.99 | -1.33 | 0.05 | -0.15 | | post run 2 o2-12.97 |
| 9-Jun-04 | 16:44:53 | 12.99 | -1.13 | 0.15 | 0.44 | | post run 2 o2-12.97 |
| 9-Jun-04 | 16:46:48 | 0.07 | 181.28 | 307.05 | 0.74 | | nx=181 co=306 |
| 9-Jun-04 | 16:46:52 | 0.07 | 181.67 | 311.96 | 0.74 | | nx=181 co=306 |

**Source Testing And Consulting Services, Inc.**

scruuber B

9-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments | |
|---|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | | |
| 9-Jun-04 | 16:46:57 | 0.07 | 181.77 | 313.04 | 0.74 | | nx=181 co=306 |
| 9-Jun-04 | 16:47:02 | 0.07 | 181.77 | 313.04 | 0.74 | | nx=181 co=306 |
| 9-Jun-04 | 16:47:07 | 0.07 | 181.57 | 313.93 | 0.44 | | nx=181 co=306 |
| 9-Jun-04 | 16:48:55 | 0.05 | 96.32 | 98.87 | 0.15 | | NX 95 CO=96.8 |
| 9-Jun-04 | 16:49:00 | 0.05 | 96.32 | 98.87 | 0.44 | | NX 95 CO=96.8 |
| 9-Jun-04 | 16:49:05 | 0.05 | 96.42 | 98.87 | 0.44 | | NX 95 CO=96.8 |
| 9-Jun-04 | 16:49:10 | 0.05 | 96.51 | 98.87 | 0.44 | | NX 95 CO=96.8 |
| 9-Jun-04 | 16:49:15 | 0.04 | 96.43 | 98.79 | 0.15 | | NX 95 CO=96.8 |
| 9-Jun-04 | 16:49:20 | 0.05 | 96.43 | 98.79 | 0.15 | | NX 95 CO=96.8 |
| 9-Jun-04 | 16:49:25 | 0.05 | 96.43 | 98.79 | -0.15 | | NX 95 CO=96.8 |
| 9-Jun-04 | 16:49:30 | 0.05 | 96.33 | 98.79 | 0.15 | | NX 95 CO=96.8 |
| 9-Jun-04 | 16:49:35 | 0.05 | 96.52 | 98.79 | 0.15 | | NX 95 CO=96.8 |
| 9-Jun-04 | 16:49:40 | 0.05 | 96.43 | 98.79 | 0.15 | | NX 95 CO=96.8 |
| 9-Jun-04 | 16:49:45 | 0.04 | 96.13 | 98.79 | 0.15 | | NX 95 CO=96.8 |
| 9-Jun-04 | 16:49:50 | 0.04 | 96.52 | 98.79 | 0.15 | | NX 95 CO=96.8 |
| 9-Jun-04 | 16:49:55 | 0.05 | 96.43 | 98.79 | 0.15 | | NX 95 CO=96.8 |
| 9-Jun-04 | 16:50:00 | 0.05 | 96.62 | 98.79 | 0.15 | | NX 95 CO=96.8 |
| 9-Jun-04 | 16:50:05 | 0.04 | 96.72 | 98.79 | 0.15 | | NX 95 CO=96.8 |
| 9-Jun-04 | 16:50:10 | 0.05 | 96.62 | 98.79 | 0.15 | | NX 95 CO=96.8 |
| 9-Jun-04 | 16:50:15 | 0.04 | 96.62 | 98.79 | 0.15 | | NX 95 CO=96.8 |
| 9-Jun-04 | 16:50:20 | 0.04 | 96.33 | 98.79 | 0.15 | | NX 95 CO=96.8 |
| 9-Jun-04 | 16:50:25 | 0.04 | 96.52 | 98.79 | 0.44 | | NX 95 CO=96.8 |
| 9-Jun-04 | 16:50:30 | 0.04 | 96.33 | 98.79 | 0.44 | | NX 95 CO=96.8 |
| 9-Jun-04 | 16:50:35 | 0.04 | 96.43 | 98.79 | 0.15 | | NX 95 CO=96.8 |
| 9-Jun-04 | 16:54:17 | 0.03 | -1.23 | 0.05 | 24.63 | | SO2=24.9 |
| 9-Jun-04 | 16:54:22 | 0.03 | -1.23 | 0.05 | 25.23 | | SO2=24.9 |
| 9-Jun-04 | 16:54:27 | 0.04 | -1.23 | -0.05 | 25.23 | | SO2=24.9 |
| 9-Jun-04 | 16:54:32 | 0.03 | -1.13 | 0.05 | 25.23 | | SO2=24.9 |
| 9-Jun-04 | 17:51:27 | 11.33 | 52.56 | 507.99 | 1.03 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 17:52:26 | 12.28 | 65.84 | 185.92 | 0.15 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 17:53:26 | 12.49 | 68.79 | 169.89 | 0.44 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 17:54:26 | 12.44 | 67.32 | 162.02 | 0.44 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 17:55:26 | 12.83 | 69.77 | 176.97 | 0.44 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 17:56:26 | 13.50 | 66.73 | 191.82 | 0.44 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 17:57:26 | 12.04 | 63.28 | 179.82 | 0.74 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 17:58:26 | 12.39 | 62.60 | 163.00 | 0.44 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 17:59:26 | 12.00 | 63.58 | 161.04 | 0.44 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:00:26 | 11.85 | 63.58 | 210.80 | 0.74 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:01:26 | 11.65 | 63.58 | 122.98 | 0.74 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:02:26 | 11.64 | 63.58 | 122.98 | 0.74 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:03:26 | 11.65 | 63.58 | 122.98 | 0.74 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:04:26 | 12.44 | 61.71 | 127.11 | 0.74 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:05:26 | 12.17 | 57.87 | 174.90 | 0.74 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:06:26 | 12.61 | 58.17 | 183.85 | 0.44 | | SCRUBBER B RUN 3 |

**Source Testing And Consulting Services, Inc.**

scruuber B

9-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments | |
|---|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | | |
| 9-Jun-04 | 18:07:26 | 12.87 | 57.19 | 176.97 | 0.74 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:08:26 | 13.18 | 59.45 | 177.95 | 0.74 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:09:26 | 13.20 | 62.89 | 200.87 | 0.44 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:10:26 | 12.78 | 66.04 | 200.87 | 0.44 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:11:26 | 12.45 | 60.83 | 178.94 | 0.44 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:12:26 | 12.21 | 61.32 | 185.82 | 0.44 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:13:26 | 12.08 | 67.51 | 194.87 | 1.03 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:14:26 | 12.43 | 53.84 | 208.83 | 0.44 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:15:26 | 12.96 | 66.43 | 191.82 | 0.74 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:16:26 | 12.61 | 68.40 | 154.84 | 0.44 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:17:26 | 12.28 | 71.05 | 98.79 | 0.74 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:18:26 | 12.37 | 71.84 | 100.85 | 0.44 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:19:26 | 11.97 | 70.86 | 103.80 | 0.15 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:20:26 | 11.95 | 71.15 | 107.93 | 0.15 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:21:26 | 12.61 | 70.86 | 109.11 | 1.03 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:22:26 | 12.11 | 71.64 | 127.01 | 0.44 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:23:26 | 12.31 | 73.22 | 111.96 | 0.15 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:24:26 | 12.83 | 70.36 | 113.05 | 0.44 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:25:26 | 13.15 | 70.86 | 113.14 | 0.44 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:26:26 | 12.20 | 69.28 | 117.08 | 0.44 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:27:26 | 12.00 | 70.27 | 129.17 | 0.74 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:28:26 | 11.53 | 64.07 | 145.01 | 0.44 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:29:26 | 11.34 | 56.35 | 162.06 | 0.59 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:30:26 | 11.51 | 50.74 | 159.90 | 0.89 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:31:26 | 11.34 | 51.63 | 238.18 | 0.59 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:32:26 | 11.33 | 42.88 | 236.01 | 0.89 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:33:26 | 11.61 | 61.17 | 434.85 | 0.59 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:34:26 | 11.88 | 61.07 | 149.97 | 0.89 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:35:26 | 12.28 | 63.53 | 125.18 | 0.89 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:36:26 | 12.74 | 65.30 | 114.07 | 1.18 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:37:26 | 11.75 | 61.85 | 105.12 | 0.59 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:38:26 | 12.25 | 64.80 | 107.98 | 0.59 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:39:26 | 12.20 | 66.08 | 124.00 | 0.89 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:40:26 | 12.21 | 62.15 | 111.02 | 0.89 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:41:26 | 12.57 | 65.30 | 102.86 | 1.18 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:42:26 | 12.69 | 65.98 | 95.78 | 0.89 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:43:26 | 13.14 | 67.56 | 86.93 | 0.59 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:44:26 | 12.43 | 65.79 | 92.83 | 0.59 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:45:26 | 12.50 | 64.80 | 93.81 | 0.59 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:46:26 | 12.40 | 66.87 | 93.81 | 0.89 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:47:26 | 12.15 | 63.23 | 92.93 | 0.59 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:48:26 | 12.86 | 67.07 | 87.72 | 0.89 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:49:26 | 13.04 | 67.56 | 82.80 | 0.89 | | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:50:26 | 12.82 | 67.26 | 79.75 | 0.89 | | SCRUBBER B RUN 3 |

**Source Testing And Consulting Services, Inc.**

scruuber B

9-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments |
|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | |
| 9-Jun-04 | 18:51:26 | 12.36 | 68.64 | 88.80 | 0.30 | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:52:26 | 12.08 | 64.51 | 91.75 | 0.30 | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:53:26 | 11.94 | 63.92 | 189.89 | 0.30 | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:54:26 | 12.16 | 66.57 | 98.73 | 0.89 | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:55:26 | 12.58 | 67.46 | 98.83 | 0.89 | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:56:26 | 12.73 | 67.66 | 94.80 | 0.59 | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:57:26 | 12.42 | 65.98 | 94.80 | 0.89 | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:58:26 | 15.67 | 20.75 | 162.95 | 0.89 | SCRUBBER B RUN 3 |
| 9-Jun-04 | 18:59:26 | 13.17 | 59.00 | 462.78 | 0.59 | SCRUBBER STOP |
| 9-Jun-04 | 19:00:56 | 0.06 | -1.18 | 2.07 | 25.08 | SO2=24.9 |
| 9-Jun-04 | 19:01:01 | 0.05 | -1.08 | 0.00 | 25.67 | SO2=24.9 |
| 9-Jun-04 | 19:01:06 | 0.05 | -1.18 | 0.00 | 25.37 | SO2=24.9 |
| 9-Jun-04 | 19:01:11 | 0.05 | -1.18 | 0.10 | 25.67 | SO2=24.9 |
| 9-Jun-04 | 19:03:47 | 0.04 | 178.68 | 303.87 | 0.30 | NX -181 CO=306 |
| 9-Jun-04 | 19:03:52 | 0.05 | 178.78 | 310.95 | 0.30 | NX -181 CO=306 |
| 9-Jun-04 | 19:03:57 | 0.05 | 178.68 | 311.93 | 0.30 | NX -181 CO=306 |
| 9-Jun-04 | 19:04:02 | 0.05 | 178.98 | 311.93 | 0.30 | NX -181 CO=306 |
| 9-Jun-04 | 19:04:07 | 0.04 | 178.98 | 312.91 | 0.30 | NX -181 CO=306 |
| 9-Jun-04 | 19:07:28 | 0.03 | 94.11 | 98.73 | 0.30 | NX=95 CO=96.8 |
| 9-Jun-04 | 19:07:33 | 0.03 | 94.01 | 98.73 | 0.30 | NX=95 CO=96.8 |
| 9-Jun-04 | 19:07:38 | 0.04 | 94.11 | 98.73 | 0.30 | NX=95 CO=96.8 |
| 9-Jun-04 | 19:07:43 | 0.03 | 94.01 | 98.83 | 0.00 | NX=95 CO=96.8 |
| 9-Jun-04 | 19:07:48 | 0.03 | 94.21 | 98.83 | 0.30 | NX=95 CO=96.8 |
| 9-Jun-04 | 19:07:53 | 0.04 | 94.01 | 98.73 | 0.30 | NX=95 CO=96.8 |
| 9-Jun-04 | 19:07:58 | 0.03 | 94.21 | 98.73 | 0.00 | NX=95 CO=96.8 |
| 9-Jun-04 | 19:08:03 | 0.04 | 94.01 | 98.83 | 0.30 | NX=95 CO=96.8 |
| 9-Jun-04 | 19:08:08 | 0.03 | 94.01 | 98.73 | 0.30 | NX=95 CO=96.8 |
| 9-Jun-04 | 19:08:13 | 0.03 | 93.81 | 98.73 | 0.59 | NX=95 CO=96.8 |
| 9-Jun-04 | 19:08:18 | 0.04 | 95.58 | 98.83 | 0.30 | NX=95 CO=96.8 |
| 9-Jun-04 | 19:08:23 | 0.03 | 95.68 | 98.73 | -0.59 | NX=95 CO=96.8 |
| 9-Jun-04 | 19:08:28 | 0.03 | 95.78 | 98.83 | 0.00 | NX=95 CO=96.8 |
| 9-Jun-04 | 19:08:33 | 0.03 | 95.98 | 98.73 | 0.30 | NX=95 CO=96.8 |
| 9-Jun-04 | 19:08:38 | 0.03 | 95.88 | 98.73 | 0.59 | NX=95 CO=96.8 |
| 9-Jun-04 | 19:09:52 | 12.97 | -1.08 | 6.98 | 0.00 | O2=12.97 |
| 9-Jun-04 | 19:09:57 | 12.97 | -1.08 | 1.97 | 0.00 | O2=12.97 |
| 9-Jun-04 | 19:10:02 | 12.96 | -0.98 | 2.07 | 0.30 | O2=12.97 |

**Source Testing And Consulting Services, Inc.**

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10-Jun-04 RAYNIER

| Parameter | | O2 | NOx | CO | SO2 | Comments |
|---|---|---|---|---|---|---|
| Units | | %V | ppmV | ppmV | ppmV | |
| 10-Jun-04 | 8:55:43 | 0.10 | 905.94 | 898.36 | 1.18 | PRE SCRUBBER CALS |
| 10-Jun-04 | 8:55:48 | 0.10 | 904.66 | 899.35 | 0.89 | PRE SCRUBBER CALS |
| 10-Jun-04 | 8:56:02 | 0.10 | 904.76 | 896.20 | 0.59 | CO 904 NX=906 |
| 10-Jun-04 | 8:56:07 | 0.10 | 903.58 | 894.33 | 0.89 | CO 904 NX=906 |
| 10-Jun-04 | 8:56:12 | 0.10 | 902.89 | 890.30 | 0.89 | CO 904 NX=906 |
| 10-Jun-04 | 8:56:17 | 0.10 | 902.40 | 890.30 | 0.89 | CO 904 NX=906 |
| 10-Jun-04 | 8:56:25 | 0.10 | 902.59 | 892.27 | 0.89 | LB |
| 10-Jun-04 | 8:56:30 | 0.10 | 901.90 | 900.23 | 0.59 | LB |
| 10-Jun-04 | 8:56:35 | 0.10 | 902.20 | 900.33 | 0.59 | LB |
| 10-Jun-04 | 8:56:40 | 0.10 | 901.12 | 905.25 | 0.89 | LB |
| 10-Jun-04 | 8:56:45 | 0.10 | 901.21 | 905.25 | 0.89 | LB |
| 10-Jun-04 | 8:59:00 | 0.07 | 456.41 | 616.02 | 1.18 | CE CO=619 NX=456 |
| 10-Jun-04 | 8:59:05 | 0.08 | 455.62 | 615.92 | 0.89 | CE CO=619 NX=456 |
| 10-Jun-04 | 8:59:10 | 0.08 | 455.82 | 617.30 | 0.89 | CE CO=619 NX=456 |
| 10-Jun-04 | 8:59:15 | 0.08 | 455.62 | 617.30 | 1.18 | CE CO=619 NX=456 |
| 10-Jun-04 | 8:59:20 | 0.08 | 455.72 | 617.30 | 1.18 | CE CO=619 NX=456 |
| 10-Jun-04 | 8:59:25 | 0.08 | 455.82 | 617.30 | 1.48 | CE CO=619 NX=456 |
| 10-Jun-04 | 8:59:30 | 0.08 | 455.72 | 614.94 | 0.89 | CE CO=619 NX=456 |
| 10-Jun-04 | 8:59:35 | 0.08 | 455.52 | 614.94 | 1.18 | CE CO=619 NX=456 |
| 10-Jun-04 | 8:59:40 | 0.08 | 455.92 | 614.94 | 1.18 | CE CO=619 NX=456 |
| 10-Jun-04 | 8:59:46 | 0.07 | 455.33 | 617.30 | 1.18 | LB |
| 10-Jun-04 | 8:59:51 | 0.07 | 455.72 | 615.04 | 0.30 | LB |
| 10-Jun-04 | 8:59:56 | 0.07 | 455.52 | 615.04 | 0.30 | LB |
| 10-Jun-04 | 9:00:01 | 0.08 | 455.52 | 613.96 | 1.18 | LB |
| 10-Jun-04 | 9:01:35 | 0.06 | 180.07 | 303.98 | 0.59 | CE NX=181 CO=306 |
| 10-Jun-04 | 9:01:40 | 0.06 | 179.97 | 314.11 | 0.89 | CE NX=181 CO=306 |
| 10-Jun-04 | 9:01:45 | 0.06 | 180.26 | 314.99 | 1.18 | CE NX=181 CO=306 |
| 10-Jun-04 | 9:01:50 | 0.06 | 180.07 | 314.99 | 1.18 | CE NX=181 CO=306 |
| 10-Jun-04 | 9:01:55 | 0.06 | 180.07 | 314.99 | 1.18 | CE NX=181 CO=306 |
| 10-Jun-04 | 9:02:00 | 0.06 | 180.16 | 316.07 | 1.48 | CE NX=181 CO=306 |
| 10-Jun-04 | 9:02:05 | 0.06 | 180.16 | 315.09 | 1.18 | CE NX=181 CO=306 |
| 10-Jun-04 | 9:02:12 | 0.06 | 180.07 | 314.99 | 1.18 | LB |
| 10-Jun-04 | 9:02:17 | 0.06 | 179.77 | 315.09 | 1.48 | LB |
| 10-Jun-04 | 9:02:22 | 0.06 | 179.87 | 315.09 | 1.48 | LB |
| 10-Jun-04 | 9:02:27 | 0.06 | 179.87 | 314.99 | 1.18 | LB |
| 10-Jun-04 | 9:05:10 | 0.06 | 94.80 | 98.83 | 0.89 | CE NX=95 CO=96.8 |
| 10-Jun-04 | 9:05:15 | 0.06 | 94.70 | 98.83 | 1.18 | CE NX=95 CO=96.8 |
| 10-Jun-04 | 9:05:20 | 0.06 | 94.70 | 98.83 | 0.89 | CE NX=95 CO=96.8 |
| 10-Jun-04 | 9:05:25 | 0.06 | 94.80 | 98.83 | 1.18 | CE NX=95 CO=96.8 |
| 10-Jun-04 | 9:05:30 | 0.06 | 94.70 | 98.83 | 1.48 | CE NX=95 CO=96.8 |
| 10-Jun-04 | 9:05:35 | 0.06 | 94.61 | 98.83 | 1.18 | LB |
| 10-Jun-04 | 9:05:40 | 0.06 | 94.70 | 98.83 | 1.18 | LB |
| 10-Jun-04 | 9:05:45 | 0.06 | 94.61 | 98.83 | 1.18 | LB |

**Source Testing And Consulting Services, Inc.**

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10-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments |
|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | |
| 10-Jun-04 | 9:05:50 | 0.06 | 94.61 | 98.83 | 0.59 | LB |
| 10-Jun-04 | 9:05:55 | 0.06 | 94.90 | 98.83 | 0.89 | LB |
| 10-Jun-04 | 9:08:28 | 0.06 | 46.02 | 45.83 | 0.30 | CE NX=46.7 CO=46 |
| 10-Jun-04 | 9:08:33 | 0.06 | 45.83 | 45.83 | 0.59 | CE NX=46.7 CO=46 |
| 10-Jun-04 | 9:08:38 | 0.06 | 45.73 | 45.93 | 0.30 | CE NX=46.7 CO=46 |
| 10-Jun-04 | 9:08:43 | 0.06 | 45.73 | 45.93 | -1.18 | CE NX=46.7 CO=46 |
| 10-Jun-04 | 9:08:48 | 0.06 | 45.73 | 45.83 | 0.30 | CE NX=46.7 CO=46 |
| 10-Jun-04 | 9:09:12 | 0.06 | 45.63 | 45.93 | 1.18 | LB |
| 10-Jun-04 | 9:09:17 | 0.06 | 45.63 | 45.83 | 0.89 | LB |
| 10-Jun-04 | 9:09:22 | 0.06 | 45.53 | 45.93 | 0.89 | LB |
| 10-Jun-04 | 9:12:40 | 19.97 | -1.08 | 0.00 | 0.30 | CE O2=19.99 |
| 10-Jun-04 | 9:12:45 | 19.97 | -1.18 | 0.00 | 0.89 | CE O2=19.99 |
| 10-Jun-04 | 9:12:50 | 19.97 | -1.18 | 0.00 | 0.89 | CE O2=19.99 |
| 10-Jun-04 | 9:12:55 | 19.98 | -1.18 | 0.00 | 0.59 | CE O2=19.99 |
| 10-Jun-04 | 9:13:02 | 19.98 | -1.18 | 0.00 | 0.00 | LB |
| 10-Jun-04 | 9:13:07 | 19.98 | -1.18 | 0.10 | 0.89 | LB |
| 10-Jun-04 | 9:13:12 | 19.98 | -1.18 | 0.00 | 0.59 | LB |
| 10-Jun-04 | 9:20:33 | 13.05 | -1.28 | 0.10 | 0.30 | O2=12.97 |
| 10-Jun-04 | 9:20:38 | 13.04 | -1.28 | 0.10 | 0.89 | O2=12.97 |
| 10-Jun-04 | 9:20:43 | 13.04 | -1.38 | 0.00 | 0.89 | O2=12.97 |
| 10-Jun-04 | 9:20:48 | 13.04 | -1.28 | 0.00 | 0.59 | O2=12.97 |
| 10-Jun-04 | 9:20:53 | 13.06 | -1.28 | 0.10 | 0.59 | O2=12.97 |
| 10-Jun-04 | 9:20:58 | 13.05 | -1.28 | 0.00 | 0.89 | O2=12.97 |
| 10-Jun-04 | 9:21:03 | 13.04 | -1.28 | 0.00 | 1.18 | O2=12.97 |
| 10-Jun-04 | 9:21:08 | 13.05 | -1.28 | 0.00 | 0.59 | O2=12.97 |
| 10-Jun-04 | 9:21:13 | 13.06 | -1.38 | 0.00 | 0.59 | O2=12.97 |
| 10-Jun-04 | 9:21:18 | 13.05 | -1.28 | 0.00 | 0.59 | O2=12.97 |
| 10-Jun-04 | 9:21:23 | 13.05 | -1.28 | 0.00 | 0.89 | O2=12.97 |
| 10-Jun-04 | 9:21:28 | 13.05 | -1.28 | 0.00 | 0.59 | O2=12.97 |
| 10-Jun-04 | 9:21:33 | 13.05 | -1.38 | 0.00 | 0.59 | O2=12.97 |
| 10-Jun-04 | 9:21:38 | 13.05 | -1.38 | 0.10 | 0.59 | O2=12.97 |
| 10-Jun-04 | 9:21:43 | 13.05 | -1.28 | 0.00 | 0.30 | O2=12.97 |
| 10-Jun-04 | 9:21:48 | 13.05 | -1.38 | 0.10 | 0.30 | O2=12.97 |
| 10-Jun-04 | 9:21:53 | 13.05 | -1.28 | -0.10 | 0.89 | O2=12.97 |
| 10-Jun-04 | 9:21:58 | 13.05 | -1.38 | 0.10 | 0.59 | O2=12.97 |
| 10-Jun-04 | 9:22:03 | 13.05 | -1.38 | 0.00 | 0.59 | O2=12.97 |
| 10-Jun-04 | 9:22:08 | 13.05 | -1.28 | 0.00 | 0.59 | O2=12.97 |
| 10-Jun-04 | 9:22:13 | 13.05 | -1.28 | 0.00 | 0.30 | O2=12.97 |
| 10-Jun-04 | 9:22:18 | 13.05 | -1.28 | 0.00 | 0.30 | O2=12.97 |
| 10-Jun-04 | 9:22:23 | 13.05 | -1.28 | 0.10 | 0.59 | O2=12.97 |
| 10-Jun-04 | 9:22:28 | 13.05 | -1.28 | 0.00 | 0.59 | O2=12.97 |
| 10-Jun-04 | 9:22:33 | 13.05 | -1.38 | 0.00 | 1.18 | O2=12.97 |
| 10-Jun-04 | 9:22:38 | 13.05 | -1.28 | 0.00 | 0.89 | O2=12.97 |
| 10-Jun-04 | 9:22:43 | 13.05 | -1.28 | 0.00 | 0.00 | O2=12.97 |

**Source Testing And Consulting Services, Inc.**

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10-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments | |
|---|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | | |
| 10-Jun-04 | 9:22:48 | 13.05 | -1.28 | 0.00 | 0.59 | | O2=12.97 |
| 10-Jun-04 | 9:22:53 | 13.05 | -1.38 | 0.00 | 0.89 | | O2=12.97 |
| 10-Jun-04 | 9:22:58 | 13.05 | -1.38 | 0.00 | 0.30 | | O2=12.97 |
| 10-Jun-04 | 9:23:03 | 13.05 | -1.28 | 0.00 | 0.59 | | O2=12.97 |
| 10-Jun-04 | 9:23:08 | 13.05 | -1.38 | 0.00 | 0.30 | | O2=12.97 |
| 10-Jun-04 | 9:23:13 | 13.05 | -1.28 | 0.00 | 0.30 | | O2=12.97 |
| 10-Jun-04 | 9:23:18 | 13.05 | -1.38 | 0.10 | 0.30 | | O2=12.97 |
| 10-Jun-04 | 9:23:23 | 13.05 | -1.38 | 0.00 | 0.59 | | O2=12.97 |
| 10-Jun-04 | 9:23:28 | 13.05 | -1.18 | 0.00 | 0.59 | | O2=12.97 |
| 10-Jun-04 | 9:23:33 | 13.05 | -1.28 | 0.00 | 0.59 | | O2=12.97 |
| 10-Jun-04 | 9:23:38 | 13.04 | -1.38 | 0.00 | 0.59 | | O2=12.97 |
| 10-Jun-04 | 9:23:43 | 13.05 | -1.38 | 0.00 | 0.59 | | O2=12.97 |
| 10-Jun-04 | 9:23:48 | 13.05 | -1.38 | 0.10 | 0.59 | | O2=12.97 |
| 10-Jun-04 | 9:23:53 | 13.05 | -1.38 | 0.00 | 0.59 | | O2=12.97 |
| 10-Jun-04 | 9:23:58 | 13.04 | -1.28 | 0.00 | 0.59 | | O2=12.97 |
| 10-Jun-04 | 9:24:07 | 13.05 | -1.28 | 0.00 | 0.59 | | LB |
| 10-Jun-04 | 9:24:12 | 13.05 | -1.28 | 0.00 | 0.89 | | LB |
| 10-Jun-04 | 9:24:17 | 13.05 | -1.38 | 0.00 | 0.89 | | LB |
| 10-Jun-04 | 9:24:22 | 13.05 | -1.38 | 0.10 | 0.59 | | LB |
| 10-Jun-04 | 9:24:27 | 13.06 | -1.28 | 0.10 | 0.59 | | LB |
| 10-Jun-04 | 9:24:32 | 13.05 | -1.28 | 0.00 | 0.89 | | LB |
| 10-Jun-04 | 9:24:37 | 13.05 | -1.28 | 0.10 | 0.59 | | LB |
| 10-Jun-04 | 9:24:42 | 13.05 | -1.28 | -0.10 | 0.59 | | LB |
| 10-Jun-04 | 9:24:47 | 13.05 | -1.38 | 0.00 | 0.89 | | LB |
| 10-Jun-04 | 9:24:52 | 13.05 | -1.28 | 0.00 | 0.59 | | LB |
| 10-Jun-04 | 9:24:57 | 13.05 | -1.48 | 0.00 | 0.59 | | LB |
| 10-Jun-04 | 9:25:02 | 13.04 | -1.28 | 0.00 | 0.59 | | LB |
| 10-Jun-04 | 9:25:07 | 13.06 | -1.38 | 0.10 | 0.59 | | LB |
| 10-Jun-04 | 9:25:12 | 13.05 | -1.28 | 0.00 | 0.59 | | LB |
| 10-Jun-04 | 9:25:17 | 13.05 | -1.38 | 0.00 | 0.00 | | LB |
| 10-Jun-04 | 9:25:22 | 13.05 | -1.38 | 0.00 | 0.30 | | LB |
| 10-Jun-04 | 9:25:27 | 13.05 | -1.38 | 0.10 | 0.30 | | LB |
| 10-Jun-04 | 9:25:32 | 13.05 | -1.28 | 0.10 | 0.30 | | LB |
| 10-Jun-04 | 9:25:37 | 13.05 | -1.28 | 0.00 | 0.30 | | LB |
| 10-Jun-04 | 9:25:42 | 13.05 | -1.38 | 0.10 | 0.59 | | LB |
| 10-Jun-04 | 9:25:47 | 13.05 | -1.28 | 0.10 | 0.59 | | LB |
| 10-Jun-04 | 9:25:52 | 13.06 | -1.38 | 0.10 | 0.59 | | LB |
| 10-Jun-04 | 9:25:57 | 13.02 | -1.38 | 0.10 | 0.59 | | LB |
| 10-Jun-04 | 9:26:02 | 13.05 | -1.38 | 0.00 | 0.59 | | LB |
| 10-Jun-04 | 9:26:07 | 13.05 | -1.48 | 0.00 | 0.30 | | LB |
| 10-Jun-04 | 9:26:12 | 13.05 | -1.38 | 0.00 | 0.30 | | LB |
| 10-Jun-04 | 9:26:17 | 13.05 | -1.28 | 0.00 | 0.59 | | LB |
| 10-Jun-04 | 9:26:22 | 13.05 | -1.38 | 0.00 | 0.30 | | LB |
| 10-Jun-04 | 9:26:27 | 13.05 | -1.38 | 0.00 | 0.30 | | LB |

**Source Testing And Consulting Services, Inc.**

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10-Jun-04 RAYNIER

| Parameter | | O2 | NOx | CO | SO2 | Comments | |
|---|---|---|---|---|---|---|---|
| Units | | %V | ppmV | ppmV | ppmV | | |
| 10-Jun-04 | 9:26:32 | 13.04 | -1.28 | 0.00 | 0.59 | | LB |
| 10-Jun-04 | 9:26:37 | 13.05 | -1.38 | 0.00 | 0.59 | | LB |
| 10-Jun-04 | 9:26:42 | 13.05 | -1.28 | 0.00 | 0.59 | | LB |
| 10-Jun-04 | 9:26:47 | 13.05 | -1.28 | 0.00 | 0.59 | | LB |
| 10-Jun-04 | 9:26:52 | 13.05 | -1.38 | 0.00 | 0.59 | | LB |
| 10-Jun-04 | 9:26:57 | 13.05 | -1.18 | -0.10 | 0.59 | | LB |
| 10-Jun-04 | 9:27:02 | 13.05 | -1.28 | 0.00 | 1.18 | | LB |
| 10-Jun-04 | 9:27:07 | 13.05 | -1.28 | 0.00 | 0.59 | | LB |
| 10-Jun-04 | 9:27:12 | 13.06 | -1.28 | 0.00 | 0.59 | | LB |
| 10-Jun-04 | 9:27:17 | 13.05 | -1.28 | 0.00 | 0.89 | | LB |
| 10-Jun-04 | 9:27:22 | 13.05 | -1.38 | 0.00 | 0.30 | | LB |
| 10-Jun-04 | 9:27:27 | 13.06 | -1.28 | 0.10 | 0.00 | | LB |
| 10-Jun-04 | 9:27:32 | 13.05 | -1.38 | 0.00 | 0.30 | | LB |
| 10-Jun-04 | 9:27:37 | 13.05 | -1.38 | 0.00 | 0.59 | | LB |
| 10-Jun-04 | 9:27:42 | 13.05 | -1.28 | 0.10 | 0.89 | | LB |
| 10-Jun-04 | 9:27:47 | 13.05 | -1.28 | 0.10 | 0.59 | | LB |
| 10-Jun-04 | 9:27:52 | 13.05 | -1.28 | 0.00 | 0.30 | | LB |
| 10-Jun-04 | 9:27:57 | 13.05 | -1.28 | 0.00 | 0.59 | | LB |
| 10-Jun-04 | 9:28:02 | 13.05 | -1.38 | 0.00 | 0.59 | | LB |
| 10-Jun-04 | 9:28:07 | 13.05 | -1.38 | 0.10 | 0.59 | | LB |
| 10-Jun-04 | 9:28:12 | 13.05 | -1.28 | 0.10 | 0.59 | | LB |
| 10-Jun-04 | 9:28:17 | 13.05 | -1.38 | 0.00 | 0.30 | | LB |
| 10-Jun-04 | 9:28:22 | 13.05 | -1.38 | 0.10 | 0.59 | | LB |
| 10-Jun-04 | 9:28:27 | 13.05 | -1.38 | 0.00 | 0.89 | | LB |
| 10-Jun-04 | 9:28:32 | 13.05 | -1.38 | 0.00 | 0.30 | | LB |
| 10-Jun-04 | 9:28:37 | 13.05 | -1.38 | 0.00 | 0.59 | | LB |
| 10-Jun-04 | 9:28:42 | 13.05 | -1.28 | 0.00 | 0.59 | | LB |
| 10-Jun-04 | 9:28:47 | 13.05 | -1.38 | 0.10 | 0.89 | | LB |
| 10-Jun-04 | 9:28:52 | 13.05 | -1.28 | 0.00 | 0.59 | | LB |
| 10-Jun-04 | 9:28:57 | 13.05 | -1.28 | 0.10 | 0.59 | | LB |
| 10-Jun-04 | 9:29:02 | 13.05 | -1.28 | 0.00 | 0.89 | | LB |
| 10-Jun-04 | 9:29:07 | 13.05 | -1.38 | 0.10 | 0.59 | | LB |
| 10-Jun-04 | 9:29:12 | 13.05 | -1.28 | 0.00 | 0.59 | | LB |
| 10-Jun-04 | 9:29:17 | 13.05 | -1.38 | 0.00 | 0.89 | | LB |
| 10-Jun-04 | 9:29:22 | 13.05 | -1.28 | 0.00 | 0.59 | | LB |
| 10-Jun-04 | 9:29:27 | 13.05 | -1.28 | 0.00 | 0.59 | | LB |
| 10-Jun-04 | 9:29:32 | 13.05 | -1.18 | 0.00 | 0.59 | | LB |
| 10-Jun-04 | 9:29:37 | 13.05 | -1.38 | 0.10 | 1.18 | | LB |
| 10-Jun-04 | 9:29:42 | 13.05 | -1.28 | 0.00 | 0.59 | | LB |
| 10-Jun-04 | 9:29:47 | 13.05 | -1.38 | 0.00 | 1.18 | | LB |
| 10-Jun-04 | 9:29:52 | 13.05 | -1.38 | 0.10 | 0.89 | | LB |
| 10-Jun-04 | 9:29:57 | 13.05 | -1.38 | 0.00 | 0.30 | | LB |
| 10-Jun-04 | 9:30:02 | 13.05 | -1.28 | 0.00 | 0.59 | | LB |
| 10-Jun-04 | 9:30:07 | 13.06 | -1.38 | 0.00 | 0.59 | | LB |

**Source Testing And Consulting Services, Inc.**

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10-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments | |
|---|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | | |
| 10-Jun-04 | 9:30:12 | 13.05 | -1.38 | -0.10 | 0.89 | | LB |
| 10-Jun-04 | 9:30:17 | 13.06 | -1.38 | 0.00 | 0.89 | | LB |
| 10-Jun-04 | 9:30:22 | 13.06 | -1.38 | -0.10 | 0.89 | | LB |
| 10-Jun-04 | 9:30:27 | 13.05 | -1.28 | 0.00 | 0.59 | | LB |
| 10-Jun-04 | 10:02:53 | 11.24 | 96.43 | 187.80 | 0.44 | | RT |
| 10-Jun-04 | 10:02:58 | 10.81 | 96.13 | 187.70 | 0.44 | | RT |
| 10-Jun-04 | 10:03:03 | 10.68 | 97.51 | 212.87 | 0.74 | | RT |
| 10-Jun-04 | 10:03:08 | 10.62 | 96.73 | 212.87 | 1.03 | | RT |
| 10-Jun-04 | 10:03:13 | 10.60 | 96.63 | 238.15 | 0.74 | | RT |
| 10-Jun-04 | 10:03:18 | 10.51 | 75.97 | 238.15 | 0.44 | | RT |
| 10-Jun-04 | 10:03:23 | 12.79 | 0.05 | 259.20 | 0.44 | | RT |
| 10-Jun-04 | 10:03:28 | 18.41 | -0.54 | 259.20 | 0.74 | | RT |
| 10-Jun-04 | 10:03:33 | 19.69 | -0.93 | 224.87 | 0.74 | | RT |
| 10-Jun-04 | 10:03:38 | 19.89 | -0.93 | 224.77 | 1.03 | | RT |
| 10-Jun-04 | 10:03:43 | 19.91 | -1.03 | 165.08 | 0.74 | | RT |
| 10-Jun-04 | 10:03:48 | 19.94 | -1.03 | 165.08 | 0.44 | | RT |
| 10-Jun-04 | 10:03:53 | 19.95 | -1.03 | 100.86 | 0.74 | | RT |
| 10-Jun-04 | 10:03:58 | 19.96 | -1.03 | 100.76 | 0.44 | | RT |
| 10-Jun-04 | 10:04:03 | 19.97 | -1.13 | 49.71 | 1.03 | | RT |
| 10-Jun-04 | 10:04:08 | 19.95 | -1.13 | 49.81 | 0.74 | | RT |
| 10-Jun-04 | 10:04:13 | 19.98 | -1.23 | 19.82 | 0.15 | | RT |
| 10-Jun-04 | 10:04:18 | 19.98 | -1.23 | 19.82 | 0.44 | | RT |
| 10-Jun-04 | 10:04:23 | 19.97 | -1.23 | 5.95 | 0.44 | | RT |
| 10-Jun-04 | 10:04:28 | 19.98 | -1.13 | 5.95 | 0.74 | | RT |
| 10-Jun-04 | 10:04:33 | 19.99 | -1.13 | 0.93 | 0.74 | | RT |
| 10-Jun-04 | 10:04:38 | 19.98 | -1.33 | 0.93 | 0.44 | | RT |
| 10-Jun-04 | 10:04:43 | 19.99 | -1.23 | -0.05 | 0.44 | | RT |
| 10-Jun-04 | 10:04:48 | 19.99 | -1.13 | -0.15 | 0.15 | | RT |
| 10-Jun-04 | 10:04:53 | 19.98 | -1.13 | -0.05 | 0.15 | | RT |
| 10-Jun-04 | 10:04:58 | 19.98 | -1.33 | -0.05 | 0.44 | | RT |
| 10-Jun-04 | 10:05:03 | 20.00 | 90.92 | -0.05 | 0.74 | | RT |
| 10-Jun-04 | 10:05:08 | 14.79 | 97.91 | -0.05 | 0.74 | | RT |
| 10-Jun-04 | 10:05:13 | 11.78 | 98.30 | 17.95 | 0.44 | | RT |
| 10-Jun-04 | 10:05:18 | 11.18 | 98.99 | 17.85 | 0.15 | | RT |
| 10-Jun-04 | 10:05:23 | 11.17 | 99.28 | 55.62 | 0.44 | | RT |
| 10-Jun-04 | 10:05:28 | 11.11 | 98.59 | 55.71 | 0.44 | | RT |
| 10-Jun-04 | 10:05:33 | 11.09 | 99.28 | 96.73 | 1.03 | | RT |
| 10-Jun-04 | 10:05:38 | 11.11 | 98.79 | 96.82 | 0.74 | | RT |
| 10-Jun-04 | 10:05:43 | 11.11 | 97.71 | 133.02 | 0.44 | | RT |
| 10-Jun-04 | 10:05:48 | 11.07 | 97.51 | 133.02 | 0.74 | | RT |
| 10-Jun-04 | 10:05:53 | 11.01 | 97.61 | 155.73 | 0.44 | | RT |
| 10-Jun-04 | 10:05:58 | 11.07 | 97.32 | 155.83 | 0.74 | | RT |
| 10-Jun-04 | 10:06:03 | 10.95 | 96.82 | 170.78 | 0.44 | | RT |
| 10-Jun-04 | 10:06:08 | 10.69 | 96.04 | 170.68 | 0.44 | | RT |

**Source Testing And Consulting Services, Inc.**

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10-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments | |
|---|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | | |
| 10-Jun-04 | 10:06:13 | 10.55 | 94.56 | 207.66 | 0.44 | | RT |
| 10-Jun-04 | 10:06:18 | 10.43 | 93.48 | 207.76 | 0.74 | | RT |
| 10-Jun-04 | 10:06:23 | 10.32 | 92.40 | 292.04 | 0.44 | | RT |
| 10-Jun-04 | 10:06:28 | 10.23 | 92.40 | 292.04 | 0.15 | | RT |
| 10-Jun-04 | 10:06:33 | 10.18 | 93.58 | 434.94 | 0.44 | | RT |
| 10-Jun-04 | 10:06:38 | 10.33 | 12.93 | 434.94 | 0.74 | | RT |
| 10-Jun-04 | 10:06:43 | 17.67 | -0.54 | 524.05 | 0.44 | | RT |
| 10-Jun-04 | 10:06:48 | 19.49 | -0.74 | 523.95 | 0.44 | | RT |
| 10-Jun-04 | 10:06:53 | 19.90 | -0.84 | 466.91 | 0.44 | | RT |
| 10-Jun-04 | 10:06:58 | 19.96 | -0.93 | 466.91 | 0.44 | | RT |
| 10-Jun-04 | 10:07:03 | 19.98 | -1.13 | 355.87 | 0.44 | | RT |
| 10-Jun-04 | 10:07:08 | 19.98 | -1.13 | 355.87 | 0.44 | | RT |
| 10-Jun-04 | 10:07:13 | 19.99 | -1.13 | 216.81 | 0.44 | | RT |
| 10-Jun-04 | 10:07:18 | 19.99 | -1.13 | 216.81 | 0.44 | | RT |
| 10-Jun-04 | 10:07:23 | 20.00 | -1.23 | 104.99 | 0.44 | | RT |
| 10-Jun-04 | 10:07:28 | 20.00 | -1.13 | 104.99 | 0.44 | | RT |
| 10-Jun-04 | 10:07:33 | 20.00 | -1.23 | 39.78 | 0.44 | | RT |
| 10-Jun-04 | 10:07:38 | 20.00 | -1.23 | 39.68 | 0.44 | | RT |
| 10-Jun-04 | 10:07:43 | 20.00 | -1.23 | 10.77 | 0.44 | | RT |
| 10-Jun-04 | 10:07:48 | 20.00 | -1.23 | 10.77 | 0.44 | | RT |
| 10-Jun-04 | 10:07:53 | 20.01 | -1.33 | 1.82 | 0.44 | | RT |
| 10-Jun-04 | 10:07:58 | 20.01 | -1.13 | 1.92 | 0.44 | | RT |
| 10-Jun-04 | 10:08:03 | 20.01 | -1.33 | -0.05 | 0.44 | | RT |
| 10-Jun-04 | 10:08:08 | 20.01 | -1.23 | -0.05 | 0.44 | | RT |
| 10-Jun-04 | 10:08:13 | 20.01 | -1.33 | -0.15 | 0.44 | | RT |
| 10-Jun-04 | 10:08:18 | 20.01 | -1.23 | -0.15 | 0.44 | | RT |
| 10-Jun-04 | 10:08:23 | 20.01 | -1.23 | -0.15 | 0.15 | | RT |
| 10-Jun-04 | 10:08:28 | 20.01 | -1.23 | -0.05 | 0.44 | | RT |
| 10-Jun-04 | 10:08:33 | 19.98 | -1.23 | -0.05 | 0.44 | | RT |
| 10-Jun-04 | 10:08:38 | 19.15 | 94.27 | -0.05 | 0.44 | | RT |
| 10-Jun-04 | 10:08:43 | 12.93 | 96.82 | 9.79 | 0.44 | | RT |
| 10-Jun-04 | 10:08:48 | 11.38 | 96.13 | 9.79 | 0.15 | | RT |
| 10-Jun-04 | 10:08:53 | 11.28 | 96.23 | 51.78 | 0.44 | | RT |
| 10-Jun-04 | 10:08:58 | 11.36 | 96.63 | 51.68 | 0.44 | | RT |
| 10-Jun-04 | 10:09:03 | 11.42 | 96.13 | 100.86 | 0.44 | | RT |
| 10-Jun-04 | 10:09:08 | 11.41 | 95.64 | 100.86 | 0.44 | | RT |
| 10-Jun-04 | 10:09:13 | 11.43 | 94.46 | 146.88 | 0.74 | | RT |
| 10-Jun-04 | 10:09:18 | 11.49 | 91.26 | 146.92 | 0.59 | | RT |
| 10-Jun-04 | 10:09:23 | 11.65 | 89.49 | 177.02 | 0.30 | | RT |
| 10-Jun-04 | 10:09:28 | 11.72 | 89.10 | 177.02 | 0.59 | | RT |
| 10-Jun-04 | 10:09:33 | 11.77 | 88.12 | 190.79 | 1.18 | | RT |
| 10-Jun-04 | 10:09:38 | 11.81 | 87.03 | 190.79 | 0.89 | | RT |
| 10-Jun-04 | 10:09:43 | 11.86 | 86.94 | 196.88 | 0.59 | | RT |
| 10-Jun-04 | 10:09:48 | 11.88 | 87.03 | 196.98 | 0.89 | | RT |

**Source Testing And Consulting Services, Inc.**

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10-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments | |
|---|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | | |
| 10-Jun-04 | 10:09:53 | 11.90 | 87.62 | 198.85 | 0.89 | | RT |
| 10-Jun-04 | 10:09:58 | 11.87 | 87.43 | 198.85 | 0.59 | | RT |
| 10-Jun-04 | 10:10:03 | 11.86 | 86.54 | 197.87 | 1.18 | | RT |
| 10-Jun-04 | 10:10:08 | 12.00 | 86.94 | 197.87 | 0.89 | | RT |
| 10-Jun-04 | 10:10:13 | 12.04 | 87.33 | 194.82 | 0.59 | | RT |
| 10-Jun-04 | 10:10:18 | 11.99 | 87.33 | 194.92 | 0.59 | | RT |
| 10-Jun-04 | 10:10:23 | 12.00 | 87.23 | 192.95 | 0.89 | | RT |
| 10-Jun-04 | 10:10:28 | 12.01 | 87.53 | 192.95 | 0.59 | | RT |
| 10-Jun-04 | 10:10:33 | 12.06 | 87.43 | 192.95 | 0.89 | | RT |
| 10-Jun-04 | 10:10:38 | 12.14 | 87.33 | 192.95 | 0.89 | | RT |
| 10-Jun-04 | 10:10:43 | 12.13 | 86.94 | 194.82 | 0.89 | | RT |
| 10-Jun-04 | 10:10:48 | 12.14 | 87.23 | 194.82 | 0.59 | | RT |
| 10-Jun-04 | 10:10:53 | 12.14 | 87.03 | 194.92 | 0.59 | | RT |
| 10-Jun-04 | 10:10:58 | 12.12 | 87.13 | 194.92 | 0.89 | | RT |
| 10-Jun-04 | 10:11:03 | 12.09 | 87.23 | 195.80 | 0.89 | | RT |
| 10-Jun-04 | 10:11:08 | 12.09 | 86.54 | 195.90 | 1.18 | | RT |
| 10-Jun-04 | 10:11:13 | 12.12 | 85.95 | 195.80 | 0.89 | | RT |
| 10-Jun-04 | 10:11:18 | 12.15 | 85.36 | 195.80 | 0.89 | | RT |
| 10-Jun-04 | 10:11:23 | 12.15 | 85.76 | 195.80 | 0.59 | | RT |
| 10-Jun-04 | 10:11:28 | 12.09 | 86.84 | 195.80 | 0.59 | | RT |
| 10-Jun-04 | 10:11:33 | 11.98 | 86.74 | 193.83 | 0.89 | | RT |
| 10-Jun-04 | 10:11:38 | 11.97 | 85.66 | 193.93 | 0.59 | | RT |
| 10-Jun-04 | 10:11:43 | 11.96 | 86.44 | 190.88 | 0.59 | | RT |
| 10-Jun-04 | 10:11:48 | 11.85 | 86.74 | 190.88 | 0.89 | | RT |
| 10-Jun-04 | 10:11:53 | 11.84 | 86.05 | 187.84 | 1.18 | | RT |
| 10-Jun-04 | 10:11:58 | 11.94 | 85.07 | 187.74 | 0.59 | | RT |
| 10-Jun-04 | 10:12:03 | 11.97 | 85.46 | 184.89 | 0.59 | | RT |
| 10-Jun-04 | 10:12:08 | 11.94 | 87.33 | 184.89 | 0.59 | | RT |
| 10-Jun-04 | 10:12:13 | 11.79 | 90.38 | 182.82 | 0.89 | | RT |
| 10-Jun-04 | 10:12:18 | 11.53 | 93.23 | 182.92 | 0.59 | | RT |
| 10-Jun-04 | 10:12:23 | 11.30 | 94.80 | 183.90 | 0.30 | | RT |
| 10-Jun-04 | 10:12:28 | 11.20 | 95.00 | 183.80 | 0.89 | | RT |
| 10-Jun-04 | 10:12:33 | 11.15 | 95.00 | 184.98 | 0.89 | | RT |
| 10-Jun-04 | 10:12:38 | 11.12 | 95.00 | 184.89 | 0.59 | | RT |
| 10-Jun-04 | 10:12:43 | 11.11 | 95.10 | 184.89 | 0.59 | | RT |
| 10-Jun-04 | 10:12:48 | 11.02 | 94.51 | 184.98 | 0.59 | | RT |
| 10-Jun-04 | 10:12:53 | 10.82 | 92.54 | 192.85 | 1.18 | | RT |
| 10-Jun-04 | 10:12:58 | 10.55 | 93.62 | 192.95 | 0.59 | | RT |
| 10-Jun-04 | 10:13:03 | 10.49 | 95.10 | 266.02 | 0.89 | | RT |
| 10-Jun-04 | 10:13:08 | 10.53 | 95.69 | 266.02 | 0.89 | | RT |
| 10-Jun-04 | 10:13:13 | 10.56 | 94.61 | 320.01 | 0.59 | | RT |
| 10-Jun-04 | 10:13:18 | 10.36 | 91.26 | 319.91 | 0.59 | | RT |
| 10-Jun-04 | 10:13:23 | 10.23 | 29.11 | 392.09 | 0.59 | | RT |
| 10-Jun-04 | 10:13:28 | 16.26 | -0.30 | 392.09 | 0.59 | | RT |

**Source Testing And Consulting Services, Inc.**

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10-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments | |
|---|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | | |
| 10-Jun-04 | 10:13:33 | 19.22 | -0.69 | 457.00 | 0.89 | | RT |
| 10-Jun-04 | 10:13:38 | 19.84 | -0.89 | 456.90 | 1.48 | | RT |
| 10-Jun-04 | 10:13:43 | 19.94 | -0.98 | 373.31 | 1.18 | | RT |
| 10-Jun-04 | 10:13:48 | 19.96 | -0.89 | 373.21 | 0.59 | | RT |
| 10-Jun-04 | 10:13:53 | 19.97 | -1.08 | 276.05 | 0.59 | | RT |
| 10-Jun-04 | 10:13:58 | 19.99 | -1.08 | 276.05 | 0.89 | | RT |
| 10-Jun-04 | 10:14:03 | 19.98 | -1.08 | 166.89 | 0.59 | | RT |
| 10-Jun-04 | 10:14:08 | 19.98 | -1.08 | 166.99 | 0.59 | | RT |
| 10-Jun-04 | 10:14:13 | 19.99 | -1.08 | 78.77 | 0.59 | | RT |
| 10-Jun-04 | 10:14:18 | 19.99 | -1.08 | 78.67 | 0.59 | | RT |
| 10-Jun-04 | 10:14:23 | 19.99 | -1.18 | 28.81 | 0.89 | | RT |
| 10-Jun-04 | 10:14:28 | 19.99 | -1.08 | 28.72 | 0.59 | | RT |
| 10-Jun-04 | 10:14:33 | 20.00 | -1.08 | 6.98 | 0.30 | | RT |
| 10-Jun-04 | 10:14:38 | 20.00 | -1.08 | 6.98 | 0.59 | | RT |
| 10-Jun-04 | 10:14:43 | 20.00 | -1.08 | 1.08 | 0.59 | | RT |
| 10-Jun-04 | 10:14:48 | 20.01 | -1.18 | 0.98 | 0.89 | | RT |
| 10-Jun-04 | 10:14:53 | 19.98 | 4.92 | -0.10 | 0.59 | | RT |
| 10-Jun-04 | 10:14:58 | 17.15 | 92.54 | 0.00 | 0.89 | | RT |
| 10-Jun-04 | 10:15:03 | 12.20 | 94.51 | 28.81 | 0.59 | | RT |
| 10-Jun-04 | 10:15:08 | 10.91 | 95.59 | 28.91 | 0.59 | | RT |
| 10-Jun-04 | 10:15:13 | 10.75 | 96.18 | 136.99 | 0.59 | | RT |
| 10-Jun-04 | 10:15:18 | 10.77 | 95.29 | 136.99 | 0.59 | | RT |
| 10-Jun-04 | 10:15:23 | 10.81 | 95.00 | 206.72 | 0.59 | | RT |
| 10-Jun-04 | 10:15:28 | 10.79 | 94.80 | 206.72 | 0.89 | | RT |
| 10-Jun-04 | 10:15:33 | 10.86 | 94.21 | 258.15 | 0.59 | | RT |
| 10-Jun-04 | 10:15:38 | 10.88 | 94.21 | 258.15 | 1.48 | | RT |
| 10-Jun-04 | 10:15:43 | 10.89 | 94.70 | 275.07 | 1.18 | | RT |
| 10-Jun-04 | 10:15:48 | 10.86 | 94.51 | 275.07 | 0.59 | | RT |
| 10-Jun-04 | 10:15:53 | 10.98 | 1.87 | 272.02 | 0.89 | | RT |
| 10-Jun-04 | 10:15:58 | 11.06 | 417.07 | 272.02 | 0.59 | | RT |
| 10-Jun-04 | 10:16:03 | 2.63 | 445.10 | 254.22 | 0.89 | | RT |
| 10-Jun-04 | 10:16:08 | 1.01 | 445.99 | 254.22 | 0.59 | | RT |
| 10-Jun-04 | 10:16:13 | 0.26 | 446.97 | 322.96 | 1.18 | | RT |
| 10-Jun-04 | 10:16:18 | 0.15 | 447.46 | 322.96 | 1.48 | | RT |
| 10-Jun-04 | 10:16:23 | 0.14 | 448.05 | 405.17 | 0.59 | | RT |
| 10-Jun-04 | 10:16:28 | 0.13 | 448.64 | 405.17 | 1.18 | | RT |
| 10-Jun-04 | 10:16:33 | 0.12 | 448.54 | 479.82 | 0.59 | | RT |
| 10-Jun-04 | 10:16:38 | 0.12 | 449.62 | 479.91 | 0.89 | | RT |
| 10-Jun-04 | 10:16:43 | 0.12 | 449.13 | 538.03 | 0.89 | | RT |
| 10-Jun-04 | 10:16:48 | 0.12 | 448.84 | 538.03 | 0.59 | | RT |
| 10-Jun-04 | 10:16:53 | 0.12 | 449.13 | 579.04 | 0.89 | | RT |
| 10-Jun-04 | 10:16:58 | 0.11 | 449.13 | 579.04 | 1.18 | | RT |
| 10-Jun-04 | 10:17:03 | 0.11 | 449.33 | 601.86 | 0.89 | | RT |
| 10-Jun-04 | 10:17:08 | 0.12 | 449.03 | 601.96 | 0.59 | | RT |

**Source Testing And Consulting Services, Inc.**

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10-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments | |
|---|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | | |
| 10-Jun-04 | 10:17:13 | 0.11 | 449.03 | 609.92 | 0.59 | | RT |
| 10-Jun-04 | 10:17:18 | 0.11 | 449.23 | 609.92 | 0.89 | | RT |
| 10-Jun-04 | 10:17:23 | 0.11 | 449.33 | 611.89 | 0.59 | | RT |
| 10-Jun-04 | 10:17:28 | 0.11 | 448.74 | 611.89 | 0.89 | | RT |
| 10-Jun-04 | 10:17:33 | 0.11 | 449.43 | 610.91 | 0.30 | | RT |
| 10-Jun-04 | 10:17:38 | 0.10 | 449.03 | 610.91 | 0.30 | | RT |
| 10-Jun-04 | 10:17:43 | 0.11 | 449.43 | 611.89 | 0.59 | | RT |
| 10-Jun-04 | 10:17:48 | 0.11 | 449.23 | 611.89 | 0.30 | | RT |
| 10-Jun-04 | 10:17:53 | 0.10 | 449.23 | 613.96 | 0.59 | | RT |
| 10-Jun-04 | 10:17:58 | 0.10 | 449.23 | 613.96 | 0.59 | | RT |
| 10-Jun-04 | 10:18:03 | 0.11 | 449.33 | 612.97 | 0.59 | | RT |
| 10-Jun-04 | 10:18:08 | 0.11 | 448.84 | 613.07 | 0.59 | | RT |
| 10-Jun-04 | 10:18:13 | 0.10 | 449.43 | 614.94 | 0.30 | | RT |
| 10-Jun-04 | 10:18:18 | 0.10 | 448.94 | 614.94 | 0.30 | | RT |
| 10-Jun-04 | 10:18:23 | 0.10 | 449.13 | 611.89 | 0.59 | | RT |
| 10-Jun-04 | 10:18:28 | 0.10 | 449.53 | 611.89 | 0.30 | | RT |
| 10-Jun-04 | 10:18:33 | 0.10 | 448.54 | 610.91 | 0.59 | | RT |
| 10-Jun-04 | 10:18:38 | 0.10 | 448.84 | 610.91 | 0.30 | | RT |
| 10-Jun-04 | 10:18:43 | 0.10 | 449.23 | 613.96 | 0.59 | | RT |
| 10-Jun-04 | 10:18:48 | 0.10 | 448.84 | 613.96 | 0.89 | | RT |
| 10-Jun-04 | 10:18:53 | 0.10 | 448.94 | 613.07 | 0.30 | | RT |
| 10-Jun-04 | 10:18:58 | 0.10 | 448.84 | 612.97 | 0.30 | | RT |
| 10-Jun-04 | 10:19:03 | 0.10 | 449.13 | 612.97 | 0.89 | | RT |
| 10-Jun-04 | 10:19:08 | 0.10 | 449.23 | 612.97 | 0.89 | | RT |
| 10-Jun-04 | 10:19:13 | 0.10 | 448.64 | 614.94 | 0.59 | | RT |
| 10-Jun-04 | 10:19:18 | 0.09 | 448.74 | 614.94 | 0.30 | | RT |
| 10-Jun-04 | 10:19:23 | 0.09 | 448.94 | 612.97 | 0.59 | | RT |
| 10-Jun-04 | 10:19:28 | 0.09 | 448.44 | 612.97 | 0.89 | | RT |
| 10-Jun-04 | 10:19:33 | 0.09 | 448.64 | 611.89 | 0.59 | | RT |
| 10-Jun-04 | 10:19:38 | 0.09 | 448.25 | 611.89 | 0.59 | | RT |
| 10-Jun-04 | 10:19:43 | 0.09 | 448.44 | 611.79 | 0.59 | | RT |
| 10-Jun-04 | 10:19:48 | 0.09 | 448.84 | 611.89 | 0.59 | | RT |
| 10-Jun-04 | 10:19:53 | 0.09 | 448.64 | 614.94 | 0.89 | | RT |
| 10-Jun-04 | 10:19:58 | 0.09 | 448.44 | 614.94 | 0.59 | | RT |
| 10-Jun-04 | 10:20:03 | 0.09 | 448.84 | 613.96 | 0.30 | | RT |
| 10-Jun-04 | 10:20:08 | 0.09 | 448.64 | 613.96 | 0.59 | | RT |
| 10-Jun-04 | 10:20:13 | 0.09 | 448.35 | 612.97 | 0.89 | | RT |
| 10-Jun-04 | 10:20:18 | 0.09 | 448.15 | 613.07 | 0.59 | | RT |
| 10-Jun-04 | 10:20:23 | 0.09 | 448.64 | 612.97 | 0.59 | | RT |
| 10-Jun-04 | 10:20:28 | 0.09 | 448.44 | 612.97 | 0.30 | | RT |
| 10-Jun-04 | 10:20:33 | 0.09 | 448.35 | 611.79 | 0.89 | | RT |
| 10-Jun-04 | 10:20:38 | 0.09 | 448.44 | 611.89 | 0.59 | | RT |
| 10-Jun-04 | 10:20:43 | 0.09 | 448.15 | 613.07 | 0.30 | | RT |
| 10-Jun-04 | 10:20:48 | 0.09 | 448.25 | 612.97 | 0.30 | | RT |

**Source Testing And Consulting Services, Inc.**

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10-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments | |
|---|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | | |
| 10-Jun-04 | 10:20:53 | 0.09 | 448.25 | 614.05 | 0.30 | | RT |
| 10-Jun-04 | 10:20:58 | 0.09 | 448.25 | 613.96 | 0.59 | | RT |
| 10-Jun-04 | 10:21:03 | 0.09 | 448.44 | 611.89 | 0.30 | | RT |
| 10-Jun-04 | 10:21:08 | 0.09 | 448.15 | 611.89 | 0.30 | | RT |
| 10-Jun-04 | 10:21:13 | 0.09 | 448.15 | 611.79 | 0.59 | | RT |
| 10-Jun-04 | 10:21:18 | 0.09 | 448.05 | 611.89 | 0.30 | | RT |
| 10-Jun-04 | 10:21:23 | 0.08 | 448.05 | 610.91 | 0.30 | | RT |
| 10-Jun-04 | 10:21:28 | 0.09 | 442.25 | 610.91 | 0.59 | | RT |
| 10-Jun-04 | 10:21:33 | 0.21 | 115.55 | 609.92 | 0.59 | | RT |
| 10-Jun-04 | 10:21:38 | 7.72 | 106.51 | 609.92 | 0.59 | | RT |
| 10-Jun-04 | 10:21:43 | 10.18 | 105.72 | 541.18 | 0.59 | | RT |
| 10-Jun-04 | 10:21:48 | 10.56 | 104.15 | 541.08 | 0.59 | | RT |
| 10-Jun-04 | 10:21:53 | 10.50 | 102.87 | 446.97 | 0.89 | | RT |
| 10-Jun-04 | 10:21:58 | 10.26 | 102.38 | 446.97 | 1.18 | | RT |
| 10-Jun-04 | 10:22:03 | 10.09 | 102.18 | 390.23 | 1.48 | | RT |
| 10-Jun-04 | 10:22:08 | 10.04 | 101.10 | 390.23 | 2.36 | | RT |
| 10-Jun-04 | 10:22:13 | 9.95 | 98.54 | 373.21 | 2.07 | | RT |
| 10-Jun-04 | 10:22:18 | 9.88 | 98.24 | 373.21 | 2.36 | | RT |
| 10-Jun-04 | 10:22:23 | 9.93 | 100.02 | 423.07 | 2.95 | | RT |
| 10-Jun-04 | 10:22:28 | 10.05 | 100.21 | 423.07 | 2.36 | | RT |
| 10-Jun-04 | 10:22:33 | 10.13 | 98.93 | 467.92 | 2.07 | | RT |
| 10-Jun-04 | 10:22:38 | 10.16 | 94.61 | 467.82 | 2.36 | | RT |
| 10-Jun-04 | 10:22:43 | 10.39 | 90.87 | 491.22 | 2.66 | | RT |
| 10-Jun-04 | 10:22:48 | 10.78 | 88.31 | 491.13 | 2.66 | | RT |
| 10-Jun-04 | 10:22:53 | 11.02 | 87.13 | 499.19 | 2.66 | | RT |
| 10-Jun-04 | 10:22:58 | 11.25 | 87.92 | 499.19 | 2.95 | | RT |
| 10-Jun-04 | 10:23:03 | 11.51 | 87.72 | 473.92 | 3.25 | | RT |
| 10-Jun-04 | 10:23:08 | 11.62 | 87.92 | 473.92 | 3.54 | | RT |
| 10-Jun-04 | 10:23:13 | 11.66 | 88.12 | 408.03 | 2.95 | | RT |
| 10-Jun-04 | 10:23:18 | 11.71 | 87.92 | 408.03 | 3.54 | | RT |
| 10-Jun-04 | 10:23:23 | 11.80 | 87.62 | 338.89 | 3.25 | | RT |
| 10-Jun-04 | 10:23:28 | 11.93 | 87.72 | 338.89 | 3.54 | | RT |
| 10-Jun-04 | 10:23:33 | 12.00 | 87.23 | 272.02 | 3.54 | | RT |
| 10-Jun-04 | 10:23:38 | 12.04 | 87.03 | 272.02 | 3.54 | | RT |
| 10-Jun-04 | 10:23:43 | 12.07 | 87.62 | 221.76 | 3.84 | | RT |
| 10-Jun-04 | 10:23:48 | 12.11 | 87.33 | 221.76 | 3.84 | | RT |
| 10-Jun-04 | 10:23:53 | 12.12 | 88.12 | 198.95 | 3.54 | | RT |
| 10-Jun-04 | 10:23:58 | 12.17 | 87.92 | 198.85 | 3.25 | | RT |
| 10-Jun-04 | 10:24:03 | 12.19 | 87.62 | 192.95 | 3.54 | | RT |
| 10-Jun-04 | 10:24:08 | 12.12 | 87.23 | 192.95 | 3.84 | | RT |
| 10-Jun-04 | 10:24:13 | 12.03 | 87.13 | 191.77 | 3.25 | | RT |
| 10-Jun-04 | 10:24:18 | 11.89 | 86.84 | 191.87 | 3.54 | | RT |
| 10-Jun-04 | 10:24:23 | 11.77 | 87.53 | 195.80 | 3.54 | | RT |
| 10-Jun-04 | 10:24:28 | 11.76 | 88.02 | 195.80 | 3.25 | | RT |

**Source Testing And Consulting Services, Inc.**

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10-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments | |
|---|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | | |
| 10-Jun-04 | 10:24:33 | 11.65 | 83.39 | 200.82 | 3.25 | | RT |
| 10-Jun-04 | 10:24:38 | 11.44 | 414.61 | 200.82 | 3.25 | | RT |
| 10-Jun-04 | 10:24:43 | 2.24 | 441.46 | 235.14 | 3.54 | | RT |
| 10-Jun-04 | 10:24:48 | 0.31 | 444.22 | 235.14 | 2.95 | | RT |
| 10-Jun-04 | 10:24:53 | 0.13 | 445.20 | 327.97 | 2.36 | | RT |
| 10-Jun-04 | 10:24:58 | 0.11 | 445.89 | 327.97 | 2.07 | | RT |
| 10-Jun-04 | 10:25:03 | 0.10 | 446.38 | 423.07 | 1.18 | | RT |
| 10-Jun-04 | 10:25:08 | 0.10 | 446.38 | 423.07 | 1.18 | | RT |
| 10-Jun-04 | 10:25:13 | 0.10 | 446.28 | 498.30 | 0.59 | | RT |
| 10-Jun-04 | 10:25:18 | 0.10 | 446.67 | 498.21 | 0.59 | | RT |
| 10-Jun-04 | 10:25:23 | 0.10 | 446.87 | 551.21 | 0.59 | | RT |
| 10-Jun-04 | 10:25:28 | 0.09 | 446.87 | 551.11 | 0.30 | | RT |
| 10-Jun-04 | 10:25:33 | 0.10 | 447.17 | 584.94 | 0.30 | | RT |
| 10-Jun-04 | 10:25:38 | 0.09 | 447.17 | 585.04 | 0.00 | | RT |
| 10-Jun-04 | 10:25:43 | 0.09 | 446.97 | 601.96 | 0.59 | | RT |
| 10-Jun-04 | 10:25:48 | 0.10 | 447.17 | 601.86 | 0.89 | | RT |
| 10-Jun-04 | 10:25:53 | 0.09 | 447.26 | 610.91 | 0.89 | | RT |
| 10-Jun-04 | 10:25:58 | 0.09 | 447.56 | 610.91 | 0.30 | | RT |
| 10-Jun-04 | 10:26:03 | 0.09 | 447.26 | 609.92 | 0.30 | | RT |
| 10-Jun-04 | 10:26:08 | 0.09 | 447.17 | 609.92 | 0.59 | | RT |
| 10-Jun-04 | 10:26:13 | 0.08 | 447.46 | 611.89 | 0.30 | | RT |
| 10-Jun-04 | 10:26:18 | 0.09 | 447.46 | 611.89 | 0.30 | | RT |
| 10-Jun-04 | 10:26:23 | 0.09 | 447.46 | 611.89 | 0.30 | | RT |
| 10-Jun-04 | 10:26:28 | 0.09 | 447.46 | 611.89 | 0.30 | | RT |
| 10-Jun-04 | 10:26:33 | 0.09 | 447.56 | 614.05 | 0.30 | | RT |
| 10-Jun-04 | 10:26:38 | 0.10 | 447.36 | 613.96 | 0.30 | | RT |
| 10-Jun-04 | 10:26:43 | 0.09 | 447.36 | 613.96 | 0.59 | | RT |
| 10-Jun-04 | 10:26:48 | 0.08 | 447.46 | 613.96 | 0.59 | | RT |
| 10-Jun-04 | 10:26:53 | 0.07 | 447.26 | 613.96 | 0.30 | | RT |
| 10-Jun-04 | 10:26:58 | 0.09 | 216.06 | 614.05 | 0.59 | | RT |
| 10-Jun-04 | 10:27:03 | 5.49 | 100.70 | 599.89 | 0.30 | | RT |
| 10-Jun-04 | 10:27:08 | 9.68 | 99.52 | 599.89 | 0.89 | | RT |
| 10-Jun-04 | 10:27:13 | 10.56 | 98.44 | 519.15 | 1.18 | | RT |
| 10-Jun-04 | 10:27:18 | 10.77 | 97.95 | 519.25 | 1.48 | | RT |
| 10-Jun-04 | 10:27:23 | 10.83 | 98.34 | 427.99 | 2.07 | | RT |
| 10-Jun-04 | 10:27:28 | 10.96 | 98.54 | 427.89 | 2.95 | | RT |
| 10-Jun-04 | 10:27:33 | 11.00 | 97.85 | 341.05 | 3.54 | | RT |
| 10-Jun-04 | 10:27:38 | 11.06 | 97.95 | 340.96 | 3.54 | | RT |
| 10-Jun-04 | 10:27:43 | 11.07 | 97.85 | 278.11 | 4.13 | | RT |
| 10-Jun-04 | 10:27:48 | 11.09 | 97.65 | 278.11 | 3.54 | | RT |
| 10-Jun-04 | 10:27:53 | 11.09 | 97.65 | 237.20 | 3.54 | | RT |
| 10-Jun-04 | 10:27:58 | 11.00 | 98.44 | 237.20 | 4.13 | | RT |
| 10-Jun-04 | 10:28:03 | 10.94 | 98.44 | 210.75 | 3.54 | | RT |
| 10-Jun-04 | 10:28:08 | 11.00 | 97.65 | 210.85 | 3.54 | | RT |

**Source Testing And Consulting Services, Inc.**

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10-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments | |
|---|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | | |
| 10-Jun-04 | 10:28:13 | 11.15 | 97.95 | 195.80 | 3.54 | | RT |
| 10-Jun-04 | 10:28:18 | 11.23 | 97.75 | 195.80 | 3.54 | | RT |
| 10-Jun-04 | 10:28:23 | 11.26 | 97.36 | 186.85 | 4.13 | | RT |
| 10-Jun-04 | 10:28:28 | 11.28 | 97.16 | 186.85 | 4.13 | | RT |
| 10-Jun-04 | 10:28:33 | 11.29 | 96.47 | 182.92 | 4.43 | | RT |
| 10-Jun-04 | 10:28:38 | 11.28 | 95.88 | 182.92 | 3.84 | | RT |
| 10-Jun-04 | 10:28:43 | 11.22 | 95.79 | 185.87 | 4.13 | | RT |
| 10-Jun-04 | 10:28:48 | 11.09 | 95.20 | 185.87 | 5.02 | | RT |
| 10-Jun-04 | 10:28:53 | 10.99 | 95.88 | 201.80 | 4.13 | | RT |
| 10-Jun-04 | 10:28:58 | 10.99 | 96.57 | 201.80 | 4.43 | | RT |
| 10-Jun-04 | 10:29:03 | 11.03 | 96.47 | 223.73 | 4.13 | | RT |
| 10-Jun-04 | 10:29:08 | 11.13 | 96.28 | 223.73 | 5.31 | | RT |
| 10-Jun-04 | 10:29:13 | 11.23 | 96.77 | 229.83 | 4.72 | | RT |
| 10-Jun-04 | 10:29:18 | 11.28 | 96.46 | 229.90 | 5.61 | | RT |
| 10-Jun-04 | 10:29:23 | 11.24 | 94.89 | 226.86 | 5.02 | | RT |
| 10-Jun-04 | 10:29:28 | 11.34 | 92.33 | 226.86 | 4.43 | | RT |
| 10-Jun-04 | 10:29:33 | 11.67 | 89.97 | 217.81 | 5.02 | | RT |
| 10-Jun-04 | 10:29:38 | 11.89 | 89.19 | 217.91 | 5.31 | | RT |
| 10-Jun-04 | 10:29:43 | 12.05 | 89.19 | 203.85 | 5.31 | | RT |
| 10-Jun-04 | 10:29:48 | 12.04 | 89.19 | 203.75 | 5.02 | | RT |
| 10-Jun-04 | 10:29:53 | 12.03 | 88.70 | 196.96 | 5.61 | | RT |
| 10-Jun-04 | 10:29:58 | 12.04 | 87.32 | 197.06 | 5.31 | | RT |
| 10-Jun-04 | 10:30:03 | 11.91 | 88.01 | 194.01 | 5.31 | | RT |
| 10-Jun-04 | 10:30:08 | 11.69 | 87.71 | 194.01 | 5.61 | | RT |
| 10-Jun-04 | 10:30:13 | 11.53 | 86.53 | 197.06 | 5.31 | | RT |
| 10-Jun-04 | 10:30:18 | 11.46 | 87.02 | 197.06 | 5.61 | | RT |
| 10-Jun-04 | 10:30:23 | 11.50 | 87.22 | 211.81 | 5.31 | | RT |
| 10-Jun-04 | 10:30:28 | 11.54 | 86.83 | 211.81 | 5.61 | | RT |
| 10-Jun-04 | 10:30:33 | 11.48 | 86.63 | 219.78 | 5.31 | | RT |
| 10-Jun-04 | 10:30:38 | 11.32 | 86.24 | 219.78 | 5.61 | | RT |
| 10-Jun-04 | 10:30:43 | 11.23 | 86.43 | 247.21 | 5.61 | | RT |
| 10-Jun-04 | 10:30:48 | 11.27 | 87.12 | 247.31 | 5.61 | | RT |
| 10-Jun-04 | 10:30:53 | 11.40 | 88.01 | 272.09 | 5.61 | | RT |
| 10-Jun-04 | 10:30:58 | 11.34 | 90.66 | 272.09 | 5.31 | | RT |
| 10-Jun-04 | 10:31:03 | 11.18 | 92.73 | 272.09 | 5.31 | | RT |
| 10-Jun-04 | 10:31:08 | 11.04 | 93.81 | 272.09 | 5.31 | | RT |
| 10-Jun-04 | 10:31:13 | 10.93 | 94.01 | 264.22 | 5.02 | | RT |
| 10-Jun-04 | 10:31:18 | 11.01 | 94.69 | 264.22 | 4.72 | | RT |
| 10-Jun-04 | 10:31:23 | 11.02 | 95.28 | 249.28 | 4.72 | | RT |
| 10-Jun-04 | 10:31:28 | 11.02 | 95.87 | 249.28 | 5.02 | | RT |
| 10-Jun-04 | 10:31:33 | 11.00 | 96.07 | 230.99 | 5.02 | | RT |
| 10-Jun-04 | 10:31:38 | 11.08 | 96.56 | 230.89 | 5.02 | | RT |
| 10-Jun-04 | 10:31:43 | 11.18 | 95.97 | 215.94 | 4.43 | | RT |
| 10-Jun-04 | 10:31:48 | 11.32 | 96.17 | 215.84 | 4.43 | | RT |

**Source Testing And Consulting Services, Inc.**

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10-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments | |
|---|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | | |
| 10-Jun-04 | 10:31:53 | 11.41 | 96.27 | 205.81 | 5.02 | | RT |
| 10-Jun-04 | 10:31:58 | 11.47 | 96.37 | 205.91 | 4.72 | | RT |
| 10-Jun-04 | 10:32:03 | 11.51 | 98.14 | 200.90 | 4.43 | | RT |
| 10-Jun-04 | 10:32:08 | 11.48 | 98.53 | 200.99 | 5.31 | | RT |
| 10-Jun-04 | 10:32:13 | 11.50 | 98.04 | 200.01 | 5.31 | | RT |
| 10-Jun-04 | 10:32:18 | 11.55 | 98.14 | 199.91 | 5.31 | | RT |
| 10-Jun-04 | 10:32:23 | 11.51 | 98.14 | 204.93 | 5.61 | | RT |
| 10-Jun-04 | 10:32:28 | 11.36 | 95.97 | 204.93 | 5.61 | | RT |
| 10-Jun-04 | 10:32:33 | 11.01 | 96.07 | 216.92 | 5.61 | | RT |
| 10-Jun-04 | 10:32:38 | 10.82 | 96.66 | 216.92 | 5.31 | | RT |
| 10-Jun-04 | 10:32:43 | 10.74 | 97.45 | 244.26 | 5.61 | | RT |
| 10-Jun-04 | 10:32:48 | 10.77 | 96.07 | 244.16 | 5.90 | | RT |
| 10-Jun-04 | 10:32:53 | 10.71 | 97.35 | 252.23 | 5.61 | | RT |
| 10-Jun-04 | 10:32:58 | 10.68 | 97.35 | 252.13 | 5.61 | | RT |
| 10-Jun-04 | 10:33:03 | 10.68 | 94.89 | 255.27 | 5.90 | | RT |
| 10-Jun-04 | 10:33:08 | 10.63 | 90.47 | 255.27 | 5.61 | | RT |
| 10-Jun-04 | 10:33:13 | 10.65 | 90.17 | 278.19 | 5.31 | | RT |
| 10-Jun-04 | 10:33:18 | 10.92 | 89.19 | 278.19 | 5.02 | | RT |
| 10-Jun-04 | 10:33:23 | 11.11 | 89.19 | 314.08 | 5.31 | | RT |
| 10-Jun-04 | 10:33:28 | 11.17 | 88.99 | 314.08 | 5.61 | | RT |
| 10-Jun-04 | 10:33:33 | 11.14 | 88.89 | 313.09 | 5.90 | | RT |
| 10-Jun-04 | 10:33:38 | 11.12 | 88.89 | 313.19 | 5.61 | | RT |
| 10-Jun-04 | 10:33:43 | 11.19 | 87.32 | 307.98 | 5.61 | | RT |
| 10-Jun-04 | 10:33:48 | 11.12 | 86.43 | 307.98 | 5.90 | | RT |
| 10-Jun-04 | 10:33:53 | 10.99 | 86.43 | 310.14 | 5.61 | | RT |
| 10-Jun-04 | 10:33:58 | 10.89 | 85.75 | 310.14 | 5.31 | | RT |
| 10-Jun-04 | 10:34:03 | 10.86 | 83.98 | 362.26 | 5.61 | | RT |
| 10-Jun-04 | 10:34:08 | 10.81 | 82.99 | 362.16 | 5.61 | | RT |
| 10-Jun-04 | 10:34:13 | 10.70 | 83.78 | 488.03 | 5.61 | | RT |
| 10-Jun-04 | 10:34:18 | 10.75 | 54.67 | 488.03 | 5.31 | | RT |
| 10-Jun-04 | 10:34:23 | 5.45 | 439.16 | 616.06 | 5.61 | | RT |
| 10-Jun-04 | 10:34:28 | 0.90 | 445.16 | 616.06 | 5.31 | | RT |
| 10-Jun-04 | 10:34:33 | 0.20 | 446.93 | 664.14 | 4.43 | | RT |
| 10-Jun-04 | 10:34:38 | 0.12 | 447.91 | 664.14 | 2.36 | | RT |
| 10-Jun-04 | 10:34:43 | 0.11 | 448.70 | 683.12 | 1.77 | | RT |
| 10-Jun-04 | 10:34:48 | 0.11 | 448.89 | 683.12 | 1.48 | | RT |
| 10-Jun-04 | 10:34:53 | 0.10 | 448.89 | 665.13 | 1.18 | | RT |
| 10-Jun-04 | 10:34:58 | 0.10 | 449.19 | 665.13 | 0.88 | | RT |
| 10-Jun-04 | 10:35:03 | 0.10 | 449.09 | 639.26 | 1.48 | | RT |
| 10-Jun-04 | 10:35:08 | 0.10 | 449.97 | 639.26 | 1.48 | | RT |
| 10-Jun-04 | 10:35:13 | 0.10 | 449.88 | 623.24 | 0.59 | | RT |
| 10-Jun-04 | 10:35:18 | 0.10 | 449.29 | 623.24 | 1.18 | | RT |
| 10-Jun-04 | 10:35:23 | 0.14 | 59.10 | 615.96 | 0.88 | | RT |
| 10-Jun-04 | 10:35:28 | 2.37 | 90.37 | 615.96 | 0.88 | | RT |

**Source Testing And Consulting Services, Inc.**

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10-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments | |
|---|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | | |
| 10-Jun-04 | 10:35:33 | 9.43 | 89.09 | 587.94 | 0.88 | | RT |
| 10-Jun-04 | 10:35:38 | 11.10 | 88.11 | 588.03 | 1.77 | | RT |
| 10-Jun-04 | 10:35:43 | 11.48 | 88.11 | 539.16 | 2.95 | | RT |
| 10-Jun-04 | 10:35:48 | 11.58 | 88.20 | 539.16 | 3.54 | | RT |
| 10-Jun-04 | 10:35:53 | 11.63 | 88.30 | 450.17 | 4.72 | | RT |
| 10-Jun-04 | 10:35:58 | 11.69 | 88.20 | 450.17 | 5.02 | | RT |
| 10-Jun-04 | 10:36:03 | 11.79 | 88.70 | 362.26 | 5.31 | | RT |
| 10-Jun-04 | 10:36:08 | 11.84 | 88.40 | 362.26 | 5.31 | | RT |
| 10-Jun-04 | 10:36:13 | 11.86 | 88.11 | 286.15 | 5.02 | | RT |
| 10-Jun-04 | 10:36:18 | 11.96 | 87.02 | 286.25 | 5.02 | | RT |
| 10-Jun-04 | 10:36:23 | 12.04 | 86.24 | 236.20 | 5.02 | | RT |
| 10-Jun-04 | 10:36:28 | 12.03 | 86.93 | 236.20 | 5.02 | | RT |
| 10-Jun-04 | 10:36:33 | 11.94 | 88.70 | 209.94 | 4.72 | | RT |
| 10-Jun-04 | 10:36:38 | 11.89 | 88.99 | 209.84 | 5.02 | | RT |
| 10-Jun-04 | 10:36:43 | 11.88 | 89.58 | 201.88 | 4.72 | | RT |
| 10-Jun-04 | 10:36:48 | 11.81 | 91.06 | 201.88 | 5.31 | | RT |
| 10-Jun-04 | 10:36:53 | 11.76 | 91.65 | 202.86 | 5.02 | | RT |
| 10-Jun-04 | 10:36:58 | 11.71 | 93.22 | 202.86 | 4.72 | | RT |
| 10-Jun-04 | 10:37:03 | 11.63 | 94.20 | 208.96 | 4.43 | | RT |
| 10-Jun-04 | 10:37:08 | 11.54 | 95.38 | 208.96 | 4.72 | | RT |
| 10-Jun-04 | 10:37:13 | 11.49 | 95.38 | 213.88 | 5.02 | | RT |
| 10-Jun-04 | 10:37:18 | 11.53 | 95.48 | 213.97 | 4.72 | | RT |
| 10-Jun-04 | 10:37:23 | 11.55 | 95.48 | 220.96 | 5.02 | | RT |
| 10-Jun-04 | 10:37:28 | 11.55 | 96.56 | 220.96 | 5.31 | | RT |
| 10-Jun-04 | 10:37:33 | 11.53 | 97.25 | 224.99 | 5.31 | | RT |
| 10-Jun-04 | 10:37:38 | 11.50 | 97.45 | 224.99 | 5.31 | | RT |
| 10-Jun-04 | 10:37:43 | 11.45 | 97.55 | 226.86 | 4.72 | | RT |
| 10-Jun-04 | 10:37:48 | 11.43 | 97.74 | 226.86 | 5.02 | | RT |
| 10-Jun-04 | 10:37:53 | 11.39 | 98.04 | 229.02 | 5.61 | | RT |
| 10-Jun-04 | 10:37:58 | 11.32 | 98.53 | 229.02 | 5.31 | | RT |
| 10-Jun-04 | 10:38:03 | 11.21 | 98.33 | 230.89 | 4.72 | | RT |
| 10-Jun-04 | 10:38:08 | 11.12 | 97.74 | 230.89 | 5.31 | | RT |
| 10-Jun-04 | 10:38:13 | 11.16 | 98.23 | 229.90 | 5.61 | | RT |
| 10-Jun-04 | 10:38:18 | 11.11 | 99.41 | 229.90 | 5.61 | | RT |
| 10-Jun-04 | 10:38:23 | 10.92 | 101.48 | 227.84 | 5.61 | | RT |
| 10-Jun-04 | 10:38:28 | 10.80 | 101.38 | 227.84 | 5.02 | | RT |
| 10-Jun-04 | 10:38:33 | 10.85 | 100.50 | 220.96 | 5.31 | | RT |
| 10-Jun-04 | 10:38:38 | 11.00 | 100.30 | 220.96 | 5.31 | | RT |
| 10-Jun-04 | 10:38:43 | 11.16 | 99.71 | 217.91 | 5.90 | | RT |
| 10-Jun-04 | 10:38:48 | 11.29 | 100.20 | 217.91 | 5.61 | | RT |
| 10-Jun-04 | 10:38:53 | 11.40 | 100.30 | 223.91 | 5.90 | | RT |
| 10-Jun-04 | 10:38:58 | 11.43 | 101.19 | 223.91 | 5.61 | | RT |
| 10-Jun-04 | 10:39:03 | 11.32 | 100.89 | 237.28 | 5.31 | | RT |
| 10-Jun-04 | 12:00:48 | 13.20 | 81.97 | 168.02 | 2.80 | | SCRUBBER A RUN 1 |

**Source Testing And Consulting Services, Inc.**

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10-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments | |
|---|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | | |
| 10-Jun-04 | 12:01:48 | 12.66 | 84.62 | 169.99 | 3.10 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:02:48 | 12.92 | 83.25 | 151.01 | 3.10 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:03:48 | 13.05 | 82.85 | 186.90 | 3.10 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:04:48 | 13.03 | 82.17 | 191.82 | 2.51 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:05:48 | 13.46 | 81.08 | 201.95 | 2.80 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:06:48 | 13.39 | 82.46 | 181.98 | 2.80 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:07:48 | 12.96 | 85.21 | 157.99 | 2.51 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:08:48 | 12.18 | 94.75 | 163.99 | 3.69 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:09:48 | 11.83 | 96.47 | 165.02 | 3.25 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:10:48 | 11.71 | 97.85 | 141.02 | 3.25 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:11:48 | 11.80 | 96.87 | 149.09 | 3.25 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:12:48 | 11.81 | 98.24 | 149.97 | 4.43 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:13:48 | 11.68 | 97.36 | 150.07 | 4.72 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:14:48 | 11.47 | 96.77 | 126.96 | 5.31 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:15:48 | 10.91 | 97.16 | 183.90 | 5.31 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:16:48 | 11.11 | 98.34 | 141.02 | 5.90 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:17:48 | 11.13 | 98.24 | 157.05 | 6.20 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:18:48 | 11.40 | 93.52 | 142.01 | 5.90 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:19:48 | 11.96 | 84.77 | 165.12 | 6.49 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:20:48 | 11.79 | 82.80 | 249.30 | 5.61 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:21:48 | 11.64 | 83.98 | 267.10 | 5.31 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:22:48 | 11.09 | 95.20 | 339.97 | 5.31 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:23:48 | 10.89 | 92.64 | 221.86 | 4.72 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:24:48 | 10.77 | 90.57 | 444.02 | 4.13 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:25:48 | 10.78 | 93.33 | 512.27 | 4.43 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:26:48 | 11.65 | 95.49 | 184.98 | 4.13 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:27:48 | 11.04 | 95.69 | 183.90 | 3.84 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:28:48 | 11.17 | 97.85 | 247.23 | 3.84 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:29:48 | 11.00 | 98.19 | 153.06 | 3.98 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:30:48 | 11.03 | 98.29 | 245.40 | 3.39 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:31:48 | 10.57 | 95.04 | 299.10 | 3.69 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:32:48 | 10.28 | 91.21 | 407.27 | 3.98 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:33:48 | 11.04 | 96.81 | 300.08 | 3.39 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:34:48 | 10.51 | 88.95 | 335.97 | 3.69 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:35:48 | 10.51 | 92.29 | 866.21 | 3.39 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:36:48 | 11.78 | 89.24 | 337.15 | 3.39 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:37:48 | 10.80 | 91.70 | 571.20 | 3.39 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:38:48 | 10.51 | 90.42 | 567.17 | 3.10 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:39:48 | 10.48 | 91.01 | 606.11 | 3.39 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:40:48 | 11.16 | 94.55 | 512.29 | 3.69 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:41:48 | 11.68 | 95.93 | 203.81 | 3.69 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:42:48 | 11.02 | 96.62 | 187.97 | 3.98 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:43:48 | 11.15 | 97.01 | 266.15 | 3.39 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:44:48 | 11.15 | 93.47 | 265.27 | 3.98 | | SCRUBBER A RUN 1 |

**Source Testing And Consulting Services, Inc.**

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| 10-Jun-04 | | RAYNIER | | | | | |
|---|---|---|---|---|---|---|---|
| | Parameter | O2 | NOx | CO | SO2 | Comments | |
| | Units | %V | ppmV | ppmV | ppmV | | |
| 10-Jun-04 | 12:45:48 | 10.90 | 89.24 | 359.97 | 3.39 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:46:48 | 10.98 | 54.14 | 199.97 | 3.69 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:47:48 | 10.73 | 52.37 | 277.26 | 3.98 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:48:48 | 9.81 | 54.14 | 713.10 | 3.69 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:49:48 | 10.60 | 47.50 | 525.42 | 3.54 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:50:48 | 10.69 | 46.22 | 482.15 | 3.84 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:51:48 | 11.25 | 41.79 | 132.07 | 4.13 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:52:48 | 11.12 | 40.22 | 241.42 | 4.13 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:53:48 | 10.42 | 39.24 | 406.33 | 3.54 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:54:48 | 11.13 | 40.02 | 112.01 | 4.13 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:55:48 | 11.34 | 40.81 | 101.88 | 3.84 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:56:48 | 11.44 | 39.04 | 78.87 | 4.43 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:57:48 | 11.80 | 35.01 | 90.77 | 4.43 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:58:48 | 12.13 | 35.30 | 91.85 | 4.13 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 12:59:48 | 12.24 | 32.45 | 95.88 | 3.54 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 13:00:48 | 12.38 | 31.37 | 92.93 | 3.84 | | SCRUBBER A RUN 1 |
| 10-Jun-04 | 13:09:56 | 0.07 | 181.33 | 313.19 | 3.84 | | X |
| 10-Jun-04 | 13:24:39 | 0.10 | 181.72 | 306.21 | 4.43 | | CO=306 NX=181 |
| 10-Jun-04 | 13:25:24 | 0.09 | 182.11 | 313.19 | 4.13 | | Test |
| 10-Jun-04 | 13:25:29 | 0.09 | 182.11 | 313.19 | 4.72 | | Test |
| 10-Jun-04 | 13:25:34 | 0.09 | 182.11 | 314.18 | 4.43 | | Test |
| 10-Jun-04 | 13:25:39 | 0.09 | 182.21 | 314.08 | 3.84 | | Test |
| 10-Jun-04 | 13:25:44 | 0.09 | 182.41 | 314.08 | 4.43 | | Test |
| 10-Jun-04 | 13:25:49 | 0.09 | 182.41 | 314.18 | 4.13 | | Test |
| 10-Jun-04 | 13:25:54 | 0.09 | 182.02 | 312.11 | 4.43 | | Test |
| 10-Jun-04 | 13:25:59 | 0.09 | 182.21 | 312.11 | 4.72 | | Test |
| 10-Jun-04 | 13:26:04 | 0.09 | 182.61 | 313.19 | 4.43 | | Test |
| 10-Jun-04 | 13:26:09 | 0.09 | 182.41 | 313.19 | 4.13 | | Test |
| 10-Jun-04 | 13:28:20 | 0.07 | 95.58 | 98.82 | 4.43 | | NX=95 CO=96.8 |
| 10-Jun-04 | 13:28:25 | 0.07 | 95.48 | 98.82 | 4.13 | | NX=95 CO=96.8 |
| 10-Jun-04 | 13:28:30 | 0.07 | 95.78 | 98.82 | 5.02 | | NX=95 CO=96.8 |
| 10-Jun-04 | 13:28:35 | 0.07 | 95.78 | 97.94 | 4.72 | | NX=95 CO=96.8 |
| 10-Jun-04 | 13:28:40 | 0.07 | 95.78 | 97.94 | 5.02 | | NX=95 CO=96.8 |
| 10-Jun-04 | 13:29:58 | 12.97 | -0.84 | 6.05 | 3.98 | | O2=12.97 |
| 10-Jun-04 | 13:30:03 | 12.97 | -0.93 | 1.13 | 3.98 | | O2=12.97 |
| 10-Jun-04 | 13:30:08 | 12.97 | -0.93 | 1.13 | 4.28 | | O2=12.97 |
| 10-Jun-04 | 13:30:13 | 12.97 | -1.03 | 0.05 | 4.28 | | O2=12.97 |
| 10-Jun-04 | 13:30:18 | 12.97 | -1.03 | 0.05 | 4.28 | | O2=12.97 |
| 10-Jun-04 | 14:39:45 | 20.72 | -1.13 | -0.05 | 4.57 | | |
| 10-Jun-04 | 14:41:39 | 11.35 | 92.19 | 134.08 | 4.57 | | SCRUBBER A RUN 2 |
| 10-Jun-04 | 14:42:39 | 11.61 | 92.88 | 151.88 | 4.28 | | SCRUBBER A RUN 2 |
| 10-Jun-04 | 14:43:39 | 11.02 | 93.67 | 142.93 | 4.87 | | SCRUBBER A RUN 2 |
| 10-Jun-04 | 14:44:39 | 11.54 | 91.41 | 162.01 | 4.57 | | SCRUBBER A RUN 2 |
| 10-Jun-04 | 14:45:39 | 11.92 | 92.29 | 177.94 | 4.57 | | SCRUBBER A RUN 2 |

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10-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments |
|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | |
| 10-Jun-04 | 14:46:39 | 11.81 | 91.41 | 163.00 | 4.57 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 14:47:39 | 11.65 | 91.21 | 165.06 | 4.57 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 14:48:39 | 11.78 | 90.32 | 168.99 | 4.28 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 14:49:39 | 11.86 | 91.95 | 204.94 | 4.72 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 14:50:39 | 12.51 | 91.16 | 244.17 | 4.72 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 14:51:39 | 13.01 | 88.31 | 303.08 | 4.72 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 14:52:39 | 12.37 | 86.93 | 249.29 | 4.72 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 14:53:39 | 12.75 | 83.78 | 202.77 | 4.72 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 14:54:39 | 13.10 | 82.21 | 255.19 | 4.43 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 14:55:39 | 13.32 | 80.74 | 284.00 | 4.72 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 14:56:39 | 12.81 | 82.90 | 210.84 | 4.43 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 14:57:39 | 12.93 | 81.23 | 183.89 | 4.72 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 14:58:39 | 12.72 | 81.92 | 230.90 | 4.72 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 14:59:39 | 12.49 | 83.19 | 169.93 | 4.43 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:00:39 | 12.47 | 82.80 | 166.98 | 4.72 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:01:39 | 12.33 | 83.29 | 190.87 | 4.43 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:02:39 | 12.57 | 84.57 | 177.99 | 4.43 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:03:39 | 12.07 | 84.77 | 139.84 | 4.72 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:04:39 | 12.21 | 83.78 | 163.93 | 4.13 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:05:39 | 12.20 | 85.85 | 173.86 | 3.84 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:06:39 | 12.47 | 85.85 | 200.91 | 4.43 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:07:39 | 11.97 | 83.98 | 166.98 | 4.72 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:08:39 | 11.78 | 85.85 | 143.97 | 4.43 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:09:39 | 12.39 | 83.59 | 151.83 | 4.43 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:10:39 | 12.25 | 82.90 | 145.05 | 3.84 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:11:39 | 11.97 | 87.13 | 137.97 | 4.43 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:12:39 | 12.01 | 88.21 | 145.93 | 4.72 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:13:39 | 11.67 | 91.16 | 137.08 | 4.43 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:14:39 | 11.67 | 89.09 | 122.04 | 4.72 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:15:39 | 11.49 | 89.68 | 130.99 | 4.72 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:16:39 | 11.91 | 87.23 | 137.97 | 4.13 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:17:39 | 12.52 | 85.06 | 158.91 | 4.43 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:18:39 | 12.51 | 85.55 | 179.86 | 4.13 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:19:39 | 11.55 | 87.82 | 133.15 | 4.72 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:20:39 | 11.87 | 87.32 | 126.07 | 4.72 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:21:39 | 11.80 | 86.73 | 151.93 | 4.13 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:22:39 | 12.50 | 87.72 | 182.91 | 4.43 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:23:39 | 12.53 | 86.44 | 179.86 | 4.43 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:24:39 | 12.39 | 87.03 | 181.04 | 4.43 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:25:39 | 11.95 | 89.88 | 171.80 | 4.43 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:26:39 | 11.70 | 91.45 | 139.84 | 4.43 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:27:39 | 12.00 | 89.19 | 154.00 | 4.43 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:28:39 | 12.04 | 88.01 | 157.05 | 3.84 | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:29:39 | 12.06 | 89.49 | 178.88 | 4.72 | SCRUBBER A RUN 2 |

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10-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments | |
|---|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | | |
| 10-Jun-04 | 15:30:39 | 11.77 | 90.27 | 156.95 | 3.54 | | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:31:39 | 11.84 | 91.26 | 144.95 | 4.13 | | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:32:39 | 12.08 | 88.60 | 141.90 | 4.43 | | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:33:39 | 12.34 | 87.32 | 161.96 | 4.13 | | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:34:39 | 12.38 | 86.14 | 206.81 | 4.13 | | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:35:39 | 12.91 | 81.52 | 225.88 | 4.72 | | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:36:39 | 13.71 | 77.49 | 292.06 | 4.13 | | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:37:39 | 13.69 | 77.69 | 244.08 | 4.43 | | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:38:39 | 13.14 | 81.23 | 208.87 | 4.13 | | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:39:39 | 13.23 | 78.47 | 211.72 | 4.43 | | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:40:39 | 13.46 | 78.28 | 226.87 | 4.13 | | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:41:39 | 13.33 | 78.18 | 216.93 | 4.43 | | SCRUBBER A RUN 2 |
| 10-Jun-04 | 15:45:24 | 12.95 | -1.18 | 1.08 | 4.43 | | POST R2 O2=12.97 |
| 10-Jun-04 | 15:45:29 | 12.96 | -1.08 | 0.00 | 4.13 | | POST R2 O2=12.97 |
| 10-Jun-04 | 15:45:34 | 12.96 | -1.18 | 0.00 | 4.13 | | POST R2 O2=12.97 |
| 10-Jun-04 | 15:45:39 | 12.96 | -1.08 | 0.00 | 4.13 | | POST R2 O2=12.97 |
| 10-Jun-04 | 15:45:44 | 12.96 | -1.08 | 0.00 | 3.84 | | POST R2 O2=12.97 |
| 10-Jun-04 | 15:45:49 | 12.96 | -1.18 | 0.00 | 4.43 | | POST R2 O2=12.97 |
| 10-Jun-04 | 15:48:15 | 0.08 | 94.70 | 97.85 | 4.13 | | NX=95 CO=96.8 |
| 10-Jun-04 | 15:48:20 | 0.08 | 94.60 | 97.75 | 4.72 | | NX=95 CO=96.8 |
| 10-Jun-04 | 15:48:25 | 0.09 | 94.70 | 97.85 | 4.43 | | NX=95 CO=96.8 |
| 10-Jun-04 | 15:48:30 | 0.10 | 94.99 | 97.75 | 4.43 | | NX=95 CO=96.8 |
| 10-Jun-04 | 15:48:35 | 0.11 | 94.50 | 97.85 | 4.43 | | NX=95 CO=96.8 |
| 10-Jun-04 | 15:48:40 | 0.13 | 94.70 | 97.85 | 4.43 | | NX=95 CO=96.8 |
| 10-Jun-04 | 15:50:48 | 0.07 | 180.29 | 312.06 | 4.28 | | CO=306 NX=181 |
| 10-Jun-04 | 15:50:53 | 0.07 | 180.20 | 313.14 | 3.98 | | CO=306 NX=181 |
| 10-Jun-04 | 15:50:58 | 0.07 | 180.20 | 313.14 | 4.28 | | CO=306 NX=181 |
| 10-Jun-04 | 15:51:03 | 0.07 | 180.29 | 312.06 | 3.98 | | CO=306 NX=181 |
| 10-Jun-04 | 15:51:08 | 0.07 | 180.39 | 312.06 | 4.28 | | CO=306 NX=181 |
| 10-Jun-04 | 15:51:13 | 0.07 | 180.59 | 312.06 | 4.57 | | CO=306 NX=181 |
| 10-Jun-04 | 15:51:18 | 0.07 | 180.69 | 312.06 | 4.28 | | CO=306 NX=181 |
| 10-Jun-04 | 15:51:23 | 0.07 | 180.59 | 312.06 | 4.28 | | CO=306 NX=181 |
| 10-Jun-04 | 16:34:14 | 0.48 | -0.93 | 2.90 | 3.98 | | Test |
| 10-Jun-04 | 16:34:19 | 0.49 | -0.93 | 2.90 | 3.69 | | Test |
| 10-Jun-04 | 16:34:24 | 0.49 | -0.93 | 2.90 | 3.69 | | Test |
| 10-Jun-04 | 17:34:09 | 12.26 | 81.03 | 141.99 | 4.13 | | SCRUBBER A R3 |
| 10-Jun-04 | 17:35:09 | 11.66 | 79.75 | 283.00 | 3.84 | | SCRUBBER A R3 |
| 10-Jun-04 | 17:36:09 | 11.41 | 80.44 | 250.16 | 3.84 | | SCRUBBER A R3 |
| 10-Jun-04 | 17:37:09 | 11.79 | 80.63 | 312.01 | 4.13 | | SCRUBBER A R3 |
| 10-Jun-04 | 17:38:09 | 12.06 | 80.04 | 145.93 | 3.84 | | SCRUBBER A R3 |
| 10-Jun-04 | 17:39:09 | 11.23 | 77.09 | 390.29 | 4.43 | | SCRUBBER A R3 |
| 10-Jun-04 | 17:40:09 | 11.00 | 78.08 | 635.23 | 3.84 | | SCRUBBER A R3 |
| 10-Jun-04 | 17:41:09 | 11.49 | 82.30 | 362.26 | 4.13 | | SCRUBBER A R3 |
| 10-Jun-04 | 17:42:09 | 11.62 | 80.34 | 189.88 | 4.13 | | SCRUBBER A R3 |

**Source Testing And Consulting Services, Inc.**

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10-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments | |
|---|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | | |
| 10-Jun-04 | 17:43:09 | 11.19 | 76.60 | 471.02 | 4.13 | | SCRUBBER A R3 |
| 10-Jun-04 | 17:44:09 | 11.22 | 78.27 | 446.14 | 4.13 | | SCRUBBER A R3 |
| 10-Jun-04 | 17:45:09 | 11.25 | 75.22 | 646.34 | 4.13 | | SCRUBBER A R3 |
| 10-Jun-04 | 17:46:09 | 11.74 | 79.26 | 680.27 | 3.84 | | SCRUBBER A R3 |
| 10-Jun-04 | 17:47:09 | 11.71 | 76.50 | 201.88 | 3.84 | | SCRUBBER A R3 |
| 10-Jun-04 | 17:48:09 | 11.64 | 75.42 | 291.17 | 3.84 | | SCRUBBER A R3 |
| 10-Jun-04 | 17:49:09 | 11.78 | 76.21 | 298.15 | 3.84 | | SCRUBBER A R3 |
| 10-Jun-04 | 17:50:09 | 11.92 | 76.60 | 239.25 | 4.13 | | SCRUBBER A R3 |
| 10-Jun-04 | 17:51:09 | 11.45 | 71.29 | 671.22 | 3.84 | | SCRUBBER A R3 |
| 10-Jun-04 | 17:52:09 | 11.51 | 71.09 | 746.45 | 4.43 | | SCRUBBER A R3 |
| 10-Jun-04 | 17:53:09 | 11.48 | 71.19 | 881.56 | 4.13 | | SCRUBBER A R3 |
| 10-Jun-04 | 17:54:09 | 11.64 | 75.42 | 686.27 | 4.13 | | SCRUBBER A R3 |
| 10-Jun-04 | 17:55:09 | 11.49 | 77.29 | 412.21 | 4.43 | | SCRUBBER A R3 |
| 10-Jun-04 | 17:56:09 | 11.93 | 78.47 | 202.86 | 3.54 | | SCRUBBER A R3 |
| 10-Jun-04 | 17:57:09 | 12.70 | 71.09 | 132.16 | 3.84 | | SCRUBBER A R3 |
| 10-Jun-04 | 17:58:09 | 12.49 | 71.49 | 121.15 | 4.72 | | SCRUBBER A R3 |
| 10-Jun-04 | 17:59:09 | 11.78 | 69.82 | 158.12 | 4.43 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:00:09 | 11.74 | 76.99 | 181.13 | 4.13 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:01:09 | 12.47 | 74.34 | 167.95 | 4.72 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:02:09 | 12.64 | 74.34 | 171.00 | 4.43 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:03:09 | 12.64 | 79.94 | 168.05 | 4.13 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:04:09 | 12.37 | 81.81 | 149.17 | 4.72 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:05:09 | 11.82 | 82.11 | 123.11 | 4.43 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:06:09 | 11.63 | 83.29 | 160.09 | 4.72 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:07:09 | 11.89 | 89.19 | 136.19 | 4.43 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:08:09 | 11.46 | 83.98 | 141.11 | 4.13 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:09:09 | 11.16 | 83.78 | 389.40 | 3.84 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:10:09 | 11.22 | 83.20 | 217.83 | 3.84 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:11:09 | 11.21 | 86.15 | 267.10 | 3.54 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:12:09 | 11.94 | 85.66 | 136.01 | 3.54 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:13:09 | 11.61 | 86.25 | 119.98 | 4.13 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:14:09 | 11.74 | 83.49 | 155.87 | 4.43 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:15:09 | 12.10 | 84.18 | 137.98 | 4.13 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:16:09 | 12.94 | 78.87 | 145.06 | 4.43 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:17:09 | 13.03 | 76.81 | 133.16 | 4.13 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:18:09 | 12.07 | 79.07 | 126.08 | 3.54 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:19:09 | 12.18 | 82.61 | 128.04 | 4.13 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:20:09 | 12.36 | 83.69 | 133.16 | 4.13 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:21:09 | 12.07 | 81.13 | 124.01 | 3.84 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:22:09 | 12.99 | 79.56 | 151.94 | 4.13 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:23:09 | 12.91 | 80.25 | 141.02 | 3.84 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:24:09 | 12.47 | 82.51 | 127.06 | 4.13 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:25:09 | 11.98 | 83.89 | 137.98 | 4.13 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:26:09 | 11.52 | 83.79 | 251.27 | 3.54 | | SCRUBBER A R3 |

**Source Testing And Consulting Services, Inc.**

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10-Jun-04 RAYNIER

| | Parameter | O2 | NOx | CO | SO2 | Comments | |
|---|---|---|---|---|---|---|---|
| | Units | %V | ppmV | ppmV | ppmV | | |
| 10-Jun-04 | 18:27:09 | 11.95 | 84.97 | 119.09 | 4.13 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:28:09 | 12.26 | 81.92 | 106.01 | 4.13 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:29:09 | 12.04 | 80.64 | 107.10 | 3.84 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:30:09 | 12.82 | 76.81 | 150.07 | 3.84 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:31:09 | 12.58 | 78.48 | 131.09 | 4.43 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:32:09 | 12.20 | 78.38 | 118.11 | 4.13 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:33:09 | 11.82 | 77.40 | 181.05 | 4.13 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:34:09 | 11.88 | 82.31 | 154.01 | 4.43 | | SCRUBBER A R3 |
| 10-Jun-04 | 18:38:38 | 0.28 | 182.72 | 311.85 | 4.13 | | NX=181 CO=306 |
| 10-Jun-04 | 18:38:43 | 0.28 | 183.02 | 312.93 | 3.84 | | NX=181 CO=306 |
| 10-Jun-04 | 18:38:48 | 0.29 | 182.52 | 312.83 | 4.43 | | NX=181 CO=306 |
| 10-Jun-04 | 18:38:53 | 0.27 | 182.82 | 312.93 | 4.13 | | NX=181 CO=306 |
| 10-Jun-04 | 18:38:58 | 0.28 | 182.72 | 311.85 | 3.84 | | NX=181 CO=306 |
| 10-Jun-04 | 18:39:03 | 0.27 | 182.92 | 311.75 | 4.13 | | NX=181 CO=306 |
| 10-Jun-04 | 18:39:08 | 0.27 | 182.82 | 310.86 | 3.84 | | NX=181 CO=306 |
| 10-Jun-04 | 18:39:13 | 0.27 | 182.82 | 310.86 | 4.43 | | NX=181 CO=306 |
| 10-Jun-04 | 18:39:18 | 0.28 | 183.02 | 311.85 | 4.43 | | NX=181 CO=306 |
| 10-Jun-04 | 18:39:23 | 0.28 | 183.21 | 311.85 | 3.84 | | NX=181 CO=306 |
| 10-Jun-04 | 18:39:28 | 0.27 | 182.92 | 311.75 | 3.84 | | NX=181 CO=306 |
| 10-Jun-04 | 18:39:33 | 0.29 | 182.82 | 311.75 | 3.84 | | NX=181 CO=306 |
| 10-Jun-04 | 18:39:38 | 0.27 | 182.92 | 312.83 | 3.84 | | NX=181 CO=306 |
| 10-Jun-04 | 18:39:43 | 0.26 | 182.92 | 312.83 | 4.13 | | NX=181 CO=306 |
| 10-Jun-04 | 18:39:48 | 0.27 | 182.72 | 312.93 | 4.13 | | NX=181 CO=306 |
| 10-Jun-04 | 18:39:53 | 0.28 | 182.62 | 312.93 | 3.84 | | NX=181 CO=306 |
| 10-Jun-04 | 18:39:58 | 0.27 | 182.72 | 312.93 | 3.84 | | NX=181 CO=306 |
| 10-Jun-04 | 18:41:28 | 0.26 | 95.79 | 98.64 | 4.13 | | NX=95 CO=96.8 |
| 10-Jun-04 | 18:41:33 | 0.27 | 95.59 | 98.54 | 3.54 | | NX=95 CO=96.8 |
| 10-Jun-04 | 18:41:38 | 0.26 | 95.49 | 97.56 | 3.84 | | NX=95 CO=96.8 |
| 10-Jun-04 | 18:41:43 | 0.25 | 95.69 | 97.56 | 3.84 | | NX=95 CO=96.8 |
| 10-Jun-04 | 18:41:48 | 0.27 | 95.88 | 97.56 | 4.13 | | NX=95 CO=96.8 |
| 10-Jun-04 | 18:43:07 | 13.15 | -0.79 | 5.70 | 3.84 | | O2=12.97 |
| 10-Jun-04 | 18:43:12 | 13.14 | -0.89 | 0.79 | 4.13 | | O2=12.97 |
| 10-Jun-04 | 18:43:17 | 13.15 | -0.98 | -0.39 | 3.84 | | O2=12.97 |
| 10-Jun-04 | 18:43:22 | 13.13 | -0.89 | -0.30 | 4.13 | | O2=12.97 |
| 10-Jun-04 | 18:43:27 | 13.14 | -0.98 | -0.30 | 3.84 | | O2=12.97 |

# APPENDIX B

# CALIBRATION DATA AND CERTIFICATES

P. O. Box 12013
Research Triangle Park, N.C. 27709
Phone 919/544-3772

# CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS MIXTURE

| | | | |
|---|---|---|---|
| Customer: | National Welders, Raleigh, NC | Reference # | 88-87696 |
| NSG PO# | 4179631 | Certification Date: | 12/01/03 |
| Customer PO# | | Expiration Date: | 12/01/06 |
| Cylinder # | CC52162 | Pressure, psig* | 2000 |

## ANALYTICAL INFORMATION

METHOD: This standard was analyzed according to EPA Traceability Protocol for Assay and certification of Gaseous Calibration Standards: Procedure G-1: September 1997.

ANALYZED CYLINDER

| Components | Certified Concentration | Analytical Accuracy** |
|---|---|---|
| Oxygen | 19.99% | +/-1% |

Balance - Nitrogen

REFERENCE STANDARD

| Type/SRM Sample # | Cylinder # | Concentration | |
|---|---|---|---|
| GMIS ( Traceable to SRM # 2659a ) | CC46336 | 20.04 % | O2/N2 |

INSTRUMENTATION

| Instrument/Model/Serial # | Last Date Calibrated | Analytical Method |
|---|---|---|
| Horiba MPA - 510 O2 41499150042 | 11/21/03 | Paramagnetic |

Analyst: BP Moore Brian P. Moore

This report states accurately the results of the investigation made upon the material submitted to the analytical laboratory. Every effort has been made to determine objectively the information requested. However, in connection with this report, National Specialty Gases shall have no liability in excess of established charge for this service. Assayed at National Specialty Gases, 630 United Drive, Durham, NC 27713 (919) 544-3772

*Do not use this standard when cylinder pressure is below 150 psig.

**Analytical accuracy includes typical known error sources which, at least, include precision of the analytical instrument.

NSG 020149L

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Research Triangle Park, N.C. 27709
Phone 919/544-3772

# CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS MIXTURE

| | | | |
|---|---|---|---|
| Customer: | National Welders, Raleigh, NC | Reference # | 88-87312 |
| NSG PO# | 4159962 | Certification Date: | 11/06/03 |
| Customer PO# | | Expiration Date: | 11/06/05 |
| Cylinder # | CC129687 | Pressure, psig* | 2000 |

**ANALYTICAL INFORMATION**

METHOD: This standard was analyzed according to EPA Traceability Protocol for Assay and certification of Gaseous Calibration Standards: Procedure G-1: September 1997.

ANALYZED CYLINDER

| Components | Certified Concentration | Analytical Accuracy** |
|---|---|---|
| Sulfur Dioxide | 248 ppm | +/-1% |

Balance - Nitrogen

REFERENCE STANDARD

| Type/SRM Sample # | Cylinder # | Concentration | |
|---|---|---|---|
| GMIS ( Traceable to SRM # 1661a ) | CC117042 | 495.6 ppm | SO2/N2 |

INSTRUMENTATION

| Instrument/Model/Serial # | Last Date Calibrated | Analytical Method |
|---|---|---|
| Rosemount 890 SO2 00032 | 10/06/03 | Ultraviolet |

Analyst: J Kenworthy Jeremy Kenworthy

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# CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS MIXTURE

| | | | |
|---|---|---|---|
| Customer: | National Welders, Raleigh, NC | Reference # | 88-87874 |
| NSG PO# | 4179631 | Certification Date: | 12/09/03 |
| Customer PO# | | Expiration Date: | 12/09/05 |
| Cylinder # | SG9151511BAL | Pressure, psig* | 2000 |

## ANALYTICAL INFORMATION

METHOD: This standard was analyzed according to EPA Traceability Protocol for Assay and certification of Gaseous Calibration Standards: Procedure G-1: September 1997.

### ANALYZED CYLINDER

| Components | Certified Concentration | Analytical Accuracy** |
|---|---|---|
| Nitric Oxide | 22.7 ppm | +/-1% |
| Carbon Monoxide | 31.7 ppm | +/-1% |

Balance - Nitrogen    Trace Gas - Nitrogen Dioxide    0.22 ppm

### REFERENCE STANDARD

| Type/SRM Sample # | Cylinder # | Concentration | |
|---|---|---|---|
| GMIS ( Traceable to SRM # 2628a ) | CC27585 | 20.01 ppm | NO/N2 |
| GMIS ( Traceable to SRM # 2635a ) | CC47611 | 25.45 ppm | CO/N2 |

### INSTRUMENTATION

| Instrument/Model/Serial # | | Last Date Calibrated | Analytical Method |
|---|---|---|---|
| TECO 42CHL NOX | CHL-63965-341 | 11/14/03 | Chemiluminescence |
| Rosemount 880A CO | 00172 | 11/21/03 | Non-dispersive Infrared |

Analyst: *J Kenworthy* Jeremy Kenworthy

This report states accurately the results of the investigation made upon the material submitted to the analytical laboratory. Every effort has been made to determine objectively the information requested. However, in connection with this report, National Specialty Gases shall have no liability in excess of established charge for this service. Assayed at National Specialty Gases, 630 United Drive, Durham, NC 27713 (919) 544-3772

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Phone 919/544-3772

# CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS MIXTURE

| | | | |
|---|---|---|---|
| Customer: | National Welders, Raleigh, NC | Reference # | 88-87830 |
| NSG PO# | 4179631 | Certification Date: | 12/08/03 |
| Customer PO# | | Expiration Date: | 12/08/06 |
| Cylinder # | SG906771ALB | Pressure, psig* | 2000 |

## ANALYTICAL INFORMATION

METHOD: This standard was analyzed according to EPA Traceability Protocol for Assay and certification of Gaseous Calibration Standards: Procedure G-1: September 1997.

### ANALYZED CYLINDER

| Components | Certified Concentration | Analytical Accuracy** |
|---|---|---|
| Oxygen | 12.98% | +/-1% |
| Balance - Nitrogen | | |

### REFERENCE STANDARD

| Type/SRM Sample # | Cylinder # | Concentration | |
|---|---|---|---|
| GMIS ( Traceable to SRM # 2659a ) | CC104352 | 20.97 % | O2/N2 |

### INSTRUMENTATION

| Instrument/Model/Serial # | Last Date Calibrated | Analytical Method |
|---|---|---|
| Horiba MPA - 510 O2 41499150042 | 11/21/03 | Paramagnetic |

Analyst: J Kenworthy Jeremy Kenworthy

This report states accurately the results of the investigation made upon the material submitted to the analytical laboratory. Every effort has been made to determine objectively the information requested. However, in connection with this report, National Specialty Gases shall have no liability in excess of established charge for this service. Assayed at National Specialty Gases, 630 United Drive, Durham, NC 27713 (919) 544-3772

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NSG 020149L

**SPECTRA GASES INC.**
3434 Route 22 West • Branchburg, NJ 08876 USA Tel.: (908) 252-9300 • (800) 932-0624 • Fax: (908) 252-0811
Shipped From: 80 Industrial Drive • Alpha, NJ 08865

## CERTIFICATE OF ANALYSIS

## EPA PROTOCOL MIXTURE

**PROCEDURE # :** G1

**CUSTOMER:** Source Testing & Consulting Serv.
**SGI ORDER # :** 0010831
**ITEM# :** 8
**P.O.# :** VERBAL-BILL

**CYLINDER # :** CC-94629
**CYLINDER PRES:** 2000 PSIG
**CGA OUTLET:** 350

**CERTIFICATION DATE:** 8/30/2001
**EXPIRATION DATE:** 8/30/2004

**CERTIFICATION HISTORY**

| COMPONENT | DATE OF ASSAY | MEAN CONCENTRATION | CERTIFIED CONCENTRATION | ANALYTICAL ACCURACY |
|---|---|---|---|---|
| Carbon Monoxide | 7/23/2001<br>8/30/2001 | 61.31 ppm<br>61.01 ppm | 61.2 ppm | +/- 1% |
| | | | | |
| | | | | |
| | | | | |

**BALANCE** Nitrogen

**PREVIOUS CERTIFICATION DATES:** None

**REFERENCE STANDARDS**

| COMPONENT | SRM/NTRM# | CYLINDER# | CONCENTRATION |
|---|---|---|---|
| Carbon Monoxide | NTRM-81679 | CC88359 | 97.4 ppm |
| | | | |
| | | | |
| | | | |

**INSTRUMENTATION**

| COMPONENT | MAKE/MODEL | SERIAL # | DETECTOR | CALIBRATION DATE(S) |
|---|---|---|---|---|
| Carbon Monoxide | Horiba VIA-510 | 570423011 | NDIR | 8/20/2001 |
| | | | | |
| | | | | |
| | | | | |

**THIS STANDARD IS NIST TRACEABLE. IT WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES. DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.**

ANALYST: RJ
REX JOHNSON

DATE: 8/30/2001

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Research Triangle Park, N.C. 27709
Phone 919/544-3772

# CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS MIXTURE

| | | | |
|---|---|---|---|
| Customer: | National Welders, Raleigh, NC | Reference # | 88-88043 |
| NSG PO# | 4179631 | Certification Date: | 12/19/03 |
| Customer PO# | | Expiration Date: | 12/19/05 |
| Cylinder # | CC61580 | Pressure, psig* | 2000 |

## ANALYTICAL INFORMATION

METHOD: This standard was analyzed according to EPA Traceability Protocol for Assay and certification of Gaseous Calibration Standards: Procedure G-1: September 1997.

ANALYZED CYLINDER

| Components | Certified Concentration | Analytical Accuracy** |
|---|---|---|
| Nitric Oxide | 181.4 ppm | +/-1% |
| Carbon Monoxide | 306 ppm | +/-1% |

Balance - Nitrogen    Trace Gas - Nitrogen Dioxide    0.1 ppm

REFERENCE STANDARD

| Type/SRM Sample # | Cylinder # | Concentration | |
|---|---|---|---|
| GMIS ( Traceable to SRM # 1685b ) | CC109646 | 205.2 ppm | NO/N2 |
| GMIS ( Traceable to SRM # 2636a ) | CC104276 | 251.5 ppm | CO/N2 |

INSTRUMENTATION

| Instrument/Model/Serial # | | Last Date Calibrated | Analytical Method |
|---|---|---|---|
| KVB Analect | EN-844 | 12/01/03 | Fourier Transform Infrared |
| Rosemount 880A CO | 00172 | 11/21/03 | Non-dispersive Infrared |

Analyst: J Kenworthy    Jeremy Kenworthy

This report states accurately the results of the investigation made upon the material submitted to the analytical laboratory. Every effort has been made to determine objectively the information requested. However, in connection with this report, National Specialty Gases shall have no liability in excess of established charge for this service. Assayed at National Specialty Gases, 630 United Drive, Durham, NC 27713 (919) 544-3772

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NSG 020149L

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Phone 919/544-3772

# CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS MIXTURE

| | | | |
|---|---|---|---|
| Customer: | National Welders, Raleigh, NC | Reference # | 88-87830 |
| NSG PO# | 4179631 | Certification Date: | 12/08/03 |
| Customer PO# | | Expiration Date: | 12/08/06 |
| Cylinder # | CC61579 | Pressure, psig* | 2000 |

## ANALYTICAL INFORMATION

METHOD: This standard was analyzed according to EPA Traceability Protocol for Assay and certification of Gaseous Calibration Standards: Procedure G-1: September 1997.

ANALYZED CYLINDER

| Components | Certified Concentration | Analytical Accuracy** |
|---|---|---|
| Oxygen | 12.97% | +/-1% |
| Balance - Nitrogen | | |

REFERENCE STANDARD

| Type/SRM Sample # | Cylinder # | Concentration | |
|---|---|---|---|
| GMIS ( Traceable to SRM # 2659a ) | CC104352 | 20.97 % | O2/N2 |

INSTRUMENTATION

| Instrument/Model/Serial # | Last Date Calibrated | Analytical Method |
|---|---|---|
| Horiba MPA - 510 O2 41499150042 | 11/21/03 | Paramagnetic |

Analyst: J Kenworthy Jeremy Kenworthy

This report states accurately the results of the investigation made upon the material submitted to the analytical laboratory. Every effort has been made to determine objectively the information requested. However, in connection with this report, National Specialty Gases shall have no liability in excess of established charge for this service. Assayed at National Specialty Gases, 630 United Drive, Durham, NC 27713 (919) 544-3772

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# CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS MIXTURE

| | | | |
|---|---|---|---|
| Customer: | National Welders, Raleigh, NC | Reference # | 88-87977 |
| NSG PO# | 4179631 | Certification Date: | 12/15/03 |
| Customer PO# | | Expiration Date: | 12/15/05 |
| Cylinder # | CC41493 | Pressure, psig* | 2000 |

## ANALYTICAL INFORMATION

METHOD: This standard was analyzed according to EPA Traceability Protocol for Assay and certification of Gaseous Calibration Standards: Procedure G-1: September 1997.

### ANALYZED CYLINDER

| Components | Certified Concentration | Analytical Accuracy** |
|---|---|---|
| Nitric Oxide | 907 ppm | +/-1% |
| Carbon Monoxide | 904 ppm | +/-1% |

Balance - Nitrogen    Trace Gas - Nitrogen Dioxide    < 1.0 ppm

### REFERENCE STANDARD

| Type/SRM Sample # | Cylinder # | Concentration | |
|---|---|---|---|
| GMIS ( Traceable to SRM # 1687b ) | CC129690 | 997 ppm | NO/N2 |
| GMIS ( Traceable to SRM # 1681b ) | CC21531 | 975.8 ppm | CO/N2 |

### INSTRUMENTATION

| Instrument/Model/Serial # | | Last Date Calibrated | Analytical Method |
|---|---|---|---|
| KVB Analect | EN-844 | 12/01/03 | Fourier Transform Infrared |
| Rosemount 880A CO | 00172 | 11/21/03 | Non-dispersive Infrared |

Analyst: J Kenworthy    Jeremy Kenworthy

This report states accurately the results of the investigation made upon the material submitted to the analytical laboratory. Every effort has been made to determine objectively the information requested. However, in connection with this report, National Specialty Gases shall have no liability in excess of established charge for this service. Assayed at National Specialty Gases, 630 United Drive, Durham, NC 27713 (919) 544-3772

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# CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS MIXTURE

| | | | |
|---|---|---|---|
| Customer: | National Welders, Raleigh, NC | Reference # | 88-90433 |
| NSG PO# | 4368226 | Certification Date: | 05/04/04 |
| Customer PO# | | Expiration Date: | 05/04/06 |
| Cylinder # | CC129538 | Pressure, psig* | 2000 |

## ANALYTICAL INFORMATION

METHOD: This standard was analyzed according to EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards: Procedure G1 (September 1997)

ANALYZED CYLINDER

| Components | Certified Concentration | Analytical Accuracy** |
|---|---|---|
| Sulfur Dioxide | 46.7 ppm | +/-1% |

Balance - Nitrogen

REFERENCE STANDARD

| Type/SRM Sample # | Cylinder # | Concentration | |
|---|---|---|---|
| GMIS ( Traceable to SRM # 1693a ) | SG9142444BAL | 50.2 ppm | SO2/N2 |

INSTRUMENTATION

| Instrument/Model/Serial # | Last Date Calibrated | Analytical Method |
|---|---|---|
| Rosemount 890 SO2 00032 | 04/14/04 | Ultraviolet |

Analyst: [signature] Jeremy Kenworthy

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# CERTIFICATE OF ANALYSIS

## EPA PROTOCOL MIXTURE

**PROCEDURE # :** G1

**CUSTOMER:** Source Testing & Consulting Serv.
**SGI ORDER # :** 0035478
**ITEM# :** 2
**P.O.# :** 200-347

**CYLINDER # :** CC-118950
**CYLINDER PRES:** 2000 PSIG
**CGA OUTLET:** 660

**CERTIFICATION DATE:** 03/24/2003
**EXPIRATION DATE:** 3/20/2005

**CERTIFICATION HISTORY**

| COMPONENT | DATE OF ASSAY | MEAN CONCENTRATION | CERTIFIED CONCENTRATION | ANALYTICAL ACCURACY |
|---|---|---|---|---|
| Carbon Monoxide | 03/13/2003<br>03/24/2003 | 45.92 ppm<br>45.99 ppm | 46.0 ppm | +/- 1% |
| Nitric Oxide | 03/13/2003<br>03/20/2003 | 46.13 ppm<br>46.3 ppm | 46.2 ppm | +/- 1% |
| NOx | | | 46.7 ppm | Reference Value Only |
| | | | | |
| | | | | |

**BALANCE** Nitrogen

**PREVIOUS CERTIFICATION DATES:** None

**REFERENCE STANDARDS**

| COMPONENT | SRM/NTRM# | CYLINDER# | CONCENTRATION |
|---|---|---|---|
| Carbon Monoxide | NTRM-31001 | CC-134716 | 101.0 ppm |
| Nitric Oxide | NTRM-82660 | CC-133646 | 99.5 ppm |
| | | | |
| | | | |

**INSTRUMENTATION**

| COMPONENT | MAKE/MODEL | SERIAL # | DETECTOR | CALIBRATION DATE(S) |
|---|---|---|---|---|
| Carbon Monoxide | Horiba VIA-510 | 570423011 | NDIR | 03/03/2003 |
| Nitric Oxide | CAI-400-CLD | 6L09004 | Cheml | 03/06/2003 |
| | | | | |
| | | | | |

**THIS STANDARD ISNIST TRACEABLE. IT WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES.**
**DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.**

ANALYST: Cheryl Patino
CHERYL PATINO

DATE: 03/24/2003

# CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS MIXTURE

| | | | |
|---|---|---|---|
| Customer: | National Welders, Raleigh, NC | Reference # | 88-87879 |
| NSG PO# | 4179631 | Certification Date: | 12/09/03 |
| Customer PO# | | Expiration Date: | 12/09/05 |
| Cylinder # | SG9148880BAL | Pressure, psig* | 2000 |

**ANALYTICAL INFORMATION**

METHOD: This standard was analyzed according to EPA Traceability Protocol for Assay and certification of Gaseous Calibration Standards: Procedure G-1: September 1997.

ANALYZED CYLINDER

| Components | Certified Concentration | Analytical Accuracy** |
|---|---|---|
| Nitric Oxide | 11.28 ppm | +/-1% |
| Carbon Monoxide | 15.62 ppm | +/-1% |

Balance - Nitrogen    Trace Gas - Nitrogen Dioxide    0.37 ppm

REFERENCE STANDARD

| Type/SRM Sample # | Cylinder # | Concentration | |
|---|---|---|---|
| GMIS ( Traceable to SRM # 2628a ) | CC16646 | 10.88 ppm | NO/N2 |
| GMIS ( Traceable to SRM # 1677c ) | CC112168 | 10.31 ppm | CO/N2 |

INSTRUMENTATION

| Instrument/Model/Serial # | | Last Date Calibrated | Analytical Method |
|---|---|---|---|
| TECO 42CHL NOX | CHL-63965-341 | 11/14/03 | Chemiluminescence |
| Rosemount 880A CO | 00172 | 11/21/03 | Non-dispersive Infrared |

Analyst: Jeremy Kenworthy

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NSG 020149L

# CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS MIXTURE

| | | | |
|---|---|---|---|
| Customer: | National Welders, Raleigh, NC | Reference # | 88-87982 |
| NSG PO# | 4179631 | Certification Date: | 12/12/03 |
| Customer PO# | | Expiration Date: | 12/12/05 |
| Cylinder # | CC60055 | Pressure, psig* | 2000 |

**ANALYTICAL INFORMATION**

METHOD: This standard was analyzed according to EPA Traceability Protocol for Assay and certification of Gaseous Calibration Standards: Procedure G-1: September 1997.

ANALYZED CYLINDER

| Components | Certified Concentration | Analytical Accuracy** |
|---|---|---|
| Nitric Oxide | 456 ppm | +/-1% |
| Carbon Monoxide | 619 ppm | +/-1% |

Balance - Nitrogen    Trace Gas - Nitrogen Dioxide    < 1.0 ppm

REFERENCE STANDARD

| Type/SRM Sample # | Cylinder # | Concentration | |
|---|---|---|---|
| GMIS ( Traceable to SRM # 1686b ) | CC16989 | 502.6 ppm | NO/N2 |
| GMIS ( Traceable to SRM # 1680b ) | CC47351 | 497.7 ppm | CO/N2 |

INSTRUMENTATION

| Instrument/Model/Serial # | | Last Date Calibrated | Analytical Method |
|---|---|---|---|
| KVB Analect | EN-844 | 12/01/03 | Fourier Transform Infrared |
| Rosemount 880A CO | 00172 | 11/21/03 | Non-dispersive Infrared |

Analyst: Jeremy Kenworthy

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NSG 020149L

# CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS MIXTURE

| | | | |
|---|---|---|---|
| Customer: | National Welders, Durham, NC | Reference # | 88-90594 |
| NSG PO# | 4377631 | Certification Date: | 05/10/04 |
| Customer PO# | | Expiration Date: | 05/10/06 |
| Cylinder # | CC59954 | Pressure, psig* | 2000 |

## ANALYTICAL INFORMATION

METHOD: This standard was analyzed according to EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards: Procedure G1 (September 1997)

ANALYZED CYLINDER

| Components | Certified Concentration | Analytical Accuracy** |
|---|---|---|
| Carbon Monoxide | 96.8 ppm | +/-1% |
| Nitric Oxide | 95.0 ppm | +/-1% |

Balance - Nitrogen Trace Gas - Nitrogen Dioxide < 0.1 ppm

REFERENCE STANDARD

| Type/SRM Sample # | Cylinder # | Concentration | |
|---|---|---|---|
| GMIS ( Traceable to SRM # 1679c ) | CC64442 | 98.3 ppm | CO/N2 |
| GMIS ( Traceable to SRM # 1684b ) | CC64261 | 99.85 ppm | NO/N2 |

INSTRUMENTATION

| Instrument/Model/Serial # | | Last Date Calibrated | Analytical Method |
|---|---|---|---|
| Rosemount 880A CO | 00172 | 04/22/04 | Non-dispersive Infrared |
| KVB Analect | EN-844 | 05/03/04 | Fourier Transform Infrared |

Analyst: Jeremy Kenworthy

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**Analytical accuracy includes typical known error sources which, at least, include precision of the analytical instrument.

NSG 020149L

# CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS MIXTURE

| | | | |
|---|---|---|---|
| Customer: | National Welders, Raleigh, NC | Reference # | 88-87875 |
| NSG PO# | 4179631 | Certification Date: | 12/09/03 |
| Customer PO# | | Expiration Date: | 12/09/05 |
| Cylinder # | CC36062 | Pressure, psig* | 2000 |

**ANALYTICAL INFORMATION**

METHOD: This standard was analyzed according to EPA Traceability Protocol for Assay and certification of Gaseous Calibration Standards: Procedure G-1: September 1997.

ANALYZED CYLINDER

| Components | Certified Concentration | Analytical Accuracy** |
|---|---|---|
| Sulfur Dioxide | 452 ppm | +/-1% |

Balance - Nitrogen

REFERENCE STANDARD

| Type/SRM Sample # | Cylinder # | Concentration | |
|---|---|---|---|
| GMIS ( Traceable to SRM # 1661a ) | CC117042 | 495.6 ppm | SO2/N2 |

INSTRUMENTATION

| Instrument/Model/Serial # | | Last Date Calibrated | Analytical Method |
|---|---|---|---|
| KVB Analect | EN-844 | 12/01/03 | Fourier Transform Infrared |

Analyst: Jeremy Kenworthy

This report states accurately the results of the investigation made upon the material submitted to the analytical laboratory. Every effort has been made to determine objectively the information requested. However, in connection with this report, National Specialty Gases shall have no liability in excess of established charge for this service. Assayed at National Specialty Gases, 630 United Drive, Durham, NC 27713 (919) 544-3772

*Do not use this standard when cylinder pressure is below 150 psig.

**Analytical accuracy includes typical known error sources which, at least, include precision of the analytical instrument.

NSG 020149L

SPECTRA GASES INC.
3434 Route 22 West • Branchburg, NJ 08876 USA Tel.: (908) 252-9300 • (800) 932-0624 • Fax: (908) 252-0811
Shipped From: 80 Industrial Drive • Alpha, NJ 08865

## RECERTIFICATION OF ANALYSIS

## EPA PROTOCOL MIXTURE

**PROCEDURE # :** G1

**CUSTOMER:** Source Testing & Consulting Serv.
**SGI ORDER # :** 0025214
**ITEM# :** 1
**P.O.# :** 200297

**CYLINDER # :** CC-114035
**CYLINDER PRES:** 1700 PSIG
**CGA OUTLET:** 660

**CERTIFICATION DATE:** 8/7/2002
**EXPIRATION DATE:** 8/7/2004

CERTIFICATION HISTORY

| COMPONENT | DATE OF ASSAY | MEAN CONCENTRATION | CERTIFIED CONCENTRATION | ANALYTICAL ACCURACY |
|---|---|---|---|---|
| Sulfur Dioxide | 1/29/2002<br>8/7/2002 | 25.00 ppm<br>24.85 ppm | 24.9 ppm | +/- 1% |
| | | | | |
| | | | | |
| | | | | |

**BALANCE** Nitrogen

PREVIOUS CERTIFICATION DATES: **1/29/02 by Spectra Gases**

REFERENCE STANDARDS

| COMPONENT | SRM/NTRM# | CYLINDER# | CONCENTRATION |
|---|---|---|---|
| Sulfur Dioxide | NTRM-81694 | CC-53335 | 96.0 ppm |
| | | | |
| | | | |
| | | | |

INSTRUMENTATION

| COMPONENT | MAKE/MODEL | SERIAL # | DETECTOR | CALIBRATION DATE(S) |
|---|---|---|---|---|
| Sulfur Dioxide | Horiba VIA-510 | 851221093 | NDIR | 7/18/2002 |
| | | | | |
| | | | | |
| | | | | |

**THIS STANDARD IS NIST TRACEABLE. IT WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES. DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.**

ANALYST: ____________
FRED PIKULA

DATE: 8/7/2002

# APPENDIX C
# PROJECT PARTICIPANTS

## PROJECT PARTICIPANTS

### STACS

| | |
|---|---|
| Bill Mayhew | Project Manager |
| Geoff Johnson | Environmental Scientist |
| Jon Proulx | Environmental Scientist |
| Lee Garcia | Environmental Scientist |
| Sid Carter | Environmental Technician |
| Aaron Harden | Document Coordinator |

### RAYONIER

| | |
|---|---|
| Dick Hopper | Environmental Director |
| Ronnie Moore | Coordinator |

DEP ROUTING AND TRANSMITTAL SLIP

TO: (NAME, OFFICE, LOCATION)

1. BRUCE MITCHELL

2. MS 5505

3.

4. DARM - TALLY

5.

PLEASE PREPARE REPLY FOR:

____ SECRETARY'S SIGNATURE

____ DIV/DIST DIR SIGNATURE

____ MY SIGNATURE

____ YOUR SIGNATURE

____ DUE DATE ______

ACTION/DISPOSITION

✓ DISCUSS WITH ME

✓ COMMENTS/ADVISE

____ REVIEW AND RETURN

____ SET UP MEETING

____ FOR YOUR INFORMATION

____ HANDLE APPROPRIATELY

____ INITIAL AND FORWARD

____ SHARE WITH STAFF

____ FOR YOUR FILES

COMMENTS:

RECEIVED
SEP 15 2005
BUREAU OF AIR REGULATION

FROM: KHALID AL-NAHDY DATE: 9/13/05 PHONE: S/C 804-3243

DEP 15-026 (12/93)

# EMISSION TEST REPORT
# FOR
# SULFITE RECOVERY BOILER
# AND
# A & B SCRUBBERS WITH
# POWER BOILERS 1, 2, & 3
# AT
# RAYONIER
# FERNANDINA BEACH, FLORIDA

**Prepared for:**

**RAYONIER**
**P.O. Box 2002**
**Foot of Gum Street**
**Fernandina Beach, Florida 32034**

**Prepared by:**

**Source Testing And Consulting Services, Inc.**
**1100 Purple Glory Drive**
**Apex, North Carolina 27502**

**June 2004**

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Table

# 1.0 INTRODUCTION

## 1.0 INTRODUCTION

Under contract to Rayonier, Source Testing And Consulting Services, Inc. (STACS) performed a series of emission tests at Rayonier's Fernandina Beach, Florida facility. Emissions testing was performed for the Sulfite Recovery Boiler and for Power Boilers #1, #2, and #3. The purpose of the tests was to demonstrate ongoing compliance with the emissions limits for particulate matter and for visible emissions for the units.

Two venturi-wet scrubbers (A and B) control emissions from the three power boilers. Emissions from Power Boilers #1 and #2 were routed through "A" Scrubber while Power Boiler #3 was routed through "B" Scrubber during the testing. Power Boiler #1 was operated on residual (No. 6 fuel oil) oil and Power Boilers #2 and #3 were operated burning bark supplemented by fuel oil as required to maintain load. Emissions from the Recovery Boiler are controlled through good combustion practices and the use of a Katzan Wet Scrubber/Brinks Demister.

All testing followed the procedures and quality control guidelines given in EPA Method 5 (40 CFR Pt 60, Appendix A). EPA Methods 1 through 4 were used in support of EPA Method 5. EPA Method 9 was used to determine visible emissions.

Sampling was performed on June 9, 2004 for the B-Scrubber, on June 10, 2004 for A-Scrubber and on May 24, 2004 for the Recovery Boiler. Additional testing was performed on May 25, 2004 on the Recovery Boiler strictly for calibration of a fixed particulate monitor.

Section 2.0 of this report provides a brief process description and a diagram of the sample point locations. Section 3.0 presents the test results. Section 4.0 outlines the procedures and test methods used and Section 5.0 discusses the quality assurance/quality control measures followed during sampling and analysis. Field data sheets, laboratory data, sample calculations, calibration data, process data, and a list of project participants are included in the Appendices to this report.

# 2.0 PROCESS DESCRIPTION AND SAMPLE POINT LOCATIONS

## 2.0 PROCESS DESCRIPTION AND SAMPLE POINT LOCATIONS

### 2.1 POWER BOILERS 1, 2 & 3 WITH SCRUBBERS A AND B

Particulate matter emissions from Power Boilers 1, 2, and 3 are controlled by one of two venturi type scrubbers with entrained water demisters downstream of the venturi. Power Boilers 2 and 3 are furnace type boilers capable of burning bark or Number 6 fuel oil. During the test series, Power Boilers 2 and 3 were fired with bark supplemented by oil to maintain load as required. Power Boiler 1 is a furnace type boiler that burns only Number 6 fuel oil.

The maximum allowable particulate emission for Power Boiler 3 through "B" Scrubber is 50.6 lb/hr while burning Hog fuel (pine bark and wood refuse), and 16.7 lb/hr when burning oil. Boiler #1 is limited to a maximum of 16.0 lb/hr particulate matter emissions burning oil. Boiler #2 is limited to 50.6 lb/hr of particulate matter on Hog fuel. Therefore, "A" Scrubber with Power Boilers 1 & 2 in operation has a maximum combined limit of 66.6 lb/hr of particulate matter.

The FDEP permit also requires that the units be operated at 90% or greater of full load during emissions testing. Copies of the process operating data collected during testing are included in Appendix D to document load conditions.

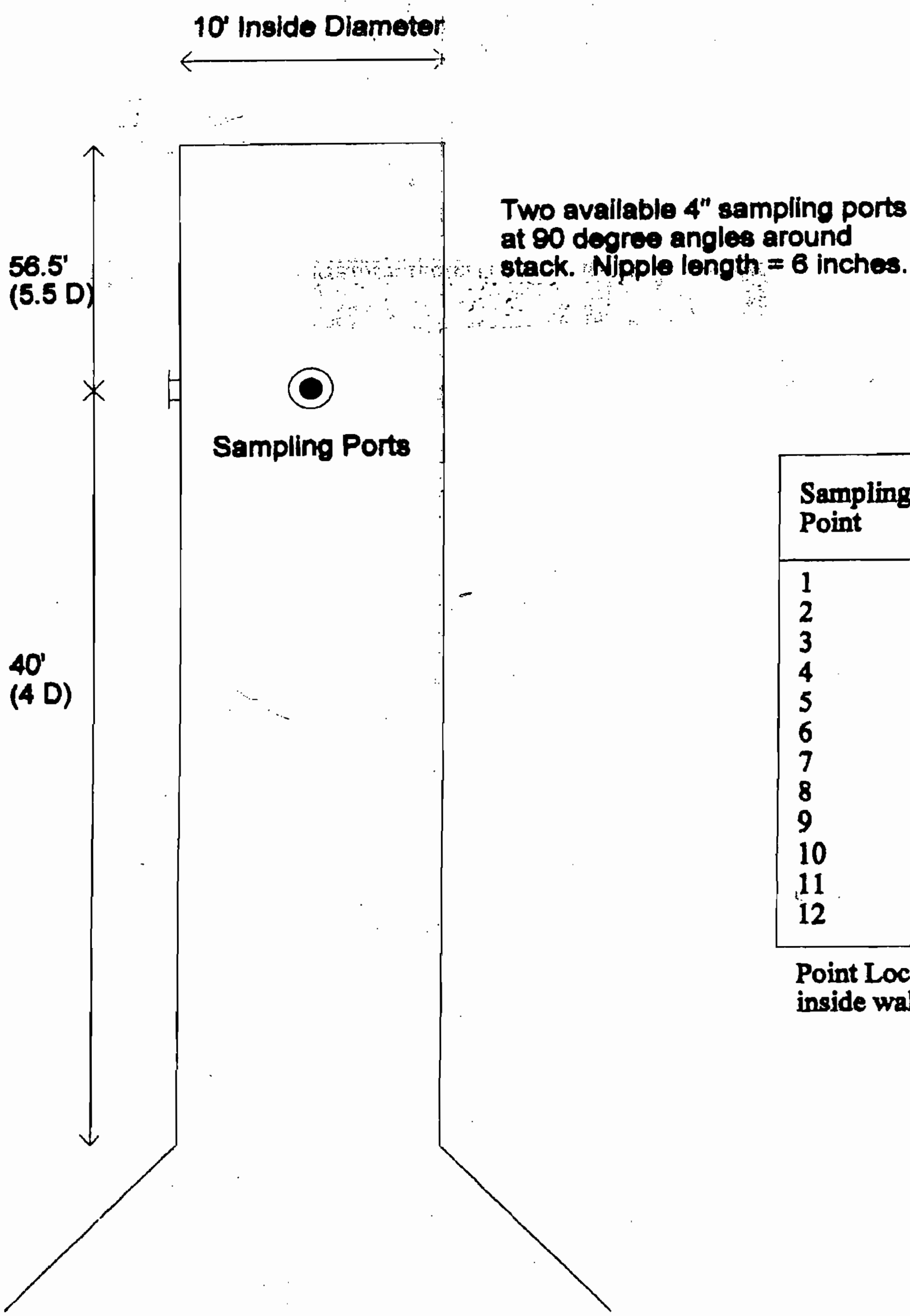
The identical scrubber stacks are 10' in inside diameter and are sampled through two ports 90° apart around the circumference of the stack. The nearest downstream disturbance from the sampling location was the atmospheric exhaust which was located one duct diameter away from the test ports. The nearest upstream disturbance was the top of the scrubber which was four diameters away from the ports. Using this criteria and EPA Method 1 guidelines, 12 sample points per traverse diameter were used, for a total of 24 points. A schematic diagram typical of the stack sampling location is included in Figure 2-1.

## 2.2 SULFITE RECOVERY BOILER

The Sulfite Recovery Boiler produces steam by the combustion of spent sulfite liquor (SSL). Particulate matter emissions from the unit are controlled by venting the effluent gases through a Katzen wet scrubber followed by venting the effluent gases through a series of Brinks mist filters.

The maximum allowable particulate mass emission rate for the sulfite recovery boiler is 67.5 lb/hr. The FDEP permit also requires that the units be operated at 90% or greater of full load during emissions testing. Copies of the process operating data collected during testing are included in Appendix D to document load conditions.

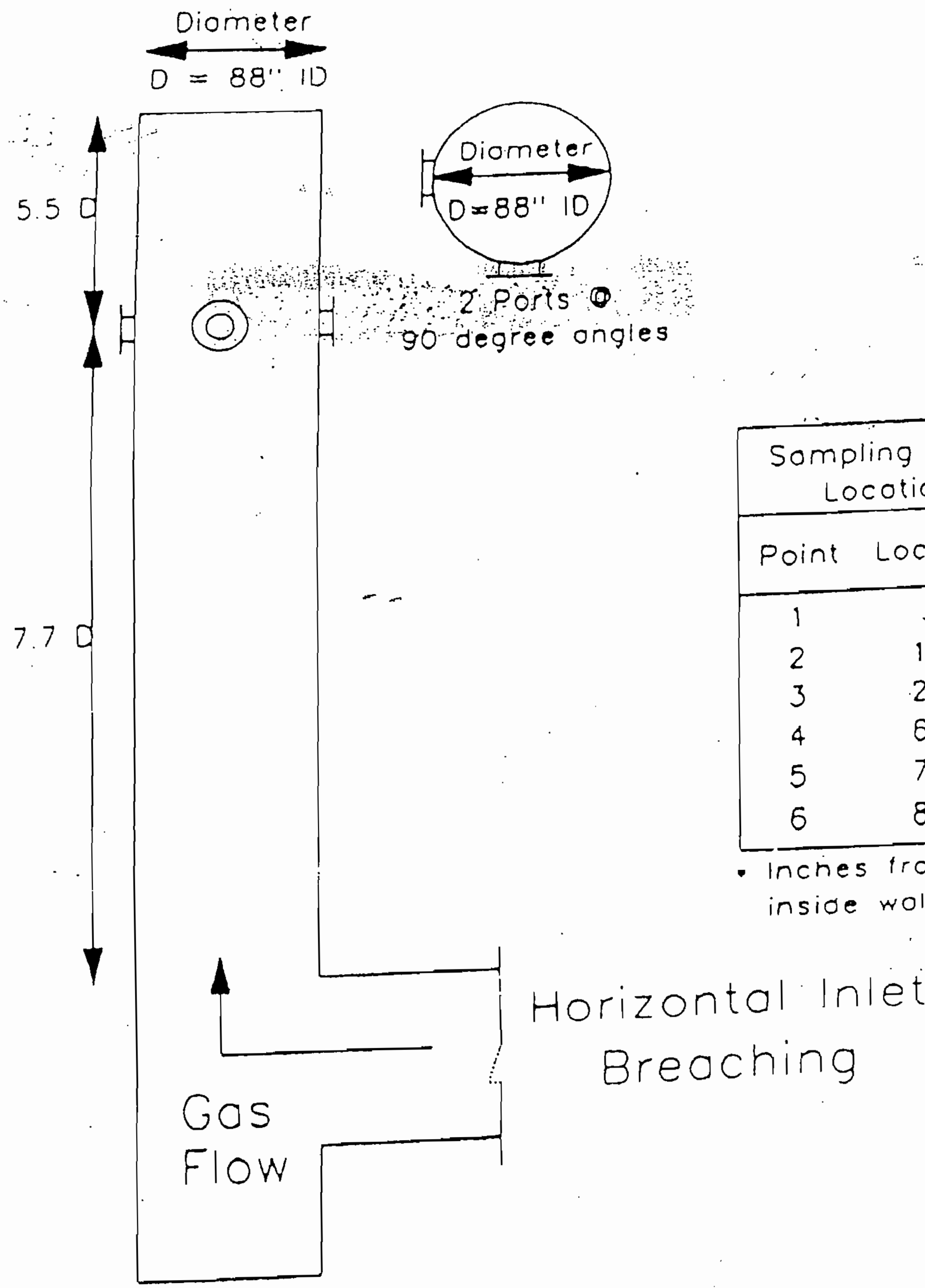
Figure 2-2 presents a schematic diagram of the emissions sampling location. Based on EPA Method 1 criteria, the location requires 12 sampling points (6 on each diameter).




| Sampling Point | Point Location |
|---|---|
| 1 | 2.52 |
| 2 | 8.04 |
| 3 | 14.20 |
| 4 | 21.24 |
| 5 | 30.00 |
| 6 | 42.70 |
| 7 | 77.30 |
| 8 | 90.00 |
| 9 | 98.80 |
| 10 | 105.80 |
| 11 | 111.96 |
| 12 | 117.48 |

Point Locations are inches from inside wall.

**Figure 2-1. A & B Scrubber Stack Schematic Diagram**




| Sampling Point Location | |
|---|---|
| Point | Location * |
| 1 | 3.87 |
| 2 | 12.85 |
| 3 | 26.00 |
| 4 | 61.95 |
| 5 | 75.15 |
| 6 | 84.13 |

* Inches from inside wall.

Figure 2-2. Sulfite Recovery Boiler Stack Schematic Diagram

# 3.0 PARTICULATE TEST RESULTS

# 3.0 PARTICULATE TEST RESULTS

## 3.1 POWER BOILERS 1, 2 & 3 WITH SCRUBBERS A AND B

Emissions testing for the "A" Scrubber was conducted on June 10, 2004. The tests for "B" Scrubber were conducted on June 9, 2004. The results of the EPA Method 5 particulate matter tests are given in Table 3-1 for the "A" Scrubber stack and in Table 3-2 for the "B" Scrubber stack. The highest observed six-minute average opacity for the two units are also included in the tables.

The average particulate mass emission rate from the "A" Scrubber stack with Power Boiler #1 burning residual fuel oil and Power Boiler #2 burning bark was 43.117 lb/hr during the tests with a range of 30.984 lb/hr to 57.145 lb/hr. The combined emission limit for the two units is 66.6 b/hr (50.6 lb/hr for Unit #2 and 16 lb/hr for Unit #1). The average particulate matter concentration in the gas stream for the "A "stack during the tests was 0.05357 grains per dry standard cubic foot (gr/dscf). The average concentration corrected to 8% oxygen was 0.1787 grams per dry standard cubic meters (grams/dscm).

Particulate matter emissions from the "B" Scrubber stack with Power Boiler #3 burning bark averaged 34.327 lb/hr and varied from 20.900 lb/hr to 47.642 lb/hr. The emission limit for Power Boiler #3 is 50.6 lb/hr. The average particulate matter concentration was 0.04368 gr/dscf. The average concentration corrected to 8% oxygen was 0.1492 grams per dry standard cubic meters (grams/dscm).

## 3.2 SULFITE RECOVERY BOILER

Emissions testing for the Sulfite Recovery Boiler was conducted on May 24, 2003. The results of the EPA Method 5 particulate matter tests for the Sulfite Recovery Boiler are given in Table 3-3. The highest observed six-minute average opacity for the unit is also included in the table.

Three tests (Runs 1,2, and 3) were run at normal operating conditions for compliance purposes. The average particulate mass emission rate from the recovery boiler during the tests was 21.334 lb/hr with a range of 19.750 lb/hr to 23.102 lb/hr. The average particulate matter concentration in the gas stream for the recovery boiler during the tests was 0.02117 grains per dry standard cubic foot (gr/dscf) at this condition. The average concentration corrected to 8% oxygen was 0.0376 grams per dry standard cubic meters (grams/dscm).

Three additional tests (4, 5, and 6) were run for Rayonier's fixed particulate meter calibration. Results are given in Table 3-4.

The average particulate mass emission rate from the recovery boiler during the additional tests was 26.027 lb/hr with a range of 22.914 lb/hr to 30.195 lb/hr. The average particulate matter concentration in the gas stream for the recovery boiler during the tests was 0.02436 grains per dry standard cubic foot (gr/dscf) at this condition. The average concentration corrected to 8% oxygen was 0.0425 grams per dry standard cubic meters (grams/dscm).

Field data sheets for all sampling are included in Appendix B. Sample calculations and run summaries are given in Appendix A. Calibration and Quality Assurance data are given in Appendix C.

Table 3-1. **Summary of Emissions Testing Data - Total Solid Particulate Matter - Scrubber A**
**Rayonier**
**Scrubber A**

| **Parameter** | **Units** | Run # | 1-A | 2-A | 3-A | AVERAGE |
|---|---|---|---|---|---|---|
| | | Date: | 10-Jun-04 | 10-Jun-04 | 10-Jun-04 | |
| | | Start Time: | 12:03 | 14:43 | 17:37 | |
| | | Stop Time: | 13:05 | 15:45 | 18:39 | |
| **Sampling Train & Analytical Parameters:** | | | | | | |
| Total Solid Particulate Matter: | g | | 0.0921 | 0.1208 | 0.1712 | 0.1280 |
| Metered Volume: | dscf | | 36.448 | 38.908 | 35.803 | 37.053 |
| Gas Stream Volumetric Flowrate: | dscfm | | 92695.6 | 100362.6 | 90347.0 | 94468.4 |
| Oxygen: | %V, dry | | 11.4 | 12.3 | 12.2 | 12.0 |
| Carbon Dioxide: | %V, dry | | 7.4 | 7.5 | 7.4 | 7.4 |
| **Total Solid Particulate (TSP) Matter Emissions:** | | | | | | |
| TSP Concentration: | gr/dscf | | 0.03900 | 0.04791 | 0.07379 | 0.05357 |
| TSP Concentration: | grams/dscm | | 0.0892 | 0.1096 | 0.1688 | 0.1226 |
| TSP Concentration: | grams/dscm @ 8% O2 | | 0.1212 | 0.1644 | 0.2504 | 0.1787 |
| TSP Mass Emission Rate: | lb/hr | | 30.984 | 41.218 | 57.145 | 43.116 |
| Visible Emissions - Six Minute Average | | | | | | 20.0 |

Table 3-2. Summary of Emissions Testing Data - Total Solid Particulate Matter - Scrubber B
Rayonier
Scrubber B

| Parameter | Units | | 1-B | 2-B | 3-B | AVERAGE |
|---|---|---|---|---|---|---|
| | | Run # | 1-B | 2-B | 3-B | AVERAGE |
| | | Date: | 9-Jun-04 | 9-Jun-04 | 9-Jun-04 | |
| | | Start Time: | 12:30 | 15:30 | 17:56 | |
| | | Stop Time: | 14:00 | 16:32 | 18:58 | |
| **Sampling Train & Analytical Parameters:** | | | | | | |
| Total Solid Particulate Matter: | g | | 0.0682 | 0.1511 | 0.1062 | 0.1085 |
| Metered Volume: | dscf | | 42.347 | 37.638 | 37.053 | 39.013 |
| Gas Stream Volumetric Flowrate: | dscfm | | 98106.4 | 89716.4 | 90837.6 | 92886.8 |
| Oxygen: | %V, dry | | 11.6 | 12.4 | 12.4 | 12.1 |
| Carbon Dioxide: | %V, dry | | 7.9 | 7.3 | 7.5 | 7.6 |
| **Total Solid Particulate (TSP) Matter Emissions:** | | | | | | |
| TSP Concentration: | gr/dscf | | 0.02485 | 0.06195 | 0.04423 | 0.04368 |
| TSP Concentration: | grams/dscm | | 0.0569 | 0.1418 | 0.1012 | 0.0999 |
| TSP Concentration: | grams/dscm @ 8% O2 | | 0.0789 | 0.2151 | 0.1536 | 0.1492 |
| TSP Mass Emission Rate: | lb/hr | | 20.900 | 47.642 | 34.439 | 34.327 |
| Visible Emissions - Six Minute Average | | | | | | 17.1 |

Table 3-3. **Summary of Compliance Emissions Testing Data - Total Solid Particulate SRB**
**Rayonier**
**SRB**

| Parameter | Units | Run # | 1 | 2 | 3 | AVERAGE |
|---|---|---|---|---|---|---|
| | | Date: | 24-May-04 | 24-May-04 | 24-May-04 | |
| | | Start Time: | 11:14 | 15:33 | 17:26 | |
| | | Stop Time: | 12:28 | 16:35 | 18:28 | |
| **Sampling Train & Analytical Parameters:** | | | | | | |
| Total Solid Particulate Matter: | g | | 0.0719 | 0.0669 | 0.0798 | 0.0729 |
| Metered Volume: | dscf | | 51.381 | 53.525 | 54.401 | 53.103 |
| Gas Stream Volumetric Flowrate: | dscfm | | 114266.4 | 119454.9 | 119059.2 | 117593.5 |
| Oxygen: | %V, dry | | 4.3 | 4.3 | 4.3 | 4.3 |
| Carbon Dioxide: | %V, dry | | 15.0 | 14.8 | 15.0 | 14.9 |
| **Total Solid Particulate (TSP) Matter Emissions:** | | | | | | |
| TSP Concentration: | gr/dscf | | 0.02160 | 0.01929 | 0.02264 | 0.02117 |
| TSP Concentration: | grams/dscm | | 0.0494 | 0.0441 | 0.0518 | 0.0484 |
| TSP Concentration: | grams/dscm @ 8% O2 | | 0.0384 | 0.0343 | 0.0403 | 0.0376 |
| TSP Mass Emission Rate: | lb/hr | | 21.151 | 19.750 | 23.102 | 21.334 |
| Visible Emissions - Six Minute Average | | | | | | 19.4 |

Table 3-4. **Summary of Emissions Testing Data for Meter Calibration - Total Solid Pa SRB**
**Rayonier**
**SRB**

| **Parameter** | **Units** | | 4 | 5 | 6 | AVERAGE |
|---|---|---|---|---|---|---|
| | | Run # | 4 | 5 | 6 | AVERAGE |
| | | Date: | 25-May-04 | 25-May-04 | 25-May-04 | |
| | | Start Time: | 9:40 | 11:18 | 13:18 | |
| | | Stop Time: | 10:42 | 12:20 | 14:20 | |
| ***Sampling Train & Analytical Parameters:*** | | | | | | |
| Total Solid Particulate Matter: | g | | 0.0853 | 0.0784 | 0.1013 | 0.0883 |
| Metered Volume: | dscf | | 56.046 | 56.231 | 55.701 | 55.993 |
| Gas Stream Volumetric Flowrate: | dscfm | | 124031.0 | 124244.8 | 125518.2 | 124598.0 |
| Oxygen: | %V, dry | | 4.2 | 3.9 | 3.9 | 4.0 |
| Carbon Dioxide: | %V, dry | | 15.3 | 15.2 | 15.3 | 15.3 |
| **Total Solid Particulate (TSP) Matter Emissions:** | | | | | | |
| TSP Concentration: | gr/dscf | | 0.02349 | 0.02152 | 0.02807 | 0.02436 |
| TSP Mass Emission Rate: | lb/hr | | 24.97 | 22.91 | 30.20 | 26.03 |
| TSP Mass Emission Rate: | grams/dscm | | 0.0537 | 0.0492 | 0.0642 | 0.0557 |
| TSP Mass Emission Rate @8% O2: | grams/dscm | | 0.0415 | 0.0374 | 0.0487 | 0.0425 |
| Visible Emissions - Six Minute Average | | | | | | 19.4 |

# 4.0 FIELD AND ANALYTICAL PROCEDURES

## 4.0 FIELD AND ANALYTICAL PROCEDURES

### 4.1 EPA METHOD 5 - PARTICULATE SAMPLING AND ANALYSIS

The sampling and analytical procedures used follow the procedures as outlined in EPA Method 5, in the Code of Federal Regulations, Chapter I, Title 40, Part 60, Appendix A, Method 5, revised as of July 1, 1991. The sampling equipment consisted of the following:

1. Sample Probe Assembly
   a. Nozzle--Stainless steel with a sharp, tapered leading edge.
   b. Probe--Stainless steel (S.S.) sheath with a 2-inch diameter glass insert wrapped with nichrome wire; rheostat controlled and capable of maintaining a temperature of 248 +/-25 degrees Fahrenheit ($^{o}$F).
   c. Pitot--Type "S" constructed and attached to probe according to specifications outlined in the Code of Federal Regulations, Chapter I, Title 40, Part 60, Appendix A, Method 2.
   d. Orsat Probe--Stainless steel 1/4 inch tubing attached to pitot tube in an interference-free arrangement.
   e. Thermocouple--Type "K" attached to the pitot tube such that the tip has no contact with metal and does not interfere with the pitot tube face openings.
2. Filter Holder--Glass with fritted glass filter support.
3. Filter Heating Assembly--Controlled heating element in aluminum module attached to end of probe; capable of maintaining 248 +/-25$^{o}$F.
4. Impingers--Four impingers connected in series with glass ball/socket joint fittings and placed in an ice bath. A Greenburg-Smith impinger standard

tip configuration is used for the second impinger. The first, third, and fourth impingers are the modified Greenburg-Smith design with a 0.5 in. ID glass tube extending to about 0.5 in. from the bottom of the flask. Final gas exit temperature is measured to within +/-2°F with a type "K" thermocouple immersed in the gas stream.

5. Control Box--Model containing vacuum gauge, external leak-free pump, thermocouples capable of measuring temperature to within +/-2°F, dry gas meter with a minimum of 2 percent accuracy, valves and related equipment as required to maintain an isokinetic sampling rate, and to determine sample volume.

Prior to leaving the laboratory, glass fiber filters were numbered for identification, heated for 2 hours at 105 degrees C, desiccated for 2 hours, and pre-weighed to the nearest 0.1 mg. Silica gel (indicating type, 6-16 Mesh) was also pre-weighed to 200 grams after oven drying for 24 hours.

Upon arrival at the sampling site, the control box was leak-checked from pump to orifice at 5 to 7 inches of water.

The sample train was prepared in the following manner: 100 mL of $H_20$ was added to the first and second impingers. The third impinger was left empty, and a pre-weighed quantity of silica gel was added to the fourth impinger for final moisture removal. After assembling the train with the pitot tube as shown in the schematic (Figure 4-1), the system was leak-checked by plugging the inlet to the probe nozzle and pulling a vacuum of at least 15 inches of mercury (Hg). A leakage rate not in excess of 0.02 cfm is considered acceptable. The pitot tube system was also leak-checked at 2 to 3 inches of water, and any leaks found were corrected.

The inside dimensions of each stack were measured and recorded. The number of sampling points and the location of these points on a traverse were determined by the guidelines set forth in the Code of Federal Regulations, Chapter I, Title 40, Part 60, Appendix A, Method 1. These points were then marked on the probe for easy visibility.

A preliminary traverse was conducted to determine the range of velocity head and the pressure of the stack. An approximate stack temperature was obtained during the same traverse, and an approximate moisture content was estimated based on knowledge of the emission source type and attendant characteristics and prior testing experience. From these data, the correct nozzle size and isokinetic K- factor were determined.

The probe was attached and the heater was adjusted to provide a gas temperature of approximately 250°F. The filter heating system was turned on, and crushed ice was placed around the impingers. After a suitable warm-up period, the nozzle was placed at the first traverse point with the tip pointing directly into the gas stream. The pump was started and the sampling rate was adjusted to isokinetic conditions. After the required time interval had elapsed, the probe was repositioned to the next traverse point, and isokinetic sampling was re-established. This was done for each point on the traverse until the run was completed. Readings were taken at least every 5 minutes or when significant changes in stack conditions necessitated additional adjustments in flow rate. At the conclusion of each run, the pump was turned off and the final readings were recorded. A final leak-check of the system was performed as previously described at the highest vacuum encountered during testing, and a leak-check of the pitot system was repeated.

### 4.1.1 SAMPLE RECOVERY

The collection train was carefully moved to a convenient sample recovery area in order to minimize the loss of collected sample or the gain of extraneous particulate matter. The volume of condensate in the first three impingers was measured and recorded on the field data sheet. The probe, nozzle, and all sample-exposed surfaces were rinsed with reagent grade acetone and put into a clean sample bottle marked "pre-filter". A brush was used to loosen any adhering particulate matter, and subsequent rinses were put into the "pre-filter" container. The filter was carefully removed from the fritted glass support and placed in its original container. The silica gel was removed from the fourth impinger and transferred to its original container. A sample of the acetone used in washing the probe was saved for a blank laboratory analysis.

### 4.1.2 ANALYTICAL PROCEDURES

The filter and any loose particulate matter were transferred from the sample container to a clean, tared glass weighing dish. The filter was placed in an oven at 105EC for 2 hours, desiccated for 2 hours, and then weighed. The original weight of the filter was deducted, and the weight gain was recorded to the nearest 0.1 mg.

The "pre-filter" and blank solutions were transferred to clean, tared beakers, then evaporated to dryness and desiccated to a constant weight. The blank correction was made, and the weight gain was recorded to the nearest 0.1 mg. The silica gel was weighed, and the weight gain was recorded to the nearest 0.1 gram.

## 4.2 <u>EPA METHOD 3--ORSAT SAMPLING AND ANALYSIS</u>

Carbon dioxide ($CO_2$) and oxygen ($O_2$) samples were collected by an integrated bag system. The Orsat sampling system consisted of a stainless steel probe, sample line from probe to a condenser, a small vacuum pump with a rotameter, and a Tedlar bag.

The Orsat sampling procedure consists of the following leak-check and sampling techniques. Prior to sampling, the bag was leak-checked at 2 to 4 inches of water. The inlet to the condenser was plugged, and a vacuum of 10 inches of Hg was pulled. The outlet of the pump was then plugged and the pump shut off. The vacuum held steady for at least 30 seconds. The sample line was then purged with stack gas and the bag was connected. Sampling was conducted at an appropriate constant rate at the same point or points and for the same length of time as the pollutant sampling. At the conclusion of the run, the pump was shut off and the bag secured.

After leak-checking the Orsat gas analyzer, an average value for each gas was determined. The gas was measured until three values were obtained that fell within the specified variance of the gas tested. Data were recorded on the field data sheet, and the bag was evacuated for the next sample run.

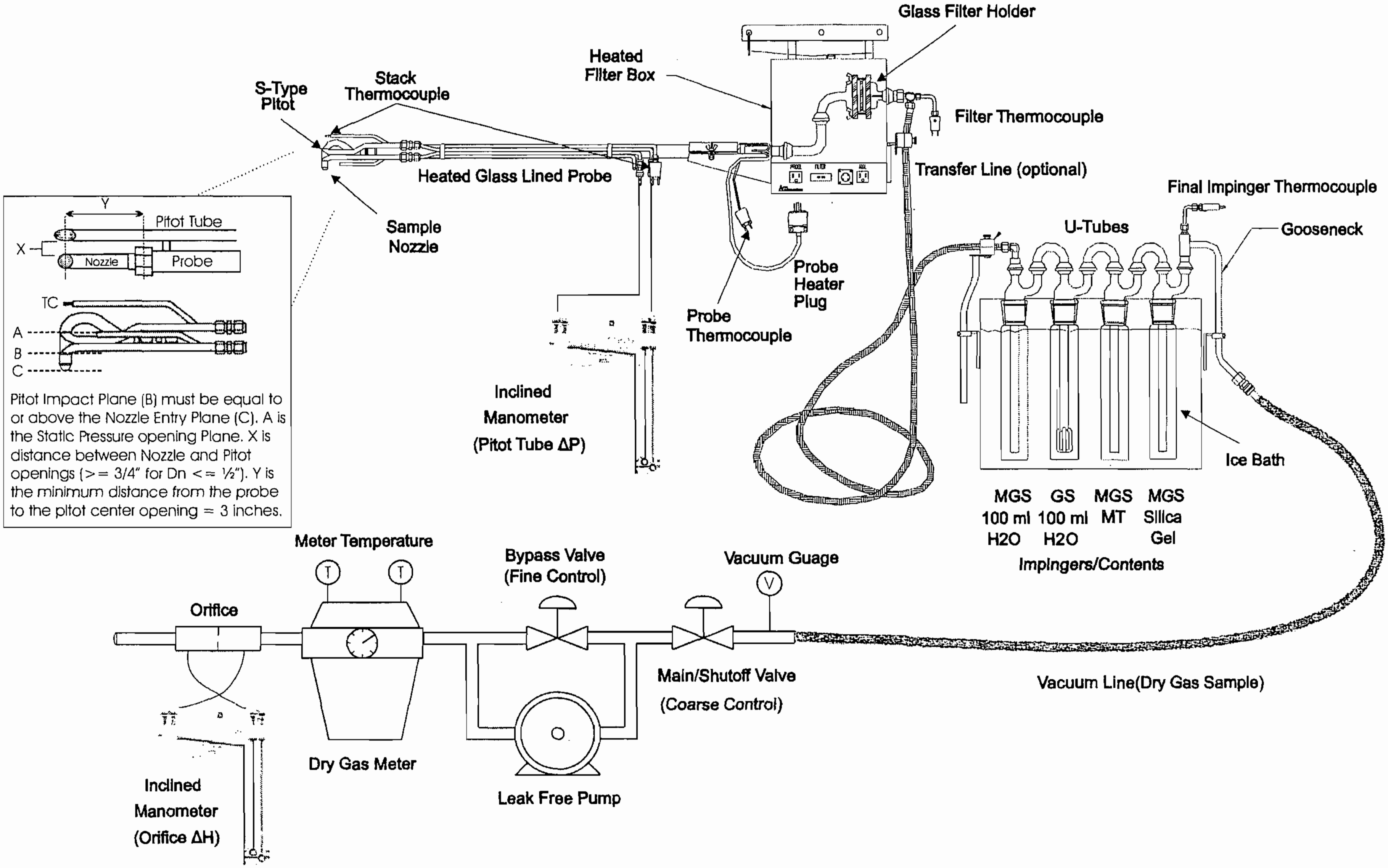



Figure 4-1. Schematic Diagram of EPA Method 5 Sampling Train

# 5.0 QUALITY ASSURANCE/QUALITY CONTROL

## 5.0 QUALITY ASSURANCE/QUALITY CONTROL

Strict Quality Assurance/Quality Control (QA/QC) measures were observed for all sampling and analysis performed for the Rayonier test program. The STACS QA/QC program is designed to provide the highest quality data in terms of the accuracy and precision of the measurements as well as the representativeness and comparability of the results.

The STACS QA/QC program for this test series includes all of the QA/QC guidelines given in EPA Methods 1-5 (40 CFR Pt 60, Appendix A) in addition to internal QA/QC standards. Primary components of the QA/QC program are listed below:

- Equipment Calibrations - including meter boxes, thermocouples, pitot tubes and analytical balance
- Equipment Leak Checks - including pre- and post-test sample train leak checks, meter and pump leak checks, pitot leak checks and ORSAT system leak checks
- Careful monitoring and documentation of sample train critical parameters including temperatures and meter pressure.
- Preliminary measurements to aid in calculating the sampling K-factor used to determine isokinetic sampling rate.
- Maintaining an isokinetic sampling rate so that the velocity through the sampling nozzle matches the surrounding flue gas stream velocity to within +/- 10%

All sampling train leak rates were less than the maximum acceptable leak rate of 0.02 cubic feet per minute. Sample train leak checks were performed at a vacuum of at least 5" Hg greater than the highest observed vacuum observed during sampling. All sample trains met the +/- 10% criterion for isokinetic sampling. All samples were desiccated and replicate analyses were performed until agreement of 0.5 mg between weighings that were six hours apart.

# APPENDIX A

# EMISSION DATA & SAMPLE CALCULATIONS

## SUMMARY OF EMISSIONS SAMPLING DATA

| Plant: Rayonier | Location: Scrubber A | Run # | 1-A | 2-A | 3-A | AVERAGE |
|---|---|---|---|---|---|---|
| Condition: Normal | | Date: | 10-Jun-04 | 10-Jun-04 | 10-Jun-04 | |
| Unit: Scrubber A | Method: Method 5 | Start Time: | 12:03 | 14:43 | 17:37 | |
| **Parameter** | **Units** | Stop Time: | 13:05 | 15:45 | 18:39 | |
| Sampling Time | min. | | 60 | 60 | 60 | 60 |
| **AMBIENT DATA:** | | | | | | |
| Ambient Temperature | deg. F | | 90 | 85 | 80 | 85.00 |
| Location Height above Pbar reading | feet | | 150 | 150 | 150 | 150 |
| Barometric Pressure | in. Hg | | 29.98 | 29.98 | 29.98 | 29.98 |
| Corrected Barometric Pressure (to location) | in. Hg | | 29.83 | 29.83 | 29.83 | 29.83 |
| **GAS METER DATA:** | | | | | | |
| Dry Gas Meter Correction Factor (gamma) | Dimensionless | | 0.9935 | 0.9935 | 0.9935 | 0.9935 |
| Average Meter Differential Pressure | in. H2O | | 1.2850 | 1.4425 | 1.2663 | 1.3313 |
| Absolute Meter Pressure | in. Hg | | 29.92 | 29.94 | 29.92 | 29.93 |
| Average Meter Temperature | degrees F | | 94.0 | 84.3 | 83.4 | 87.2 |
| Metered Dry Sample Gas Volume | dcf | | 38.487 | 40.346 | 37.086 | 38.640 |
| Average Sampling Rate | dscfm | | 0.607 | 0.648 | 0.597 | 0.618 |
| Standard Metered Volume | dscf | | 36.448 | 38.908 | 35.803 | 37.053 |
| Standard Metered Volume | dscm | | 1.0322 | 1.1019 | 1.0140 | 1.0493 |
| **MOISTURE DATA:** | | | | | | |
| Moisture Determination Technique: | | | Gravimetric | Gravimetric | Gravimetric | |
| Relative Humidity: | %RH | | #N/A | #N/A | #N/A | #N/A |
| Saturated Vapor Pressure of Water: | inches Hg | | 5.6034 | 5.3021 | 5.8247 | 5.5768 |
| Vapor Phase Moisture Content at Saturation: | % Volume | | 18.79 | 17.78 | 19.53 | 18.70 |
| Total Condensate Collected | grams H20 | | 210.7 | 200.9 | 248.6 | 220.07 |
| Standard Volume of Water Vapor | scf | | 9.935 | 9.472 | 11.721 | 10.376 |
| Measured Moisture Content | mole fraction | | 0.2142 | 0.1958 | 0.2466 | 0.2189 |
| Measured Moisture Content | % Volume | | 21.42 | 19.58 | 24.66 | 21.89 |
| Gas Stream Vapor Phase Moisture (Bs): | % Volume | | 18.79 | 17.78 | 19.53 | 18.70 |
| **FIXED GAS DATA:** | | | | | | |
| Oxygen Concentration, Dry Basis | % Volume | | 11.4 | 12.3 | 12.2 | 12.0 |
| Carbon Dioxide Concentration, Dry Basis | % Volume | | 7.4 | 7.5 | 7.4 | 7.4 |
| Carbon Monoxide Concentration, Dry Basis | % Volume | | 0.0 | 0.0 | 0.0 | 0.0 |
| Other Primary Gas Constituent, Dry Basis | % Volume | | #N/A | #N/A | #N/A | #N/A |
| Nitrogen Concentration, Dry Basis (gas balance) | % Volume | | 81.2 | 80.2 | 80.4 | 80.6 |
| Gas Molecular Weight, Dry Basis | lb/lb-mole | | 29.640 | 29.692 | 29.672 | 29.668 |
| Gas Molecular Weight, Wet Basis | lb/lb-mole | | 27.147 | 27.403 | 26.793 | 27.114 |
| Fo Calculated: | Dimensionless | | 1.284 | 1.147 | 1.176 | 1.202 |
| Excess Air: | % | | 113.40 | 138.38 | 134.93 | 128.90 |
| Ultimate CO2 | %V,d | | 16.28 | 18.23 | 17.78 | 17.43 |
| **DUCT CONFIGURATION:** | | | | | | |
| Duct Geometry (C = Circular, R = Rectangular) | | | C | C | C | |
| Duct Dimensions (Diameter) | inches | | 120 | 120 | 120 | 120 |
| Effective Duct Diameter (De) | inches | | 120 | 120 | 120 | 120 |
| Stack Cross-Sectional Area | ft2 | | 78.54 | 78.54 | 78.54 | 78.54 |
| **DUCT GAS CONDITIONS:** | | | | | | |
| Static Pressure of Gas Stream | in. H2O | | -0.170 | -0.160 | -0.140 | -0.157 |
| Absolute Duct Gas Pressure | in. Hg | | 29.818 | 29.818 | 29.820 | 29.818 |
| Gas Stream Temperature | degrees F | | 138.13 | 136.00 | 139.63 | 137.92 |
| Gas Stream Wet Bulb Temperature: | degrees F | | 0 | 0 | 0 | 0 |
| **VELOCITY DATA:** | | | | | | |
| Pitot Tube Coefficient | Dimensionless | | 0.84 | 0.84 | 0.84 | 0.84 |
| Avg. Square Root of Velocity Head | (in. H2O)^0.5 | | 0.4609 | 0.4891 | 0.4661 | 0.4720 |
| Gas Stream Velocity | ft/sec | | 28.454 | 29.995 | 28.998 | 29.149 |
| Gas Stream Velocity | ft/min | | 1707.26 | 1799.72 | 1739.90 | 1748.96 |
| Gas Stream Velocity | meters/min | | 520.37 | 548.56 | 530.32 | 533.08 |
| Gas Stream Velocity | mi/hr | | 19.402 | 20.453 | 19.773 | 19.876 |
| **FLOWRATE/ENGLISH UNITS** | | | | | | |
| Actual Volumetric Flow Rate, Wet Basis | acfm | | 134087.6 | 141349.8 | 136651.6 | 137363.0 |
| Standard Volumetric Flow Rate, Wet Basis | scfm | | 117961.5 | 124796.8 | 119925.3 | 120894.5 |
| Standard Volumetric Flow Rate, Dry Basis | dscfm | | 92695.6 | 100362.6 | 90347.0 | 94468.4 |
| Standard Volumetric Flow Rate, Wet Basis | kscfh | | 7077.69 | 7487.81 | 7195.52 | 7253.67 |
| Standard Volumetric Flow Rate, Dry Basis | kdscfh | | 5561.74 | 6021.76 | 5420.82 | 5668.11 |
| Total Mass Flow Rate (wet) | kpph | | 498.67 | 532.54 | 500.37 | 510.52 |
| **FLOWRATE/METRIC UNITS** | | | | | | |
| Actual Volumetric Flow Rate, Wet Basis | acmm | | 3797.36 | 4003.03 | 3869.97 | 3890.12 |
| Standard Volumetric Flow Rate, Wet Basis | scmm | | 3340.67 | 3534.24 | 3396.28 | 3423.73 |
| Standard Volumetric Flow Rate, Dry Basis | dscmm | | 2625.14 | 2842.27 | 2558.63 | 2675.35 |
| **ISOKINETIC SAMPLING DATA:** | | | | | | |
| Nozzle Diameter: | inches | | 0.31 | 0.31 | 0.31 | 0.31 |
| Area of Nozzle: | ft^2 | | 5.241E-04 | 5.241E-04 | 5.241E-04 | 5.241E-04 |
| Isokinetic Sampling Rate: | %I | | 98.3 | 96.9 | 99.0 | 98.1 |
| **PARTICULATE MATTER:** | | | | | | |
| Particulate Matter Collected: | grams | | 0.0921 | 0.1208 | 0.1712 | 0.1280 |
| Particulate Matter Concentration: | grams/dscm | | 0.08923 | 0.10963 | 0.16884 | 0.12257 |
| Particulate Matter Mass Emission Rate: | grams/sec | | 3.904 | 5.193 | 7.200 | 5.432 |
| Particulate Matter Concentration: | lb/dscf | | 5.57E-06 | 6.84E-06 | 1.05E-05 | 7.65E-06 |
| Particulate Matter Concentration: | grains/dscf | | 0.03900 | 0.04791 | 0.07379 | 0.05357 |
| Particulate Matter Mass Emission Rate: | lb/hr | | 30.984 | 41.218 | 57.145 | 43.116 |

## SUMMARY OF EMISSIONS SAMPLING DATA

| | | | | | | |
|---|---|---|---|---|---|---|
| **Plant:** Rayonier **Location:** Scrubber B | | Run # | 1-B | 2-B | 3-B | AVERAGE |
| **Condition:** Normal | | Date: | 9-Jun-04 | 9-Jun-04 | 9-Jun-04 | |
| **Unit:** Scrubber B **Method:** Method 29 | | Start Time: | 12:30 | 15:30 | 17:56 | |
| **Parameter** | **Units** | Stop Time: | 14:00 | 16:32 | 18:58 | |
| Sampling Time | min. | | 60 | 60 | 60 | 60 |
| **AMBIENT DATA:** | | | | | | |
| Ambient Temperature | deg. F | | 85 | 80 | 78 | 81.00 |
| Location Height above Pbar reading | feet | | 150 | 150 | 150 | 150 |
| Barometric Pressure | in. Hg | | 29.94 | 29.94 | 29.94 | 29.94 |
| Corrected Barometric Pressure (to location) | in. Hg | | 29.79 | 29.79 | 29.79 | 29.79 |
| **GAS METER DATA:** | | | | | | |
| Dry Gas Meter Correction Factor (gamma) | Dimensionless | | 1.0095 | 1.0095 | 1.0095 | 1.0095 |
| Average Meter Differential Pressure | in. H2O | | 1.6300 | 1.3000 | 1.3325 | 1.4208 |
| Absolute Meter Pressure | in. Hg | | 29.91 | 29.89 | 29.89 | 29.89 |
| Average Meter Temperature | degrees F | | 81.5 | 79.5 | 80.0 | 80.4 |
| Metered Dry Sample Gas Volume | dcf | | 43.039 | 38.143 | 37.579 | 39.587 |
| Average Sampling Rate | dscfm | | 0.706 | 0.627 | 0.618 | 0.650 |
| Standard Metered Volume | dscf | | 42.347 | 37.638 | 37.053 | 39.013 |
| Standard Metered Volume | dscm | | 1.1993 | 1.0659 | 1.0493 | 1.1048 |
| **MOISTURE DATA:** | | | | | | |
| Moisture Determination Technique: | | | Gravimetric | Gravimetric | Gravimetric | |
| Relative Humidity: | %RH | | #N/A | #N/A | #N/A | #N/A |
| Saturated Vapor Pressure of Water: | inches Hg | | 6.6801 | 6.3099 | 6.2898 | 6.4266 |
| Vapor Phase Moisture Content at Saturation: | % Volume | | 22.44 | 21.19 | 21.12 | 21.58 |
| Total Condensate Collected | grams H20 | | 319.4 | 257.6 | 257.6 | 278.20 |
| Standard Volume of Water Vapor | scf | | 15.060 | 12.146 | 12.146 | 13.117 |
| Measured Moisture Content | mole fraction | | 0.2623 | 0.2440 | 0.2469 | 0.2511 |
| Measured Moisture Content | % Volume | | 26.23 | 24.40 | 24.69 | 25.11 |
| Gas Stream Vapor Phase Moisture (Bs): | % Volume | | 22.44 | 21.19 | 21.12 | 21.58 |
| **FIXED GAS DATA:** | | | | | | |
| Oxygen Concentration, Dry Basis | % Volume | | 11.6 | 12.4 | 12.4 | 12.1 |
| Carbon Dioxide Concentration, Dry Basis | % Volume | | 7.9 | 7.3 | 7.5 | 7.6 |
| Carbon Monoxide Concentration, Dry Basis | % Volume | | 0.0 | 0.0 | 0.0 | 0.0 |
| Other Primary Gas Constituent, Dry Basis | % Volume | | #N/A | #N/A | #N/A | #N/A |
| Nitrogen Concentration, Dry Basis (gas balance) | % Volume | | 80.5 | 80.3 | 80.1 | 80.3 |
| Gas Molecular Weight, Dry Basis | lb/lb-mole | | 29.728 | 29.664 | 29.696 | 29.696 |
| Gas Molecular Weight, Wet Basis | lb/lb-mole | | 26.651 | 26.818 | 26.809 | 26.759 |
| Fo Calculated: | Dimensionless | | 1.177 | 1.164 | 1.133 | 1.158 |
| Excess Air: | % | | 119.98 | 140.67 | 141.51 | 134.05 |
| Ultimate CO2 | %V,d | | 17.75 | 17.95 | 18.44 | 18.05 |
| **DUCT CONFIGURATION:** | | | | | | |
| Duct Geometry (C = Circular, R = Rectangular) | | | C | C | C | |
| Duct Dimensions (Diameter) | inches | | 120 | 120 | 120 | 120 |
| Effective Duct Diameter (De) | inches | | 120 | 120 | 120 | 120 |
| Stack Cross-Sectional Area | ft2 | | 78.54 | 78.54 | 78.54 | 78.54 |
| **DUCT GAS CONDITIONS:** | | | | | | |
| Static Pressure of Gas Stream | in. H2O | | -0.230 | -0.200 | -0.170 | -0.200 |
| Absolute Duct Gas Pressure | in. Hg | | 29.773 | 29.775 | 29.778 | 29.775 |
| Gas Stream Temperature | degrees F | | 145.00 | 142.75 | 142.63 | 143.46 |
| Gas Stream Wet Bulb Temperature: | degrees F | | 0 | 0 | 0 | 0 |
| **VELOCITY DATA:** | | | | | | |
| Pitot Tube Coefficient | Dimensionless | | 0.84 | 0.84 | 0.84 | 0.84 |
| Avg. Square Root of Velocity Head | (in. H2O)^0.5 | | 0.5183 | 0.4630 | 0.4704 | 0.4839 |
| Gas Stream Velocity | ft/sec | | 32.498 | 28.887 | 29.352 | 30.246 |
| Gas Stream Velocity | ft/min | | 1949.87 | 1733.21 | 1761.14 | 1814.74 |
| Gas Stream Velocity | meters/min | | 594.32 | 528.28 | 536.79 | 553.13 |
| Gas Stream Velocity | mi/hr | | 22.159 | 19.697 | 20.014 | 20.623 |
| **FLOWRATE/ENGLISH UNITS** | | | | | | |
| Actual Volumetric Flow Rate, Wet Basis | acfm | | 153142.8 | 136126.2 | 138319.4 | 142529.5 |
| Standard Volumetric Flow Rate, Wet Basis | scfm | | 132995.6 | 118667.8 | 120613.6 | 124092.4 |
| Standard Volumetric Flow Rate, Dry Basis | dscfm | | 98106.4 | 89716.4 | 90837.6 | 92886.8 |
| Standard Volumetric Flow Rate, Wet Basis | kscfh | | 7979.74 | 7120.07 | 7236.82 | 7445.54 |
| Standard Volumetric Flow Rate, Dry Basis | kdscfh | | 5886.39 | 5382.99 | 5450.26 | 5573.21 |
| Total Mass Flow Rate (wet) | kpph | | 551.96 | 495.58 | 503.53 | 517.02 |
| **FLOWRATE/METRIC UNITS** | | | | | | |
| Actual Volumetric Flow Rate, Wet Basis | acmm | | 4337.00 | 3855.09 | 3917.20 | 4036.43 |
| Standard Volumetric Flow Rate, Wet Basis | scmm | | 3766.44 | 3360.67 | 3415.78 | 3514.30 |
| Standard Volumetric Flow Rate, Dry Basis | dscmm | | 2778.37 | 2540.77 | 2572.52 | 2630.56 |
| **ISOKINETIC SAMPLING DATA:** | | | | | | |
| Nozzle Diameter: | inches | | 0.31 | 0.31 | 0.31 | 0.31 |
| Area of Nozzle: | ft^2 | | 5.241E-04 | 5.241E-04 | 5.241E-04 | 5.241E-04 |
| Isokinetic Sampling Rate: | %I | | 107.9 | 104.8 | 101.9 | 104.9 |
| **PARTICULATE MATTER:** | | | | | | |
| Particulate Matter Collected: | grams | | 0.0682 | 0.1511 | 0.1062 | 0.1085 |
| Particulate Matter Concentration: | grams/dscm | | 0.05687 | 0.14176 | 0.10121 | 0.09994 |
| Particulate Matter Mass Emission Rate: | grams/sec | | 2.633 | 6.003 | 4.339 | 4.325 |
| Particulate Matter Concentration: | lb/dscf | | 3.55E-06 | 8.85E-06 | 6.32E-06 | 6.24E-06 |
| Particulate Matter Concentration: | grains/dscf | | 0.02485 | 0.06195 | 0.04423 | 0.04368 |
| Particulate Matter Mass Emission Rate: | lb/hr | | 20.900 | 47.642 | 34.439 | 34.327 |

**SUMMARY OF EMISSIONS SAMPLING DATA**

| | | | | | | |
|---|---|---|---|---|---|---|
| **Plant:** Rayonier | **Location:** SRB | Run # | 1 | 2 | 3 | AVERAGE |
| **Condition:** Normal | | Date: | 24-May-04 | 24-May-04 | 24-May-04 | |
| **Unit:** SRB | **Method:** Method 5 | Start Time: | 11:14 | 15:33 | 17:26 | |
| **Parameter** | **Units** | Stop Time: | 12:28 | 16:35 | 18:28 | |
| Sampling Time | min. | | 60 | 60 | 60 | 60 |
| **AMBIENT DATA:** | | | | | | |
| Ambient Temperature | deg. F | | 80 | 80 | 82 | 80.67 |
| Location Height above Pbar reading | feet | | 250 | 250 | 250 | 250 |
| Barometric Pressure | in. Hg | | 30.04 | 30.04 | 30.04 | 30.04 |
| Corrected Barometric Pressure (to location) | in. Hg | | 29.79 | 29.79 | 29.79 | 29.79 |
| **GAS METER DATA:** | | | | | | |
| Dry Gas Meter Correction Factor (gamma) | Dimensionless | | 1.0095 | 1.0095 | 1.0095 | 1.0095 |
| Average Meter Differential Pressure | in. H2O | | 2.5625 | 2.8200 | 2.8175 | 2.7333 |
| Absolute Meter Pressure | in. Hg | | 29.98 | 30.00 | 30.00 | 29.99 |
| Average Meter Temperature | degrees F | | 89.3 | 82.9 | 80.7 | 84.3 |
| Metered Dry Sample Gas Volume | dcf | | 52.851 | 54.379 | 55.040 | 54.090 |
| Average Sampling Rate | dscfm | | 0.856 | 0.892 | 0.907 | 0.885 |
| Standard Metered Volume | dscf | | 51.381 | 53.525 | 54.401 | 53.103 |
| Standard Metered Volume | dscm | | 1.4551 | 1.5158 | 1.5406 | 1.5039 |
| **MOISTURE DATA:** | | | | | | |
| Moisture Determination Technique: | | | Gravimetric | Gravimetric | Gravimetric | |
| Relative Humidity: | %RH | | #N/A | #N/A | #N/A | #N/A |
| Saturated Vapor Pressure of Water: | inches Hg | | 2.2429 | 2.5213 | 2.5274 | 2.4306 |
| Vapor Phase Moisture Content at Saturation: | % Volume | | 7.53 | 8.47 | 8.49 | 8.16 |
| Total Condensate Collected | grams H20 | | 103.8 | 109 | 115 | 109.27 |
| Standard Volume of Water Vapor | scf | | 4.894 | 5.139 | 5.422 | 5.152 |
| Measured Moisture Content | mole fraction | | 0.0870 | 0.0876 | 0.0906 | 0.0884 |
| Measured Moisture Content | % Volume | | 8.70 | 8.76 | 9.06 | 8.84 |
| Gas Stream Vapor Phase Moisture (Bs): | % Volume | | 7.53 | 8.47 | 8.49 | 8.16 |
| **FIXED GAS DATA:** | | | | | | |
| Oxygen Concentration, Dry Basis | % Volume | | 4.3 | 4.3 | 4.3 | 4.3 |
| Carbon Dioxide Concentration, Dry Basis | % Volume | | 15.0 | 14.8 | 15.0 | 14.9 |
| Carbon Monoxide Concentration, Dry Basis | % Volume | | 0.0 | 0.0 | 0.0 | 0.0 |
| Other Primary Gas Constituent, Dry Basis | % Volume | | #N/A | #N/A | #N/A | #N/A |
| Nitrogen Concentration, Dry Basis (gas balance) | % Volume | | 80.7 | 80.9 | 80.7 | 80.8 |
| Gas Molecular Weight, Dry Basis | lb/lb-mole | | 30.572 | 30.540 | 30.572 | 30.561 |
| Gas Molecular Weight, Wet Basis | lb/lb-mole | | 29.479 | 29.441 | 29.433 | 29.451 |
| Fo Calculated: | Dimensionless | | 1.107 | 1.122 | 1.107 | 1.112 |
| Excess Air: | % | | 25.26 | 25.18 | 25.26 | 25.24 |
| Ultimate CO2 | %V,d | | 18.89 | 18.63 | 18.89 | 18.80 |
| **DUCT CONFIGURATION:** | | | | | | |
| Duct Geometry (C = Circular, R = Rectangular) | | | C | C | C | |
| Duct Dimensions (Diameter) | inches | | 88 | 88 | 88 | 88 |
| Effective Duct Diameter (De) | inches | | 88 | 88 | 88 | 88 |
| Stack Cross-Sectional Area | ft2 | | 42.24 | 42.24 | 42.24 | 42.24 |
| **DUCT GAS CONDITIONS:** | | | | | | |
| Static Pressure of Gas Stream | in. H2O | | -0.280 | -0.240 | -0.240 | -0.253 |
| Absolute Duct Gas Pressure | in. Hg | | 29.769 | 29.772 | 29.772 | 29.771 |
| Gas Stream Temperature | degrees F | | 105.00 | 109.00 | 109.08 | 107.69 |
| Gas Stream Wet Bulb Temperature: | degrees F | | 0 | 0 | 0 | 0 |
| **VELOCITY DATA:** | | | | | | |
| Pitot Tube Coefficient | Dimensionless | | 0.84 | 0.84 | 0.84 | 0.84 |
| Avg. Square Root of Velocity Head | (in. H2O)^0.5 | | 0.9218 | 0.9670 | 0.9670 | 0.9519 |
| Gas Stream Velocity | ft/sec | | 53.112 | 55.951 | 55.959 | 55.007 |
| Gas Stream Velocity | ft/min | | 3186.73 | 3357.03 | 3357.56 | 3300.44 |
| Gas Stream Velocity | meters/min | | 971.32 | 1023.22 | 1023.38 | 1005.97 |
| Gas Stream Velocity | mi/hr | | 36.215 | 38.150 | 38.156 | 37.507 |
| **FLOWRATE/ENGLISH UNITS** | | | | | | |
| Actual Volumetric Flow Rate, Wet Basis | acfm | | 134598.0 | 141790.8 | 141813.1 | 139400.6 |
| Standard Volumetric Flow Rate, Wet Basis | scfm | | 125150.5 | 130924.6 | 130926.0 | 129000.4 |
| Standard Volumetric Flow Rate, Dry Basis | dscfm | | 114266.4 | 119454.9 | 119059.2 | 117593.5 |
| Standard Volumetric Flow Rate, Wet Basis | kscfh | | 7509.03 | 7855.48 | 7855.56 | 7740.02 |
| Standard Volumetric Flow Rate, Dry Basis | kdscfh | | 6855.99 | 7167.29 | 7143.55 | 7055.61 |
| Total Mass Flow Rate (wet) | kpph | | 574.50 | 600.25 | 600.07 | 591.61 |
| **FLOWRATE/METRIC UNITS** | | | | | | |
| Actual Volumetric Flow Rate, Wet Basis | acmm | | 3811.81 | 4015.52 | 4016.15 | 3947.83 |
| Standard Volumetric Flow Rate, Wet Basis | scmm | | 3544.26 | 3707.78 | 3707.83 | 3653.29 |
| Standard Volumetric Flow Rate, Dry Basis | dscmm | | 3236.02 | 3382.96 | 3371.76 | 3330.25 |
| **ISOKINETIC SAMPLING DATA:** | | | | | | |
| Nozzle Diameter: | inches | | 0.252 | 0.252 | 0.252 | 0.252 |
| Area of Nozzle: | ft^2 | | 3.464E-04 | 3.464E-04 | 3.464E-04 | 3.464E-04 |
| Isokinetic Sampling Rate: | %I | | 91.4 | 91.1 | 92.9 | 91.8 |
| **PARTICULATE MATTER:** | | | | | | |
| Particulate Matter Collected: | grams | | 0.0719 | 0.0669 | 0.0798 | 0.0729 |
| Particulate Matter Concentration: | grams/dscm | | 0.04941 | 0.04413 | 0.05180 | 0.04845 |
| Particulate Matter Mass Emission Rate: | grams/sec | | 2.665 | 2.488 | 2.911 | 2.688 |
| Particulate Matter Concentration: | lb/dscf | | 3.09E-06 | 2.76E-06 | 3.23E-06 | 3.02E-06 |
| Particulate Matter Concentration: | grains/dscf | | 0.02160 | 0.01929 | 0.02264 | 0.02117 |
| Particulate Matter Mass Emission Rate: | lb/hr | | 21.151 | 19.750 | 23.102 | 21.334 |

SUMMARY OF EMISSIONS SAMPLING DATA

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Plant:** Rayonier | **Location:** SRB | | Run # | 4 | 5 | 6 | AVERAGE |
| **Condition:** Bypass Open | | | Date: | 25-May-04 | 25-May-04 | 25-May-04 | |
| **Unit:** SRB | **Method:** Method 5 | | Start Time: | 9:40 | 11:18 | 13:21 | |
| **Parameter** | | **Units** | Stop Time: | 10:42 | 12:20 | 14:24 | |
| Sampling Time | | min. | | 60 | 60 | 60 | 60 |
| **AMBIENT DATA:** | | | | | | | |
| Ambient Temperature | | deg. F | | 75 | 75 | 85 | 78.33 |
| Location Height above Pbar reading | | feet | | 250 | 250 | 250 | 250 |
| Barometric Pressure | | in. Hg | | 29.92 | 29.92 | 29.92 | 29.92 |
| Corrected Barometric Pressure (to location) | | in. Hg | | 29.67 | 29.67 | 29.67 | 29.67 |
| **GAS METER DATA:** | | | | | | | |
| Dry Gas Meter Correction Factor (gamma) | | Dimensionless | | 1.0095 | 1.0095 | 1.0095 | 1.0095 |
| Average Meter Differential Pressure | | in. H2O | | 3.0575 | 3.0875 | 3.1625 | 3.1025 |
| Absolute Meter Pressure | | in. Hg | | 29.89 | 29.90 | 29.90 | 29.90 |
| Average Meter Temperature | | degrees F | | 82.9 | 91.5 | 88.9 | 87.8 |
| Metered Dry Sample Gas Volume | | dcf | | 57.135 | 58.226 | 57.396 | 57.586 |
| Average Sampling Rate | | dscfm | | 0.934 | 0.937 | 0.928 | 0.933 |
| Standard Metered Volume | | dscf | | 56.046 | 56.231 | 55.701 | 55.993 |
| Standard Metered Volume | | dscm | | 1.5872 | 1.5925 | 1.5774 | 1.5857 |
| **MOISTURE DATA:** | | | | | | | |
| Moisture Determination Technique: | | | | Gravimetric | Gravimetric | Gravimetric | |
| Relative Humidity: | | %RH | | #N/A | #N/A | #N/A | #N/A |
| Saturated Vapor Pressure of Water: | | inches Hg | | 2.3670 | 2.5092 | 2.6205 | 2.4989 |
| Vapor Phase Moisture Content at Saturation: | | % Volume | | 7.99 | 8.47 | 8.84 | 8.43 |
| Total Condensate Collected | | grams H20 | | 116.4 | 120.4 | 121 | 119.27 |
| Standard Volume of Water Vapor | | scf | | 5.488 | 5.677 | 5.705 | 5.623 |
| Measured Moisture Content | | mole fraction | | 0.0892 | 0.0917 | 0.0929 | 0.0913 |
| Measured Moisture Content | | % Volume | | 8.92 | 9.17 | 9.29 | 9.13 |
| Gas Stream Vapor Phase Moisture (Bs): | | % Volume | | 7.99 | 8.47 | 8.84 | 8.43 |
| **FIXED GAS DATA:** | | | | | | | |
| Oxygen Concentration, Dry Basis | | % Volume | | 4.2 | 3.9 | 3.9 | 4.0 |
| Carbon Dioxide Concentration, Dry Basis | | % Volume | | 15.3 | 15.2 | 15.3 | 15.3 |
| Carbon Monoxide Concentration, Dry Basis | | % Volume | | 0.0 | 0.0 | 0.0 | 0.0 |
| Other Primary Gas Constituent, Dry Basis | | % Volume | | #N/A | #N/A | #N/A | #N/A |
| Nitrogen Concentration, Dry Basis (gas balance) | | % Volume | | 80.5 | 80.9 | 80.8 | 80.7 |
| Gas Molecular Weight, Dry Basis | | lb/lb-mole | | 30.616 | 30.588 | 30.604 | 30.603 |
| Gas Molecular Weight, Wet Basis | | lb/lb-mole | | 29.491 | 29.434 | 29.433 | 29.452 |
| Fo Calculated: | | Dimensionless | | 1.092 | 1.118 | 1.111 | 1.107 |
| Excess Air: | | % | | 24.61 | 22.32 | 22.35 | 23.09 |
| Ultimate CO2 | | %V,d | | 19.15 | 18.69 | 18.81 | 18.88 |
| **DUCT CONFIGURATION:** | | | | | | | |
| Duct Geometry (C = Circular, R = Rectangular) | | | | C | C | C | |
| Duct Dimensions (Diameter) | | inches | | 88 | 88 | 88 | 88 |
| Effective Duct Diameter (De) | | inches | | 88 | 88 | 88 | 88 |
| Stack Cross-Sectional Area | | ft2 | | 42.24 | 42.24 | 42.24 | 42.24 |
| **DUCT GAS CONDITIONS:** | | | | | | | |
| Static Pressure of Gas Stream | | in. H2O | | -0.500 | -0.480 | -0.470 | -0.483 |
| Absolute Duct Gas Pressure | | in. Hg | | 29.633 | 29.635 | 29.635 | 29.634 |
| Gas Stream Temperature | | degrees F | | 106.83 | 108.83 | 110.33 | 108.67 |
| Gas Stream Wet Bulb Temperature: | | degrees F | | 0 | 0 | 0 | 0 |
| **VELOCITY DATA:** | | | | | | | |
| Pitot Tube Coefficient | | Dimensionless | | 0.84 | 0.84 | 0.84 | 0.84 |
| Avg. Square Root of Velocity Head | | (in. H2O)^0.5 | | 1.0071 | 1.0124 | 1.0255 | 1.0150 |
| Gas Stream Velocity | | ft/sec | | 58.246 | 58.711 | 59.547 | 58.834 |
| Gas Stream Velocity | | ft/min | | 3494.73 | 3522.63 | 3572.79 | 3530.05 |
| Gas Stream Velocity | | meters/min | | 1065.19 | 1073.70 | 1088.99 | 1075.96 |
| Gas Stream Velocity | | mi/hr | | 39.715 | 40.032 | 40.602 | 40.117 |
| **FLOWRATE/ENGLISH UNITS** | | | | | | | |
| Actual Volumetric Flow Rate, Wet Basis | | acfm | | 147606.9 | 148785.3 | 150904.0 | 149098.7 |
| Standard Volumetric Flow Rate, Wet Basis | | scfm | | 136176.7 | 136788.0 | 138374.4 | 137113.0 |
| Standard Volumetric Flow Rate, Dry Basis | | dscfm | | 124031.0 | 124244.8 | 125518.2 | 124598.0 |
| Standard Volumetric Flow Rate, Wet Basis | | kscfh | | 8170.60 | 8207.28 | 8302.46 | 8226.78 |
| Standard Volumetric Flow Rate, Dry Basis | | kdscfh | | 7441.86 | 7454.69 | 7531.09 | 7475.88 |
| Total Mass Flow Rate (wet) | | kpph | | 625.38 | 626.97 | 634.22 | 628.86 |
| **FLOWRATE/METRIC UNITS** | | | | | | | |
| Actual Volumetric Flow Rate, Wet Basis | | acmm | | 4180.23 | 4213.60 | 4273.60 | 4222.48 |
| Standard Volumetric Flow Rate, Wet Basis | | scmm | | 3856.52 | 3873.83 | 3918.76 | 3883.04 |
| Standard Volumetric Flow Rate, Dry Basis | | dscmm | | 3512.56 | 3518.61 | 3554.68 | 3528.61 |
| **ISOKINETIC SAMPLING DATA:** | | | | | | | |
| Nozzle Diameter: | | inches | | 0.252 | 0.252 | 0.252 | 0.252 |
| Area of Nozzle: | | ft^2 | | 3.464E-04 | 3.464E-04 | 3.464E-04 | 3.464E-04 |
| Isokinetic Sampling Rate: | | %I | | 91.9 | 92.0 | 90.2 | 91.4 |
| **PARTICULATE MATTER:** | | | | | | | |
| Particulate Matter Collected: | | grams | | 0.0853 | 0.0784 | 0.1013 | 0.0883 |
| Particulate Matter Concentration: | | grams/dscm | | 0.05374 | 0.04923 | 0.06422 | 0.05573 |
| Particulate Matter Mass Emission Rate: | | grams/sec | | 3.146 | 2.887 | 3.805 | 3.279 |
| Particulate Matter Concentration: | | lb/dscf | | 3.36E-06 | 3.07E-06 | 4.01E-06 | 3.48E-06 |
| Particulate Matter Concentration: | | grains/dscf | | 0.02349 | 0.02152 | 0.02807 | 0.02436 |
| Particulate Matter Mass Emission Rate: | | lb/hr | | 24.970 | 22.914 | 30.195 | 26.027 |

| | | | | |
|---|---|---|---|---|
| Rayonier | Scrubber A | Normal | Unit: | Scrubber A |

VELOCITY AND VOLUMETRIC FLOWRATE DETERMINATION
EPA METHOD 2 CALCULATIONS

| Parameter | | Definition | Units |
|---|---|---|---|
| Cp | - | Pitot Tube Coefficient | Dimensionless |
| Vs | - | Gas Stream Velocity | ft/sec |
| Qsd | - | Volumetric Flow Rate at Standard Conditions,Dry Basis | dscfm |
| Qact | - | Actual Volumetric Flow Rate, Wet Basis | acfm |
| Bws | - | Moisture Content | mole fraction |
| Dp | - | Avg. Sq. Root of Velocity Head | (in. H2O)^0.5 |
| Pb | - | Absolute Barometric Pressure | in. Hg |
| Kp | - | Constant = 89.49 (ft)(lb/lb-mol)(in.Hg^0.5)/(s)(_R)(in.H2O) | |
| Ts | - | Absolute Gas Stream Temperature | degrees R |
| Ms | - | Sample Gas Molecular Weight, Wet Basis | lb/lb-mole |
| Sp | - | Static Pressure of Gas Stream | in. H2O |
| 528 | - | Absolute Standard Temperature | degrees R |
| CSA | - | Stack Cross-Sectional Area | ft2 |
| Ps | - | Absolute Stack Gas Pressure | in. Hg |
| 60 | - | Conversion Factor | sec/min. |
| Pi | - | Constant Ratio ~ 3.1416 | Dimensionless |
| D | - | Duct Diameter | inches |

TEST DATA RUN # 1-A

| | | | |
|---|---|---|---|
| Ms = | 27.464 | Cp = | 0.84 |
| Bws = | 0.1870 | Pb = | 29.98 |
| Sp = | -0.17 | Ts = | 598.1 |
| D = | 120.00 | Dp = | 0.4609 |

Circular Duct

Ps = Pb + (Sp/13.6) = 29.98 + (-0.17/13.6) = 29.97 in.Hg

Vs = (85.49)(Cp)(Dp)*[(Ts)/(Ms*Ps)]^0.5

= 85.49*0.84*0.4609*[598.1/(27.464*29.97)]^0.5

= 28.219 ft/s 28.219 ft/s

CSA = (Pi)[(D)^2]/[(4)(144)] = 3.1416*(120.00^0.5)/(4*144)= 78.540 ft2 78.540

Qact = (Vs)*CSA*60 = 28.219*78.540*60 = 132978.3 acfm

$$Qsd = \frac{(Qact)(1\text{-}Bws)(528)(Ps)}{(Ts)(29.92)} = \frac{132{,}978.3*(1 - 0.1870)*528*29.97}{598.1*29.92}$$

= 95589.77 dscfm 95589.77 dscfm

| Rayonier | Scrubber A | Normal | Unit: | Scrubber A |
|---|---|---|---|---|

MOLECULAR WEIGHT DETERMINATION
EPA METHOD 3 CALCULATIONS

| Parameter | | Definition | Units |
|---|---|---|---|
| Md | - | Sample Gas Molecular Weight, Dry Basis | lb/lb-mole |
| Ms | - | Sample Gas Molecular Weight, Wet Basis | lb/lb-mole |
| Bws | - | Moisture Content | mole fraction |
| %CO2 | - | Carbon Dioxide Concentration, Dry Basis | % Volume |
| %CO | - | Carbon Monoxide Concentration, Dry Basis | % Volume |
| %O2 | - | Oxygen Concentration, Dry Basis | % Volume |
| %N2 | - | Nitrogen Concentration, Dry Basis (gas balance) | % Volume |
| 0.32 | - | Molecular Weight of Oxygen (O2), divided by 100% | lb/lb-mole |
| 0.28 | - | Molecular Weight of Carbon Monoxide, divided by 100% | lb/lb-mole |
| 0.28 | - | Molecular Weight of Nitrogen (N2), divided by 100% | lb/lb-mole |
| 0.44 | - | Molecular Weight of Carbon Dioxide, divided by 100% | lb/lb-mole |
| 18.0 | - | Molecular Weight of Water | lb/lb-mole |

TEST DATA RUN # 1-A

| | | | |
|---|---|---|---|
| Bws = | 0.1870 | %CO = | 0.00 |
| %N2 = | 81.20 | %CO2 = | 7.40 |
| %O2 = | 11.40 | | |

Md = (0.44)(%CO2) + (0.32)(%O2) + (0.28)(%N2 + %CO)

= (0.44)*7.40 + (0.32)*11.40 + (0.28)*(81.20 + 0.00)

= 29.640 lb/lb-mol

Ms = (Md)(1 - Bws) + (18.0)(Bws)

= 29.640*(1 - 0.1870) + 18.0*0.1870

= 27.464 lb/lb-mol

| Rayonier | Scrubber A | Normal | Unit: | Scrubber A |
|---|---|---|---|---|

MOISTURE CONTENT DETERMINATION
EPA METHOD 4 CALCULATIONS

| Parameter | Definition | Units |
|---|---|---|
| Pm - | Absolute Meter Pressure | in. Hg |
| Po - | Average Meter Differential Pressure | in. H2O |
| Ps - | Absolute Stack Gas Pressure | in. Hg |
| Pstd - | Absolute Standard Barometric Pressure (29.92) | in. Hg |
| Pb - | Absolute Barometric Pressure | in. Hg |
| K - | Standard Volume H2O Vapor/Unit Weight Liquid Constant = 0.04715 cu.ft/g | ft3/g |
| Tm - | Average Meter Temperature | degrees R |
| Tstd - | Absolute Standard Temperature (528_R) | degrees R |
| DGMC - | Dry Gas Meter Correction Factor (gamma) | Dimensionless |
| Vlcg - | Total Condensate Collected | grams H20 |
| Vm - | Metered Dry Sample Gas Volume | dcf |
| Vmstd - | Metered Volume at Standard Conditions(528_R, 1atm) | dscf |
| Vwstd - | Volume of Water Vapor Collected, at Standard Conditions (528_R, 1atm) | scf |
| W(sat) - | Vapor Pressure of H2O at Stack Temperature | in. Hg |
| Bws - | Moisture Content | mole fraction |
| Bwd - | Moisture Content | % Volume |

TEST DATA RUN # 1-A

| | | | |
|---|---|---|---|
| Pb = | 29.98 | Tm = | 554 |
| Vm = | 38.487 | Po = | 1.285 |
| Vlcg= | 210.7 | DGMC = | 0.9935 |
| W(sat)= | 5.603402 | Ps = | 29.9675 |

MEASURED MOISTURE CALCULATIONS

Pm = Pb +(Po/13.6) = 29.98 + (1.29/13.6) = 30.074 in. Hg

$$Vmstd = \frac{(Vm)(DGMC)(Pm)(Tstd)}{(Pstd)(Tm)} = \frac{38.487*0.9935*30.07*528}{29.92*554.0} = 36.448 \text{ ft3}$$

Vwstd = (K)(Vlcg) = (0.04715)*(210.7) = 9.935 ft3

Bws = (Vwstd)/{ (Vwstd)+(Vmstd)} = 9.935/(9.935+36.448) = 0.2142 mol frac

Bwd = (Bws)*100 % = 0.2142*100% = 21.42% V

SATURATED MOISTURE CALCULATIONS

B(sat) = W(sat)/Ps = 5.60/29.97 = 0.186983 mol frac

VAPOR PHASE MOISTURE

Bws = 0.186983 Lower of Measured or Saturated Moisture

Bwd = (Bws)*100 % = 18.70%

| Rayonier | Scrubber A | Normal | Unit: | Scrubber A |
|---|---|---|---|---|

ISOKINETIC SAMPLING RATE
EPA METHOD 5 CALCULATIONS

| Parameter | | Definition | Units |
|---|---|---|---|
| K4 | - | Constant = 0.09450 | |
| Ts | - | Average Stack Temperature | degrees R |
| Vmstd | - | Metered Volume at Standard Conditions(528_R, 1atm) | dscf |
| Ps | - | Absolute Stack Gas Pressure | in. Hg |
| Vs | - | Gas Stream Velocity | ft/sec |
| Bws | - | Moisture Content | mole fraction |
| t | - | Sampling Time Duration | minutes |
| Dn | - | Sample Nozzle Diameter | inches |
| An | - | Area of Nozzle | ft2 |
| %I | - | Percent of Isokinetic Sampling | % |

TEST DATA RUN # 1-A

| | | | |
|---|---|---|---|
| Ts = | 598.125 | Vs = | 28.21887 |
| Vmstd = | 36.44779 | Bws = | 0.186983 |
| Ps = | 29.9675 | Dn = | 0.31 |
| t = | 60 | | |

An = (Pi)[(Dn)^2]/[(4)(144)]

= 3.1416*(0.310^0.5)/(4*144)

= 5.24E-04 ft2      5.24E-04 ft2

$$\%I = \frac{K4(Ts)(Vmstd)}{(Ps)(Vs)(An)(t)(1-Bws)}$$

$$= \frac{0.09450*598.1*36.448}{29.97*28.22*0.0005241*60.0(1 - 0.187)}$$

= 95.28 % Isokinetic      95.28028 %

| Rayonier | Scrubber A | Normal | Unit: | Scrubber A |
|---|---|---|---|---|

## PARTICULATE MATTER EMISSIONS
## EPA METHOD 5 CALCULATIONS

| Parameter | | Definition | Units |
|---|---|---|---|
| Mn | - | Total Mass of Particulate Matter Collected | grams |
| Vmstd | - | Metered Volume at Standard Conditions(528_R, 1atm) | dscf |
| Qsd | - | Volumetric Flow Rate at Standard Conditions,Dry Basis | dscfm |
| Cs | - | Concentration of Particulate Matter in Gas | gr/dscf |
| ER | - | Particulate Matter Emission Rate | lb/hr |
| 15.43 | - | Conversion Factor (grains/gram) | gr/g |
| 7000 | - | Conversion Factor (grains/lb) | gr/lb |
| 60 | - | Conversion Factor (minutes/hour) | min/hr |

TEST DATA RUN # 1-A

Mn = 0.0921
Vmstd = 36.44779
Qsd = 95589.77

$$Cs = \frac{(Mn)*15.43}{(Vmstd)} = \frac{0.09210*15.43}{36.448} = 0.03900 \text{ gr/dscf}$$

ER = (Cs)(Qsd)(60)/7000 = 0.0390*95,589.8*60/7000

= 30.98386 lb/hr     30.98386 lb/hr

| | | | |
|---|---|---|---|
| Fd | - | Dry F Factor (gas volume to heat input ratio) | dscf/MMBtu |
| %O2 | - | Oxygen Concentration, Dry Basis | % Volume |
| E | - | Particulate Matter Emission Rate | lb/MMBtu |

$$E = \frac{(Cs)(Fd)(20.9)}{(7000)(20.9\text{-}\%O2)} = \frac{\#N/A}{7000*(20.9 - 11.4)} = \#N/A \text{ lb/MMBtu}$$

# APPENDIX B

# FIELD DATA SHEETS

## STACS ISOKINETIC SAMPLING FIELD DATA SHEET

| | | | | | |
|---|---|---|---|---|---|
| Facility: | Rayonier | Meter #: | A5 | Baro. Press: | 29.98 | 
| Unit: | scrubber A | DH@: | 1.781 | Ambient Temp: | 90 |
| Location: | | DGM Factor: | .9935 | Nozzle Dia: | .310 |
| Test Type: | MS | Pitot #: | 18 | Static P: | -.17 |
| Run #: | 1A | Pitot Coef: | .84 | Stack Dimensions: | 120 |
| Condition: | | | | Stack Height: | ~150' |
| Operator(s): | JBP / FLG | K-Factor: | 6 | Init. Leak Check: | 0.003 cfm@ 15 "Hg |
| Date: | 6-10-04 | Filter#: | 495 | Final Leak Check: | 0.001 cfm@ 10 "Hg |

Page #: 1 Pitot LC: ✓

| Traverse Point Number | Time | Gas Meter Reading Vm(ft3) | Velocity Head ("H2O) | Orifice Press. ("H2O) | Stack Temp (F) | Probe Temp (F) | Filter Temp (F) | Impinger Temp (F) | Dry Gas Meter Temp. Inlet (F) | Dry Gas Meter Temp. Outlet (F) | Vacuum ("Hg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1203 | 75.883 | | | | | | | | | |
| A 1 | 1205.5 | 77.6 | .25 | 1.5 | 137 | 261 | 244 | 67 | 90 | 90 | 2 |
| 2 | 1208 | 79.3 | .21 | 1.3 | 136 | 260 | 246 | 65 | 92 | 92 | 2 |
| 3 | 1210.5 | 80.9 | .22 | 1.3 | 137 | 260 | 244 | 64 | 92 | 92 | 2 |
| 4 | 1213 | 82.5 | .2 | 1.2 | 138 | 256 | 245 | 63 | 93 | 93 | 2 |
| 5 | 1215.5 | 84.0 | .24 | 1.5 | 138 | 257 | 245 | 62 | 93 | 93 | 2 |
| 6 | 1218 | 85.6 | .22 | 1.3 | 140 | 256 | 244 | 62 | 93 | 93 | 2 |
| 7 | 1220.5 | 87.3 | .25 | 1.5 | 139 | 256 | 244 | 63 | 93 | 93 | 2 |
| 8 | 1223 | 89.0 | .22 | 1.3 | 139 | 257 | 243 | 63 | 94 | 94 | 2 |
| 9 | 1225.5 | 90.5 | .19 | 1.1 | 140 | 255 | 243 | 63 | 94 | 94 | 2 |
| 10 | 1228 | 92.0 | .19 | 1.1 | 140 | 254 | 245 | 63 | 94 | 94 | 2 |
| 11 | 1230.5 | 93.3 | .15 | .9 | 128 | 252 | 241 | 63 | 94 | 94 | 2 |
| 12 | 1233 | 94.687 | .14 | .84 | 132 | 252 | 244 | 64 | 94 | 94 | 2 |
| stop | 1235 | 94.705 | LC | 0.002 | @ 12"Hg | | | | | | |
| B 1 | 1237.5 | 96.1 | .16 | 1.0 | 137 | 251 | 244 | 66 | 95 | 95 | 2 |
| 2 | 1240 | 97.4 | .16 | 1.0 | 138 | 252 | 245 | 64 | 95 | 95 | 2 |
| 3 | 1242.5 | 99.1 | .23 | 1.4 | 141 | 252 | 251 | 64 | 95 | 95 | 2 |
| 4 | 1245 | 100.8 | .23 | 1.4 | 140 | 253 | 252 | 64 | 95 | 95 | 2 |
| 5 | 1247.5 | 102.4 | .22 | 1.3 | 140 | 245 | 248 | 63 | 95 | 95 | 2 |
| 6 | 1250 | 104.1 | .25 | 1.5 | 140 | 252 | 246 | 63 | 95 | 95 | 2 |
| 7 | 1252.5 | 105.9 | .28 | 1.6 | 140 | 252 | 246 | 63 | 95 | 95 | 2 |
| 8 | 1255 | 107.7 | .27 | 1.6 | 141 | 254 | 256 | 63 | 95 | 95 | 2 |
| 9 | 1257.5 | 109.5 | .24 | 1.5 | 139 | 259 | 252 | 64 | 95 | 95 | 2 |
| 10 | 1300 | 111.3 | .25 | 1.5 | 139 | 258 | 253 | 64 | 95 | 95 | 2 |
| 11 | 1302.5 | 112.9 | .19 | 1.1 | 138 | 258 | 258 | 64 | 95 | 95 | 2 |
| 12 | 1305 | 114.388 | .18 | 1.1 | 138 | 255 | 256 | 65 | 95 | 95 | 2 |
| | | 38.487 | | | 138.1 | | | | | 94 | |
| | | | | 1.285 | | | | | | | |
| | | | .4609 | | | | | | | | |
| | | 36.6158 | | | | | | | | | |
| | | | | | | Bws = | .2132 | | | | |
| | | | | | | | | Q = | 93,581 | | |
| | | | | | | | | | 97.8 | %I | |
| Avg/Tot. | | | | | | | | | | | |

| Impinger | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Final | 290 | 112 | | 212.4 | |
| Initial | 100 | 100 | | 203.7 | |
| Total | | | | | 210.7 |
| ORSAT/CEM | 1 | 2 | 3 | 4 | |
| O2 | | | | | |
| CO2 | | | | | |

Total Traverse Point %'s

6 Point (4.4) (14.6) (29.6) (70.4) (85.4) (95.6)

12 Point (2.1)(6.7)(11.8)(17.7)(25.0)(35.6)(64.4)(75.0)(82.3)(88.2)(93.3)(97.9)

Note: Nearest upstream disturbance or exit must be 2 duct diameters away and nearest downstream disturbance must be at least 8 diameters away to use 6 points per traverse.

# STACS ISOKINETIC SAMPLING FIELD DATA SHEET

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Facility: | RAYONIER | Meter #: | A-5 | Baro. Press: | 29.98 | Page #: | 1 |
| Unit: | Scrubber A | DH@: | 1.781 | Ambient Temp: | 85 | Pitot LC: | ✓ |
| Location: | | DGM Factor: | 0.9935 | Nozzle Dia: | .310 | | |
| Test Type: | M5 | Pitot #: | P18 | Static P: | -.16 | | |
| Run #: | 2-A | Pitot Coef: | 84 | Stack Dimensions: | 120" | | |
| Condition: | | | | Stack Height: | ~150' | | |
| Operator(s): | JBP / SC | K-Factor: | 6 | Init. Leak Check: | 0.004 cfm@ 15 "Hg | | |
| Date: | 6-10-04 | Filter#: | 472 | Final Leak Check: | 0.002 cfm@ 10 "Hg | | |

| Traverse Point Number | Time | Gas Meter Reading Vm(ft3) | Velocity Head ("H2O) | Orifice Press. ("H2O) | Stack Temp (F) | Probe Temp (F) | Filter Temp (F) | Impinger Temp (F) | Dry Gas Meter Temp. Inlet (F) | Dry Gas Meter Temp. Outlet (F) | Vacuum ("Hg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1443 | 15.217 | | | | | | | | | |
| A1 | 1445.5 | 16.9 | .23 | 1.4 | 138 | 251 | 249 | 66 | 84 | 84 | 3 |
| 2 | 1448 | 18.5 | .22 | 1.3 | 137 | 252 | 247 | 62 | 84 | 84 | 3 |
| 3 | 1450.5 | 20.1 | .24 | 1.4 | 138 | 244 | 247 | 62 | 83 | 83 | 3 |
| 4 | 1453 | 21.9 | .24 | 1.4 | 135 | 244 | 249 | 63 | 83 | 83 | 3 |
| 5 | 1455.5 | 23.5 | .25 | 1.5 | 136 | 247 | 248 | 63 | 84 | 84 | 3 |
| 6 | 1458 | 25.1 | .26 | 1.6 | 135 | 248 | 246 | 63 | 83 | 83 | 3 |
| 7 | 1500.5 | 26.9 | .28 | 1.7 | 136 | 249 | 247 | 63 | 83 | 83 | 3 |
| 8 | 1503 | 28.7 | .30 | 1.8 | 136 | 249 | 249 | 64 | 83 | 83 | 3 |
| 9 | 1505.5 | 30.8 | .31 | 1.8 | 137 | 244 | 257 | 64 | 84 | 84 | 3 |
| 10 | 1508 | 32.5 | .26 | 1.6 | 137 | 245 | 257 | 64 | 84 | 84 | 3 |
| 11 | 1510.5 | 34.2 | .24 | 1.4 | 136 | 248 | 255 | 64 | 84 | 84 | 3 |
| 12 | 1513 | 35.992 | .21 | 1.3 | 136 | 253 | 254 | 64 | 84 | 84 | 3 |
| STOP | 1515 | 36.017 | LC | 0.004 @ 10"Hg | | | | | | | |
| B1 | 1517.5 | 37.6 | .22 | 1.3 | 137 | 246 | 260 | 66 | 84 | 84 | 3 |
| 2 | 1520 | 39.3 | .22 | 1.3 | 137 | 247 | 252 | 64 | 85 | 85 | 3 |
| 3 | 1522.5 | 40.9 | .24 | 1.4 | 137 | 249 | 249 | 64 | 85 | 85 | 3 |
| 4 | 1525 | 42.6 | .23 | 1.4 | 136 | 247 | 256 | 65 | 85 | 85 | 3 |
| 5 | 1527.5 | 44.4 | .27 | 1.6 | 136 | 247 | 246 | 62 | 85 | 85 | 3 |
| 6 | 1530 | 46.1 | .25 | 1.5 | 136 | 243 | 243 | 61 | 85 | 85 | 3 |
| 7 | 1532.5 | 47.8 | .26 | 1.6 | 136 | 245 | 244 | 61 | 85 | 85 | 3 |
| 8 | 1535 | 49.6 | .27 | 1.6 | 137 | 249 | 247 | 62 | 85 | 85 | 3 |
| 9 | 1537.5 | 51.3 | .23 | 1.4 | 135 | 248 | 244 | 62 | 85 | 85 | 3 |
| 10 | 1540 | 52.8 | .2 | 1.2 | 134 | 248 | 249 | 62 | 85 | 85 | 3 |
| 11 | 1542.5 | 54.2 | .18 | 1.1 | 133 | 248 | 243 | 63 | 85 | 85 | 3 |
| 12 | 1545 | 55.588 | .16 | .96 | 133 | 249 | 246 | 63 | 85 | 83 | 3 |
| | | | | 1.44 | | | | | | 84.3 | |
| | | | .4891 | | 136 | | | | | | |
| | | 40.346 | | | | | | | | | |
| | | 39.0833 | | | | | | | | | |
| | | | | | | Bws = | .1949 | | | | |
| | | | | | | | | Φ = | 10/,107 | | |
| | | | | | | | | 96.6 | % I | | |
| Avg/Tot. | | | | | | | | | | | |

| Impinger | 1 | 2 | 3 | 199.6 4 | 5 |
|---|---|---|---|---|---|
| Final | 285 | 106 | | | |
| Initial | 100 | 100 | | 189.7 | |
| Total | | | | | 200.9 |
| ORSAT/CEM | 1 | 2 | 3 | 4 | |
| O2 | | | | | |
| CO2 | 7.5 | | | | |

| Total | Traverse Point %'s |
|---|---|
| 6 Point | (4.4) (14.6) (29.6) (70.4) (85.4) (95.6) |
| 12 Point | (2.1)(6.7)(11.8)(17.7)(25.0)(35.6)(64.4)(75.0)(82.3)(88.2)(93.3)(97.9) |

Note: Nearest upstream disturbance or exit must be 2 duct diameters away and nearest downstream disturbance must be at least 8 diameters *away to use 6 points per traverse.*

## STACS ISOKINETIC SAMPLING FIELD DATA SHEET

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Facility: | Rayonier | Meter #: | A-5 | Baro. Press: | 29.88 | Page #: | 1 |
| Unit: | Scrubber A | DH@: | 1.781 | Ambient Temp: | 80 | Pitot LC: | ✓ |
| Location: | | DGM Factor: | 0.9935 | Nozzle Dia: | .310 | | |
| Test Type: | M5 | Pitot #: | | Static P: | -0.14 | | |
| Run #: | 3-A | Pitot Coef: | .84 | Stack Dimensions: | 120" | | |
| Condition: | | | | Stack Height: | ~150' | | |
| Operator(s): | JBP/SC | K-Factor: | 5.8 | Init. Leak Check: | 0.000 cfm@ 11 "Hg | | |
| Date: | 6-10-04 | Filter#: | | Final Leak Check: | 0.000 cfm@ 6 "Hg | | |

| Traverse Point Number | Time | Gas Meter Reading Vm(ft3) | Velocity Head ("H2O) | Orifice Press. ("H2O) | Stack Temp (F) | Probe Temp (F) | Filter Temp (F) | Impinger Temp (F) | Dry Gas Meter Temp. Inlet (F) | Dry Gas Meter Temp. Outlet (F) | Vacuum ("Hg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1737 | 56.167 | | | | | | | | | |
| A 1 | 1739.5 | 57.6 | .21 | 1.2 | 139 | 256 | 252 | 64 | 83 | | 2 |
| 2 | 1742 | 59.321 | .21 | 1.2 | 140 | 257 | 251 | 60 | 83 | | 2 |
| 3 | 1744.5 | 60.8 | .22 | 1.3 | 141 | 256 | 248 | 58 | 83 | | 2 |
| 4 | 1747 | 62.37 | .22 | 1.3 | 141 | 255 | 249 | 58 | 83 | | 3 |
| 5 | 1749.5 | 63.9 | .25 | 1.5 | 142 | 253 | 250 | 58 | 84 | | 3 |
| 6 | 1752 | 65.6 | .24 | 1.4 | 142 | 251 | 250 | 58 | 84 | | 3 |
| 7 | 1754.5 | 67.1 | .27 | 1.6 | 141 | 250 | 253 | 59 | 84 | | 3 |
| 8 | 1757 | 69.1 | .26 | 1.5 | 142 | 248 | 253 | 59 | 84 | | 4 |
| 9 | 1759.5 | 71.3 | .2 | 1.2 | 141 | 254 | 254 | 59 | 84 | | 3 |
| 10 | 1802 | 72.7 | .19 | 1.1 | 140 | 256 | 255 | 59 | 84 | | 3 |
| 11 | 1804.5 | 73.7 | .17 | .99 | 139 | 255 | 255 | 60 | 84 | | 3 |
| 12 | 1807 | 74.676 | .16 | .93 | 138 | 251 | 253 | 60 | 84 | | 3 |
| stop | 1809 | 74.672 | | LC | 0.00 | @ 10 "Hg | | | | | |
| B 1 | 1811.5 | 76.8 | .18 | 1.0 | 139 | 253 | 258 | 63 | 84 | | 3 |
| 2 | 1814 | 78.6 | .19 | 1.1 | 140 | 256 | 247 | 60 | 84 | | 3 |
| 3 | 1816.5 | 80.4 | .21 | 1.2 | 141 | 256 | 249 | 61 | 83 | | 3 |
| 4 | 1819 | 82.2 | .22 | 1.3 | 141 | 257 | 256 | 61 | 83 | | 4 |
| 5 | 1821.5 | 83.6 | .27 | 1.6 | 140 | 256 | 253 | 61 | 83 | | 4 |
| 6 | 1824 | 84.7 | .26 | 1.5 | 138 | 255 | 254 | 61 | 83 | | 4 |
| 7 | 1826.5 | 86.2 | .24 | 1.4 | 139 | 256 | 255 | 62 | 83 | | 4 |
| 8 | 1829 | 87.4 | .23 | 1.3 | 139 | 253 | 255 | 61 | 83 | | 4 |
| 9 | 1831.5 | 88.8 | .23 | 1.3 | 138 | 254 | 254 | 62 | 83 | | 4 |
| 10 | 1834 | 90.2 | .22 | 1.3 | 137 | 257 | 257 | 62 | 83 | | 3 |
| 11 | 1836.5 | 91.7 | .21 | 1.2 | 137 | 258 | 256 | 62 | 83 | | 3 |
| 12 | 1839 | 93.219 | .18 | 1.0 | 136 | 255 | 256 | 62 | 83 | | 3 |
| Avg/Tot. | | | | | | | | | | | |

Nozzle Calibration: ① ⊖ ⊘

| Impinger | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Final | 292 | 193 | | | 207.4 |
| Initial | 100 | 100 | | | 198.8 |
| Total | | | | | 248.6 |

| ORSAT/CEM | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| O2 | | | | |
| CO2 | 7.4 | | | |

Total Traverse Point %'s

6 Point (4.4) (14.6) (29.6) (70.4) (85.4) (95.6)

12 Point (2.1)(6.7)(11.8)(17.7)(25.0)(35.6)(64.4)(75.0)(82.3)(88.2)(93.3)(97.9)

Note: Nearest upstream disturbance or exit must be 2 duct diameters away and nearest downstream disturbance must be at least 8 diameters away to use 6 points per traverse.

## STACS ISOKINETIC SAMPLING FIELD DATA SHEET

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Facility: | RAYONIER | Meter #: | A-7 | Baro. Press: | 29.94 | Page #: | 1 |
| Unit: | SCRUBBER B | DH@: | 1.785 | Ambient Temp: | 85 | Pitot LC: | ✓ |
| Location: | | DGM Factor: | 1.0095 | Nozzle Dia: | .310 | | |
| Test Type: | M29 | Pitot #: | P18 | Static P: | -.23 | | |
| Run #: | 1 | Pitot Coef: | .84 | Stack Dimensions: | 120 | | |
| Condition: | | | | Stack Height: | ~150 | | |
| Operator(s): | JBP / SC | K-Factor: | 6.5 | Init. Leak Check: | 0.004 cfm@ | 15 | "Hg |
| Date: | 6-9-04 | Filter#: | 496 | Final Leak Check: | 0 cfm@ | 10 | "Hg |

| Traverse Point Number | Time | Gas Meter Reading Vm(ft3) | Velocity Head ("H2O) | Orifice Press. ("H2O) | Stack Temp (F) | Probe Temp (F) | Filter Temp (F) | Impinger Temp (F) | Dry Gas Meter Temp. Inlet (F) | Dry Gas Meter Temp. Outlet (F) | Vacuum ("Hg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1230 | 10.188 | | | | | | | | | |
| A 1 | 1232.5 | 11.8 | .2 | 1.3 | 147 | 247 | 258 | 66 | 87 | 87 | 3 |
| 2 | 1235 | 13.5 | .24 | 1.6 | 146 | 242 | 260 | 64 | 85 | 85 | 3 |
| 3 | 1237.5 | 15.5 | .3 | 1.9 | 146 | 246 | 261 | 57 | 81 | 81 | 4 |
| 4 | 1240 | 17.1 | .25 | 1.6 | 146 | 247 | 253 | 59 | 81 | 81 | 4 |
| 5 | 1242.5 | 19.0 | .36 | 2.2 | 147 | 244 | 255 | 60 | 81 | 81 | 4 |
| 6 | 1245 | 20.9 | .33 | 2.1 | 147 | 247 | 250 | 61 | 81 | 81 | 5 |
| 7 | 1247.5 | 23.1 | .4 | 2.6 | 146 | 242 | 243 | 61 | 81 | 81 | 6 |
| 8 | 1250 | 24.9 | .31 | 2.0 | 147 | 248 | 258 | 62 | 81 | 81 | 5 |
| 9 | 1252.5 | 27.0 | .32 | 2.0 | 145 | 245 | 253 | 62 | 81 | 81 | 5 |
| 10 | 1255 | 28.8 | .31 | 2.0 | 146 | 242 | 246 | 62 | 81 | 81 | 5 |
| 11 | 1257.5 | 31.0 | .33 | 2.2 | 145 | 250 | 249 | 63 | 81 | 81 | 6 |
| 12 | 1300 | 32.907 | .34 | 2.2 | 145 | 256 | 251 | 63 | 81 | 81 | 6 |
| STOP | 1302 | 32.921 | | | | | | | | | |
| B 12 | 1304.5 | 34.9 | .32 | 2.1 | 146 | 243 | 261 | 63 | 81 | 81 | 7 |
| 11 | 1307 | 36.7 | .24 | 1.6 | 145 | 256 | 262 | 63 | 81 | 81 | 6 |
| 10 | 1309.5 | 38.3 | .22 | 1.4 | 145 | 253 | 252 | 63 | 81 | 81 | 5 |
| 9 | 1312 | 40.1 | .19 | 1.3 | 145 | 258 | 253 | 64 | 82 | 82 | 5 |
| 8 | 1314.5 | 41.6 | .21 | 1.4 | 145 | 254 | 248 | 64 | 81 | 81 | 5 |
| 7 | 1317 | 43.2 | .23 | 1.5 | 144 | 256 | 247 | 64 | 81 | 81 | 5 |
| 6 | 1319.5 | 45.0 | .26 | 1.7 | 143 | 255 | 256 | 63 | 82 | 82 | 6 |
| 5 | 1322 | 46.8 | .27 | 1.7 | 144 | 255 | 257 | 62 | 82 | 82 | 7 |
| 4 | 1323.5 | 47.683 | .23 | 1.5 | 144 | 258 | 252 | 62 | 81 | 81 | 7 |
| ~~3~~ | ~~1327~~ | | LOST | BARK | 1323.5 | | | | | | |
| ~~2~~ | ~~1329.5~~ | | | | | | | | | | |
| ~~1~~ | ~~1332~~ | | | | | | | | | | |
| | 1352 | 47.693 | | | | | | | | | |
| 4 | 1353 | 48.4 | .22 | 1.5 | 142 | 252 | 249 | 65 | 80 | 80 | 7 |
| 3 | 1355.5 | 50.1 | .22 | 1.4 | 142 | 254 | 255 | 62 | 81 | 81 | 7 |
| 2 | 1358 | 51.6 | .20 | 1.3 | 142 | 257 | 257 | 61 | 81 | 81 | 6 |
| 1 | 1400.5 | 53.241 | .22 | 1.4 | 142 | 255 | 256 | 62 | 81 | 81 | 6 |
| | | | | | | | | | | | |
| | | | | 1.813 | | | | | | | |
| | | 43.039 | | | 144.9 | | | | | 81.5 | |
| | | | .5167 | | | | | | | | |
| | | | | | | | | | | | |
| | | 42.547 | | | | | | | 11 | | |
| | | | | | | | Bws = .2611 | | | | |
| | | | | | | | | | 95.69 | | |
| Avg/Tot. | | | | | | | | | | | |

| Impinger | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Final | | | | | |
| Initial | | | | | |
| Total | | | | | 319.4 |

| ORSAT/CEM | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| O2 | 11.8 | | | |
| CO2 | 7.9 | | | |

Total Traverse Point %'s

6 Point (4.4) (14.6) (29.6) (70.4) (85.4) (95.6)

12 Point (2.1)(6.7)(11.8)(17.7)(25.0)(35.6)(64.4)(75.0)(82.3)(88.2)(93.3)(97.9)

Note: Nearest upstream disturbance or exit must be 2 duct diameters away and nearest downstream disturbance must be at least 8 diameters away to use 6 points per traverse.

## STACS ISOKINETIC SAMPLING FIELD DATA SHEET

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Facility: | RAYONIER | Meter #: | A-7 | Baro. Press: | 29.94 | Page #: | 1 |
| Unit: | Scrubber B | DH@: | 1.785 | Ambient Temp: | 80 | Pitot LC: | ✓ |
| Location: | | DGM Factor: | 1.0095 | Nozzle Dia: | .30 | | |
| Test Type: | M29 | Pitot #: | P18 | Static P: | -.20 | | |
| Run #: | 2 | Pitot Coef: | .84 | Stack Dimensions: | 120" | | |
| Condition: | | | | Stack Height: | ~150' | | |
| Operator(s): | JBP | K-Factor: | 6.8 | Init. Leak Check: | 0.010 cfm@ 15 "Hg | | |
| Date: | 6/9/04 | Filter#: | | Final Leak Check: | 0.000 cfm@ 14 "Hg | | |

| Traverse Point Number | Time | Gas Meter Reading Vm(ft3) | Velocity Head ("H2O) | Orifice Press. ("H2O) | Stack Temp (F) | Probe Temp (F) | Filter Temp (F) | Impinger Temp (F) | Dry Gas Meter Temp. Inlet (F) | Dry Gas Meter Temp. Outlet (F) | Vacuum ("Hg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1530 | 53.432 | | | | | | | | | |
| B 1 | 1532.5 | 55.1 | .2 | 1.3 | 144 | 257 | 260 | 64 | 77 | 77 | 3 |
| 2 | 1535 | 56.7 | .22 | 1.4 | 143 | 255 | 257 | 60 | 78 | 78 | 3 |
| 3 | 1537.5 | 58.2 | .24 | 1.5 | 142 | 254 | 257 | 60 | 78 | 78 | 3 |
| 4 | 1540 | 60.0 | .23 | 1.4 | 142 | 257 | 257 | 61 | 78 | 78 | 3 |
| 5 | 1542.5 | 61.7 | .24 | 1.5 | 143 | 255 | 257 | 61 | 78 | 78 | 3 |
| 6 | 1545 | 63.2 | .18 | 1.2 | 142 | 252 | 256 | 61 | 78 | 78 | 3 |
| 7 | 1547.5 | 64.7 | .20 | 1.3 | 143 | 250 | 256 | 61 | 78 | 78 | 3 |
| 8 | 1550 | 66.2 | .22 | 1.4 | 143 | 254 | 257 | 61 | 79 | 79 | 3 |
| 9 | 1552.5 | 68.0 | .25 | 1.6 | 143 | 256 | 254 | 61 | 79 | 79 | 3 |
| 10 | 1555 | 69.8 | .26 | 1.6 | 145 | 257 | 252 | 62 | 79 | 79 | 3 |
| 11 | 1557.5 | 71.4 | .26 | 1.6 | 144 | 252 | 259 | 62 | 79 | 79 | 4 |
| 12 | 1600 | 73.226 | .27 | 1.7 | 144 | 251 | 257 | 62 | 80 | 80 | 4 |
| STOP | 1602 | 73.239 | LC | 0.008 | @ 12"Hg | | | | | | |
| A 12 | 1604.5 | 75.0 | .26 | 1.6 | 141 | 252 | 258 | 66 | 80 | 80 | 4 |
| 11 | 1607 | 76.7 | .27 | 1.7 | 141 | 252 | 259 | 64 | 80 | 80 | 4 |
| 10 | 1609.5 | 78.4 | .19 | 1.2 | 141 | 253 | 259 | 63 | 80 | 80 | 3 |
| 9 | 1612 | 80.0 | .24 | 1.5 | 141 | 251 | 258 | 63 | 80 | 80 | 3 |
| 8 | 1614.5 | 81.5 | .25 | 1.5 | 143 | 252 | 259 | 63 | 81 | 81 | 3 |
| 7 | 1617 | 83.1 | .27 | 1.6 | 143 | 252 | 259 | 63 | 81 | 81 | 3 |
| 6 | 1619.5 | 84.3 | .17 | 1.0 | 143 | 251 | 258 | 62 | 81 | 81 | 3 |
| 5 | 1622 | 85.9 | .15 | .9 | 143 | 253 | 258 | 62 | 81 | 81 | 3 |
| 4 | 1624.5 | 87.153 | .12 | .72 | 143 | 255 | 254 | 62 | 81 | 81 | 3 |
| 3 | 1627 | 88.5 | .15 | .9 | 143 | 250 | 250 | 61 | 81 | 81 | 3 |
| 2 | 1629.5 | 89.9 | .17 | 1.0 | 143 | 251 | 252 | 61 | 81 | 81 | 3 |
| 1 | 1632 | 91.588 | .19 | 1.2 | 143 | 252 | 254 | 61 | 81 | 81 | 3 |
| | | | | | | | | | | 79.5 | |
| | | 38.143 | | | | | | | | | |
| | | | .463 | | 142.8 | | | | | | |
| | | 37.8697 | | 1.347 | | | | | | | |
| | | | | | Bws = .2926 | | | | 105% I | | |
| | | | | | | | Q = 90,133 | | | | |
| Avg/Tot. | | | | | | | | | | | |

| Impinger | 1 | 2 | 3 | 4 | 5 | Total |
|---|---|---|---|---|---|---|
| Final | | | | | | |
| Initial | | | | | | |
| Total | | | | | 257.6 | |

| ORSAT/CEM | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| O2 | 12.4 | | | |
| CO2 | 7.3 | | | |

Traverse Point %'s

6 Point (4.4) (14.6) (29.6) (70.4) (85.4) (95.6)

12 Point (2.1)(6.7)(11.8)(17.7)(25.0)(35.6)(64.4)(75.0)(82.3)(88.2)(93.3)(97.9)

Note: Nearest upstream disturbance or exit must be 2 duct diameters away and nearest downstream disturbance must be at least 8 diameters away to use 6 points per traverse.

# STACS ISOKINETIC SAMPLING FIELD DATA SHEET

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Facility: | A[illegible]UIER | Meter #: | 47 | Baro. Press: | 29.94 | Page #: | 1 |
| Unit: | | DH@: | 1.785 | Ambient Temp: | 78 | Pitot LC: | ✓ |
| Location: | Scrubber B | DGM Factor: | 1.0095 | Nozzle Dia: | .310 | | |
| Test Type: | M29 | Pitot #: | 18 | Static P: | -.17 | | |
| Run #: | 3 | Pitot Coef: | .84 | Stack Dimensions: | 120" | | |
| Condition: | | | | Stack Height: | ~150' | | |
| Operator(s): | JBP | K-Factor: | 6 | Init. Leak Check: | 0.002 cfm@ 15 "Hg | | |
| Date: | 6-9-04 | Filter#: | | Final Leak Check: | .0 cfm@ 10 "Hg | | |

| Traverse Point Number | Time | Gas Meter Reading Vm(ft3) | Velocity Head | Orifice Press. | Stack Temp | Probe Temp | Filter Temp | Impinger Temp | Dry Gas Meter Temp. Inlet | Dry Gas Meter Temp. Outlet | Vacuum |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1756 | 873.28 | ("H2O) | ("H2O) | (F) | (F) | (F) | (F) | (F) | (F) | ("Hg) |
| A1 | 1758.5 | 89.0 | .20 | 1.2 | 144 | 249 | 251 | 64 | 78 | 78 | 3 |
| 2 | 1801 | 90.6 | .21 | 1.2 | 143 | 250 | 252 | 63 | 79 | 79 | 3 |
| 3 | 1803.5 | 92.1 | .21 | 1.2 | 143 | 251 | 257 | 57 | 79 | 79 | 3 |
| 4 | 1806 | 93.6 | .24 | 1.4 | 145 | 252 | 259 | 58 | 79 | 79 | 3 |
| 5 | 1808.5 | 95.2 | .24 | 1.4 | 144 | 252 | 256 | 58 | 79 | 79 | 3 |
| 6 | 1811 | 96.9 | .26 | 1.5 | 144 | 248 | 256 | 59 | 79 | 79 | 3 |
| 7 | 1813.5 | 98.5 | .25 | 1.5 | 142 | 249 | 257 | 60 | 79 | 79 | 3 |
| 8 | 1816 | 100.0 | .24 | 1.4 | 142 | 247 | 258 | 60 | 80 | 80 | 3 |
| 9 | 1818.5 | 101.6 | .26 | 1.5 | 142 | 248 | 253 | 61 | 80 | 80 | 3 |
| 10 | 1821 | 103.4 | .24 | 1.4 | 141 | 248 | 251 | 61 | 80 | 80 | 3 |
| 11 | 1823.5 | 105.0 | .23 | 1.4 | 141 | 249 | 256 | 61 | 80 | 80 | 4 |
| 12 | 1826 | 106.526 | .23 | 1.4 | 141 | 250 | 255 | 62 | 80 | 80 | 4 |
| STOP | 1828 | 106.541 | LC | 0.004 | @15"Hg | | | | | | |
| B1 | 1830.5 | 108.0 | .18 | 1.1 | 141 | 249 | 257 | 65 | 80 | 80 | 3 |
| 2 | 1833 | 109.8 | .19 | 1.1 | 143 | 249 | 250 | 62 | 80 | 80 | 3 |
| 3 | 1835.5 | 111.3 | .21 | 1.2 | 142 | 249 | 253 | 62 | 80 | 80 | 3 |
| 4 | 1838 | 112.8 | .23 | 1.3 | 145 | 251 | 257 | 63 | 81 | 81 | 4 |
| 5 | 1840.5 | 114.4 | .26 | 1.5 | 144 | 250 | 258 | 63 | 80 | 80 | 5 |
| 6 | 1843 | 116.2 | .25 | 1.4 | 143 | 254 | 260 | 64 | 81 | 81 | 5 |
| 7 | 1845.5 | 117.7 | .21 | 1.2 | 144 | 253 | 251 | 64 | 81 | 81 | 5 |
| 8 | 1848 | 119.2 | .22 | 1.3 | 141 | 252 | 256 | 64 | 81 | 81 | 5 |
| 9 | 1850.5 | 120.7 | .21 | 1.2 | 142 | 251 | 255 | 64 | 81 | 81 | 5 |
| 10 | 1853 | 122.1 | .21 | 1.2 | 142 | 253 | 254 | 64 | 81 | 81 | 4 |
| 11 | 1855.5 | 123.5 | .18 | 1.1 | 142 | 251 | 254 | 64 | 81 | 81 | 4 |
| 12 | 1856 | 124.922 | .17 | 1.1 | 142 | 252 | 255 | 65 | 81 | 81 | 4 |
| | | | | | | | | | | 80 | |
| | | | | 1.3 | 142.6 | | | | | | |
| | | 37.579 | | | | | | | | | |
| | | | .4704 | | | | | | | | |
| | | 37.2214 | | | | Bws= | .2458 | | 101.7 | %I | |
| | | | | | | | | Q = | 91,458 | | |
| Avg/Tot. | | | | | | | | | | | |

| Impinger | 1 | 2 | 3 | 4 | 5 | Total |
|---|---|---|---|---|---|---|
| Final | | | | | | |
| Initial | | | | | | |
| Total | | | | | 2576 | |
| ORSAT/CEM | 1 | 2 | 3 | 4 | | |
| O2 | 12.8 | | | | | |
| CO2 | 7.5 | | | | | |

Traverse Point %'s

6 Point (4.4) (14.6) (29.6) (70.4) (85.4) (95.6)

12 Point (2.1)(6.7)(11.8)(17.7)(25.0)(35.6)(64.4)(75.0)(82.3)(88.2)(93.3)(97.9)

*Note: Nearest upstream disturbance or exit must be 2 duct diameters away and nearest downstream disturbance must be at least 8 diameters away to use 6 points per traverse.*

## STACS ISOKINETIC SAMPLING FIELD DATA SHEET

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Facility: | Rayonier | Meter #: | A7 | Baro. Press.: | 30.04 | Page #: | 1 |
| Unit: | SRB | ΔH @ | 1.785 | Ambient Temp: | 80 | Pitot LC: | ✓ |
| Location: | Fernandina | DGM Factor: | 1.0885 | Nozzle Dia: | .252 | | |
| Test Type: | M5 | Pitot #: | P18 | Static P: | -.28 | | |
| Run #: | 1 | Pitot Coef: | .84 | Stack Dimensions: | 88 | | |
| Condition: | | Wet Bulb | | Stack Height: | ~250 | | |
| Operator(s): | JBP | K | 3.0 | Init. Leak Check: | 0.004 Lpm@ 15 "Hg | | |
| Date: | 5-24-04 | | | Final Leak Check: | 0.002 Lpm@ 15 "Hg | | |

| Traverse Point Number | Time | Gas Meter Reading Vm(L3) | Flow ~~Rate~~ ΔP (~~LPM~~) | Meter Press. ("H2O) | Stack Temp (F) | Probe Temp (F) | Impinger Temp (F) | Dry Gas Meter Temp. Inlet (F) | Dry Gas Meter Temp. Outlet (F) | Vacuum ("Hg) | Filter Temp |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1114 | 48.487 | | | | | | | | | |
| A6 | 1119 | 53.2 | 0.9 | 2.7 | 105 | 261 | 57 | 85 | 85 | 4 | 259 |
| 5 | 1124 | 57.6 | 0.95 | 2.8 | 105 | 252 | 59 | 86 | 86 | 5 | 263 |
| 4 | 1129 | 62.2 | .91 | .27 | 105 | 256 | 58 | 86 | 86 | 6 | 258 |
| 3 | 1134 | 68.5 | .88 | 2.65 | 105 | 261 | 59 | 88 | 88 | 7 | 257 |
| 2 | 1139 | 71.2 | .81 | 2.4 | 105 | 245 | 60 | 88 | 88 | 6 | 258 |
| 1 | 1144 | 74.753 | .55 | 1.65 | 105 | 246 | 61 | 90 | 90 | 4 | 262 |
| stop | 1158 | 75.698 | | L.C 0.001 @ 10 "Hg | | | | | | | |
| B6 | 1203 | 80.3 | .95 | 2.8 | 105 | 261 | 65 | 90 | 90 | 5 | 261 |
| 5 | 1208 | 85.0 | .93 | 2.8 | 105 | 260 | 62 | 90 | 90 | 5 | 261 |
| 4 | 1213 | 89.3 | .96 | 2.9 | 105 | 257 | 57 | 91 | 91 | 5 | 260 |
| 3 | 1218 | 93.7 | .92 | 2.8 | 105 | 258 | 58 | 92 | 92 | 5 | 260 |
| 2 | 1223 | 98.3 | .77 | 2.3 | 105 | 258 | 58 | 93 | 93 | 4 | 260 |
| 1 | 1228 | 102.283 | .72 | 2.2 | 105 | 258 | 59 | 93 | 93 | 4 | 264 |
| | | | | | | | | | 89.3 | | |
| | | | | 2.558 | 105 | | | | | | |
| | | 52.851 | | | | | | | 91.5 | | |
| | | | .9218 | | | | | | | | |
| | | | | (2.633) | | | | | | | |
| | | 26.585 | | | | | | | | | |
| | | (25.9482) | | | | | | | | | |
| | | 51.7916 std. | | | | | | | | | |
| | | | | Q = | 108,342 | | | | | | |
| | | | | | Bws = | .0862 | | | | | |
| Avg/Tot. | | | | | | | | | | | |

| Impinger | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Final | 180 | 116 | | 198.5 |
| Initial | 100 | 100 | — | 190.7 |
| Total | 80 | 16 | | 7.8 |
| ORSAT/CEM | 1 | 2 | 3 | 103.8 4 |
| O2 | 4.5 | | | |
| CO2 | 15.0 | | | |

Total Traverse Point %'s

6 Point (4.4) (14.6) (29.6) (70.4) (85.4) (95.6)

12 Point (2.1)(6.7)(11.8)(17.7)(25.0)(35.6)(64.4)(75.0)(82.3)(88.2)(93.3)(97.9)

Note: Nearest upstream disturbance or exit must be 2 duct diameters away and nearest downstream disturbance must be at least 8 diameters away to use 6 points per traverse.

3.9 6.2
12.8 75.2
26 89.1

34

## STACS ISOKINETIC SAMPLING FIELD DATA SHEET

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Facility: | Rayonier | Meter #: | A 7 | Baro. Press: | 30.04 | Page #: | 1 |
| Unit: | SRB | ΔH@ | 1.0095 | Ambient Temp: | 80 | Pitot LC: | ✓ |
| Location: | Stack | DGM Factor: | 1.785 | Nozzle Dia: | .252 | | |
| Test Type: | MS | Pitot #: | P18 | Static P: | -.24 | | |
| Run #: | 2 | Pitot Coef: | .84 | Stack Dimensions: | 88" | | |
| Condition: | | Wet Bulb | | Stack Height: | ~250' | | |
| Operator(s): | JBP | Filter # | 471 | Init. Leak Check: | 0.001 Lpm@ | 15 | "Hg |
| Date: | 5/24/04 | | | Final Leak Check: | 0.002 Lpm@ | 11 | "Hg |

| Traverse Point Number | Time | Gas Meter Reading Vm(L3) | Flow Rate ΔP (~~LPM~~) | Meter Press. ("H2O) | Stack Temp (F) | Probe Temp (F) | Impinger Temp (F) | Dry Gas Meter Temp. Inlet (F) | Dry Gas Meter Temp. Outlet (F) | Vacuum ("Hg) | Filter Box |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1533 | 03.725 | | | | | | | | | |
| A6 | 1538 | 8.3 | .98 | 2.9 | 109 | 254 | 64 | 82 | 82 | 5 | 256 |
| 5 | 1543 | 12.8 | 1.0 | 3.0 | 109 | 258 | 63 | 82 | 82 | 5 | 257 |
| 4 | 1548 | 17.3 | 1.1 | 3.3 | 109 | 248 | 62 | 82 | 82 | 5 | 260 |
| 3 | 1553 | 22.1 | 1.0 | 3.0 | 109 | 253 | 62 | 83 | 83 | 5 | 258 |
| 2 | 1558 | 27.0 | .93 | 2.8 | 109 | 258 | 62 | 83 | 83 | 5 | 258 |
| 1 | 1603 | 30.817 | .70 | 2.1 | 109 | 258 | 62 | 83 | 83 | 4 | 251 |
| STOP | 1605 | 30.836 | | LC 0.001 @ 12"Hg | | | | | | | |
| B6 | 1610 | 35.8 | 1.05 | 3.15 | 109 | 256 | 61 | 83 | 83 | 5 | 255 |
| 5 | 1615 | 40.3 | 1.0 | 3.0 | 109 | 248 | 60 | 83 | 83 | 5 | 249 |
| 4 | 1620 | 45.6 | 1.05 | 3.15 | 109 | 248 | 60 | 83 | 83 | 6 | 251 |
| 3 | 1625 | 49.8 | .95 | 2.9 | 109 | 256 | 61 | 83 | 83 | 6 | 247 |
| 2 | 1630 | 54.7 | .85 | 2.6 | 109 | 247 | 62 | 84 | 84 | 6 | 251 |
| 1 | 1635 | 58.123 | .67 | 2.0 | 109 | 244 | 63 | 84 | 84 | 6 | 250 |
| | | | | | | | | | 829 | | |
| | | | .9670 | | 109 | | | | | | |
| | | 54.379 | | 2.825 | | | | | | | |
| | | 53.9522 scf | | | | | | | | | |
| | | | | | Bws = | .0869 | | | | | |
| | | | | | | Q = | 120,000 | | | | |
| | | | | | | | | 91.4 | %I | | |
| Avg/Tot. | | | | | | | | | | | |

| Impinger | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Final | 188 | 108 | — | 209.3 |
| Initial | 100 | 100 | 0 | 196.3 |
| Total | | | | 13 |
| ORSAT/CEM | 1 | 2 | 3 | 4 109 |
| O2 | 4.5 | | | |
| CO2 | 14.8 | | | |

Total Traverse Point %'s

6 Point (4.4) (14.6) (29.6) (70.4) (85.4) (95.6)

12 Point (2.1)(6.7)(11.8)(17.7)(25.0)(35.6)(64.4)(75.0)(82.3)(88.2)(93.3)(97.9)

Note: Nearest upstream disturbance or exit must be 2 duct diameters away and nearest downstream disturbance must be at least 8 diameters away to use 6 points per traverse.

## STACS ISOKINETIC SAMPLING FIELD DATA SHEET

| | | | | | |
|---|---|---|---|---|---|
| Facility: RAYONIER | Meter #: | A-7 | Baro. Press: | 30.04 | Page #: 1 |
| Unit: SRB | ΔH@ | 1.785 | Ambient Temp: | 82 | Pitot LC: ✓ |
| Location: Stack | DGM Factor: | 1.0095 | Nozzle Dia: | .252 | |
| Test Type: MS | Pitot #: | 118 | Static P: | -.24 | |
| Run #: 3 | Pitot Coef: | .84 | Stack Dimensions: | 88" | |
| Condition: | Wet Bulb | | Stack Height: | ~250' | |
| Operator(s): JBP | | | Init. Leak Check: | 0.001 Lpm@ 15 "Hg | |
| Date: 5-24-04 | Filter # | 465 | Final Leak Check: | .004 Lpm@ 10 "Hg | |

| Traverse Point Number | Time | Gas Meter Reading Vm(L3) | Flow Rate ΔP | Meter Press. ("H2O) | Stack Temp (F) | Probe Temp (F) | Impinger Temp (F) | Dry Gas Meter Temp. Inlet (F) | Dry Gas Meter Temp. Outlet (F) | Vacuum ("Hg) | Filter Box |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1726 | 72.033 | | | | | | | | | |
| A6 | 1731 | 77.0 | 1.0 | 3.0 | 110 | 251 | 60 | 81 | 81 | 5 | 261 |
| 5 | 1736 | 81.9 | 1.05 | 3.15 | 109 | 253 | 60 | 80 | 80 | 5 | 260 |
| 4 | 1741 | 85.8 | 1.0 | 3.0 | 109 | 254 | 60 | 80 | 80 | 5 | 258 |
| 3 | 1746 | 90.5 | 1.0 | 3.0 | 109 | 254 | 60 | 81 | 81 | 5 | 260 |
| 2 | 1751 | 95.4 | .83 | 2.5 | 109 | 246 | 61 | 81 | 81 | 5 | 259 |
| 1 | 1756 | 99.668 | .75 | 2.3 | 109 | 247 | 62 | 81 | 81 | 5 | 249 |
| STOP | 1758 | 99.683 | | LC 0.002 @ 12"Hg | | | | | | | |
| B6 | 1803 | 104.6 | 1.0 | 3.0 | 109 | 244 | 64 | 81 | 81 | 5 | 248 |
| 5 | 1808 | 109.5 | 1.1 | 3.3 | 109 | 247 | 62 | 81 | 81 | 6 | 251 |
| 4 | 1813 | 113.9 | 1.05 | 3.15 | 109 | 249 | 61 | 81 | 81 | 6 | 253 |
| 3 | 1818 | 118.6 | .97 | 2.9 | 109 | 250 | 61 | 80 | 80 | 5 | 254 |
| 2 | 1823 | 122.9 | .78 | 2.3 | 109 | 247 | 62 | 81 | 81 | 5 | 256 |
| 1 | 1828 | 127.088 | .74 | 2.2 | 109 | 247 | 63 | 80 | 80 | 5 | 252 |
| | | | | | | | | | 80.7 | | |
| | | | .9670 | | | | | | | | |
| | | 55.040 | | | 109.1 | | | | | | |
| | | | | 2.817 | | | | | | | |
| | | 54.8291 std | | | | | | | | | |
| | | | | | | Bws | =.0899 | | | | |
| | | | | | | Q = 119,593 | | | | | |
| | | | | | | | | 93.2 | % I | | |
| Avg/Tot. | | | | | | | | | | | |

| Impinger | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Final | 195 | 105 | | 203.5 |
| Initial | 100 | 100 | | 188.5 |
| Total | | | | 115.0 |

| ORSAT/CEM | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| O2 | 4.5 | | | |
| CO2 | 15.0 | | | |

Total Traverse Point %'s

6 Point (4.4) (14.6) (29.6) (70.4) (85.4) (95.6)

12 Point (2.1)(6.7)(11.8)(17.7)(25.0)(35.6)(64.4)(75.0)(82.3)(88.2)(93.3)(97.9)

Note: Nearest upstream disturbance or exit must be 2 duct diameters away and nearest downstream disturbance must be at least 8 diameters away to use 6 points per traverse.

# STACS ISOKINETIC SAMPLING FIELD DATA SHEET

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Facility: | RAYONIER | Meter #: | A7 | Baro. Press: | 29.92 | Page #: | 1 |
| Unit: | SRB | ΔH@ | 1.785 | Ambient Temp: | 75 | Pitot LC: | ✓ |
| Location: | RECOVERY | DGM Factor: | 1.0095 | Nozzle Dia: | .252 | | |
| Test Type: | MS | Pitot #: | P18 | Static P: | -.5 | | |
| Run #: | 4 | Pitot Coef: | .84 | Stack Dimensions: | 88" | | |
| Condition: | | Wet Bulb | | Stack Height: | ~250' | | |
| Operator(s): | JBP | K | 3.0 | Init. Leak Check: | .002 Lpm@ 15 "Hg | | |
| Date: | 5/25/04 | | | Final Leak Check: | 0.000 Lpm@ 17 "Hg | | |

| Traverse Point Number | Time | Gas Meter Reading Vm(ft3) | Flow Rate ("LPM) | Meter Press. ("H2O) | Stack Temp (F) | Probe Temp (F) | Impinger Temp (F) | Dry Gas Meter Temp. Inlet (F) | Dry Gas Meter Temp. Outlet (F) | Vacuum ("Hg) | Filter Temp |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0940 | ~~28.857~~ 830.531 | | | | | | | | | |
| 1-1 | 0945 | 836.010 | 1.0 | 3.0 | 107 | 259 | 60 | 78 | 87 | 2.0 | 265 |
| 2 | 0950 | 840.210 | 1.1 | 3.3 | 106 | 262 | 59 | 80 | 88 | 2.0 | 267 |
| 3 | 0955 | 845.171 | 1.1 | 3.3 | 106 | 256 | 58 | 81 | 84 | 3.0 | 270 |
| 4 | 1000 | 850.200 | 1.2 | 3.6 | 107 | 257 | 57 | 81 | 84 | 7.0 | 276 |
| 5 | 1005 | 854.610 | .90 | 2.75 | 107 | 259 | 56 | 79 | 83 | 7.0 | 274 |
| 6 | 1010 | 858.803 | .75 | 2.25 | 107 | 261 | 56 | 78 | 84 | 6.5 | 275 |
| START- 1012 | | 858.874 | | LK ✓ | 0 @ 10" | LK ✓ | | 0 @ 10" | | | |
| 2-1 | 1017 | 862.910 | .80 | 2.40 | 107 | 260 | 56 | 79 | 85 | 6.0 | 275 |
| 2 | 1022 | 867.715 | .98 | 2.94 | 107 | 261 | 55 | 80 | 85 | 6.0 | 275 |
| 3 | 1027 | 872.651 | 1.1 | 3.3 | 107 | 258 | 55 | 80 | 86 | 7.0 | 277 |
| 4 | 1032 | 877.800 | 1.2 | 3.6 | 107 | 261 | 57 | 81 | 86 | 8.0 | 277 |
| 5 | 1037 | 882.811 | 1.1 | 3.3 | 107 | 259 | 56 | 83 | 87 | 8.5 | 277 |
| 6 | 1042 | 887.557 | 1.0 | 3.0 | 107 | 259 | 57 | 84 | 87 | 8.0 | 281 |
| | | | | | | | | | 82.9 | | |
| | | 56.955 | | 2.978 | 106.8 | | | | | | |
| | | | 1.0071 | | | | | | | | |
| | | 56.3048 | | | | | | | | | |
| | | | | | | | Q = | 124,619 | | | |
| | | | | | | | | | 91.9 %I | | |
| Avg/Tot. | 100 | 100 | | | | | | | | | |

| | | | | |
|---|---|---|---|---|
| Impinger | 180ml 1 | 113ml 2 | 0 3 | 208.2 4 |
| Final | | | | 184.8 |
| Initial | | | | |
| Total | | | | 116.4 |
| ORSAT/CEM | 1 | 2 | 3 | 4 |
| O2 | 4.2 | | | |
| CO2 | 15.3 | | | |

Total Traverse Point %'s

6 Point (4.4) (14.6) (29.6) (70.4) (85.4) (95.6)

12 Point ~~(2.1)(6.7)~~(11.8)(17.7)(25.0)(35.6)(64.4)(75.0)(82.3)(88.2)(93.3)(97.9)

Note: Nearest upstream disturbance or exit must be 2 duct diameters away and nearest downstream disturbance must be at least 8 diameters away to use 6 points per traverse.

# STACS ISOKINETIC SAMPLING FIELD DATA SHEET

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Facility: | RAYONIER | Meter #: | A-7 | Baro. Press: | | Page #: | 1 of 1 |
| Unit: | | | | Ambient Temp: | 75 | Pitot LC: | OK |
| Location: | RECOVERY | DGM Factor: | 1.0095 | Nozzle Dia: .252 | | | |
| Test Type: | #5 | Pitot #: | B18 | Static P: | -.48 | | |
| Run #: | 5 | Pitot Coef: | .84 | Stack Dimensions: | 88" | | |
| Condition: | | Wet Bulb | | Stack Height: | | | |
| Operator(s): | SJC | K-3.0 | | Init. Leak Check: | 0.000 | Lpm@ 14 | "Hg |
| Date: | 5-25-04 | Filter # | 469 | Final Leak Check: | 0.000 | Lpm@ 12 | "Hg |

| Traverse Point Number | Time | Gas Meter Reading Vm(L3) | Flow Rate ("LPM) | Meter Press. ("H2O) | Stack Temp (F) | Probe Temp (F) | Impinger Temp (F) | Dry Gas Meter Temp. Inlet (F) | Dry Gas Meter Temp. Outlet (F) | Vacuum ("Hg) | Filter Temp |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | ~~1117~~ 1118 | 888.999 | | | | | | | | | |
| 1-1 | 1123 | 893.311 | .85 | 2.55 | 108 | 249 | 55 | 88 | 86 | 6.0 | 278 |
| 2 | 1128 | 898.100 | .95 | 2.85 | 108 | 251 | 55 | 88 | 88 | 6.5 | 269 |
| 3 | 1133 | 902.010 | 1.1 | 3.3 | 108 | 247 | 56 | 91 | 91 | 7.0 | 277 |
| 4 | 1138 | 906.825 | 1.1 | 3.3 | 107 | 242 | 56 | 90 | 90 | 7.0 | 280 |
| 5 | 1143 | 912.665 | 1.2 | 3.6 | 108 | 250 | 58 | 91 | 91 | 7.5 | 288 |
| 6 | 1148 | 917.832 | 1.0 | 3.0 | 109 | 252 | 58 | 92 | 92 | 8.0 | 279 |
| L.C | | 0.000 | 12 Hg | | | | | | | | |
| START | 1150 | | | | | | | ~~92~~ | ~~92~~ | ~~6.0~~ | ~~282~~ |
| 2-1 | 1155 | 921.911 | .75 | 2.25 | 109 | 250 | 57 | 92 | 92 | 6.0 | 282 |
| 2 | 1200 | 926.410 | 1.1 | 3.30 | 109 | 248 | 58 | 93 | 93 | 6.0 | 293 |
| 3 | 1205 | 931.621 | 1.2 | 3.6 | 109 | 249 | 58 | 93 | 93 | 6.0 | 281 |
| 4 | 1210 | 936.498 | 1.0 | 3.0 | 109 | 251 | 58 | 94 | 94 | 7.5 | 298 |
| 5 | 1215 | 941.515 | 1.1 | 3.3 | 109 | 250 | 59 | 94 | 94 | 7.0 | 288 |
| 6 | 1220 | 946.296 | 1.0 | 3.0 | 111 | 252 | 59 | 94 | 94 | 7.0 | 281 |
| | | 57.297 | | | | | | | 91.5 | | |
| | | | | 3.088 | | | | | | | |
| | | | | | 108.8 | | | | | | |
| | | | 1.0124 | | | | | | | | |
| | | 55.7746 | | | | | | | | | |
| | | | | | | Bws = | .0923 | | | | |
| | | | | | | Q = | 124566 | | | | |
| | | | | | | | | 91.1 | %I | | |
| Avg/Tot. | | | | | | | | | | | |

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Impinger | 100 | 100 | 0 | |
| Final | 187 | 119 | 0 | 208.5 |
| Initial | | | | 194.1 |
| Total | | | | |
| ORSAT/CEM | | | | 120.4 |
| O2 | 4.1 | | | |
| CO2 | 15.2 | | | |

Total Traverse Point %'s

6 Point (4.4) (14.6) (29.6) (70.4) (85.4) (95.6)

12 Point (2.1)(6.7)(11.8)(17.7)(25.0)(35.6)(64.4)(75.0)(82.3)(88.2)(93.3)(97.9)

Note: Nearest upstream disturbance or exit must be 2 duct diameters away and nearest downstream disturbance must be at least 8 diameters away to use 6 points per traverse.

## STACS ISOKINETIC SAMPLING FIELD DATA SHEET

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Facility: | RAYONIER | Meter #: | A7 | Baro. Press: | 29.92 | Page #: | 1of1 |
| Unit: | | DH@: | 10095 | Ambient Temp: | 85 | Pitot LC: | OK |
| Location: | RECOVERY | DGM Factor: | 1.785 | Nozzle Dia: | .252 | | |
| Test Type: | #5 | Pitot #: | B-18 | Static P: | -.47 | | |
| Run #: | 6 | Pitot Coef: | .84 | Stack Dimensions: | 88" | | |
| Condition: | | | | Stack Height: | | | |
| Operator(s): | JC JP | K-Factor: | 3.0 | Init. Leak Check: | 0.000 cfm@ 14 "Hg | | |
| Date: | 5-25-04 | Filter#: | 474 | Final Leak Check: | 0.000 cfm@ 13 "Hg | | |

| Traverse Point Number | Time | Gas Meter Reading Vm(ft3) | Velocity Head ("H2O) | Orifice Press. ("H2O) | Stack Temp (F) | Probe Temp (F) | Filter Temp (F) | Impinger Temp (F) | Dry Gas Meter Temp. Inlet (F) | Dry Gas Meter Temp. Outlet (F) | Vacuum ("Hg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1318 | 949.294 | | | | | | | | | |
| 1-1 | 1323 | 953.220 | .85 | 2.55 | 110 | 252 | 239 | 52 | 87 | 87 | 5.0 |
| 2 | 1328 | 958.251 | 1.0 | 3.0 | 110 | 253 | 249 | 52 | 87 | 87 | 5.0 |
| 3 | 1333 | 962.000 | 1.0 | 3.0 | 113 | 249 | 251 | 53 | 88 | 88 | 5.0 |
| 4 | 1338 | 968.001 | 1.1 | 3.3 | 110 | 251 | 257 | 53 | 89 | 89 | 5.5 |
| 5 | 1343 | 972.991 | 1.1 | 3.3 | 110 | 255 | 255 | 54 | 89 | 89 | 5.5 |
| 6 | 1348 | 978.061 | 1.2 | 3.6 | 110 | 252 | 227 | 55 | 89 | 89 | 5.5 |
| L.C. | | | 0.000 | 12 Hg | | | | | | | |
| START | 1350 | 978.990 | | | | | | | | | |
| 2-1 | 1355 | 982.755 | .90 | 2.70 | 111 | 247 | 252 | 56 | 89 | 89 | 5.0 |
| 2 | 1400 | 987.625 | 1.1 | 3.3 | 110 | 251 | 253 | 56 | 89 | 89 | 5.0 |
| 3 | 1405 | 992.600 | 1.2 | 3.6 | 110 | 256 | 251 | 58 | 90 | 90 | 5.5 |
| 4 | 1410 | 997.832 | 1.1 | 3.3 | 110 | 249 | 253 | 60 | 90 | 90 | 6.0 |
| 5 | 1415 | 1002.731 | 1.1 | 3.3 | 110 | 249 | 253 | 60 | 91 | 91 | 6.0 |
| 6 | 1420 | 1007.619 | 1.0 | 3.0 | 110 | 250 | 250 | 62 | 89 | 89 | 6.0 |
| | | ~~58.325~~ | Hg | | | | | | | | |
| | | | | | | | | | | 88.9 | |
| | | 57.396 | | | 110.3 | | | | | | |
| | | | | 3.163 | | | | | | | |
| | | | 1.0255 | | | | | | | | |
| | | 56.1459 | | | | | | | | | |
| | | | | | Bws= .090 | | | | | | |
| | | | | | | | | Q= | 126,139 | | |
| | | | | | | | | | 90.5 | 90.1 | |

Filter Temp: Fitting Temp, ~~229~~

Nozzle Calibration:

Avg/Tot.

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Impinger | 196 | 109 | | | |
| Final | | | | 222.1 | |
| Initial | | | | 206.1 | |
| Total | | | | | |

| ORSAT/CEM | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| O2 | 4.0 | | | |
| CO2 | 15.3 | | | |

Total Traverse Point %'s

6 Point (4.4) (14.6) (29.6) (70.4) (85.4) (95.6)

12 Point (2.1)(6.7)(11.8)(17.7)(25.0)(35.6)(64.4)(75.0)(82.3)(88.2)(93.3)(97.9)

*Note: Nearest upstream disturbance or exit must be 2 duct diameters away and nearest downstream disturbance must be at least 8 diameters away to use 6 points per traverse.*

Rayonier Fernandina

**Source Testing and Consulting Services Inc.**
**Gravimetric Analysis Data Sheet**

A = Acetone Wash
F = Filter

| Date | | | | 6/13/04 | 6/14/04 | 6/15/04 | | | |
|---|---|---|---|---|---|---|---|---|---|
| Time | | | | 0630 | 1000 | 1030 | | | |
| Beaker/ Filter# | Sample ID | Volume | Tare (g) | Final Weights(g) | | | | | |
| | | | | 1st wt. | 2nd wt. | 3rd wt. | 4th wt. | Final wt. | Net wt. |
| 10 | SRB-1-A | 155 | 60.9089 | .9159 | .9153 | .9153 | | 60.9153 | .0064 |
| 466 | SRB-1-F | | .4251 | .4906 | .4906 | | | .4906 | .0655 |
| 47 | SRB-2-A | 140 | 60.3987 | .4087 | .4088 | | | 60.4088 | .0101 |
| 471 | SRB-2-F | | .4291 | .4860 | .4859 | | | .4859 | .0568 |
| 5-4 | SRB-3-A | 160 | 61.4103 | .4242 | .4235 | .4236 | | 61.4236 | .0133 |
| 465 | SRB-3-F | | .4219 | .4885 | .4884 | | | .4884 | .0665 |
| 13 | SRB-4-A | 140 | 61.3624 | .3834 | .3832 | | | 61.3832 | .0208 |
| 470 | SRB-4-F | | .4214 | .4861 | .4859 | | | .4859 | .0645 |
| 1B | SRB-5-A | 170 | 61.4706 | .4828 | .4825 | | | 61.4825 | .0119 |
| 469 | SRB-5-F | | .4223 | .4887 | .4888 | | | .4888 | .0665 |
| 8B | SRB-6-A | 145 | 61.5981 | .6519 | .6511 | .6512 | | 61.6512 | .0531 |
| 474 | SRB-6-F | | .4214 | .4696 | .4696 | | | .4696 | .0482 |
| 25 | B-1-A | 165 | 62.9898 | 63.0132 | 61.0132 | | | 61.0132 | .0234 |
| 496 | B-1-F | | .4213 | .4661 | .4661 | | | .4661 | .0448 |
| 27 | B-2-A | 150 | 57.7919 | .9297 | .9285 | .9287 | | 57.9287 | .1368 |
| 497 | B-2-F | | .4236 | .4379 | .4379 | | | .4379 | .0143 |
| 7B | B-3-A | 160 | 61.9351 | 62.0093 | 62.0095 | | | 62.0095 | .0744 |
| 493 | B-3-F | | .4242 | .4562 | .4560 | | | .4560 | .0318 |
| 6B | A-1-A | 180 | 64.2871 | .3486 | .3486 | | | 64.3486 | .0615 |
| 495 | A-1-F | | .4210 | .4515 | .4516 | | | .4516 | .0306 |
| 3B | A-2-A | 175 | 61.1216 | .2110 | .2112 | | | 61.2112 | .0896 |
| 472 | A-2-F | | .4289 | .4611 | .4600 | .4601 | | .4601 | .0312 |
| 4B | A-3-A | 150 | 61.4303 | .5806 | .5808 | | | 61.5808 | .505 |
| 473 | A-3-F | | .4264 | .4471 | .4471 | | | .4471 | .0207 |
| 477 | F-BlK | | .4199 | .4199 | .4199 | | | .4199 | — |
| 6B | A-BlK | 185 | 68.4481 | 68.4480 | 68.4480 | | | 68.4480 | — |

| Calibration | | | | | | | |
|---|---|---|---|---|---|---|---|
| 0.1g wt. | | .1000 | .1000 | .1000 | | | |
| 0.5g wt. | | .5001 | .5000 | .5000 | | | |
| 1g wt. | | 1.0000 | 1.0000 | 1.0000 | | | |
| 50g wt. | | 49.9999 | 50.0001 | 50.0000 | | | |
| 100g wt. | | 100.0000 | 100.0000 | 99.9999 | | | |

*Visible Emission Observation Form*

**SOURCE NAME** RAYONIER

**ADDRESS** End of Gum STREET

**CITY** FERNAdinaBEAch **STATE** FlA **ZIP** 32034

**PHONE**

**SOURCE ID NUMBER**

**PROCESS EQUIPMENT** BARK Boiler "A"

**OPERATING MODE**

**CONTROL EQUIPMENT** WET Scrubber

**OPERATING MODE** normal

**DESCRIBE EMISSION POINT**
START Round white Metal STOP SAme

**HEIGHT ABOVE GROUND LEVEL** START 160' STOP 160'

**HEIGHT RELATIVE TO OBSERVER** START 160' STOP 160'

**DISTANCE FROM OBSERVER** START 1000yd STOP 1000yd

**DIRECTION FROM OBSERVER** START WEST STOP WEST

**DESCRIBE EMISSIONS** Looping
START STEAM Plume STOP SAme

**EMISSION COLOR** START white STOP white

**PLUME TYPE:** CONTINUOUS ☒ FUGITIVE ☐ INTERMITTENT ☐

**WATER DROPLETS PRESENT:** NO ☐ YES ☒

**IF WATER DROPLET PLUME** ATTACHED ☒ DETACHED ☐

**POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED**
START 200 yds End of Plume STOP SAme

**DESCRIBE BACKGROUND**
START SKY STOP SKY

**BACKGROUND COLOR** START Blue STOP Blue

**SKY CONDITIONS** START Scattered STOP SAmE

**WIND SPEED** START 3-5 STOP 3-5

**WIND DIRECTION** START N.W STOP N.W

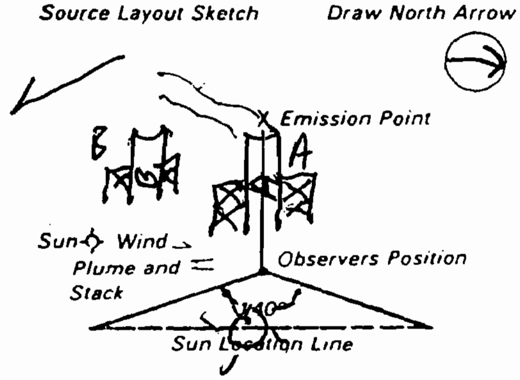
**AMBIENT TEMP.** START 91 STOP 91

**WET BULB TEMP.** 82

**RH, percent** 69

Source Layout Sketch

Draw North Arrow




**OBSERVATION DATE** 6-10-04 **START TIME** 1200 **STOP TIME** 1300

| MIN \ SEC | 0 | 15 | 30 | 45 | MIN \ SEC | 0 | 15 | 30 | 45 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 10 | 10 | 15 | 15 | 31 | 5 | 5 | 10 | 10 |
| 2 | 15 | 15 | 10 | 15 | 32 | 10 | 15 | 15 | 10 |
| 3 | 15 | 10 | 10 | 10 | 33 | 15 | 10 | 10 | 10 |
| 4 | 10 | 15 | 15 | 15 | 34 | 10 | 10 | 10 | 5 |
| 5 | 15 | 15 | 15 | 10 | 35 | 5 | 5 | 10 | 10 |
| 6 | 10 | 10 | 10 | 15 | 36 | 10 | 15 | 15 | 15 |
| 7 | 15 | 15 | 15 | 15 | 37 | 10 | 10 | 10 | 15 |
| 8 | 10 | 10 | 10 | 10 | 38 | 15 | 15 | 15 | 10 |
| 9 | 10 | 10 | 10 | 10 | 39 | 10 | 10 | 15 | 15 |
| 10 | 15 | 15 | 15 | 10 | 40 | 10 | 10 | 10 | 10 |
| 11 | 10 | 15 | 15 | 15 | 41 | 10 | 10 | 10 | 15 |
| 12 | 15 | 15 | 10 | 10 | 42 | 15 | 15 | 10 | 10 |
| 13 | 10 | 10 | 10 | 15 | 43 | 10 | 10 | 10 | 10 |
| 14 | 15 | 15 | 15 | 20 | 44 | 10 | 10 | 10 | 15 |
| 15 | 20 | 15 | 15 | 15 | 45 | 15 | 15 | 10 | 10 |
| 16 | 15 | 20 | 20 | 15 | 46 | 15 | 15 | 15 | 15 |
| 17 | 15 | 15 | 20 | 20 | 47 | 15 | 15 | 15 | 10 |
| 18 | 15 | 15 | 15 | 20 | 48 | 10 | 10 | 10 | 10 |
| 19 | 20 | 20 | 20 | 15 | 49 | 5 | 5 | 5 | 10 |
| 20 | 15 | 15 | 15 | 15 | 50 | 10 | 15 | 15 | 10 |
| 21 | 20 | 20 | 20 | 15 | 51 | 10 | 10 | 10 | 15 |
| 22 | 15 | 15 | 10 | 10 | 52 | 15 | 15 | 15 | 10 |
| 23 | 10 | 10 | 10 | 10 | 53 | 10 | 10 | 10 | 5 |
| 24 | 15 | 15 | 15 | 10 | 54 | 5 | 5 | 10 | 10 |
| 25 | 10 | 10 | 15 | 15 | 55 | 10 | 10 | 10 | 10 |
| 26 | 10 | 10 | 10 | 10 | 56 | 15 | 15 | 15 | 15 |
| 27 | 10 | 15 | 15 | 10 | 57 | 15 | 10 | 10 | 5 |
| 28 | 10 | 10 | 10 | 10 | 58 | 5 | 5 | 10 | 15 |
| 29 | 10 | 10 | 10 | 10 | 59 | 15 | 10 | 10 | 10 |
| 30 | 5 | 5 | 5 | 10 | 60 | 10 | 10 | 10 | 10 |

17.

**AVERAGE OPACITY FOR HIGHEST PERIOD** 17.08

**NUMBER OF READINGS ABOVE** 17.08 % **WERE** 13

**RANGE OF OPACITY READINGS** MINIMUM 5 MAXIMUM 20

**OBSERVER'S NAME (PRINT)** Sid CARTER

**OBSERVER'S SIGNATURE** Sid Carter **DATE** 6-10-04

**ORGANIZATION** S.T.A.C.S

**CERTIFIED BY** E.T.A **DATE** 2-04

**VERIFIED BY** **DATE**

**COMMENTS** V.E. Taken during Run

**I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS**
**SIGNATURE**

**TITLE** **DATE**

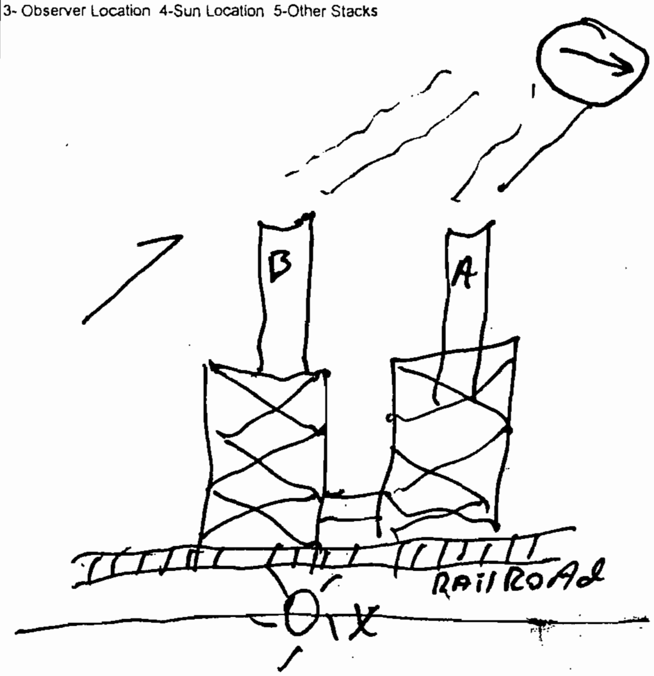
**STACS** Source Testing And Consulting Services Inc.

# Visible Emissions Form

Page No. 1 of 1

| | |
|---|---|
| Source Name: RAYONIER | Type of Source: |
| Address: End of Gum STREET | |
| City: FERNADINA BEACH | State: Fl  Zip: |
| Phone: | Source ID Number: |
| Process Equip: BARK Boiler | Operating Mode: |
| Control Equip: H2O Scrubber | Operating Mode: NORMAL |
| Describe Emission Point: Round white Metal Stack | |
| Height above ground level: 160' | Height relative to Observer: 160' |
| Distance from observer: 1000 yds | Direction from Observer: Start WEST  End West |
| Describe Emissions & Color: Start white STEAM Looping | End SAME |
| Visible Water Vapor? If yes, distance above stack for reading: Yes / No 300' | |
| Point in Plume at Which Opacity was Determined: End of Plume ≈ 300yds | |
| Describe Plume Background: Start SKY  End SKY | Background Color: Start ~~white/Blue~~ white/Blue  End SAME |
| Sky Conditions: Start OVERCAST  End SAME | |
| Wind Speed: 5.7 | Wind Direction From: Start SE  End SE |
| Ambient Temperature: 83 | Wet Bulb Temp: 78  RH Percent: 79° |

Notes: 1-Stack or Point being read 2- Wind Direction From 3- Observer Location 4-Sun Location 5-Other Stacks




Observation Date: 6-19-04  Start Time: 1230  End Time: 1330

| Min \ Sec | 0 | 15 | 30 | 45 | Comments |
|---|---|---|---|---|---|
| 1 | 10 | 10 | 15 | 15 | |
| 2 | 15 | 15 | 10 | 15 | |
| 3 | 20 | 20 | 15 | 10 | |
| 4 | 10 | 10 | 15 | 15 | |
| 5 | 15 | 15 | 15 | 10 | |
| 6 | 10 | 15 | 15 | 10 | |
| 7 | 20 | 20 | 20 | 15 | |
| 8 | 20 | 15 | 15 | 10 | |
| 9 | 10 | 10 | 10 | 15 | |
| 10 | 15 | 15 | 20 | 15 | |
| 11 | 15 | 15 | 15 | 15 | |
| 12 | 10 | 10 | 15 | 10 | |
| 13 | 15 | 15 | 15 | 20 | |
| 14 | 20 | 20 | 15 | 15 | |
| 15 | 15 | 20 | 20 | 10 | |
| 16 | 10 | 10 | 15 | 15 | |
| 17 | 15 | 15 | 20 | 20 | |
| 18 | 20 | 20 | 15 | 15 | |
| 19 | 15 | 15 | 10 | 10 | |
| 20 | 15 | 15 | 10 | 10 | |
| 21 | 20 | 20 | 20 | 15 | |
| 22 | 15 | 15 | 10 | 15 | |
| 23 | 15 | 15 | 20 | 20 | |
| 24 | 25 | 25 | 20 | 20 | |
| 25 | 20 | 20 | 25 | 25 | |
| 26 | 20 | 20 | 15 | 15 | |
| 27 | 20 | 20 | 20 | 20 | |
| 28 | 20 | 20 | 20 | 20 | |
| 29 | 10 | 10 | 10 | 15 | |
| 30 | 15 | 15 | 10 | 10 | |

| Min \ Sec | 0 | 15 | 30 | 45 | Comments |
|---|---|---|---|---|---|
| 31 | 15 | 15 | 15 | 10 | |
| 32 | 10 | 10 | 10 | 15 | |
| 33 | 20 | 20 | 20 | 15 | |
| 34 | 10 | 10 | 10 | 15 | |
| 35 | 15 | 15 | 15 | 15 | |
| 36 | 15 | 20 | 20 | 20 | |
| 37 | 20 | 20 | 20 | 15 | |
| 38 | 15 | 15 | 20 | 20 | |
| 39 | 20 | 25 | 25 | 20 | |
| 40 | 15 | 15 | 10 | 10 | |
| 41 | 10 | 10 | 10 | 10 | |
| 42 | 10 | 15 | 15 | 15 | |
| 43 | 10 | 10 | 15 | 10 | |
| 44 | 10 | 15 | 15 | 10 | |
| 45 | 10 | 10 | 10 | 10 | |
| 46 | 15 | 15 | 15 | 15 | |
| 47 | 15 | 15 | 10 | 10 | |
| 48 | 10 | 10 | 10 | 10 | |
| 49 | 10 | 15 | 15 | 15 | |
| 50 | 15 | 20 | 20 | 20 | |
| 51 | 25 | 15 | 15 | 10 | |
| 52 | 10 | 10 | 10 | 15 | 20% |
| 53 | 10 | 10 | 10 | 10 | |
| 54 | 10 | 15 | 15 | 20 | |
| 55 | 20 | 15 | 15 | 15 | |
| 56 | 10 | 10 | 15 | 15 | |
| 57 | 15 | 15 | 20 | 20 | |
| 58 | 20 | 15 | 15 | 10 | |
| 59 | 10 | 10 | 10 | 15 | |
| 60 | 15 | 15 | 15 | 10 | |

Range of Opacity: Minimum 10  Maximum 25

Print Observer's Name: Sid CARTER

Observer's Signature: Sid Carter  Date: 6-19-04

Organization: S.T.A.C.S

Certified By: E.T.A  Date: 2-04

I have received a copy of these opacity observations

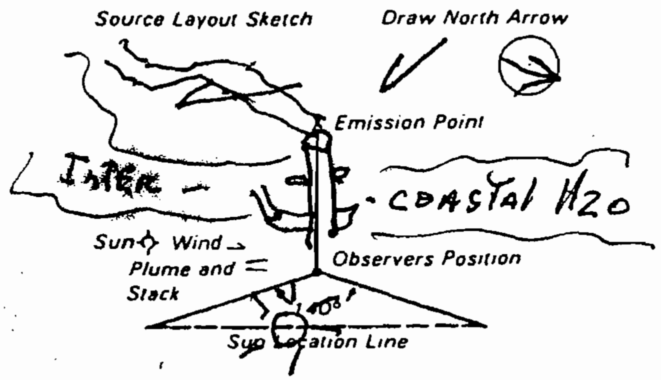
Print Name:

Signature:

Title: | Date:

*Visible Emission Observation Form*

| | |
|---|---|
| SOURCE NAME RAYONIER | |
| ADDRESS Foot of Gum STREET P.O. Box 2002 | |
| CITY Fernandina Bch | STATE FLA ZIP 32035 |
| PHONE 904-277-1480 | SOURCE ID NUMBER |
| PROCESS EQUIPMENT Recovery Boiler | OPERATING MODE 378 K/HR |
| CONTROL EQUIPMENT Brinks Scrubber | OPERATING MODE NORMAL |
| DESCRIBE EMISSION POINT STACK (SOUTHERN MOST) START Round METAL STOP | |
| HEIGHT ABOVE GROUND LEVEL START 300' STOP 300' | HEIGHT RELATIVE TO OBSERVER START 300' STOP 300' |
| DISTANCE FROM OBSERVER START 900' STOP 900' | DIRECTION FROM OBSERVER START WEST STOP WEST |
| DESCRIBE EMISSIONS STEAM Plume START Looping STOP Looping | |
| EMISSION COLOR START white STOP white | PLUME TYPE: CONTINUOUS ☒ FUGITIVE ☐ INTERMITTENT ☐ |
| WATER DROPLETS PRESENT NO ☒ YES ☐ | IF WATER DROPLET PLUME ATTACHED ☐ DETACHED ☐ |
| POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED START 300 yds Down STREAM FROM STOP Emission point | |
| DESCRIBE BACKGROUND START SKY STOP SKY | |
| BACKGROUND COLOR START Blue STOP Blue | SKY CONDITIONS START CLEAR STOP CLEAR |
| WIND SPEED START 5-10 STOP 5-10 | WIND DIRECTION START S.E. STOP S.E. |
| AMBIENT TEMP START 87 STOP 87 | WET BULB TEMP 77 RH, percent 65 |




| | |
|---|---|
| COMMENTS V.E. Taken during 1st Run #5 | |
| I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS SIGNATURE | |
| TITLE | DATE |

OBSERVATION DATE 5-24-04 START TIME 1115 A.M STOP TIME 1215

| MIN \ SEC | 0 | 15 | 30 | 45 | MIN \ SEC | 0 | 15 | 30 | 45 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 15 | 15 | 15 | 10 | 31 | 15 | 15 | 15 | 20 |
| 2 | 10 | 15 | 15 | 15 | 32 | 10 | 10 | 15 | 15 |
| 3 | 15 | 15 | 10 | 10 | 33 | 15 | 15 | 15 | 15 |
| 4 | 20 | 20 | 15 | 15 | 34 | 15 | 20 | 20 | 20 |
| 5 | 10 | 15 | 10 | 10 | 35 | 10 | 10 | 15 | 15 |
| 6 | 20 | 20 | 15 | 15 | 36 | 10 | 10 | 10 | 15 |
| 7 | 15 | 15 | 15 | 10 | 37 | 20 | 20 | 15 | 15 |
| 8 | 10 | 15 | 15 | 20 | 38 | 15 | 15 | 20 | 20 |
| 9 | 20 | 15 | 20 | 25 | 39 | 10 | 10 | 15 | 10 |
| 10 | 25 | 20 | 20 | 20 | 40 | 15 | 15 | 10 | 10 |
| 11 | 15 | 20 | 20 | 20 | 41 | 15 | 20 | 20 | 15 |
| 12 | 25 | 20 | 20 | 15 | 42 | 20 | 15 | 15 | 15 |
| 13 | 20 | 20 | 15 | 15 | 43 | 15 | 15 | 15 | 15 |
| 14 | 15 | 15 | 15 | 10 | 44 | 25 | 20 | 20 | 15 |
| 15 | 10 | 10 | 10 | 15 | 45 | 15 | 15 | 15 | 15 |
| 16 | 15 | 15 | 15 | 15 | 46 | 10 | 10 | 15 | 15 |
| 17 | 20 | 15 | 15 | 10 | 47 | 10 | 15 | 15 | 20 |
| 18 | 15 | 15 | 20 | 20 | 48 | 15 | 20 | 15 | 20 |
| 19 | 20 | 10 | 10 | 15 | 49 | 20 | 20 | 15 | 15 |
| 20 | 15 | 15 | 15 | 15 | 50 | 20 | 20 | 20 | 20 |
| 21 | 20 | 20 | 20 | 15 | 51 | 15 | 15 | 15 | 15 |
| 22 | 15 | 10 | 10 | 10 | 52 | 15 | 15 | 10 | 10 |
| 23 | 10 | 15 | 20 | 20 | 53 | 10 | 10 | 10 | 15 |
| 24 | 20 | 20 | 20 | 15 | 54 | 20 | 20 | 25 | 20 |
| 25 | 15 | 15 | 20 | 20 | 55 | 20 | 15 | 15 | 15 |
| 26 | 20 | 20 | 15 | 15 | 56 | 15 | 15 | 15 | 15 |
| 27 | 15 | 15 | 20 | 15 | 57 | 15 | 15 | 15 | 20 |
| 28 | 20 | 15 | 15 | 15 | 58 | 10 | 10 | 15 | 20 |
| 29 | 15 | 15 | 15 | 15 | 59 | 20 | 20 | 15 | 15 |
| 30 | 20 | 20 | 15 | 15 | 60 | 25 | 20 | 15 | 15 |

19.4%

| | |
|---|---|
| AVERAGE OPACITY FOR HIGHEST PERIOD 18.96 | NUMBER OF READINGS ABOVE 18.96 % WERE 70 |
| RANGE OF OPACITY READINGS MINIMUM 10 | MAXIMUM 25 |
| OBSERVER'S NAME (PRINT) Sid CARTER | |
| OBSERVER'S SIGNATURE Sid Carter | DATE 5-24-04 |
| ORGANIZATION S.T.A.C.S | |
| CERTIFIED BY E.T.A. | DATE 2-04 |
| VERIFIED BY | DATE |

# APPENDIX C

# CALIBRATION DATA

**BEST AVAILABLE COPY**

# VISIBLE EMISSIONS EVALUATOR

This is to certify that

*Sidney J. Carter*

met the specifications of Federal Reference Method 9 and qualified as a visible emissions evaluator. Maximum deviation on white and black smoke did not exceed 7.5% opacity and no single error exceeding 15% opacity was incurred during the certification test conducted by Eastern Technical Associates of Raleigh, North Carolina. This certificate is valid for six months from date of issue.

| 314903 | Orlando, Florida | February 11, 2004 |
|---|---|---|
| Certificate Number | Location | Date of Issue |

President

Director of Training

**Source Testing And Consulting Services**
**Meter Box Calibration**

Calibration Date: 1/19/2004
Meter Box: A-7
Technician: JBP

| Orifice ID | Y Calibration | Delta H @ Cal. | Vac |
|---|---|---|---|
| 63 | pass | pass | pass |
| 40 | pass | pass | pass |
| 48 | pass | pass | pass |
| 55 | pass | pass | pass |
| 73 | pass | pass | pass |

PART 1: Orifice Calibration

Calibration Orifice Set:
Critical Vacuum: 13.9
Barometric Pressure ( in. Hg ): 29.200

Collected Data

| Orifice ID | Run # | Delta H | Initial Meter Volume ( cu ft ) | Final Meter Volume ( cu ft ) | Init Meter Temp ( F ) | Final Meter Temp ( F ) | Init Amb Temp ( F ) | Final Amb Temp ( F ) | Run Time min\|sec | | K Factor | Vac |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63 | 1 | 1.90 | 74.344 | 101.568 | 74.00 | 75.00 | 70.00 | 70.00 | 35 | 0 | 0.5971 | 21 |
| 63 | 2 | 1.90 | 101.568 | 107.772 | 75.00 | 75.00 | 70.00 | 70.00 | 8 | 0 | 0.5971 | 20 |
| 40 | 1 | 0.31 | 38.170 | 41.730 | 73.00 | 72.00 | 70.00 | 70.00 | 11 | 15 | 0.2403 | 25 |
| 40 | 2 | 0.31 | 43.720 | 61.172 | 71.00 | 71.00 | 70.00 | 70.00 | 56 | 0 | 0.2403 | 25 |
| 48 | 1 | 0.65 | 26.414 | 32.073 | 72.00 | 73.00 | 70.00 | 70.00 | 12 | 30 | 0.3511 | 22 |
| 48 | 2 | 0.65 | 32.073 | 38.170 | 73.00 | 73.00 | 70.00 | 70.00 | 13 | 30 | 0.3511 | 22 |
| 55 | 1 | 1.10 | 7.772 | 19.245 | 73.00 | 72.00 | 70.00 | 69.00 | 19 | 0 | 0.4636 | 20 |
| 55 | 2 | 1.10 | 19.245 | 26.414 | 72.00 | 72.00 | 70.00 | 69.00 | 12 | 0 | 0.4636 | 20 |
| 73 | 1 | 3.50 | 55.183 | 67.405 | 74.00 | 75.00 | 70.00 | 70.00 | 11 | 30 | 0.8261 | 15 |
| 73 | 2 | 3.50 | 67.405 | 74.344 | 75.00 | 75.00 | 70.00 | 70.00 | 6 | 30 | 0.8261 | 15 |

Calculated Data

| Orifice ID | Run # | Meter Volume ( cu ft ) | Meter Volume ( std cu ft ) | Corrected Meter Volume ( std cu ft ) | Ave Meter Temp ( F ) | Ave Amb Temp ( F ) | Y | Delta H @ |
|---|---|---|---|---|---|---|---|---|
| 63 | 1 | 27.224 | 26.36080 | 26.50697 | 74.5 | 70 | 1.0055 | 1.8136 |
| 63 | 2 | 6.204 | 6.00167 | 6.05874 | 75 | 70 | 1.0095 | 1.8119 |
| | AVE | | | | | | 1.0075 | 1.8127 |
| 40 | 1 | 3.56 | 3.44628 | 3.42887 | 72.5 | 70 | 0.9949 | 1.8193 |
| 40 | 2 | 17.452 | 16.94225 | 17.06816 | 71 | 70 | 1.0074 | 1.8244 |
| | AVE | | | | | | 1.0012 | 1.8218 |
| 48 | 1 | 5.659 | 5.48292 | 5.56655 | 72.5 | 70 | 1.0153 | 1.7899 |
| 48 | 2 | 6.097 | 5.90175 | 6.01187 | 73 | 70 | 1.0187 | 1.7882 |
| | AVE | | | | | | 1.0170 | 1.7891 |
| 55 | 1 | 11.473 | 11.12859 | 11.17756 | 72.5 | 69.5 | 1.0044 | 1.7396 |
| 55 | 2 | 7.169 | 6.96033 | 7.05951 | 72 | 69.5 | 1.0142 | 1.7413 |
| | AVE | | | | | | 1.0093 | 1.7405 |
| 73 | 1 | 12.222 | 11.88193 | 12.04968 | 74.5 | 70 | 1.0141 | 1.7594 |
| 73 | 2 | 6.939 | 6.73962 | 6.81069 | 75 | 70 | 1.0105 | 1.7577 |
| | AVE | | | | | | 1.0123 | 1.7585 |
| | | | | | Average for All Runs | | 1.0095 | 1.7845 |

PART 2: Thermocouple Calibration

T/C Calibrator Make: Extech
T/C Calibrator Model: Oyster
Hg Thermometer Reading ( F ) :

| Calibrator Output ( F ) | Meter Reading ( F ) | Error ( F ) | Allowable Error ( F ) | Result |
|---|---|---|---|---|
| 0.0 | 0 | 0 | 9.24 | pass |
| 32.0 | 32 | 0 | 9.88 | pass |
| 70.0 | 69 | -1 | 10.64 | pass |
| 100.0 | 99 | -1 | 11.24 | pass |
| 200.0 | 200 | 0 | 13.24 | pass |
| 500.0 | 499 | -1 | 19.24 | pass |
| 1200.0 | 1198 | -2 | 33.24 | pass |
| 1995.0 | 1993 | -2 | 49.24 | pass |

Source Testing And Consulting Services
Meter Box Calibration

Calibration Date: 3/6/2004
Meter Box: A-5
Technician: JBP

| Orifice ID | Y Calibration | Delta H @ Cal. | Vac |
|---|---|---|---|
| 63 | pass | pass | pass |
| 40 | pass | pass | pass |
| 48 | pass | pass | pass |
| 55 | pass | pass | pass |
| 73 | pass | pass | pass |

PART 1: Orifice Calibration

Calibration Orifice Set: Critical Vacuum: 13.9

Barometric Pressure ( in. Hg ): 29.200

Collected Data

| Orifice ID | Run # | Delta H | Initial Meter Volume ( cu ft ) | Final Meter Volume ( cu ft ) | Init Meter Temp ( F ) | Final Meter Temp ( F ) | Init Amb Temp ( F ) | Final Amb Temp ( F ) | Run Time min | Run Time sec | K Factor | Vac |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63 | 1 | 1.90 | 48.815 | 55.986 | 83.00 | 83.00 | 76.00 | 77.00 | 9 | 0 | 0.5971 | 18 |
| 63 | 2 | 1.90 | 55.986 | 74.263 | 83.00 | 82.00 | 76.00 | 76.00 | 23 | 0 | 0.5971 | 18 |
| 40 | 1 | 0.28 | 40.932 | 45.680 | 75.00 | 76.00 | 74.00 | 74.00 | 15 | 0 | 0.2403 | 25 |
| 40 | 2 | 0.28 | 45.680 | 50.427 | 76.00 | 77.00 | 74.00 | 74.00 | 15 | 0 | 0.2403 | 25 |
| 48 | 1 | 0.65 | 16.680 | 30.062 | 72.00 | 74.00 | 71.00 | 72.00 | 29 | 0 | 0.3511 | 24 |
| 48 | 2 | 0.65 | 30.062 | 40.932 | 74.00 | 75.00 | 72.00 | 74.00 | 23 | 30 | 0.3511 | 24 |
| 55 | 1 | 1.20 | 74.263 | 109.866 | 82.00 | 81.00 | 76.00 | 77.00 | 58 | 0 | 0.4636 | 21 |
| 55 | 2 | 1.20 | 9.866 | 16.643 | 81.00 | 71.00 | 77.00 | 76.00 | 11 | 0 | 0.4636 | 21 |
| 73 | 1 | 3.50 | 51.314 | 137.872 | 67.00 | 82.00 | 69.00 | 75.00 | 79 | 30 | 0.8261 | 17 |
| 73 | 2 | 3.50 | 37.872 | 48.815 | 82.00 | 83.00 | 75.00 | 76.00 | 10 | 0 | 0.8261 | 17 |

Calculated Data

| Orifice ID | Run # | Meter Volume ( cu ft ) | Meter Volume ( std cu ft ) | Corrected Meter Volume ( std cu ft ) | Ave Meter Temp ( F ) | Ave Amb Temp ( F ) | Y | Delta H @ |
|---|---|---|---|---|---|---|---|---|
| 63 | 1 | 7.171 | 6.83493 | 6.77466 | 83 | 76.5 | 0.9912 | 1.8071 |
| 63 | 2 | 18.277 | 17.43651 | 17.32110 | 82.5 | 76 | 0.9934 | 1.8071 |
| | AVE | | | | | | 0.9923 | 1.8071 |
| 40 | 1 | 4.748 | 4.57024 | 4.55467 | 75.5 | 74 | 0.9966 | 1.6461 |
| 40 | 2 | 4.747 | 4.56076 | 4.55467 | 76.5 | 74 | 0.9987 | 1.6430 |
| | AVE | | | | | | 0.9976 | 1.6445 |
| 48 | 1 | 13.382 | 12.95345 | 12.89615 | 73 | 71.5 | 0.9956 | 1.7933 |
| 48 | 2 | 10.87 | 10.49237 | 10.43561 | 74.5 | 73 | 0.9946 | 1.7933 |
| | AVE | | | | | | 0.9951 | 1.7933 |
| 55 | 1 | 35.603 | 33.96878 | 33.89764 | 81.5 | 76.5 | 0.9979 | 1.8919 |
| 55 | 2 | 6.777 | 6.53228 | 6.42886 | 76 | 76.5 | 0.9842 | 1.9113 |
| | AVE | | | | | | 0.9910 | 1.9016 |
| 73 | 1 | 86.558 | 84.14955 | 83.14321 | 74.5 | 72 | 0.9880 | 1.7660 |
| 73 | 2 | 10.943 | 10.48163 | 10.42403 | 82.5 | 75.5 | 0.9945 | 1.7514 |
| | AVE | | | | | | 0.9913 | 1.7587 |
| | | | | | Average for All Runs | | 0.9935 | 1.7810 |

PART 2: Thermocouple Calibration

T/C Calibrator Make: Extech T/C Calibrator Model: Oyster

Hg Thermometer Reading ( F ) :

| Calibrator Output ( F ) | Meter Reading ( F ) | Error ( F ) | Allowable Error ( F ) | Result |
|---|---|---|---|---|
| 0.0 | 0 | 0 | 9.24 | pass |
| 32.0 | 31 | -1 | 9.88 | pass |
| 70.0 | 68 | -2 | 10.64 | pass |
| 100.0 | 98 | -2 | 11.24 | pass |
| 200.0 | 200 | 0 | 13.24 | pass |
| 500.0 | 498 | -2 | 19.24 | pass |
| 1200.0 | 1199 | -1 | 33.24 | pass |
| 1995.0 | 1998 | 3 | 49.24 | pass |

## POST TEST METER CALIBRATION DATA - EMC APPROVED ALTERNATIVE METHOD (ALT - 009)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Plant:** | Rayonier | **Location:** | Scrubber A | | Run # | 1-A | 2-A | 3-A | AVERAGE |
| **Condition:** | Normal | **Meter #:** | **A-5** | | Date: | 6/10/04 | 6/10/04 | 6/10/04 | |
| **Unit:** | Scrubber A | **Method:** | Method 5 | | Start Time: | 12:03 | 14:43 | 17:37 | |
| **Parameter** | | | | **Units** | Stop Time: | 13:05 | 15:45 | 18:39 | |
| Sampling Time | | | | min. | | 60.00 | 60.00 | 60.00 | **60.0** |
| **GAS METER DATA:** | | | | | | | | | |
| Average Meter Differential Pressure | | | | in. H2O | | 1.285 | 1.4425 | 1.27 | **1.33** |
| Absolute Meter Pressure | | | | in. Hg | | 29.92 | 29.94 | 29.92 | **29.93** |
| Average Meter Temperature | | | | degrees F | | 94 | 84.25 | 83.42 | **87.22** |
| Metered Dry Sample Gas Volume | | | | dcf | | 38.487 | 40.346 | 37.086 | **38.64** |
| Gas Molecular Weight, Dry Basis | | | | lb/lb-mole | | 29.64 | 29.69 | 29.67 | **29.67** |
| **Pre Test Calibration Factors** | | | | | | | | | |
| DeltaH@ | | | | in. H2O | | 1.781 | 1.781 | 1.781 | **1.781** |
| Dry Gas Meter Correction Factor (gamma) | | | | Dimensionless | | 0.9935 | 0.9935 | 0.9935 | **0.9935** |
| **Post Test Data** | | | | | | | | | |
| Calculated Meter Correction Factor (Yqa) | | | | Dimensionless | | **1.0066** | **1.0073** | **1.0265** | **1.0135** |
| Difference (Post Test and Pretest Y - Maximum Allowed 5%) | | | | % | | **1.32%** | **1.39%** | **3.32%** | **2.01%** |

## POST TEST METER CALIBRATION DATA - EMC APPROVED ALTERNATIVE METHOD (ALT - 009)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Plant:** | Rayonier | **Location:** | Scrubber B | | Run # | 1-B | 2-B | 3-B | AVERAGE |
| **Condition:** | Normal | **Meter #:** | **A-7** | | Date: | 6/9/04 | 6/9/04 | 6/9/04 | |
| **Unit:** | Scrubber B | **Method:** | Method 29 | | Start Time: | 12:30 | 15:30 | 17:56 | |
| **Parameter** | | | | **Units** | Stop Time: | 14:00 | 16:32 | 18:58 | |
| Sampling Time | | | | min. | | 60.00 | 60.00 | 60.00 | **60.0** |
| **GAS METER DATA:** | | | | | | | | | |
| Average Meter Differential Pressure | | | | in. H2O | | 1.63 | 1.3 | 1.3325 | **1.42** |
| Absolute Meter Pressure | | | | in. Hg | | 29.91 | 29.89 | 29.89 | **29.89** |
| Average Meter Temperature | | | | degrees F | | 81.54 | 79.54 | 80 | **80.36** |
| Metered Dry Sample Gas Volume | | | | dcf | | 43.039 | 38.143 | 37.579 | **39.59** |
| Gas Molecular Weight, Dry Basis | | | | lb/lb-mole | | 29.73 | 29.66 | 29.70 | **29.70** |
| **Pre Test Calibration Factors** | | | | | | | | | |
| DeltaH@ | | | | in. H2O | | 1.785 | 1.785 | 1.785 | **1.785** |
| Dry Gas Meter Correction Factor (gamma) | | | | Dimensionless | | 1.0095 | 1.0095 | 1.0095 | **1.0095** |
| **Post Test Data** | | | | | | | | | |
| Calculated Meter Correction Factor (Yqa) | | | | Dimensionless | | **1.0000** | **1.0073** | **1.0349** | **1.0141** |
| Difference (Post Test and Pretest Y - Maximum Allowed 5%) | | | | % | | **-0.94%** | **-0.22%** | **2.52%** | **0.45%** |

## POST TEST METER CALIBRATION DATA - EMC APPROVED ALTERNATIVE METHOD (ALT - 009)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Plant:** | Rayonier | **Location:** | SRB | | Run # | 1 | 2 | 3 | AVERAGE |
| **Condition:** | Normal | **Meter #:** | **A-7** | | Date: | 5/24/04 | 5/24/04 | 5/24/04 | |
| **Unit:** | SRB | **Method:** | Method 5 | | Start Time: | 11:14 | 15:33 | 17:26 | |
| **Parameter** | | | | **Units** | Stop Time: | 12:28 | 16:35 | 18:28 | |
| Sampling Time | | | | min. | | 60.00 | 60.00 | 60.00 | **60.0** |
| **GAS METER DATA:** | | | | | | | | | |
| Average Meter Differential Pressure | | | | in. H2O | | 2.5625 | 2.82 | 2.8175 | **2.73** |
| Absolute Meter Pressure | | | | in. Hg | | 29.98 | 30.00 | 30.00 | **29.99** |
| Average Meter Temperature | | | | degrees F | | 89.3333333 | 82.9166667 | 80.6666667 | **84.31** |
| Metered Dry Sample Gas Volume | | | | dcf | | 52.851 | 54.379 | 55.04 | **54.09** |
| Gas Molecular Weight, Dry Basis | | | | lb/lb-mole | | 30.57 | 30.54 | 30.57 | **30.56** |
| **Pre Test Calibration Factors** | | | | | | | | | |
| DeltaH@ | | | | in. H2O | | 1.785 | 1.785 | 1.785 | **1.785** |
| Dry Gas Meter Correction Factor (gamma) | | | | Dimensionless | | 1.0095 | 1.0095 | 1.0095 | **1.0095** |
| **Post Test Data** | | | | | | | | | |
| Calculated Meter Correction Factor (Yqa) | | | | Dimensionless | | **1.0129** | **1.0269** | **1.0114** | **1.0171** |
| Difference (Post Test and Pretest Y - Maximum Allowed 5%) | | | | % | | **0.33%** | **1.72%** | **0.19%** | **0.75%** |

## POST TEST METER CALIBRATION DATA - EMC APPROVED ALTERNATIVE METHOD (ALT - 009)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Plant:** | Rayonier | **Location:** | SRB | | Run # | 4 | 5 | 6 | AVERAGE |
| **Condition:** | Bypass Open | **Meter #:** | **A-7** | | Date: | 5/25/04 | 5/25/04 | 5/25/04 | |
| **Unit:** | SRB | **Method:** | Method 5 | | Start Time: | 9:40 | 11:18 | 13:18 | |
| **Parameter** | | | | **Units** | Stop Time: | 10:42 | 12:20 | 14:20 | |
| Sampling Time | | | | min. | | 60.00 | 60.00 | 60.00 | **60.0** |
| **GAS METER DATA:** | | | | | | | | | |
| Average Meter Differential Pressure | | | | in. H2O | | 3.0575 | 3.0875 | 3.1625 | **3.10** |
| Absolute Meter Pressure | | | | in. Hg | | 29.89 | 29.90 | 29.90 | **29.90** |
| Average Meter Temperature | | | | degrees F | | 82.9166667 | 91.5 | 88.9166667 | **87.78** |
| Metered Dry Sample Gas Volume | | | | dcf | | 57.135 | 58.226 | 57.396 | **57.59** |
| Gas Molecular Weight, Dry Basis | | | | lb/lb-mole | | 30.62 | 30.59 | 30.60 | **30.60** |
| **Pre Test Calibration Factors** | | | | | | | | | |
| DeltaH@ | | | | in. H2O | | 1.785 | 1.785 | 1.785 | **1.785** |
| Dry Gas Meter Correction Factor (gamma) | | | | Dimensionless | | 1.0095 | 1.0095 | 1.0095 | **1.0095** |
| **Post Test Data** | | | | | | | | | |
| Calculated Meter Correction Factor (Yqa) | | | | Dimensionless | | **1.0181** | **1.0123** | **1.0365** | **1.0223** |
| Difference (Post Test and Pretest Y - Maximum Allowed 5%) | | | | % | | **0.85%** | **0.27%** | **2.67%** | **1.27%** |

# Type S Pitot Tube Inspection Data Form

Source Testing and Consulting Services, Inc
1100 Purple Glory Drive
Apex, NC 27502
PH(919)-367-2200/FAX(919)-367-2222

| | | | |
|---|---|---|---|
| **Pitot Tube I.D. #** | P018 | **Date** | 08-Feb-04 |
| **Location** | Shop | **Tech.** | MAD |

**Quick Connects Attached & Leak Free?** y

**Pitot Tube Assembly Level?** y

| Parameter | Value | Acceptance Criteria | Results | Meets Criteria? |
|---|---|---|---|---|
| $\alpha_1$ = | 1 ° | $\alpha_1 < 10$ ° | 1 ° | TRUE |
| $\alpha_2$ = | 0 ° | $\alpha_2 < 10$ ° | 0 ° | TRUE |
| $\beta_1$ = | 1 ° | $\beta_1 < 5$ ° | 1 ° | TRUE |
| $\beta_2$ = | 0 ° | $\beta_2 < 5$ ° | 0 ° | TRUE |
| $\gamma$ = | 1 ° | | | |
| $\theta$ = | 0 ° | | | |
| A = | 1.125 " | | | |
| $z = A \sin\gamma$ = | 0.020 " | z < .125 in. | 0.020 " | TRUE |
| $w = A \sin\theta$ = | 0.000 " | w < 0.03125 in. | 0.000 " | TRUE |
| $P_A$ = | 0.557 " | $1.05\ Dt < P_A < 1.5\ Dt$ | 0.557 " | TRUE |
| $P_b$ = | 0.557 " | $1.05\ Dt < P_b < 1.5\ Dt$ | 0.557 " | TRUE |
| $D_t$ = | 0.375 " | 0.18750" <= Dt <= 0.3750" | 0.375 " | TRUE |
| | | $P_A = P_b$ +/- 0.0630" | 0.000 " | TRUE |

**Pitot Tube Acceptable ?.............................................................................................. TRUE**

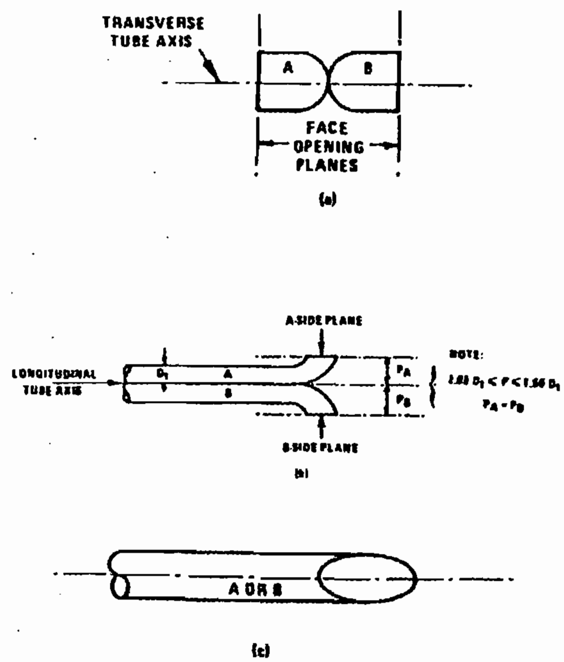



Figure 2-2. Properly constructed Type S pitot tube, shown in: (a) end view; face opening planes perpendicular to transverse axis; (b) top view; face opening planes parallel to longitudinal axis; (c) side view; both legs of equal length and centerlines coincident, when viewed from both sides. Baseline coefficient values of 0.84 may be assigned to pitot tubes constructed this way.

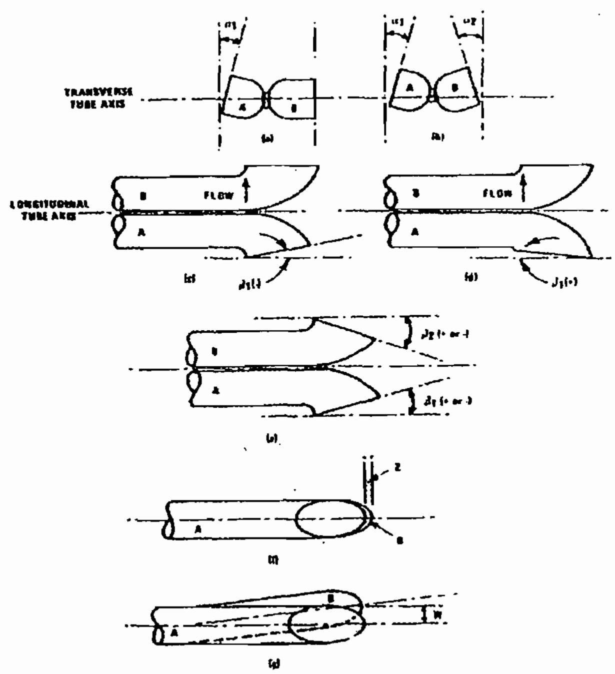



Figure 2-3. Types of face-opening misalignment that can result from field use or improper construction of Type S pitot tubes. These will not affect the baseline value of Cp(s) so long as $\alpha_1$ and $\alpha_2$ 10°, $\beta_1$ and $\beta_2$ 5°, z 0.32 cm (1/8 in.) and w 0.08 cm (1/32 in.) (citation 11 in Section 8).

# APPENDIX D

# PROCESS DATA

## Rayonier

### Fernandina Mill

**"A" SCRUBBER STACK TEST ANALYSIS** for 10-Jun-04

**Steam Output from No. 2 Power Boiler**

| Run Number | Steam Production [1000 lb./hr. of 1000 BTU/lb. Steam] Power Boiler No. 1 | Power Boiler No. 2 | Total |
|---|---|---|---|
| A-1 | 90 | 105 | 195 |
| A-2 | 100 | 97 | 198 |
| A-3 | 93 | 105 | 197 |
| Average | 95 | 101 | 196 |
| Capacity | 120 | 120 | 240 |
| A Scrubber Actual Total % of Capacity = | | | 82% |

**Oil Input to Boiler**

| Run Number | Power Boiler No. 1 Gal. Oil | Test Min. | BTU/gal | MMBTU/hr from Oil | Power Boiler No. 2 Gal. Oil | Test Min. | BTU/gal | MMBTU/hr from Oil | Test Result per Stack test |
|---|---|---|---|---|---|---|---|---|---|
| A-1 | 718 | 61 | 155,833 | 110 | 0 | 61 | 155833 | 0.0 | 30.984 |
| A-2 | 756 | 62 | 155833 | 114 | 0 | 62 | 155833 | 0.0 | 41.218 |
| A-3 | 676 | 60 | 155,833 | 105 | 0 | 60 | 155,833 | 0.0 | 57.145 |
| Average | 737 | 62 | 155,833 | 112 | 0 | 62 | 155,833 | 0 | 43 |
| Permit Maximum | [ mmBTU/hr ] | | | 185 | | | | 184 | |

**Allowable Particulate Emissions Calculation**

| | | |
|---|---|---|
| Test total BTU Input from Oil for B Scrubber | 112 | MM BTU/hr. |
| Maximum Steam Output from 1 & 2 PB | 240,000 | lb./hr. [1000 BTU Steam] |
| Test Operating Rate | 82% | |
| Test Steam Output Rate | 196,381 | lb./hr. [135,000 x test operating rate] |
| Boiler Efficiency on Oil | 65% | |
| Test Steam from Oil | 72,831 | lb./hr. [total input from oil x Eff. on oil] |
| Test Steam from Bark [by difference] | 123,550 | lb./hr. |
| Boiler Efficiency on Bark | 55% | Permit Max. |
| Test Heat Input from Bark | 225 | mmBTU/hr. 218 |
| Emissions Factor for Bark | 0.23 | lb. PM/MMBTU |
| Emissions Factor for Oil | 0.086 | lb. PM/MMBTU |
| Allowable Emissions from Bark | 51.7 | lb. PM/hr [emissions factor x heat input] |
| Allowable Emissions from Oil | 9.6 | lb. PM/hr [emissions factor x heat input] |
| Total Allowable Emissions for A Scrubber | 61.3 | lb. PM/hr. (Including Oil Emissions) |
| Total Allowable Emissions for A Scrubber | 61.3 | lb. PM/hr. ( By Oil Emissions Factor or Permit) |
| Actual emissions for A Scrubber 10-Jun-04 Test | 43.1 | lb. PM/hr. |

| Maximum By Permit | |
|---|---|
| 50.6 | #2 Bark Only |
| 15.2 | #2 Oil Only |
| 16.0 | #1 Oil Only |

**Rayonier**

**Fernandina Mill**

**Power Boilers Scrubber Test**

*Power Boiler Scrubber* "A"
*Date* 6/10/2004
*Run #* A-1

| | Start of Test hours | min | End of Test hours | min | Totals min | Time Corrected | |
|---|---|---|---|---|---|---|---|
| *Time* | 12 | 03 | 13 | 04 | 61 | 0.98361 | |
| ***Boiler No. 1*** | | | | | | | |
| *Steam Flow Integrator (x 1000)* | 381.2 | | 472.8 | | 91600 | 90098.4 | lb/hr |
| *Steam Temperature (° F)* | 758.9 | | 787.3 | | 773.1 | | |
| *Drum Pressure (psig.)* | 388.8 | | 336.4 | | 362.6 | | |
| *Oil Flow Intergrator (bbls.)* | 86.5 | | 103.6 | | 17.1 | 706 | gal/hr |
| *Steam Flow (lb/hr x 1000)* | 89.8 | | 81.8 | | 85.8 | | |
| *Oil Flow (gpm)* | 9.5 | | 11.6 | | 10.55 | | |
| ***Boiler No. 2*** | | | | | | | |
| *Steam Flow Integrator (x 1000)* | 428 | | 534.9 | | 106900 | 105148 | lb/hr |
| *Steam Temperature (° F)* | 715.7 | | 743.1 | | 729.4 | | |
| *Drum Pressure (psig.)* | 392.1 | | 340.9 | | 366.5 | | |
| *Oil Flow Intergrator (bbls.)* | 0 | | 0 | | 0 | 0 | gal/hr |
| *Steam Flow (lb/hr x 1000)* | 114.6 | | 112.1 | | 113350 | | |
| *Oil Flow (gpm)* | 5.2 | | 4.7 | | 4.95 | 297 | gal/hr |
| ***Bark Integrator*** | 159.7 | | 184.9 | | 25.2 | 25 | wet/tons/hr |
| *Bark to Boiler:* Num.(s) 2 And / or 3 | | | | | | | |
| *Scrubber "A" pH* | 7.1 | | 7.1 | | 7.1 | | |

**Rayonier**

**Fernandina Mill**

**"A" SCRUBBER STACK TEST ANALYSIS** for 10-Jun-04

**Steam Output from No. 1 & No. 2 Power Boilers**

| Run Number | Steam Production [1000 lb./hr. of 1000 BTU/lb. Steam] Power Boiler No. 1 | Power Boiler No. 2 | Total |
|---|---|---|---|
| A-1 | 90 | 105 | 195 |
| Average | 90 | 105 | 195 |
| Capacity | 120 | 120 | 240 |

A Scrubber Actual Total % of Capacity = 81%

**Oil Input to Boilers**

| Run Number | Power Boiler No. 1 Gal. Oil | Test Min. | BTU/gal | MMBTU/hr from Oil | Power Boiler No. 2 Gal. Oil | Test Min. | BTU/gal | MMBTU/hr from Oil |
|---|---|---|---|---|---|---|---|---|
| A-1 | 718.2 | 61 | 155,833 | 110 | 0 | 61 | 155,833 | 0 |
| Average | 718 | 61 | 155,833 | 110 | 0 | 61 | 155,833 | 0 |
| Permit Maximum | [ mmBTU/hr ] | | | 185 | | | | 184 |

**Allowable Particulate Emissions Calculation**

| | | | |
|---|---|---|---|
| Test total BTU Input from Oil for A Scrubber | 110 | MM BTU/hr. | |
| Maximum Steam Output from 1 & 2 PB | 240,000 | lb./hr. [1000 BTU Steam] | |
| Test Operating Rate | 81% | | |
| Test Steam Output Rate | 195,246 | lb./hr. [240,000 x test operating rate] | |
| Boiler Efficiency on Oil | 65% | | |
| Test Steam from Oil | 71,555 | lb./hr. [total input from oil x Eff. on oil] | |
| Test Steam from Bark [by difference] | 123,691 | lb./hr. | |
| Boiler Efficiency on Bark | 55% | Permit Max. | |
| Test Heat Input from Bark | 225 | mmBTU/hr. 218 | Maximum |
| Emissions Factor for Bark | 0.23 | lb. PM/MMBTU | By |
| Emissions Factor for Oil | 0.086 | lb. PM/MMBTU | Permit |
| Allowable Emissions from Bark | 51.7 | lb. PM/hr [emissions factor x heat input] | 50.6 #2 Bark Only |
| Allowable Emissions from Oil | 9.5 | lb. PM/hr [emissions factor x heat input] | 15.2 #2 Oil Only |
| Total Allowable Emissions for A Scrubber | 61.2 | lb. PM/hr. (Including Oil Emissions) | 16.0 #1 Oil Only |
| Total Allowable Emissions for A Scrubber | 61.2 | lb. PM/hr. ( By Oil Emissions Factor or Permit) | |
| Actual emissions for A Scrubt Jun 2004 test] | 31.0 | lb. PM/hr. | |

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## Rayonier

### Fernandina Mill

**"A" SCRUBBER STACK TEST ANALYSIS** for 10-Jun-04

**Steam Output from No. 1 & No. 2 Power Boilers**

| Run Number | Steam Production [1000 lb./hr. of 1000 BTU/lb. Steam] Power Boiler No. 1 | Power Boiler No. 2 | Total |
|---|---|---|---|
| A-2 | 100 | 97 | 198 |
| Average | 100 | 97 | 198 |
| Capacity | 120 | 120 | 240 |

A Scrubber Actual Total % of Capacity = 82%

**Oil Input to Boilers**

| Run Number | Power Boiler No. 1 Gal. Oil | Test Min. | BTU/gal | MMBTU/hr from Oil | Power Boiler No. 2 Gal. Oil | Test Min. | BTU/gal | MMBTU/hr from Oil |
|---|---|---|---|---|---|---|---|---|
| A-2 | 756 | 62 | 155,833 | 114 | 0 | 62 | 155,833 | 0 |
| Average | 756 | 62 | 155,833 | 114 | 0 | 62 | 155,833 | 0 |
| Permit Maximum | [ mmBTU/hr ] | | | 185 | | | | 184 |

**Allowable Particulate Emissions Calculation**

| | | | | | |
|---|---|---|---|---|---|
| Test total BTU Input from Oil for A Scrubber | 114 | MM BTU/hr. | | | |
| Maximum Steam Output from 1 & 2 PB | 240,000 | lb./hr. [1000 BTU Steam] | | | |
| Test Operating Rate | 82% | | | | |
| Test Steam Output Rate | 197,516 | lb./hr. [240,000 x test operating rate] | | | |
| Boiler Efficiency on Oil | 65% | | | | |
| Test Steam from Oil | 74,106 | lb./hr. [total input from oil x Eff. on oil] | | | |
| Test Steam from Bark [by difference] | 123,410 | lb./hr. | | | |
| Boiler Efficiency on Bark | 55% | | Permit Max. | | |
| Test Heat Input from Bark | 224 | mmBTU/hr. | 218 | Maximum By Permit | |
| Emissions Factor for Bark | 0.23 | lb. PM/MMBTU | | | |
| Emissions Factor for Oil | 0.086 | lb. PM/MMBTU | | | |
| Allowable Emissions from Bark | 51.6 | lb. PM/hr [emissions factor x heat input] | | 50.6 | #2 Bark Only |
| Allowable Emissions from Oil | 9.8 | lb. PM/hr [emissions factor x heat input] | | 15.2 | #2 Oil Only |
| Total Allowable Emissions for A Scrubber | 61.4 | lb. PM/hr. | (Including Oil Emissions) | 16.0 | #1 Oil Only |
| Total Allowable Emissions for A Scrubber | 61.4 | lb. PM/hr. | ( By Oil Emissions Factor or Permit) | | |
| Actual emissions for A Scrubt Jun 2004 test] | 41.2 | lb. PM/hr. | | | |

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**Rayonier**

**Fernandina Mill**

**Power Boilers Scrubber Test**

*Power Boiler Scrubber* "A"
*Date* 6/10/2004
*Run #* A-2

| | Start of Test | | End of Test | | Totals | Time | |
|---|---|---|---|---|---|---|---|
| | hours | min | hours | min | min | Corrected | |
| *Time* | 14 | 43 | 15 | 45 | 62 | 0.96774 | |
| ***Boiler No. 1*** | | | | | | | |
| *Steam Flow Integrator (x 1000 )* | 633.2 | | 736.7 | | 103500 | 100161 | lb/hr |
| *Steam Temperature (° F)* | 801.5 | | 778.2 | | 789.85 | | |
| *Drum Pressure (psig.)* | 353.3 | | 305.5 | | 329.4 | | |
| *Oil Flow Intergrator (bbls.)* | 136.5 | | 154.5 | | 18 | 731.613 | gal/hr |
| *Steam Flow (lb/hr x 1000)* | 106 | | 100.1 | | 103.05 | | |
| *Oil Flow (gpm)* | 13.1 | | 11.3 | | 12.2 | | |
| ***Boiler No. 2*** | | | | | | | |
| *Steam Flow Integrator (x 1000 )* | 657.7 | | 758.3 | | 100600 | 97354.8 | lb/hr |
| *Steam Temperature (° F)* | 745.8 | | 720.9 | | 733.35 | | |
| *Drum Pressure (psig.)* | 349.9 | | 299.2 | | 324.55 | | |
| *Oil Flow Intergrator (bbls.)* | 0 | | 0 | | 0 | 0 | gal/hr |
| *Steam Flow (lb/hr x 1000)* | 109.2 | | 94.6 | | 101900 | | |
| *Oil Flow (gpm)* | 4.9 | | 4.9 | | 4.9 | 294 | gal/hr |
| ***Bark Integrator*** | 222.6 | | 245.9 | | 23.3 | 23 | wet/tons/hr |
| *Bark to Boiler:* Num.(s) 2 And / or 3 | | | | | | | |
| *Scrubber "A" pH* | 7.1 | | 6.9 | | 7.0 | | |

**Rayonier**

**Fernandina Mill**

**Power Boilers Scrubber Test**

*Power Boiler Scrubber* "A"
*Date* 6/10/2004
*Run #* A-3

| | Start of Test hours | min | End of Test hours | min | Totals min | Time Corrected | |
|---|---|---|---|---|---|---|---|
| *Time* | 17 | 35 | 18 | 35 | 60 | 1 | |
| ***Boiler No. 1*** | | | | | | | |
| *Steam Flow Integrator (x 1000)* | 875.9 | | 968.6 | | 92700 | 92700 | lb/hr |
| *Steam Temperature (° F)* | 766.6 | | 795.6 | | 781.1 | | |
| *Drum Pressure (psig.)* | 359.7 | | 318.6 | | 339.15 | | |
| *Oil Flow Intergrator (bbls.)* | 185.5 | | 201.6 | | 16.1 | 676 | gal/hr |
| *Steam Flow (lb/hr x 1000)* | 98.9 | | 92.1 | | 95.5 | | |
| *Oil Flow (gpm)* | 10.9 | | 12.3 | | 11.6 | | |
| ***Boiler No. 2*** | | | | | | | |
| *Steam Flow Integrator (x 1000)* | 891.4 | | 996 | | 104600 | 104600 | lb/hr |
| *Steam Temperature (° F)* | 719 | | 737.4 | | 728.2 | | |
| *Drum Pressure (psig.)* | 360.8 | | 317.2 | | 339 | | |
| *Oil Flow Intergrator (bbls.)* | 0 | | 0 | | 0 | 0 | gal/hr |
| *Steam Flow (lb/hr x 1000)* | 114.1 | | 103.3 | | 108700 | | |
| *Oil Flow (gpm)* | 5.3 | | 4.6 | | 4.95 | 297 | gal/hr |
| ***Bark Integrator*** | 290.9 | | 314.9 | | 24 | 24 | wet/tons/hr |
| *Bark to Boiler:* Num.(s) 2 And / or 3 | | | | | | | |
| *Scrubber "A" pH* | 7.1 | | 7.0 | | 7.1 | | |

## Rayonier

### Fernandina Mill

**"A" SCRUBBER STACK TEST ANALYSIS** for 10-Jun-04

**Steam Output from No. 1 & No. 2 Power Boilers**

| Run Number | Steam Production [1000 lb./hr. of 1000 BTU/lb. Steam] Power Boiler No. 1 | Power Boiler No. 2 | Total |
|---|---|---|---|
| A-3 | 93 | 105 | 197 |
| Average | 93 | 105 | 197 |
| Capacity | 120 | 120 | 240 |

A Scrubber Actual Total % of Capacity = 82%

**Oil Input to Boilers**

| Run Number | Power Boiler No. 1 Gal. Oil | Test Min. | BTU/gal | MMBTU/hr from Oil | Power Boiler No. 2 Gal. Oil | Test Min. | BTU/gal | MMBTU/hr from Oil |
|---|---|---|---|---|---|---|---|---|
| A-3 | 676.2 | 60 | 155,833 | 105 | 0 | 60 | 155,833 | 0 |
| Average | 676 | 60 | 155,833 | 105 | 0 | 60 | 155,833 | 0 |
| Permit Maximum | [ mmBTU/hr ] | | | 185 | | | | 184 |

**Allowable Particulate Emissions Calculation**

| | | | | | |
|---|---|---|---|---|---|
| Test total BTU Input from Oil for A Scrubber | 105 | MM BTU/hr. | | | |
| Maximum Steam Output from 1 & 2 PB | 240,000 | lb./hr. [1000 BTU Steam] | | | |
| Test Operating Rate | 82% | | | | |
| Test Steam Output Rate | 197,300 | lb./hr. [240,000 x test operating rate] | | | |
| Boiler Efficiency on Oil | 65% | | | | |
| Test Steam from Oil | 68,493 | lb./hr. [total input from oil x Eff. on oil] | | | |
| Test Steam from Bark [by difference] | 128,807 | lb./hr. | | | |
| Boiler Efficiency on Bark | 55% | | Permit Max. | | |
| Test Heat Input from Bark | 234 | mmBTU/hr. | 218 | Maximum By Permit | |
| Emissions Factor for Bark | 0.23 | lb. PM/MMBTU | | | |
| Emissions Factor for Oil | 0.086 | lb. PM/MMBTU | | | |
| Allowable Emissions from Bark | 53.9 | lb. PM/hr [emissions factor x heat input] | | 50.6 | #2 Bark Only |
| Allowable Emissions from Oil | 9.1 | lb. PM/hr [emissions factor x heat input] | | 15.2 | #2 Oil Only |
| Total Allowable Emissions for A Scrubber | 62.9 | lb. PM/hr. | (Including Oil Emissions) | 16.0 | #1 Oil Only |
| Total Allowable Emissions for A Scrubber | 62.9 | lb. PM/hr. | ( By Oil Emissions Factor or Permit) | | |
| Actual emissions for A Scrubt Jun 2004 test] | 57.1 | lb. PM/hr. | | | |

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## "B" SCRUBBER STACK TEST ANALYSIS for 9-Jun-04

### Steam Output from No. 3 Power Boiler

| Run Number | Steam Production [1000 lb./hr. of 1000 BTU/lb. Steam] Power Boiler No. 3 |
|---|---|
| B1 | 122 |
| B2 | 135 |
| B3 | 116 |
| | |
| Average | 125 |
| Capacity | 135 |

B Scrubber Actual Total % of Capacity = 92%

### Oil Input to Boiler

| | Power Boiler No. 3 | | | | |
|---|---|---|---|---|---|
| Run Number | Gal. Oil | Test Min. | BTU/gal | MMBTU/hr from Oil | Test Result per Stack test |
| B1 | 230.58 | 52 | 155,833 | 41 | 20.90 |
| B2 | 184.8 | 56 | 155,833 | 31 | 47.64 |
| B3 | 142.8 | 61 | 155,833 | 22 | 34.44 |
| Average | 186 | 56 | 155,833 | 31 | 34.33 |
| Permit Maximum | [mmBtu/hr] | | | 207 | |

### Allowable Particulate Emissions Calculation

| | | | | |
|---|---|---|---|---|
| Test total BTU Input from Oil for B Scrubber | 31 | MM BTU/hr. | | |
| Maximum Steam Output from 3 PB | 135,000 | lb./hr. [1000 BTU Steam] | | |
| Test Operating Rate | 92% | | | |
| Test Steam Output Rate | 124,648 | lb./hr. [135,000 x test operating rate] | | |
| Boiler Efficiency on Oil | 65% | | | |
| Test Steam from Oil | 20,411 | lb./hr. [total input from oil x Eff. on oil] | | |
| Test Steam from Bark [by difference] | 104,237 | lb./hr. | | |
| Boiler Efficiency on Bark | 55% | | Permit Max. | |
| Test Heat Input from Bark | 190 | mmBTU/hr | 245 | |
| Emissions Factor for Bark | 0.207 | lb. PM/MMBTU | | Permit Maximum |
| Emissions Factor for Oil | 0.086 | lb. PM/MMBTU | | |
| Allowable Emissions from Bark | 39.2 | lb. PM/hr [emissions factor x heat input] | | 50.6 |
| Allowable Emissions from Oil | 2.7 | lb. PM/hr [emissions factor x heat input] | | 16.7 |
| Total Allowable Emissions for B Scrubber | 41.9 | lb. PM/hr. | (Including Oil Emissions) | |
| Total Allowable Emissions for B Scrubber | 41.9 | lb. PM/hr. | ( By Oil Emissions Factor or Permit) | |
| Actual emissions for B Scrubber 9-Jun-04 Test | 34.3 | lb. PM/hr. | | |

**"B" SCRUBBER STACK TEST ANALYSIS** for 9-Jun-04

**Steam Output from No. 3 Power Boiler**

| Run Number | Steam Production [1000 lb./hr. of 1000 BTU/lb. Steam] Power Boiler No. 3 |
|---|---|
| B1 | 122 |
| Average | 122 |
| Capacity | 135 |

B Scrubber Actual Total % of Capacity = 90%

**Oil Input to Boiler**

| Power Boiler No. 3 | | | | |
|---|---|---|---|---|
| Run Number | Gal. Oil | Test Min. | BTU/gal | MMBTU/hr from Oil |
| B1 | 230.58 | 52 | 155,833 | 41 |
| Average | 231 | 52 | 155,833 | 41 |

| | | |
|---|---|---|
| Permit Maximum on Oil | [mmBtu/hr] | 207 |
| Permit Maximum on Bark | [mmBtu/hr] | 245 |

**Allowable Particulate Emissions Calculation**

| | | | | |
|---|---|---|---|---|
| Test total BTU Input from Oil for B Scrubber | 41 | MM BTU/hr. | | |
| Maximum Steam Output from 3 PB | 135,000 | lb./hr. [1000 BTU Steam] | | |
| Test Operating Rate | 90% | | | |
| Test Steam Output Rate | 122,164 | lb./hr. [135,000 x test operating rate] | | |
| Boiler Efficiency on Oil | 65% | | | |
| Test Steam from Oil | 26,949 | lb./hr. [total input from oil x Eff. on oil] | | |
| Test Steam from Bark | 95,215 | lb./hr. | | |
| Boiler Efficiency on Bark | 55% | Permit Max. | | |
| Test Heat Input from Bark | 173 | mmBTU/hr. **245** | | |
| Emissions Factor for Bark | 0.207 | lb. PM/MMBTU | Permit Maximum | |
| Emissions Factor for Oil | 0.086 | lb. PM/MMBTU | | |
| Allowable Emissions from Bark | 35.8 | lb. PM/hr [emissions factor x heat input] | 50.6 | #3Bark Only |
| Allowable Emissions from Oil | 3.6 | lb. PM/hr [emissions factor x heat input] | 16.7 | #3 Oil Only |
| Total Allowable Emissions for B Scrubber | 39.4 | lb. PM/hr. | (Including Oil Emissions) | |
| Total Allowable Emissions for B Scrubber | 39.4 | lb. PM/hr. | ( By Oil Emissions Factor or Permit) | |
| Actual emissions for B Scrubber 9-Jun-04 Test | 20.9 | lb. PM/hr. | | |

**Power Boilers Scrubber Test**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | *Power Boiler Scrubber* | | | "B" | | | | |
| | *Date* | | | 09-Jun-04 | | | | |
| | *Run #* | | | B1 -1 | | | | |
| | | | | | | part 1 | Combined | |
| | *Start of Test* | | *End of Test* | | *Totals* | *Time* | *Time* | |
| | hours | min | hours | min | min | *corrected* | *corrected* | |
| *Time* | 12 | 28 | 13 | 20 | 52 | 1.15385 | 0.9836 | |
| ***Boiler No. 3*** | | | | | | | | |
| *Steam Flow Integrator (x 1000)* | 467.4 | | 574 | | 106600 | 123000 | 122164 | lb/hr |
| *Steam Temperature (° F)* | 747.7 | | 745 | | 746.35 | | | |
| *Drum Pressure (psig.)* | 453.6 | | 465 | | 459.3 | | | |
| *Oil Flow Intergrator (bbl.)* | 19.8 | | 25.29 | | 5.49 | 266.054 | 268.11 | gal/hr |
| *Steam Flow (lb/hr x 1000)* | 125.8 | | 122 | | 123900 | | | |
| *Oil Flow (gpm)* | 5.1 | | 5 | | 5.05 | | | |
| ***Bark Integrator*** | 152.2 | | 176.852 | | 24.652 | 28 | 28 | wet/ tons/ hr |
| *Bark to Boiler:* | Num.(s) | 2 | And / or | 3 | | | | |
| *Scrubber "B" pH* | 8.1 | | 8.0 | | 8.1 | | | |

**Power Boilers Scrubber Test**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Power Boiler Scrubber | | | | **"B"** | | | |
| | Date | | | | 09-Jun-04 | | | |
| | Run # | | | | B1 -2 | | | |
| | | | | | | | Part 2 | |
| | Start of Test | | End of Test | | Totals | | Time | |
| | hours | min | hours | min | min | | corrected | |
| Time | 13 | 50 | 13 | 59 | 9 | | 6.66667 | |
| **Boiler No. 3** | | | | | | | | |
| Steam Flow Integrator (x 1000) | 637.1 | | 654.7 | | 17600 | | 117333 | lb/hr |
| Steam Temperature (° F) | 745.5 | | 742.4 | | 743.95 | | | |
| Drum Pressure (psig.) | 493.2 | | 452 | | 472.6 | | | |
| Oil Flow Intergrator (bbl.) | 33.2 | | 34.2 | | 1 | | 280 | gal/hr |
| Steam Flow (lb/hr x 1000) | 125.1 | | 128.5 | | 126800 | | | |
| Oil Flow (gpm) | 5 | | 4.9 | | 4.95 | | | |
| **Bark Integrator** | 186.4 | | 190.6 | | 4.2 | | 28 | wet/tons/hr |
| Bark to Boiler: | Num.(s) 2 | | And / or 3 | | | | | |
| Scrubber "B" pH | 7.9 | | 7.9 | | 7.9 | | | |

## "B" SCRUBBER STACK TEST ANALYSIS    for 9-Jun-04

### Steam Output from No. 3 Power Boiler

| Run Number | Steam Production [1000 lb./hr. of 1000 BTU/lb. Steam] Power Boiler No. 3 |
|---|---|
| B2 | 135 |
| Average | 135 |
| Capacity | 135 |

B Scrubber Actual Total % of Capacity = 100%

### Oil Input to Boiler

| Run Number | Power Boiler No. 3 Gal. Oil | Test Min. | BTU/gal | MMBTU/hr from Oil |
|---|---|---|---|---|
| B2 | 184.8 | 56 | 155,833 | 31 |
| Average | 185 | 56 | 155,833 | 31 |

| | | |
|---|---|---|
| Permit Maximum on Oil | [mmBtu/hr] | 207 |
| Permit Maximum on Bark | [mmBtu/hr] | 245 |

### Allowable Particulate Emissions Calculation

| | | | Permit Maximum | |
|---|---|---|---|---|
| Test total BTU Input from Oil for B Scrubber | 31 | MM BTU/hr. | | |
| Maximum Steam Output from 3 PB | 135,000 | lb./hr. [1000 BTU Steam] | | |
| Test Operating Rate | 100% | | | |
| Test Steam Output Rate | 135,321 | lb./hr. [135,000 x test operating rate] | | |
| Boiler Efficiency on Oil | 65% | | | |
| Test Steam from Oil | 20,056 | lb./hr. [total input from oil x Eff. on oil] | | |
| Test Steam from Bark | 115,266 | lb./hr. | | |
| Boiler Efficiency on Bark | 55% | | | |
| Test Heat Input from Bark | 210 | mmBTU/hr. Permit Max. 245 | | |
| Emissions Factor for Bark | 0.207 | lb. PM/MMBTU | | |
| Emissions Factor for Oil | 0.086 | lb. PM/MMBTU | | |
| Allowable Emissions from Bark | 43.4 | lb. PM/hr [emissions factor x heat input] | 50.6 | #3Bark Only |
| Allowable Emissions from Oil | 2.7 | lb. PM/hr [emissions factor x heat input] | 16.7 | #3 Oil Only |
| Total Allowable Emissions for B Scrubber | 46.0 | lb. PM/hr. | (Including Oil Emissions) | |
| Total Allowable Emissions for B Scrubber | 46.0 | lb. PM/hr. | ( By Oil Emissions Factor or Permit) | |
| Actual emissions for B Scrubber 9-Jun-04 Test | **47.6** | lb. PM/hr. | | |

Power Boilers Scrubber Test

| | |
|---|---|
| *Power Boiler Scrubber* | "B" |
| *Date* | 09-Jun-04 |
| *Run #* | B2 |

| | *Start of Test* | | *End of Test* | | *Totals* | *Time* | |
|---|---|---|---|---|---|---|---|
| | hours | min | hours | min | min | *corrected* | |
| *Time* | 15 | 29 | 16 | 25 | 56 | 1.07143 | |
| ***Boiler No. 3*** | | | | | | | |
| *Steam Flow Integrator (x 1000)* | 821 | | 947.3 | | 126300 | 135321 | lb/hr |
| *Steam Temperature ($^{o}$ F)* | 750.3 | | 752.8 | | 751.55 | | |
| *Drum Pressure (psig.)* | 474.3 | | 382 | | 428.15 | | |
| *Oil Flow Intergrator (bbl.)* | 40.8 | | 45.2 | | 4.4 | 198 | gal/hr |
| *Steam Flow (lb/hr x 1000)* | 140.5 | | 132.2 | | 136350 | | |
| *Oil Flow (gpm)* | 3 | | 5.8 | | 4.4 | | |
| ***Bark Integrator*** | 231.3 | | 258.9 | | 27.6 | 30 | wet/tons/hr |
| *Bark to Boiler:* Num.(s) | 2 | | And / or 3 | | | | |
| *Scrubber "B" pH* | 7.9 | | 7.9 | | 7.9 | | |

## "B" SCRUBBER STACK TEST ANALYSIS for 9-Jun-04

### Steam Output from No. 3 Power Boiler

| Run Number | Steam Production [1000 lb./hr. of 1000 BTU/lb. Steam] Power Boiler No. 3 |
|---|---|
| B3 | 116 |
| Average | 116 |
| Capacity | 135 |

B Scrubber Actual Total % of Capacity = 86%

### Oil Input to Boiler

| | Power Boiler No. 3 | | | |
|---|---|---|---|---|
| Run Number | Gal. Oil | Test Min. | BTU/gal | MMBTU/hr from Oil |
| B3 | 143 | 61 | 155,833 | 22 |
| Average | 143 | 61 | 155,833 | 22 |

| | | |
|---|---|---|
| Permit Maximum on Oil | [mmBtu/hr] | 207 |
| Permit Maximum on Bark | [mmBtu/hr] | 245 |

### Allowable Particulate Emissions Calculation

| | | | | |
|---|---|---|---|---|
| Test total BTU Input from Oil for B Scrubber | 22 | MM BTU/hr. | | |
| Maximum Steam Output from 3 PB | 135,000 | lb./hr. [1000 BTU Steam] | | |
| Test Operating Rate | 86% | | | |
| Test Steam Output Rate | 116,459 | lb./hr. [135,000 x test operating rate] | | |
| Boiler Efficiency on Oil | 65% | | | |
| Test Steam from Oil | 14,227 | lb./hr. [total input from oil x Eff. on oil] | | |
| Test Steam from Bark [by difference] | 102,232 | lb./hr. | | |
| Boiler Efficiency on Bark | 55% | Permit Max. | | |
| Test Heat Input from Bark | 186 | mmBTU/hr. 245 | | |
| Emissions Factor for Bark | 0.207 | lb. PM/MMBTU | Permit | |
| Emissions Factor for Oil | 0.086 | lb. PM/MMBTU | Maximum | |
| Allowable Emissions from Bark | 38.5 | lb. PM/hr [emissions factor x heat input] | 50.6 | #3Bark Only |
| Allowable Emissions from Oil | 1.9 | lb. PM/hr [emissions factor x heat input] | 16.7 | #3 Oil Only |

| | | | |
|---|---|---|---|
| Total Allowable Emissions for B Scrubber | 40.4 | lb. PM/hr. | (Including Oil Emissions) |
| Total Allowable Emissions for B Scrubber | 40.4 | lb. PM/hr. | ( By Oil Emissions Factor or Permit) |
| Actual emissions for B Scrubber 9-Jun-04 Test | 34.4 | lb. PM/hr. | |

**Power Boilers Scrubber Test**

| | |
|---|---|
| *Power Boiler Scrubber* | "B" |
| *Date* | 09-Jun-04 |
| *Run #* | B3 |

| | Start of Test | | End of Test | | Totals | Time | |
|---|---|---|---|---|---|---|---|
| | hours | min | hours | min | min | corrected | |
| *Time* | 17 | 55 | 18 | 56 | 61 | 0.98361 | |
| ***Boiler No. 3*** | | | | | | | |
| *Steam Flow Integrator (x 1000)* | 1118.4 | | 1236.8 | | 118400 | 116459 | lb/hr |
| *Steam Temperature (° F)___* | 755.7 | | 738.6 | | 747.15 | | |
| *Drum Pressure (psig.)_____* | 466.4 | | 431.1 | | 448.75 | | |
| *Oil Flow Intergrator (bbl.)__* | 62.5 | | 65.9 | | 3.4 | 140.459 | gal/hr |
| *Steam Flow (lb/hr x 1000)_* | 123.6 | | 129.6 | | 126600 | | |
| *Oil Flow (gpm)_________* | 0 | | 4 | | 2 | | |
| ***Bark Integrator*** | 291 | | 320.2 | | 29.2 | 29 | wet/tons/hr |
| *Bark to Boiler:* Num.(s) 2 And / or 3 | | | | | | | |
| *Scrubber "B" pH* | 7.6 | | 7.8 | | 7.70 | | |

## Sulfite Recovery Boiler Scrubber Stack Test Analysis for 24-May-04

### Steam Output from the Sulfite Recovery Boiler

| Run Number | Steam Production [1000 lb./hr. of 1000 BTU/lb. Steam] Sulfite Recovery Boiler |
|---|---|
| 1 | 375 |
| 2 | 399 |
| 3 | 354 |
| Average | 376 |

| Oil Input to Boiler | | | | | Liquor Input to Boiler | | Test Result |
|---|---|---|---|---|---|---|---|
| Sulfite Recovery Boiler | | | | | | | Particulate |
| Run Number | Gal. Oil | Test Min. | BTU/gal | MMBTU/hr from Oil | Gal. Liquor | Liquor Flow lbs/hr. | (per Stack test) lbs/hr. |
| 1 | 0 | 74 | 155,833 | 0 | 10407 | 65,111 | 21.2 |
| 2 | 0 | 63 | 155,833 | 0 | 11341 | 69,665 | 19.8 |
| 3 | 0 | 69 | 155,833 | 0 | 11295 | 66,210 | 23.1 |
| Average | 0 | 69 | 155,833 | 0 | 11,014 | 66,995 | 21.3 |

| | |
|---|---|
| Permit Maximum [lbs/hr. SSL] | 70,000 |
| Recovery Boiler Actual Total % of Capacity = | 96% |
| Standard Operating Max | 63,000 |
| Percent of Standard Operating Max | 106% |

| | | |
|---|---|---|
| Permit Maximum (particulate) | | 67.5 lbs/hr. |
| Permit Maximum (particulate) | | 67.5 lbs/hr. |
| Permit Limit | **2.5** | PM lb/ADTUP |
| Test Value | **0.74** | PM lb/ADTUP |

## Recovery Boiler Compliance Test

Date: 24-May-04

Run: # 1

| | Start of Test hour | min | End of Test hour | min | Difference | %of hour | |
|---|---|---|---|---|---|---|---|
| Time | 11 | 16 | 12 | 30 | 74 | 0.810811 | |
| "B" Liquor Flow, gallons | 48247.5 | | 61082.4 | | 12834.9 | 10406.68 | gph |
| Liquor Flow, gpm meter | 174 | | 174 | | 174 | 10440 | gph |
| Liquor Temperature, deg F | 205 | | 205 | | 205 | | |
| Liquor Hydrometer Reading | 1.255 | | 1.255 | | 1.255 | | |
| Liquor solids, % OD | 59.6 | | 59.5 | | 59.55 | | |
| No. of Liquor guns | 10 | | 10 | | 10 | | |
| No. of oil guns | 0 | | 0 | | 0 | | |
| No. of oil guns @ pressure | 0 | | 0 | | 0 | | |
| Steam load, lbs/hr chart x 1000 | 378 | | 376 | | 377 | | |
| Steam Flow Integrator x 1000, lb | 1822.5 | | 2285.1 | | 462600 | 375081.1 | lb/hr |
| Steam Temperature, deg F | 852 | | 851 | | 851.5 | | |
| Steam Pressure, psi | 978 | | 984 | | 981 | | |
| SO2, ppm | 248 | | 248 | | 248 | | |

| | | | |
|---|---|---|---|
| Liquor Flow Calculation | (gph)(8.345)(sp.gr.)(%OD) | 65110.70 | lb/hr |
| Integrator Calculation: | TSP Mass Emission Rate results: | 21.15 | lb/hr |

(End of test value - Start of test value)(60 min./hr / Test time, min.) = Units/hr

## Recovery Boiler Compliance Test

Date: 24-May-04

Run: # 2

| | Start of Test hour | min | End of Test hour | min | Difference | %of hour | |
|---|---|---|---|---|---|---|---|
| Time | 15 | 35 | 16 | 38 | 63 | 0.952381 | |
| "B" Liquor Flow, gallons | 93925.7 | | 105833.9 | | 11908.2 | 11341.14 | gph |
| Liquor Flow, gpm meter | 190 | | 190 | | 190 | 11400 | gph |
| Liquor Temperature, deg F | 204 | | 204 | | 204 | | |
| Liquor Hydrometer Reading | 1.255 | | 1.255 | | 1.255 | | |
| Liquor solids, % OD | 58.7 | | 58 | | 58.35 | | |
| No. of Liquor guns | 10 | | 10 | | 10 | | |
| No. of oil guns | 0 | | 0 | | 0 | | |
| No. of oil guns @ pressure | 0 | | 0 | | 0 | | |
| Steam load, lbs/hr chart x 1000 | 398 | | 401 | | 399.5 | | |
| Steam Flow Integrator x 1000, lb | 3458.9 | | 3877.9 | | 419000 | 399047.6 | lb/hr |
| Steam Temperature, deg F | 868 | | 869 | | 868.5 | | |
| Steam Pressure, psi | 1001 | | 1003 | | 1002 | | |
| SO2, ppm | 226 | | 238 | | 232 | | |

Liquor Flow Calculation (gph)(8.345)(sp.gr.)(%OD) 69665.18 lb/hr

Integrator Calculation: TSP Mass Emission Rate results: 19.75 lb/hr

(End of test value - Start of test value)(60 min./hr / Test time, min.) = Units/hr

## Recovery Boiler Compliance Test

Date: 24-May-04

Run: # 3

| | Start of Test hour | min | End of Test hour | min | Difference | %of hour | |
|---|---|---|---|---|---|---|---|
| Time | 17 | 29 | 18 | 38 | 69 | 0.869565 | |
| "B" Liquor Flow, gallons | 77251.3 | | 90240.3 | | 12989 | 11294.78 | gph |
| Liquor Flow, gpm meter | 209 | | 210 | | 209.5 | 12570 | gph |
| Liquor Temperature, deg F | 192 | | 192 | | 192 | | |
| Liquor Hydrometer Reading | 1.242 | | 1.238 | | 1.24 | | |
| Liquor solids, % OD | 57.1 | | 56.2 | | 56.65 | | |
| No. of Liquor guns | 8 | | 8 | | 8 | | |
| No. of oil guns | 0 | | 0 | | 0 | | |
| No. of oil guns @ pressure | 0 | | 0 | | 0 | | |
| Steam load, lbs/hr chart x 1000 | 395 | | 393 | | 394 | | |
| Steam Flow Integrator x 1000, lb | 2502.7 | | 2909.5 | | 406800 | 353739.1 | lb/hr |
| Steam Temperature, deg F | 873 | | 870 | | 871.5 | | |
| Steam Pressure, psi | 995 | | 994 | | 994.5 | | |
| SO2, ppm | 239 | | 238 | | 238.5 | | |

| | | | |
|---|---|---|---|
| Liquor Flow Calculation | (gph)(8.345)(sp.gr.)(%OD) | 66210.34 | lb/hr |
| Integrator Calculation: | TSP Mass Emission Rate results: | 23.10 | lb/hr |

(End of test value - Start of test value)(60 min./hr / Test time, min.) = Units/hr

## Sulfite Recovery Boiler Scrubber Stack Test Analysis for 25-May-04

### Steam Output from the Sulfite Recovery Boiler

| Run Number | Steam Production [1000 lb./hr. of 1000 BTU/lb. Steam] Sulfite Recovery Boiler |
|---|---|
| 4 | 389 |
| 5 | 398 |
| 6 | 392 |
| Average | 393 |

| Oil Input to Boiler | | | | | Liquor Input to Boiler | | Test Result |
|---|---|---|---|---|---|---|---|
| Sulfite Recovery Boiler | | | | | | | Particulate |
| Run Number | Gal. Oil | Test Min. | BTU/gal | MMBTU/hr from Oil | Gal. Liquor | Liquor Flow lbs/hr. | (per Stack test) lbs/hr. |
| 4 | 0 | 64 | 155,833 | 0 | 11226 | 68,046 | 25.0 |
| 5 | 0 | 189.5 | 155,833 | 0 | 11427 | 70,377 | 22.9 |
| 6 | 0 | 189.5 | 155,833 | 0 | 11283 | 68,557 | 30.2 |
| Average | 0 | 148 | 155,833 | 0 | 11,312 | 68,993 | 26.0 |

| | | |
|---|---|---|
| Permit Maximum | [lbs/hr. SSL] | 70,000 |
| Recovery Boiler Actual Total % of Capacity = | | 99% |
| Standard Operating Max | | 63,000 |
| Percent of Standard Operating Max | | 110% |

| | | | |
|---|---|---|---|
| Permit Maximum | (particulate) | 67.5 lbs/hr. | |
| Permit Maximum | (particulate) | 67.5 lbs/hr. | |
| Permit Limit | | **2.5** | PM lb/ADTUP |
| Test Value | | **0.88** | PM lb/ADTUP |

**Recovery Boiler Compliance Test**

| | |
|---|---|
| Date: | 25-May-04 |
| Run: # | 4 |

| | Start of Test hour | min | End of Test hour | min | Difference | %of hour | |
|---|---|---|---|---|---|---|---|
| Time | 9 | 40 | 10 | 44 | 64 | 0.9375 | |
| "B" Liquor Flow, gallons | 35865.5 | | 47840.3 | | 11974.8 | 11226.38 | gph |
| Liquor Flow, gpm meter | 187 | | 187 | | 187 | 11220 | gph |
| Liquor Temperature, deg F | 196 | | 197 | | 196.5 | | |
| Liquor Hydrometer Reading | 1.246 | | 1.25 | | 1.248 | | |
| Liquor solids, % OD | 57.6 | | 58.8 | | 58.2 | | |
| No. of Liquor guns | 10 | | 10 | | 10 | | |
| No. of oil guns | 0 | | 0 | | 0 | | |
| No. of oil guns @ pressure | 0 | | 0 | | 0 | | |
| Steam load, lbs/hr chart x 1001 | 388 | | 389 | | 388.5 | | |
| Steam Flow Integrator x 1000, lb | 1212.7 | | 1627.9 | | 415200 | 389250 | lb/hr |
| Steam Temperature, deg F | 872 | | 866 | | 869 | | |
| Steam Pressure, psi | 995 | | 995 | | 995 | | |
| SO2, ppm | 185 | | 198 | | 191.5 | | |

| | | | |
|---|---|---|---|
| Liquor Flow Calculation | (gph)(8.345)(sp.gr.)(%OD) | 68046.13 | lb/hr |
| Integrator Calculation: | TSP Mass Emission Rate results: | 24.97 | lb/hr |

(End of test value - Start of test value)(60 min./hr / Test time, min.) = Units/hr

## Recovery Boiler Compliance Test

Date: 25-May-04

Run: # 5

| | Start of Test hour | min | End of Test hour | min | Difference | %of hour | |
|---|---|---|---|---|---|---|---|
| Time | 11 | 18 | 12 | 22 | 64 | 0.9375 | |
| "B" Liquor Flow, gallons | 54053.3 | | 66242.3 | | 12189 | 11427.19 | gph |
| Liquor Flow, gpm meter | 189 | | 190 | | 189.5 | 11370 | gph |
| Liquor Temperature, deg F | 198 | | 200 | | 199 | | |
| Liquor Hydrometer Reading | 1.25 | | 1.256 | | 1.253 | | |
| Liquor solids, % OD | 58.8 | | 59 | | 58.9 | | |
| No. of Liquor guns | 9 | | 10 | | 9.5 | | |
| No. of oil guns | 0 | | 0 | | 0 | | |
| No. of oil guns @ pressure | 0 | | 0 | | 0 | | |
| Steam load, lbs/hr chart x 1002 | 392 | | 397 | | 394.5 | | |
| Steam Flow Integrator x 1000, lb | 1844.3 | | 2269.2 | | 424900 | 398343.8 | lb/hr |
| Steam Temperature, deg F | 864 | | 868 | | 866 | | |
| Steam Pressure, psi | 998 | | 999 | | 998.5 | | |
| SO2, ppm | 201 | | 210 | | 205.5 | | |

| | | | |
|---|---|---|---|
| Liquor Flow Calculation | (gph)(8.345)(sp.gr.)(%OD) | 70377.21 | lb/hr |

Integrator Calculation: TSP Mass Emission Rate results: 22.91 lb/hr

(End of test value - Start of test value)(60 min./hr / Test time, min.) = Units/hr

**Recovery Boiler Compliance Test**

Date: 25-May-04

Run: # 6

| | Start of Test hour | min | End of Test hour | min | Difference | %of hour | |
|---|---|---|---|---|---|---|---|
| Time | 13 | 11 | 14 | 22 | 71 | 0.84507 | |
| "B" Liquor Flow, gallons | 75531 | | 88882.3 | | 13351.3 | 11282.79 | gph |
| Liquor Flow, gpm meter | 189 | | 190 | | 189.5 | 11370 | gph |
| Liquor Temperature, deg F | 200 | | 201 | | 200.5 | | |
| Liquor Hydrometer Reading | 1.256 | | 1.244 | | 1.25 | | |
| Liquor solids, % OD | 59 | | 57.5 | | 58.25 | | |
| No. of Liquor guns | 9 | | 9 | | 9 | | |
| No. of oil guns | 0 | | 0 | | 0 | | |
| No. of oil guns @ pressure | 0 | | 0 | | 0 | | |
| Steam load, lbs/hr chart x 1003 | 394 | | 393 | | 393.5 | | |
| Steam Flow Integrator x 1000, lb | 2593.2 | | 3056.6 | | 463400 | 391605.6 | lb/hr |
| Steam Temperature, deg F | 866 | | 866 | | 866 | | |
| Steam Pressure, psi | 998 | | 998 | | 998 | | |
| SO2, ppm | 234 | | 238 | | 236 | | |

| | | | |
|---|---|---|---|
| Liquor Flow Calculation | (gph)(8.345)(sp.gr.)(%OD) | 68556.52 | lb/hr |

Integrator Calculation: TSP Mass Emission Rate results: 30.2 lb/hr

(End of test value - Start of test value)(60 min./hr / Test time, min.) = Units/hr

| | | | |
|---|---|---|---|
| Date | 5/24/2004 | Test Start Time | 11:06 |
| Test # | 1 | Avg Wet | 18.86 |
| | | Avg Dry | 19.22 |

Readouts from the mill particulate meter

| readout # | Time | Wet | Dry |
|---|---|---|---|
| 1 | 11:19 | 17.37 | 17.79 |
| 2 | 11:24 | 20.72 | 21.15 |
| 3 | 11:35 | 16.55 | 16.79 |
| 4 | 11:40 | 21.02 | 21.6 |
| 5 | 11:51 | 17.34 | 17.64 |
| 6 | 11:57 | 25.11 | 25.58 |
| 7 | 12:07 | 17.08 | 17.4 |
| 8 | 12:12 | 18.35 | 18.64 |
| 9 | 12:23 | 16.93 | 17.19 |
| 10 | 12:29 | 18.1 | 18.45 |

| | | | |
|---|---|---|---|
| Date | 5/24/2004 | Test Start Time | 15:30 |
| Test # | 2 | Avg Wet | 18.58 |
| | | Avg Dry | 19.47 |

Readouts from the mill particulate meter

| readout # | Time | Wet | Dry |
|---|---|---|---|
| 1 | 15:37 | 17.22 | 18.07 |
| 2 | 15:43 | 21.82 | 22.79 |
| 3 | 15:53 | 18.81 | 19.65 |
| 4 | 15:59 | 16.91 | 17.76 |
| 5 | 16:09 | 18.51 | 19.55 |
| 6 | 16:15 | 17.84 | 18.58 |
| 7 | 16:20 | 17.34 | 18.13 |
| 8 | 16:31 | 20.17 | 21.21 |

| | | | |
|---|---|---|---|
| Date | 5/24/2004 | Test Start Time | 17:23 |
| Test # | 3 | Avg Wet | 19.35 |
| | | Avg Dry | 20.34 |

Readouts from the mill particulate meter

| readout # | Time | Wet | Dry |
|---|---|---|---|
| 1 | 17:31 | 17.71 | 18.72 |
| 2 | 17:36 | 20.01 | 21.23 |
| 3 | 17:46 | 18.38 | 19.25 |
| 4 | 17:53 | 21.45 | 22.52 |
| 5 | 18:03 | 18.36 | 19.21 |
| 6 | 18:08 | 20.25 | 21.28 |
| 7 | 18:19 | 18.8 | 19.67 |
| 8 | 18:25 | 19.84 | 20.82 |

| | | | | |
|---|---|---|---|---|
| Date | 5/25/2004 | Test Start Time | | 9:35 |
| Test # | 4 | Avg Wet | 18.54 | |
| | | Avg Dry | 19.29 | |

Readouts from the mill particulate meter

| readout # | Time | Wet | Dry |
|---|---|---|---|
| 1 | 9:43 | 18.18 | 18.97 |
| 2 | 9:48 | 23.2 | 24.03 |
| 3 | 9:58 | 17.48 | 18.15 |
| 4 | 10:04 | 18.05 | 18.83 |
| 5 | 10:15 | 17.72 | 18.337 |
| 6 | 10:20 | 20.21 | 21.16 |
| 7 | 10:31 | 17.18 | 17.86 |
| 8 | 10:36 | 16.28 | 16.98 |

| | | | | |
|---|---|---|---|---|
| Date | 5/25/2004 | Test Start Time | | 11:09 |
| Test # | 5 | Avg Wet | 18.20 | |
| | | Avg Dry | 19.04 | |

Readouts from the mill particulate meter

| readout # | Time | Wet | Dry |
|---|---|---|---|
| 1 | 11:18 | 16.86 | 17.68 |
| 2 | 11:25 | 21.5 | 22.39 |
| 3 | 11:35 | 18.66 | 19.41 |
| 4 | 11:41 | 20.58 | 21.46 |
| 5 | 11:52 | 18.37 | 19.15 |
| 6 | 11:58 | 18.34 | 19.39 |
| 7 | 12:07 | 15.91 | 16.663 |
| 8 | 12:13 | 15.38 | 16.18 |
| | | 18.2 | |

| | | | | |
|---|---|---|---|---|
| Date | 5/25/2004 | Test Start Time | | 13:05 |
| Test # | 6 | Avg Wet | 18.75 | |
| | | Avg Dry | 19.85 | |

Readouts from the mill particulate meter

| readout # | Time | Wet | Dry |
|---|---|---|---|
| 1 | 13:14 | 17.32 | 18.38 |
| 2 | 13:19 | 20.94 | 22.35 |
| 3 | 13:28 | 16.7 | 17.6 |
| 4 | 13:35 | 21.28 | 22.55 |
| 5 | 13:45 | 16.3 | 17.18 |
| 6 | 13:51 | 20.38 | 21.57 |
| 7 | 14:02 | 17.5 | 18.44 |
| 8 | 14:07 | 19.58 | 20.75 |

# APPENDIX E

# PROJECT PARTICIPANTS

## PROJECT PARTICIPANTS

### STACS

| | |
|---|---|
| Bill Mayhew | Project Manager |
| Jon Proulx | Environmental Scientist |
| Geoff Johnson | Environmental Technician |
| Lee Garcia | Environmental Technician |
| Sid Carter | Environmental Technician |
| Aaron Harden | Document Coordinator |

### RAYONIER

| | |
|---|---|
| Ronnie Moore | Coordinator |

| SENDER: *COMPLETE THIS SECTION* | *COMPLETE THIS SECTION ON DELIVERY* |
|---|---|
| ■ Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.<br>■ Print your name and address on the reverse so that we can return the card to you.<br>■ Attach this card to the back of the mailpiece, or on the front if space permits. | A. Signature<br>X Claire Dukes ☐ Agent ☐ Addressee<br>B. Received by (*Printed Name*) C. Date of Delivery |
| 1. Article Addressed to:<br><br>Mr. F. J. Perrett, Environmental Manager<br>Rayonier Performance Fibers LLC<br>Fernandina Beach Mill<br>The Foot of the Gum Tree<br>Post Office Box 2002<br>Fernandina Beach, FL 32035-2002 | D. Is delivery address different from item 1? ☐ Yes<br>If YES, enter delivery address below: ☐ No<br><br>3. Service Type<br>☒ Certified Mail ☐ Express Mail<br>☐ Registered ☐ Return Receipt for Merchandise<br>☐ Insured Mail ☐ C.O.D.<br>4. Restricted Delivery? (*Extra Fee*) ☐ Yes |
| 2. Article Number<br>(*Transfer from service label*) | 7000 1670 0013 3110 0154 |

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

## U.S. Postal Service
## CERTIFIED MAIL RECEIPT
*(Domestic Mail Only; No Insurance Coverage Provided)*

OFFICIAL USE

7000 1670 0013 3110 0154

| | |
|---|---|
| Postage | $ |
| Certified Fee | |
| Return Receipt Fee (Endorsement Required) | |
| Restricted Delivery Fee (Endorsement Required) | |

Postmark Here

Mr. F. J. Perrett, Environmental Manager
Rayonier Performance Fibers LLC
Fernandina Beach Mill
The Foot of the Gum Tree
Post Office Box 2002
Fernandina Beach, FL 32035-2002

PS Form 3800, May 2000 See Reverse for Instructions

1. BRUCE MITCHELL
2. MS 5505
4. DARM - TALLY
5.

| PLEASE PREPARE REPLY FOR: | COMMENTS: |
|---|---|
| ____ SECRETARY'S SIGNATURE | RECEIVED |
| ____ DIV/DIST DIR SIGNATURE | SEP 16 2005 |
| ____ MY SIGNATURE | BUREAU OF AIR REGULATION |
| ____ YOUR SIGNATURE | |
| ____ DUE DATE ____ | |
| ACTION/DISPOSITION | |
| ✓ DISCUSS WITH ME | |
| ✓ COMMENTS/ADVISE | |
| ____ REVIEW AND RETURN | |
| ____ SET UP MEETING | |
| ____ FOR YOUR INFORMATION | |
| ____ HANDLE APPROPRIATELY | |
| ____ INITIAL AND FORWARD | |
| ____ SHARE WITH STAFF | |
| ____ FOR YOUR FILES | |

FROM: KHALID AL-NAHDY DATE: 9/13/05 PHONE: S/C 804-3243

DEP 15-026 (12/93)

U.S. Postal Service
## CERTIFIED MAIL RECEIPT
*(Domestic Mail Only; No Insurance Coverage Provided)*

7001 0320 0001 3692 1926

OFFICIAL USE

| | | |
|---|---|---|
| Postage | $ | Postmark Here |
| Certified Fee | | |
| Return Receipt Fee (Endorsement Required) | | |
| Restricted Delivery Fee (Endorsement Required) | | |

T

Se

Mr. F. J. Perrett
General Manager
Rayonier, Inc.
Post Office Box 2002
Fernandina Beach, FL 32035-2002

Sti or Ci

PS Form 3800, January 2001 See Reverse for Instructions

**SENDER: *COMPLETE THIS SECTION***

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Mr. F. J. Perrett, Environmental Manager
Rayonier Performance Fibers LLC
Fernandina Beach Mill
The Foot of the Gum Tree
Post Office Box 2002
Fernandina Beach, FL 32035-2002

***COMPLETE THIS SECTION ON DELIVERY***

A. Signature
X Theresa Mason ☐ Agent ☐ Addressee

B. Received by (*Printed Name*) Theresa Mason

C. Date of Delivery 12/13

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

2002

3. Service Type
☒ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (*Extra Fee*) ☐ Yes

2. Article Number
(*Transfer from service label*) 7001 0320 0001 3692 3999

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

**U.S. Postal Service**
**CERTIFIED MAIL RECEIPT**
*(Domestic Mail Only; No Insurance Coverage Provided)*

7001 0320 0001 3692 3999

OFFICIAL USE

| | |
|---|---|
| Postage | $ |
| Certified Fee | |
| Return Receipt Fee (Endorsement Required) | |
| Restricted Delivery Fee (Endorsement Required) | |

Postmark Here

Mr. F. J. Perrett, Environmental Manager
Rayonier Performance Fibers LLC
Fernandina Beach Mill
The Foot of the Gum Tree
Post Office Box 2002
Fernandina Beach, FL 32035-2002

PS Form 3800, January 2001 See Reverse for Instructions

7000 1670 0013 3110 0093

## U.S. Postal Service
# CERTIFIED MAIL RECEIPT
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OFFICIAL USE

| | | |
|---|---|---|
| Postage | $ | Postmark Here |
| Certified Fee | | |
| Return Receipt Fee (Endorsement Required) | | |
| Restricted Delivery Fee (Endorsement Required) | | |

Mr. F. J. Perrett, Environmental Manager
Rayonier Performance Fibers LLC
Fernandina Beach Mill
The Foot of the Gum Tree
Post Office Box 2002
Fernandina Beach, FL 32035-2002

PS Form 3800, May 2000 See Reverse for Instructions

**SENDER: *COMPLETE THIS SECTION***

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Mr. F. J. Perrett, Environmental Manager
Rayonier Performance Fibers LLC
Fernandina Beach Mill
The Foot of the Gum Tree
Post Office Box 2002
Fernandina Beach, FL 32035-2002

***COMPLETE THIS SECTION ON DELIVERY***

A. Signature
X Ruth a. Benjamin ☐ Agent ☐ Addressee

B. Received by (*Printed Name*) Ruth a. Benjamin

C. Date of Delivery 2-3-06

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☒ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (*Extra Fee*) ☐ Yes

2. Article Number
(*Transfer from service label*) 7000 1670 0013 3110 0079

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

**U.S. Postal Service**
**CERTIFIED MAIL RECEIPT**
*(Domestic Mail Only; No Insurance Coverage Provided)*

OFFICIAL USE

| | |
|---|---|
| Postage | $ |
| Certified Fee | |
| Return Receipt Fee (Endorsement Required) | |
| Restricted Delivery Fee (Endorsement Required) | |

Postmark Here

7000 1670 0013 3110 0079

Mr. F. J. Perrett, Environmental Manager
Rayonier Performance Fibers LLC
Fernandina Beach Mill
The Foot of the Gum Tree
Post Office Box 2002
Fernandina Beach, FL 32035-2002

PS Form 3800, May 2000 See Reverse for Instructions

7000 1670 0013 3110 0529

**U.S. Postal Service**

# CERTIFIED MAIL RECEIPT

*(Domestic Mail Only; No Insurance Coverage Provided)*

OFFICIAL USE

| | | |
|---|---|---|
| Postage | $ | Postmark Here |
| Certified Fee | | |
| Return Receipt Fee (Endorsement Required) | | |
| Restricted Delivery Fee (Endorsement Required) | | |

Mr. F. J. Perrett, Environmental Manager
Rayonier Performance Fibers LLC
Fernandina Beach Mill
The Foot of the Gum Tree
Post Office Box 2002
Fernandina Beach, FL 32035-1309

PS Form 3800, May 2000 See Reverse for Instructions