Cedar Bay Generating Company, L.P
P. O. Box 26324
Jacksonville, FL 32226-6324

9640 Eastport Road
Jacksonville, FL
32218

904.751.4000
Fax: 904.751.7320

August 1, 2005

Florida Department of Environmental Protection
Title V Section; Bureau of Air Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Fl 32399-2400

RECEIVED
AUG 02 2005
BUREAU OF AIR REGULATION

Attention: Mr. Jeff Koerner, P.E., Administrator

RE: Cedar Bay Cogeneration facility
Title V Permit # 0310337-007-AV; PSD-FL-137A
Conditions of Certification PA 88-24
Air Construction Permit Application

Dear Mr. Koerner:

Cedar Bay Generating Company, L.P. (Cedar Bay), is seeking authorization from the Florida Department of Environmental Protection (FDEP) to co-fire up to 5 percent (by weight) of tire-derived fuel (TDF) and change the coal sulfur limitation at the Cedar Bay Cogeneration Facility (Facility). Cedar Bay is also requesting an administrative change of the production limit for co-firing short fiber rejects (SFR) from a volume basis to a weight basis. Specifically, Cedar Bay requests FDEP to change the Prevention of Significant Deterioration (PSD) permit for the Facility [PSD-FL-137(A)] and Title V permit to modify the Conditions of Certification that were issued for the Facility under the Florida Electrical Power Plant Siting Act (PPSA; PA 88-24) for these changes. Although a change to the Facility's PSD permit is being requested to allow the co-firing of TDF and change the coal sulfur limit, there will not be any significant net emissions increase at the Facility, and thus the requirements of the PSD review process are not triggered.

Please find enclosed four copies of air construction permit applications for the requested changes. Please contact me at (904) 751-4000 or our environmental consultant Mr. Ken Kosky of Golder Associates (352-336-5600) if you have any questions on the application. Your expeditious handling is appreciated.

Sincerely,

Martin Kreft

Martin Kreft
Cedar Bay Generating Company, L.P.

Enclosures

cc: Kennard F. Kosky, P.E. Golder Associates
H. Oven, FDEP
S. Pace, ERMD-City of Jacksonville

EXP

Parcels: 1/1

ORIGIN: TLH

From: DEP AIR RESOURCE MGMT
P. Adams
DIRECTOR OFFICE STE 23
111 S MAGNOLIA DR
TALLAHASSEE, FL 32301
UNITED STATES Tel:850-921-9505

To: U.S. EPA Region 4
Mr. Jim Little
61 Forsyth Street
Air Permits Section
Atlanta, GA 30303
UNITED STATES

Sender's ref 37550201000 A7 AP255

POSTCODE: 30303

Tel: 404-562-9141

Description: PSD-FL-360 draft permit

Weight: 3 lbs for 1 pcs
Date: 2005-10-14

DHL standard terms and conditions apply.

HARB 6V
ATT

(2L)US30303

WAYBILL: 28260414151

(Non-Negotiable)

▲ PEEL HERE PEEL HERE ▲

Please fold or cut in half

DO NOT PHOTOCOPY

Using a photocopy could delay the delivery of your package and will result in additional shipping charge

SENDER'S RECEIPT

| | | | |
|---|---|---|---|
| Waybill #: | 28260414151 | Rate Estimate: | 6 |
| | | Protection: | Not Required |
| To(Company): U.S. EPA Region 4<br>Air Permits Section<br>61 Forsyth Street<br><br>Atlanta, GA 30303<br>UNITED STATES | | Description: | PSD-FL-360 draft permit |
| | | Weight (lbs.): | 3 |
| | | Dimensions: | 0 x 0 x 0 |
| | | Ship Ref: | 37550201000 A7 AP255 |
| | | Service Level: | Next Day 12:00 (Next business day by 12 PM) |
| Attention To: | Mr. Jim Little | Special Svc: | |
| Phone#: | 404-562-9141 | | |
| Sent By: | P. Adams | Date Printed: | 10/14/2005 |
| Phone#: | 850-921-9505 | Bill Shipment To: | Sender |
| | | Bill To Acct: | 778941286 |

DHL Signature (optional) ______________________ Route ______ Date ______ Time ______

For Tracking, please go to www.dhl-usa.com or call 1-800-225-5345

Thank you for shipping with DHL

Create new shipment ▶ View pending shipments Print waybill

EXPRESS

EXP

Parcels: 1/1

From: DEP AIR RESOURCE MGMT
P. Adams
DIRECTOR OFFICE STE 23
111 S MAGNOLIA DR
TALLAHASSEE, FL 32301
UNITED STATES Tel:850-921-9505

ORIGIN: TLH

To: National Park Service
Mr. John Bunyak
12795 W. Alameda Parkway
Air Division
Lakewood, CO 80228
UNITED STATES

Sender's ref
37550201000 A7 AP255

POSTCODE:
80228

Tel: 303-966-2818

Description: PSD-FL-360 draft permit

Weight: 3 lbs for 1 pcs
Date: 2005-10-14

DHL standard terms and conditions apply.

EGEH 9E

(2L)US80228

WAYBILL: 28260291754

(Non-Negotiable)

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Please fold or cut in half

DO NOT PHOTOCOPY

Using a photocopy could delay the delivery of your package and will result in additional shipping charge

SENDER'S RECEIPT
Waybill #: 28260291754

To(Company):
National Park Service
Air Division
12795 W. Alameda Parkway

Lakewood, CO 80228
UNITED STATES

Attention To: Mr. John Bunyak
Phone#: 303-966-2818

Sent By: P. Adams
Phone#: 850-921-9505

Rate Estimate: 14.81
Protection: Not Required
Description: PSD-FL-360 draft permit

Weight (lbs.): 3
Dimensions: 0 x 0 x 0

Ship Ref: 37550201000 A7 AP255
Service Level: Next Day 12:00 (Next business day by 12 PM)

Special Svc:

Date Printed: 10/14/2005
Bill Shipment To: Sender
Bill To Acct: 778941286

DHL Signature (optional) ____________________ Route ______ Date ______ Time ______

For Tracking, please go to www.dhl-usa.com or call 1-800-225-5345
Thank you for shipping with DHL

Create new shipment

View pending shipments

Print waybill

DHL EXPRESS

**EXP**

**From:** DEP AIR RESOURCE MGMT
P. Adams
DIRECTOR OFFICE STE 23
111 S MAGNOLIA DR
TALLAHASSEE, FL 32301
UNITED STATES Tel:850-921-9505

**To:** Miami-Dade County DERM
Mr. Patrick Wong
33 Southwest Second Avenue
Suite 900
Air Quality Management Division
Miami, FL 33130
UNITED STATES

Tel: 305-372-6925

Parcels: 1/1

ORIGIN: TLH

Sender's ref 37550201000 A7 AP255

POSTCODE: 33130

Description: PSD-FL-360 draft permit

Weight: 3 lbs for 1 pcs
Date: 2005-10-14

DHL standard terms and conditions apply.

**OBEW 9D**
**FSC**

(2L)US33130

WAYBILL: 28260240256 (Non-Negotiable)

PEEL HERE PEEL HERE

Please fold or cut in half

## DO NOT PHOTOCOPY

Using a photocopy could delay the delivery of your package and will result in additional shipping charge

SENDER'S RECEIPT
Waybill #: 28260240256

To(Company):
Miami-Dade County DERM
Air Quality Management Division
33 Southwest Second Avenue
Suite 900
Miami, FL 33130
UNITED STATES

Attention To: Mr. Patrick Wong
Phone#: 305-372-6925

Sent By: P. Adams
Phone#: 850-921-9505

Rate Estimate: 6.5
Protection: Not Required
Description: PSD-FL-360 draft permit

Weight (lbs.): 3
Dimensions: 0 x 0 x 0

Ship Ref: 37550201000 A7 AP255
Service Level: Next Day 12:00 (Next business day by 12 PM)

Special Svc:

Date Printed: 10/14/2005
Bill Shipment To: Sender
Bill To Acct: 778941286

DHL Signature (optional) ______________ Route ______ Date ______ Time ______

For Tracking, please go to www.dhl-usa.com or call 1-800-225-5345
Thank you for shipping with DHL

Create new shipment ▸ View pending shipments Print waybill

Golder Associates

# APPLICATION FOR MODIFICATION
# CO-FIRING TIRE-DERIVED FUEL
# COAL SULFUR CONTENT
# SHORT FIBER REJECTS
# CEDAR BAY COGENERATION FACILITY
# JACKSONVILLE, FLORIDA

**Prepared For:**
**Cedar Bay Generating Company, L.P.**
**9640 Eastport Road**
**Jacksonville, Florida 32218-2260**

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

**July 2005**

**0537586**

**DISTRIBUTION:**
**4 Copies – FDEP**
**2 Copies – Cedar Bay**
**1 Copy – Golder Associates Inc.**

# APPLICATION

# Department of
# Environmental Protection

RECEIVED
AUG 02 2005
BUREAU OF AIR REGULATION

## Division of Air Resource Management

## APPLICATION FOR AIR PERMIT - LONG FORM

### I. APPLICATION INFORMATION

**Air Construction Permit** – Use this form to apply for an air construction permit 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: **Cedar Bay Generating Company, L.P.** | |
| 2. Site Name: **Cedar Bay Cogeneration Facility** | |
| 3. Facility Identification Number: **0310337** | |
| 4. Facility Location...: **Cedar Bay Cogeneration Facility**<br>Street Address or Other Locator: **9640 Eastport Road**<br>City: **Jacksonville** County: **Duval** Zip Code: **32218** | |
| 5. Relocatable Facility?<br>☐ Yes ☒ No | 6. Existing Title V Permitted Facility?<br>☒ Yes ☐ No |

**Application Contact**

| |
|---|
| 1. Application Contact Name: **Jeffery Walker, Environmental Manager** |
| 2. Application Contact Mailing Address...<br>Organization/Firm: **Cedar Bay Generating Company**<br>Street Address: **9640 Eastport Road**<br>City: **Jacksonville** State: **FL** Zip Code: **32226** |
| 3. Application Contact Telephone Numbers...<br>Telephone: **(904) 696-1547** ext. Fax: **(904) 751-7320** |
| 4. Application Contact Email Address: **jeffwalker@cogentrix.com** |

**Application Processing Information (DEP Use)**

| | |
|---|---|
| 1. Date of Receipt of Application: | 8-2-05 |
| 2. Project Number(s): | 0310337-009-AC |
| 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**

☒ 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

**This application is a request for the utilization of up to 5 percent by weight of tire-derived fuel (TDF) and change the coal sulfur limit from 1.7 percent by weight on a ship (train load) basis and 1.2 percent by weight on an annual basis. The alternate sulfur limitation requested is 3.2 lb/MMBtu, as is currently authorized for co-firing petroleum coke with coal. Cedar Bay is also requesting an administrative change of the production limit for co-firing short fiber rejects from a volume basis to a weight basis.**

## APPLICATION INFORMATION

### Scope of Application

| Emissions Unit ID Number | Description of Emissions Unit | Air Permit Type | Air Permit Proc. Fee |
|---|---|---|---|
| 001 | Circulating Fluidized Bed Boiler A – 1,063 MMBtu/hr | | NA |
| 002 | Circulating Fluidized Bed Boiler B – 1,063 MMBtu/hr | | NA |
| 003 | Circulating Fluidized Bed Boiler C – 1,063 MMBtu/hr | | NA |
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### Application Processing Fee

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

**Owner/Authorized Representative Statement**

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

1. Owner/Authorized Representative Name :
   **Martin Kreft, General Manager**

2. Owner/Authorized Representative Mailing Address...
   Organization/Firm: **Cedar Bay Generating Company**
   Street Address: **9640 Eastport Road**
   City: **Jacksonville** State: **FL** Zip Code: **32218-2260**

3. Owner/Authorized Representative Telephone Numbers...
   Telephone: **(904) 751-4000** ext.**143** Fax: **(904) 751-7320**

4. Owner/Authorized Representative Email Address: **martinkreft@cogentrix.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.*

   Martin Kreft
   Signature

   8-1-05
   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: **Kennard F. Kosky**<br>Registration Number: **14996** | |
| 2. Professional Engineer Mailing Address...<br>Organization/Firm: **Golder Associates Inc.****<br>Street Address: **6241 NW 23rd Street, Suite 500**<br>City: **Gainesville** State: **FL** Zip Code: **32653** | |
| 3. Professional Engineer Telephone Numbers...<br>Telephone: **(352) 336-5600** ext.**516** Fax: **(352) 336-6603** | |
| 4. Professional Engineer Email Address: **kkosky@golder.com** | |

5. Professional Engineer Statement:

*I, the undersigned, hereby certify, except as particularly noted herein*, that:*

*(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*

*(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.*

*(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.*

*(4) If the purpose of this application is to obtain an air construction permit (check here ☒, 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.*

*(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.*

Kennard F. Kosky
Signature

7/26/08
Date

(seal)

KENNARD F. KOSKY
STATE OF FLORIDA
PROFESSIONAL ENGINEER

* Attach any exception to certification statement.
** **Board of Professional Engineers Certificate of Authorization #00001670**

## II. FACILITY INFORMATION

### A. GENERAL FACILITY INFORMATION

**Facility Location and Type**

| | | | |
|---|---|---|---|
| 1. Facility UTM Coordinates... Zone **17** East (km) **441.610** North (km) **3365.552** | | 2. Facility Latitude/Longitude... Latitude (DD/MM/SS) **30/25/21** Longitude (DD/MM/SS) **81/36/23** | |
| 3. Governmental Facility Code: **0** | 4. Facility Status Code: **A** | 5. Facility Major Group SIC Code: **49** | 6. Facility SIC(s): **4911** |
| 7. Facility Comment: **Applicant is seeking authorization to utilize TDF and change the coal sulfur limit. See Part II.** | | | |

**Facility Contact**

| |
|---|
| 1. Facility Contact Name: **Jeffery Walker, Environmental Manager** |
| 2. Facility Contact Mailing Address... Organization/Firm: **Cedar Bay Generating Company** Street Address: **9640 Eastport Road** City: **Jacksonville** State: **FL** Zip Code: **32226** |
| 3. Facility Contact Telephone Numbers: Telephone: **(904) 696-1547** ext. Fax: **(904)751-7320** |
| 4. Facility Contact Email Address: **jeffwalker@cogentrix.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 INFORMATION

### 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: **The applicable facility-wide conditions contained in the Title V permit will not change as a result of this application.** | |

## FACILITY INFORMATION

**List of Pollutants Emitted by Facility**

| 1. Pollutant Emitted | 2. Pollutant Classification | 3. Emissions Cap [Y or N]? |
|---|---|---|
| **PM - Particulate Matter Total** | **A** | **Y** |
| **$PM_{10}$ - Particulate Matter** | **A** | **Y** |
| **$NO_x$ - Nitrogen Oxides** | **A** | **Y** |
| **$SO_2$ - Sulfur Dioxide** | **A** | **Y** |
| **CO - Carbon Monoxide** | **A** | **Y** |
| **VOC - Volatile Organic Compounds** | **A** | **Y** |
| **SAM - Sulfuric Acid Mist** | **B** | **Y** |
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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 Nos. 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:

## 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:_____ ☒ Previously Submitted, Date:**Jan 2004** | |
| 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:_____ ☒ Previously Submitted, Date: **Jan 2004** | |
| 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: **Jan 2004** | |

**Additional Requirements for Air Construction Permit Applications**

| | |
|---|---|
| 1. Area Map Showing Facility Location:<br>☐ Attached, Document ID:_____ ☒ Not Applicable (existing permitted facility) | |
| 2. Description of Proposed Construction or Modification:<br>☒ Attached, Document ID:**See Part II** | |
| 3. Rule Applicability Analysis:<br>☒ Attached, Document ID:**See Part II** | |
| 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**

| |
|---|
| **See Part II.** |

# III. EMISSIONS UNIT INFORMATION

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

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

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

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

## A. GENERAL EMISSIONS UNIT INFORMATION

### Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

   ☒ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

   ☐ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

### Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

   ☒ This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:
   **Boiler A**

3. Emissions Unit Identification Number: **001**

| 4. Emissions Unit Status Code: | 5. Commence Construction Date: | 6. Initial Startup Date: | 7. Emissions Unit Major Group SIC Code: | 8. Acid Rain Unit? |
|---|---|---|---|---|
| **A** | | **01/25/1994** | **49** | ☐ Yes ☒ No |

9. Package Unit:
   Manufacturer: Model Number:

10. Generator Nameplate Rating: MW

11. Emissions Unit Comment:
   **Circulating Fluidized Bed (CFB) Boiler A with limestone injection for $SO_2$ emissions reduction. Ammonia injection for $NO_x$ emissions reduction. Fuel is primarily bituminous coal with No. 2 fuel oil for startup. Combustion products are flue gas with fly ash and bed ash.**

## Emissions Unit Control Equipment

1. Control Equipment/Method(s) Description:

**Baghouse**
**Efficiency = (1-emission)/load = 0.0055 gr/acr / 19.5 gr/acr = 99.97%**

**Ammonia injection**
**Efficiency = 54% for $NO_x$ (estimated)**

**Dry limestone injection**
**Efficiency from 89 to 95% based on Quarterly Reports**

**Air preheater**
**Reduction Efficiency not determined.**
**Intake air is preheated via flue gas to reduce fuel requirements.**

**Control of Oxygen**
**Reduction Efficiency not determined.**

2. Control Device or Method Code(s): **016, 032/107, 041, 027, 033**

## B. EMISSIONS UNIT CAPACITY INFORMATION

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

**Emissions Unit Operating Capacity and Schedule**

| | |
|---|---|
| 1. Maximum Process or Throughput Rate: | **104,000 lb/hr coal; 39,000 ton/month coal; 390,000 TPY coal.** |
| 2. Maximum Production Rate: | |
| 3. Maximum Heat Input Rate: **1,063** million Btu/hr | |
| 4. Maximum Incineration Rate: | pounds/hr<br>tons/day |
| 5. Requested Maximum Operating Schedule: | **24** hours/day; **7** days/week<br>**52** weeks/year; **8,760** hours/year |
| 6. Operating Capacity/Schedule Comment: | **Limits set by PSD-FL-137A.**<br>**CFB Boilers A, B, and C feed a common steam turbine with a nominal rating of 250 MW and supply steam to an adjacent recycled liner board mill.** |

## 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: **B1** | | 2. Emission Point Type Code: **2** |
| 3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: **Boiler Stack (B1)** | | |
| 4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: **001 = Boiler A; 002 = Boiler B; 003 - Boiler C** | | |
| 5. Discharge Type Code: **V** | 6. Stack Height: **403** feet | 7. Exit Diameter: **13.26** feet |
| 8. Exit Temperature: **265** °F | 9. Actual Volumetric Flow Rate: **1,004,000** acfm | 10. Water Vapor: **5** % |
| 11. Maximum Dry Standard Flow Rate: **895,403** dscfm | | 12. Nonstack Emission Point Height: feet |
| 13. Emission Point UTM Coordinates... Zone: **17** East (km): **441.871** North (km): **3365.587** | | 14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS) |
| 15. Emission Point Comment: **The 3 CFB boilers share a common stack designated as point B1. Flue gas from the boilers is discharged through this stack. Prior to the stack, each flue gas stream is passed through a baghouse which removes fly ash.** **Stack information based on Title V Application.** **See Attachment CB-EU1-C15 for Applicable Regulations.** | | |

## D. SEGMENT (PROCESS/FUEL) INFORMATION

**Segment Description and Rate:** Segment 1 of 2

| | | |
|---|---|---|
| 1. Segment Description (Process/Fuel Type):<br>**Segment 1 of 2: Bituminous coal used in boiler.** | | |
| 2. Source Classification Code (SCC):<br>**1-01-002-17** | 3. SCC Units:<br>**Tons Burned** | |
| 4. Maximum Hourly Rate:<br>**52** | 5. Maximum Annual Rate:<br>**390,000** | 6. Estimated Annual Activity Factor: |
| 7. Maximum % Sulfur:<br>**2%** | 8. Maximum % Ash:<br>**11.6% (typical)** | 9. Million Btu per SCC Unit:<br>**24** |
| 10. Segment Comment:<br>**Maximum sulfur will be based on an equivalent 3.2 lb/ $SO_2$/MMBtu. See Part II.** | | |

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

| | | |
|---|---|---|
| 1. Segment Description (Process/Fuel Type):<br>**Segment 2 of 2: Tire-Derived Fuel (TDF)** | | |
| 2. Source Classification Code (SCC):<br>**1-01-008-01** | 3. SCC Units:<br>**Tons Burned** | |
| 4. Maximum Hourly Rate:<br>**2.2** | 5. Maximum Annual Rate:<br>**19,272** | 6. Estimated Annual Activity Factor: |
| 7. Maximum % Sulfur:<br>**2% (typical)** | 8. Maximum % Ash:<br>**5% (typical)** | 9. Million Btu per SCC Unit:<br>**29.4** |
| 10. Segment Comment:<br>**Based on 5% TDF (by weight). See Part II.** | | |

## 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 | 016 | 027 | EL |
| $PM_{10}$ | 016 | 027 | EL |
| $NO_x$ | 032/107 | 027 | EL |
| $SO_2$ | 041 | 027 | EL |
| CO | 033 | 027 | EL |
| VOC | 027 | | EL |
| SAM | 041 | 027 | EL |
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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 (TSP)** | 2. Total Percent Efficiency of Control: **99.97** |
| 3. Potential Emissions: **19.1** lb/hour **78** tons/year | 4. Synthetically Limited? ☒ Yes ☐ No |
| 5. Range of Estimated Fugitive Emissions (as applicable): to tons/year | |
| 6. Emission Factor: **0.018 lb/MMBtu**<br>Reference: **PSD-FL-137A** | 7. Emissions Method Code: **0** |
| 8. Calculation of Emissions:<br>**1,063 MMBtu/hr x 0.018 lb/MMBtu = 19.1 lb/hr**<br>**19.1 lb/hr x 8,760 hr/yr x ton/2,000 lbs x 0.93 (capacity factor) = 78 TPY** | |
| 9. Pollutant Potential/Estimated Fugitive Emissions Comment:<br>**PSD-FL-137(A). Annual emissions limited for 3 boilers to not trigger PSD review. See Part II.** | |

## 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: **OTHER** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **See Part II** | 4. Equivalent Allowable Emissions: **19.1** lb/hour **78** tons/year |
| 5. Method of Compliance: **Method 5 or 17; 40 CFR, Appendix A** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **0.018 lb/MMBtu** **Annual emissions for 3 boilers limited to not trigger PSD review. See Part II.** | |

**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: **$PM_{10}$** | 2. Total Percent Efficiency of Control: **99.97** |
| 3. Potential Emissions: **19.1** lb/hour **78** tons/year | 4. Synthetically Limited? ☒ Yes ☐ No |
| 5. Range of Estimated Fugitive Emissions (as applicable): to tons/year | |
| 6. Emission Factor: **0.018 lb/MMBtu** Reference: **PSD-FL-137(A)** | 7. Emissions Method Code: **0** |

8. Calculation of Emissions:

**1,063 MMBtu/hr x 0.018 lb/MMBtu = 19.1 lb/hr**
**19.1 lb/hr x 8,760 hr/yr x ton/2,000 lbs x 0.93 (capacity factor) = 78 TPY**

9. Pollutant Potential/Estimated Fugitive Emissions Comment:

**PSD-FL-137(A). Annual emissions for 3 boilers limited to not trigger PSD review. See Part II.**

## 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: **OTHER** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **See Part II** | 4. Equivalent Allowable Emissions: **19.1** lb/hour **78** tons/year |
| 5. Method of Compliance: **Method 5 or 17; 40 CFR, Appendix A** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **0.018 lb/MMBtu** **Annual emissions for 3 boilers limited when co-firing petroleum coke with coal to not trigger PSD review. See Part II.** | |

**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: **$SO_2$** | 2. Total Percent Efficiency of Control: |
| 3. Potential Emissions: **318.9** lb/hour **866** tons/year | 4. Synthetically Limited? ☒ Yes ☐ No |
| 5. Range of Estimated Fugitive Emissions (as applicable): to tons/year | |
| 6. Emission Factor: **0.30 lb/MMBtu* 0.20 lb/MMBtu**** Reference: **Permit PA-88-24A, PSD-FL-137B** | 7. Emissions Method Code: **0** |
| 8. Calculation of Emissions: **1,063 MMBtu/hr x 0.3 lb/MMBtu = 318.9 lb/hr** **1,063 MMBtu/hr x 0.2 lb/MMBtu x 8,760 hr/yr x ton/2,000 lb x 0.93 (capacity factor) = 866 TPY** | |
| 9. Pollutant Potential/Estimated Fugitive Emissions Comment: **PSD-FL-137(A). * 3-hour rolling average; ** 30-day rolling average. Annual emissions limited for 3 boilers to not trigger PSD review. Increase in coal sulfur limit requested. See Part II.** | |

## 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: **OTHER** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **See Comment.** | 4. Equivalent Allowable Emissions: **318.9** lb/hour **866** tons/year |
| 5. Method of Compliance: **Continuous Emissions Monitoring** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **3-hour rolling average for $SO_2$ = 0.30 lb/MMBtu** **30-day rolling average for $SO_2$ = 0.20 lb/MMBtu** **Annual emissions for 3 boilers limited to not trigger PSD review. See Part II.** | |

**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:<br>**$NO_x$** | 2. Total Percent Efficiency of Control:<br>**54% (estimated)** |
| 3. Potential Emissions:<br>**180.7** lb/hour **736.1** tons/year | 4. Synthetically Limited?<br>☒ Yes ☐ No |
| 5. Range of Estimated Fugitive Emissions (as applicable):<br>to tons/year | |
| 6. Emission Factor: **0.17 lb/MMBtu***<br>Reference: **PSD-FL-137(A)** | 7. Emissions Method Code:<br>**0** |
| 8. Calculation of Emissions:<br>**1,063 MMBtu/hr x 0.17 lb/MMBtu = 180.7 lb/hr**<br>**180.7 lb/hr x 8,760 hr/yr x ton/2,000 lb x 0.93 (capacity factor) = 736.1 TPY** | |
| 9. Pollutant Potential/Estimated Fugitive Emissions Comment:<br>**PSD-FL-137(A). * 30-day rolling average. Annual emissions limited for 3 boilers to not trigger PSD review. See Part II.** | |

## 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: **OTHER** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **See Part II.** | 4. Equivalent Allowable Emissions: **180.7** lb/hour **736.1** tons/year |
| 5. Method of Compliance: **Continuous Emissions Monitoring and Method 7, 7A, B, C, D, or E.** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **30-day rolling average for $NO_x$ = 0.17 lb/MMBtu** **Annual emissions for 3 boilers limited to not trigger PSD review. See Part II.** | |

**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:<br>**CO** | 2. Total Percent Efficiency of Control: |
| 3. Potential Emissions:<br>**186** lb/hour **649** tons/year | 4. Synthetically Limited?<br>☒ Yes ☐ No |
| 5. Range of Estimated Fugitive Emissions (as applicable):<br>to tons/year | |
| 6. Emission Factor: **0.175 lb/MMBtu**<br>Reference: **PSD-FfL-137(A)** | 7. Emissions Method Code:<br>**0** |
| 8. Calculation of Emissions:<br><br>**1,063 MMBtu/hr x 0.175 lb/MMBtu = 186 lb/hr**<br>**Annual potential emissions based on maximum emissions for 3 boilers so that PSD is not triggered. See Part II.** | |
| 9. Pollutant Potential/Estimated Fugitive Emissions Comment:<br><br>**Annual emissions limited for 3 boilers to not trigger PSD review. See Part II.** | |

## 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: **OTHER** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **See Part II.** | 4. Equivalent Allowable Emissions: **186** lb/hour **649** tons/year |
| 5. Method of Compliance: **Continuous Emissions Monitoring and Method 10.** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **Annual emissions limited for 3 boilers to not trigger PSD review. See Part II.** **8-hour rolling average for CO = 0.175 lb/MMBtu.** | |

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: **VOC** | 2. Total Percent Efficiency of Control: |
| 3. Potential Emissions: **16.0** lb/hour **65** tons/year | 4. Synthetically Limited? ☒ Yes ☐ No |
| 5. Range of Estimated Fugitive Emissions (as applicable): to tons/year | |
| 6. Emission Factor: **0.015 lb/MMBtu** <br> Reference: | 7. Emissions Method Code: **0** |
| 8. Calculation of Emissions: <br> **1,063 MMBtu/hr x 0.015 lb/MMBtu = 16 lb/hr** <br> **See Part II.** | |
| 9. Pollutant Potential/Estimated Fugitive Emissions Comment: <br> **See Part II.** | |

## 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.**

<u>**Allowable Emissions**</u> Allowable Emissions 1 of 1

| | |
|---|---|
| 1. Basis for Allowable Emissions Code: **OTHER** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **See Part II.** | 4. Equivalent Allowable Emissions: **16.0** lb/hour **65** tons/year |
| 5. Method of Compliance: **Method 18 or 25.** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **See Part II. 0.015 lb/MMBtu VOC.** | |

<u>**Allowable Emissions**</u> 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): | |

<u>**Allowable Emissions**</u> 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: **SAM** | 2. Total Percent Efficiency of Control: |
| 3. Potential Emissions: **0.50** lb/hour **2.0** tons/year | 4. Synthetically Limited? ☒ Yes ☐ No |
| 5. Range of Estimated Fugitive Emissions (as applicable): to tons/year | |
| 6. Emission Factor: **4.66 x $10^{-4}$ lb/MMBtu** Reference: **PSD-FL-137(A)** | 7. Emissions Method Code: **0** |
| 8. Calculation of Emissions: **1,063 MMBtu/hr x 0.000466 lb/MMBtu = 0.5 lb/hr** | |
| 9. Pollutant Potential/Estimated Fugitive Emissions Comment: **PSD-FL-137(A). See Part II.** | |

## 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: **OTHER** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **See Part II.** | 4. Equivalent Allowable Emissions: **0.50** lb/hour **2.0** tons/year |
| 5. Method of Compliance: **Method 8.** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **4.66 x 10-4 lb/MMBtu. See Part II.** | |

**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: ☐ Rule ☒ Other |
| 3. Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: **27** % Maximum Period of Excess Opacity Allowed: **6** min/hour | |
| 4. Method of Compliance: **COM, Method 9.** | |
| 5. Visible Emissions Comment: **27% opacity for oil-burning during startup. PSD-FL-137(A)** | |

**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 ____ of ____

| | |
|---|---|
| 1. Parameter Code: **See Comment.** | 2. Pollutant(s): |
| 3. CMS Requirement: | ☒ Rule ☐ Other |
| 4. Monitor Information... Manufacturer: **Various** Model Number: | Serial Number: |
| 5. Installation Date: | 6. Performance Specification Test Date: |
| 7. Continuous Monitor Comment: **Baghouse flue has CEMs for $NO_x$, $SO_2$, CO, $CO_2$, and VE. Manufacturers, models, and serial numbers previously submitted.** | |

**Continuous Monitoring System:** Continuous Monitor ____ of ____

| | |
|---|---|
| 1. Parameter Code: | 2. Pollutant(s): |
| 3. CMS Requirement: | ☐ Rule ☐ Other |
| 4. Monitor Information... Manufacturer: 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)<br>☐ Attached, Document ID: _____ ☒ Previously Submitted, Date **Jan 2004** |
| 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)<br>☒ Attached, Document ID: **See Part II** ☐ 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)<br>☐ Attached, Document ID: _____ ☒ Previously Submitted, Date **Jan 2004** |
| 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)<br>☐ Attached, Document ID: _____ ☐ Previously Submitted, Date _____<br>☒ 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)<br>☐ Attached, Document ID: _____ ☐ Previously Submitted, Date _____<br>☒ 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: **See Part II** ☐ 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: _____ ☒ Not Applicable | |
| 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 CB-EU1-C15

# LIST OF APPLICABLE REGULATIONS

## ATTACHMENT CB-EU1-C15

## LIST OF APPLICABLE REGULATIONS

| | |
|---|---|
| 40 CFR 60.40a | Applicability >250 MMBtu/hr |
| 40 CFR 60.41a | Definitions |
| 40 CFR 60.42a | Standard for particulate matter |
| 40 CFR 60.43a(a) | Standard for sulfur dioxide |
| 40 CFR 60.43a(g) | Compliance with the emission limitation and percent reduction requirements |
| 40 CFR 60.44a | Standard for nitrogen oxides |
| 40 CFR 60.46a | Compliance provisions |
| 40 CFR 60.47a | Emission monitoring |
| 40 CFR 60.48a | Compliance determination procedures and methods |
| 40 CFR 60.49a | Reporting requirements |
| FAC 62-204.800 | Standards of performance for New Stationary Sources |
| FAC 62-210.550 | Stack Height Policy |
| FAC 62-210.700 | Excess Emissions |
| FAC 62-212-300 | General preconstruction review |
| FAC 62-212-400 | Prevention of Significant Deterioration |
| FAC 62-296.405 | Fossil Fuel Steam Generators with more than 240 MMBtu/hr heat input |
| FAC 62-296.570(4)(a) | Reasonable Available Control Technology - Requirements for major VOC and $NO_x$ emission Facilities |
| FAC 62-296.702 | Fossil Fuel Steam Generators |
| FAC 62-296.711 | Material Handling, Sizing, Screening, Crushing, and Grinding Operations |
| FAC 62-297.401(5) | EPA Method 5 |
| FAC 62-297.401(6) | EPA Method 6 |
| FAC 62-297.401(7) | EPA Method 7 |
| FAC 62-297.401(8) | EPA Method 8 |
| FAC 62-297.401(9) | EPA Method 9 |
| FAC 62-297.401(10) | EPA Method 10 |
| FAC 62-297.401(12) | EPA Method 12 |
| FAC 62-297.401(13) | EPA Method 13 |
| FAC 62-297.401(15) | EPA Method 15 |
| FAC 62-297.401(17) | EPA Method 17 |
| FAC 62-297.401(19) | EPA Method 19 |
| FAC 62-297.401(25) | EPA Method 25 |
| FAC 62-297.401(32)(a) | EPA Method 101A |
| FAC 62-297.401(35) | EPA Method 104 |
| FAC 62-297.401(41) | EPA Method 201 |
| FAC 62-297.520 | EPA Performance Specifications |
| FAC 62-297.570 | Test Reports |
| FAC 62-297.620 | Exceptions and Approval of Alternate Procedures and Requirements |
| | |

## III. EMISSIONS UNIT INFORMATION

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

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

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

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

## A. GENERAL EMISSIONS UNIT INFORMATION

### Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

   ☒ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

   ☐ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

### Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

   ☒ This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:
   **Boiler B**

3. Emissions Unit Identification Number: **002**

| 4. Emissions Unit Status Code: | 5. Commence Construction Date: | 6. Initial Startup Date: | 7. Emissions Unit Major Group SIC Code: | 8. Acid Rain Unit? |
|---|---|---|---|---|
| **A** | | **01/25/1994** | **49** | ☐ Yes<br>☒ No |

9. Package Unit:
   Manufacturer: Model Number:

10. Generator Nameplate Rating: MW

11. Emissions Unit Comment:
    **Circulating Fluidized Bed (CFB) Boiler B with limestone injection for $SO_2$ emissions reduction. Ammonia injection for $NO_x$ emissions reduction. Fuel is primarily bituminous coal with No. 2 fuel oil for startup. Combustion products are flue gas with fly ash and bed ash.**

## Emissions Unit Control Equipment

| | |
|---|---|
| 1. Control Equipment/Method(s) Description:<br><br>**Baghouse**<br>**Efficiency = (1-emission)/load = 0.0055 gr/acr / 19.5 gr/acr = 99.97%**<br><br>**Ammonia injection**<br>**Efficiency = 54% for $NO_x$ (estimated)**<br><br>**Dry limestone injection**<br>**Efficiency from 89 to 95% based on Quarterly Reports**<br><br>**Air preheater**<br>**Reduction Efficiency not determined.**<br>**Intake air is preheated via flue gas to reduce fuel requirements.**<br><br>**Control of Oxygen**<br>**Reduction Efficiency not determined.** | |
| 2. Control Device or Method Code(s): **016, 032/107, 041, 027, 033** | |

## B. EMISSIONS UNIT CAPACITY INFORMATION

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

**Emissions Unit Operating Capacity and Schedule**

| | |
|---|---|
| 1. Maximum Process or Throughput Rate: | **104,000 lb/hr coal; 39,000 ton/month coal; 390,000 TPY coal.** |
| 2. Maximum Production Rate: | |
| 3. Maximum Heat Input Rate: **1,063** million Btu/hr | |
| 4. Maximum Incineration Rate: | pounds/hr<br>tons/day |
| 5. Requested Maximum Operating Schedule: | **24** hours/day; **7** days/week<br>**52** weeks/year; **8,760** hours/year |
| 6. Operating Capacity/Schedule Comment: | **Limits set by PSD-FL-137(A).**<br>**CFB Boilers A, B, and C feed a common steam turbine with a nominal rating of 250 MW and supply steam to an adjacent recycled liner board mill.** |

## 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: **B1** | 2. Emission Point Type Code: **2** |
| 3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: **Boiler Stack (B1)** | |
| 4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: **001 = Boiler A; 002 = Boiler B; 003 - Boiler C** | |

| | | |
|---|---|---|
| 5. Discharge Type Code: **V** | 6. Stack Height: **403** feet | 7. Exit Diameter: **13.26** feet |
| 8. Exit Temperature: **265** °F | 9. Actual Volumetric Flow Rate: **1,004,000** acfm | 10. Water Vapor: **5** % |

| | |
|---|---|
| 11. Maximum Dry Standard Flow Rate: **895,403** dscfm | 12. Nonstack Emission Point Height: feet |
| 13. Emission Point UTM Coordinates... Zone: **17** East (km): **441.871** North (km): **3365.587** | 14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS) |

15. Emission Point Comment:

**The 3 CFB boilers share a common stack designated as point B1. Flue gas from the boilers is discharged through this stack. Prior to the stack, each flue gas stream is passed through a baghouse which removes fly ash.**

**Stack information based on Title V Application.**

**See Attachment CB-EU1-C15 for Applicable Regulations.**

## D. SEGMENT (PROCESS/FUEL) INFORMATION

**Segment Description and Rate:** Segment 1 of 2

| | | |
|---|---|---|
| 1. Segment Description (Process/Fuel Type):<br><br>**Segment 1 of 2: Bituminous coal used in boiler.** | | |
| 2. Source Classification Code (SCC):<br>**1-01-002-17** | 3. SCC Units:<br>**Tons Burned** | |
| 4. Maximum Hourly Rate:<br>**52** | 5. Maximum Annual Rate:<br>**390,000** | 6. Estimated Annual Activity Factor: |
| 7. Maximum % Sulfur:<br>**2%** | 8. Maximum % Ash:<br>**11.6% (typical)** | 9. Million Btu per SCC Unit:<br>**24** |
| 10. Segment Comment:<br>**Maximum sulfur will be based on an equivalent 3.2 lb/ $SO_2$/MMBtu. See Part II.** | | |

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

| | | |
|---|---|---|
| 1. Segment Description (Process/Fuel Type):<br><br>**Segment 2 of 2: Tire-Derived Fuel (TDF)** | | |
| 2. Source Classification Code (SCC):<br>**1-01-008-01** | 3. SCC Units:<br>**Tons Burned** | |
| 4. Maximum Hourly Rate:<br>**2.2** | 5. Maximum Annual Rate:<br>**19,272** | 6. Estimated Annual Activity Factor: |
| 7. Maximum % Sulfur:<br>**2% (typical)** | 8. Maximum % Ash:<br>**5% (typical)** | 9. Million Btu per SCC Unit:<br>**29.4** |
| 10. Segment Comment:<br>**Based on 5% TDF (by weight). See Part II.** | | |

## 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 | 016 | 027 | EL |
| $PM_{10}$ | 016 | 027 | EL |
| $NO_x$ | 032/107 | 027 | EL |
| $SO_2$ | 041 | 027 | EL |
| CO | 033 | 027 | EL |
| VOC | 027 | | EL |
| SAM | 041 | 027 | EL |
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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 (TSP)** | 2. Total Percent Efficiency of Control: **99.97** |
| 3. Potential Emissions: **19.1** lb/hour **78** tons/year | 4. Synthetically Limited? ☒ Yes ☐ No |
| 5. Range of Estimated Fugitive Emissions (as applicable): to tons/year | |
| 6. Emission Factor: **0.018 lb/MMBtu** Reference: **PSD-FL-137(A)** | 7. Emissions Method Code: **0** |

8. Calculation of Emissions:

**1,063 MMBtu/hr x 0.018 lb/MMBtu = 19.1 lb/hr**
**19.1 lb/hr x 8,760 hr/yr x ton/2,000 lbs x 0.93 (capacity factor) = 78 TPY**

9. Pollutant Potential/Estimated Fugitive Emissions Comment:

**PSD-FL-137(A). Annual emissions limited for 3 boilers to not trigger PSD review. See Part II.**

## 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: **OTHER** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **See Part II** | 4. Equivalent Allowable Emissions: **19.1** lb/hour **78** tons/year |
| 5. Method of Compliance: **Method 5 or 17; 40 CFR, Appendix A** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **0.018 lb/MMBtu** **Annual emissions for 3 boilers limited to not trigger PSD review. See Part II.** | |

**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: **$PM_{10}$** | 2. Total Percent Efficiency of Control: **99.97** |
| 3. Potential Emissions: **19.1** lb/hour **78** tons/year | 4. Synthetically Limited? ☒ Yes ☐ No |
| 5. Range of Estimated Fugitive Emissions (as applicable): to tons/year | |
| 6. Emission Factor: **0.018 lb/MMBtu**<br>Reference: **PSD-FL-137(A)** | 7. Emissions Method Code: **0** |
| 8. Calculation of Emissions:<br><br>**1,063 MMBtu/hr x 0.018 lb/MMBtu = 19.1 lb/hr**<br>**19.1 lb/hr x 8,760 hr/yr x ton/2,000 lbs x 0.93 (capacity factor) = 78 TPY** | |
| 9. Pollutant Potential/Estimated Fugitive Emissions Comment:<br><br>**PSD-FL-137(A). Annual emissions for 3 boilers limited to not trigger PSD review. See Part II.** | |

## 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: **OTHER** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **See Part II** | 4. Equivalent Allowable Emissions: **19.1** lb/hour **78** tons/year |
| 5. Method of Compliance: **Method 5 or 17; 40 CFR, Appendix A** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **0.018 lb/MMBtu** **Annual emissions for 3 boilers limited when co-firing petroleum coke with coal to not trigger PSD review. See Part II.** | |

**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: **$SO_2$** | 2. Total Percent Efficiency of Control: |
| 3. Potential Emissions: **318.9** lb/hour **866** tons/year | 4. Synthetically Limited? ☒ Yes ☐ No |
| 5. Range of Estimated Fugitive Emissions (as applicable): to tons/year | |
| 6. Emission Factor: **0.30 lb/MMBtu* 0.20 lb/MMBtu**** Reference: **Permit PA-88-24A, PSD-FL-137B** | 7. Emissions Method Code: **0** |

8. Calculation of Emissions:

**1,063 MMBtu/hr x 0.3 lb/MMBtu = 318.9 lb/hr**
**1,063 MMBtu/hr x 0.2 lb/MMBtu x 8,760 hr/yr x ton/2,000 lb x 0.93 (capacity factor) = 866 TPY**

9. Pollutant Potential/Estimated Fugitive Emissions Comment:

**PSD-FL-137(A). * 3-hour rolling average; ** 30-day rolling average. Annual emissions limited for 3 boilers to not trigger PSD review. Increase in coal sulfur limit requested. See Part II.**

## 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: **OTHER** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **See Comment.** | 4. Equivalent Allowable Emissions: **318.9** lb/hour **866** tons/year |
| 5. Method of Compliance: **Continuous Emissions Monitoring** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **3-hour rolling average for $SO_2$ = 0.30 lb/MMBtu**<br>**30-day rolling average for $SO_2$ = 0.20 lb/MMBtu**<br>**Annual emissions for 3 boilers limited to not trigger PSD review. See Part II.** | |

**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: **$NO_x$** | 2. Total Percent Efficiency of Control: **54% (estimated)** |
| 3. Potential Emissions: **180.7** lb/hour **736.1** tons/year | 4. Synthetically Limited? ☒ Yes ☐ No |
| 5. Range of Estimated Fugitive Emissions (as applicable): to tons/year | |
| 6. Emission Factor: **0.17 lb/MMBtu*** Reference: **PSD-FL-137(A)** | 7. Emissions Method Code: **0** |
| 8. Calculation of Emissions: **1,063 MMBtu/hr x 0.17 lb/MMBtu = 180.7 lb/hr**<br>**180.7 lb/hr x 8,760 hr/yr x ton/2,000 lb x 0.93 (capacity factor) = 736.1 TPY** | |
| 9. Pollutant Potential/Estimated Fugitive Emissions Comment: **PSD-FL-137(A). * 30-day rolling average. Annual emissions limited for 3 boilers to not trigger PSD review. See Part II.** | |

## 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: **OTHER** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **See Part II.** | 4. Equivalent Allowable Emissions: **180.7** lb/hour **736.1** tons/year |
| 5. Method of Compliance: **Continuous Emissions Monitoring and Method 7, 7A, B, C, D, or E.** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **30-day rolling average for $NO_x$ = 0.17 lb/MMBtu** **Annual emissions for 3 boilers limited to not trigger PSD review. See Part II.** | |

**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: **CO** | 2. Total Percent Efficiency of Control: |
| 3. Potential Emissions: **186** lb/hour **649** tons/year | 4. Synthetically Limited? ☒ Yes ☐ No |
| 5. Range of Estimated Fugitive Emissions (as applicable): to tons/year | |
| 6. Emission Factor: **0.175 lb/MMBtu** Reference: **PSD-FfL-137(A)** | 7. Emissions Method Code: **0** |
| 8. Calculation of Emissions: **1,063 MMBtu/hr x 0.175 lb/MMBtu = 186 lb/hr** **Annual potential emissions based on maximum emissions for 3 boilers so that PSD is not triggered. See Part II.** | |
| 9. Pollutant Potential/Estimated Fugitive Emissions Comment: **Annual emissions limited for 3 boilers to not trigger PSD review. See Part II.** | |

## 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: **OTHER** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **See Part II.** | 4. Equivalent Allowable Emissions: **186** lb/hour **649** tons/year |
| 5. Method of Compliance: **Continuous Emissions Monitoring and Method 10.** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **Annual emissions limited for 3 boilers to not trigger PSD review. See Part II.** **8-hour rolling average for CO = 0.175 lb/MMBtu.** | |

**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: **VOC** | 2. Total Percent Efficiency of Control: |
| 3. Potential Emissions: **16.0** lb/hour **65**tons/year | 4. Synthetically Limited? ☒ Yes ☐ No |
| 5. Range of Estimated Fugitive Emissions (as applicable): to tons/year | |
| 6. Emission Factor: **0.015 lb/MMBtu**<br>Reference: | 7. Emissions Method Code: **0** |
| 8. Calculation of Emissions:<br>**1,063 MMBtu/hr x 0.015 lb/MMBtu = 16 lb/hr**<br>**See Part II.** | |
| 9. Pollutant Potential/Estimated Fugitive Emissions Comment:<br>**See Part II.** | |

## 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: **OTHER** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **See Part II.** | 4. Equivalent Allowable Emissions: **16.0** lb/hour **65**tons/year |
| 5. Method of Compliance: **Method 18 or 25.** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **See Part II. 0.015 lb/MMBtu VOC.** | |

**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: **SAM** | 2. Total Percent Efficiency of Control: |
| 3. Potential Emissions: **0.50** lb/hour **2.0** tons/year | 4. Synthetically Limited? ☒ Yes ☐ No |
| 5. Range of Estimated Fugitive Emissions (as applicable): to tons/year | |
| 6. Emission Factor: **$4.66 \times 10^{-4}$ lb/MMBtu**<br>Reference: **PSD-FL-137(A)** | 7. Emissions Method Code: **0** |
| 8. Calculation of Emissions:<br>**1,063 MMBtu/hr x 0.000466 lb/MMBtu = 0.5 lb/hr** | |
| 9. Pollutant Potential/Estimated Fugitive Emissions Comment:<br>**PSD-FL-137(A). See Part II.** | |

## 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: **OTHER** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **See Part II.** | 4. Equivalent Allowable Emissions: **0.50** lb/hour **2.0** tons/year |
| 5. Method of Compliance: **Method 8.** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **4.66 x 10-4 lb/MMBtu. See Part II.** | |

**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:<br>**VE** | 2. Basis for Allowable Opacity:<br>☐ Rule ☒ Other |
| 3. Allowable Opacity:<br>Normal Conditions: **20** % Exceptional Conditions: **27** %<br>Maximum Period of Excess Opacity Allowed: **6** min/hour | |
| 4. Method of Compliance:<br>**COM, Method 9.** | |
| 5. Visible Emissions Comment:<br>**27% opacity for oil-burning during startup. PSD-FL-137(A)** | |

**Visible Emissions Limitation:** Visible Emissions Limitation _____ of _____

| | |
|---|---|
| 1. Visible Emissions Subtype: | 2. Basis for Allowable Opacity:<br>☐ Rule ☐ Other |
| 3. Allowable Opacity:<br>Normal Conditions: % Exceptional Conditions: %<br>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 _____ of _____

| | |
|---|---|
| 1. Parameter Code: **See Comment.** | 2. Pollutant(s): |
| 3. CMS Requirement: | ☒ Rule ☐ Other |
| 4. Monitor Information... Manufacturer: **Various** Model Number: | Serial Number: |
| 5. Installation Date: | 6. Performance Specification Test Date: |
| 7. Continuous Monitor Comment: **Baghouse flue has CEMs for $NO_x$, $SO_2$, CO, $CO_2$, and VE. Manufacturers, models, and serial numbers previously submitted.** | |

**Continuous Monitoring System:** Continuous Monitor _____ of _____

| | |
|---|---|
| 1. Parameter Code: | 2. Pollutant(s): |
| 3. CMS Requirement: | ☐ Rule ☐ Other |
| 4. Monitor Information... Manufacturer: 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)<br>☐ Attached, Document ID: _____ ☒ Previously Submitted, Date **Jan 2004** |
| 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)<br>☒ Attached, Document ID: **See Part II** ☐ 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)<br>☐ Attached, Document ID: _____ ☒ Previously Submitted, Date **Jan 2004** |
| 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)<br>☐ Attached, Document ID: _____ ☐ Previously Submitted, Date _____<br>☒ 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)<br>☐ Attached, Document ID: _____ ☐ Previously Submitted, Date _____<br>☒ 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: **See Part II** ☐ 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: _____ ☒ Not Applicable | |
| 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 | |

EMISSIONS UNIT INFORMATION
Section [2]
CFB Boiler B

## Additional Requirements Comment

## III. EMISSIONS UNIT INFORMATION

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

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

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

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

## A. GENERAL EMISSIONS UNIT INFORMATION

**Title V Air Operation Permit Emissions Unit Classification**

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

   ☒ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

   ☐ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

**Emissions Unit Description and Status**

1. Type of Emissions Unit Addressed in this Section: (Check one)

   ☒ This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:
   **Boiler C**

3. Emissions Unit Identification Number: **003**

| 4. Emissions Unit Status Code: | 5. Commence Construction Date: | 6. Initial Startup Date: | 7. Emissions Unit Major Group SIC Code: | 8. Acid Rain Unit? |
|---|---|---|---|---|
| **A** | | **01/25/1994** | **49** | ☐ Yes ☒ No |

9. Package Unit:
   Manufacturer: Model Number:

10. Generator Nameplate Rating: MW

11. Emissions Unit Comment:
   **Circulating Fluidized Bed (CFB) Boiler C with limestone injection for $SO_2$ emissions reduction. Ammonia injection for $NO_x$ emissions reduction. Fuel is primarily bituminous coal with No. 2 fuel oil for startup. Combustion products are flue gas with fly ash and bed ash.**

## Emissions Unit Control Equipment

1. Control Equipment/Method(s) Description:

**Baghouse**
**Efficiency = (1-emission)/load = 0.0055 gr/acr / 19.5 gr/acr = 99.97%**

**Ammonia injection**
**Efficiency = 54% for $NO_x$ (estimated)**

**Dry limestone injection**
**Efficiency from 89 to 95% based on Quarterly Reports**

**Air preheater**
**Reduction Efficiency not determined.**
**Intake air is preheated via flue gas to reduce fuel requirements.**

**Control of Oxygen**
**Reduction Efficiency not determined.**

2. Control Device or Method Code(s): **016, 032/107, 041, 027, 033**

## B. EMISSIONS UNIT CAPACITY INFORMATION

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

**Emissions Unit Operating Capacity and Schedule**

| | |
|---|---|
| 1. Maximum Process or Throughput Rate: | **104,000 lb/hr coal;**<br>**39,000 ton/month coal;**<br>**390,000 TPY coal.** |
| 2. Maximum Production Rate: | |
| 3. Maximum Heat Input Rate: **1,063** million Btu/hr | |
| 4. Maximum Incineration Rate: | pounds/hr<br>tons/day |
| 5. Requested Maximum Operating Schedule: | **24** hours/day **7** days/week<br>**52** weeks/year **8,760** hours/year |
| 6. Operating Capacity/Schedule Comment:<br><br>**Limits set by PSD-FL-137A.**<br><br>**CFB Boilers A, B, and C feed a common steam turbine with a nominal rating of 250 MW and supply steam to an adjacent recycled liner board mill.** | |

## 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: **B1** | 2. Emission Point Type Code: **2** | |
| 3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: **Boiler Stack (B1)** | | |
| 4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: **001 = Boiler A; 002 = Boiler B; 003 - Boiler C** | | |
| 5. Discharge Type Code: **V** | 6. Stack Height: **403** feet | 7. Exit Diameter: **13.26** feet |
| 8. Exit Temperature: **265** °F | 9. Actual Volumetric Flow Rate: **1,004,000** acfm | 10. Water Vapor: **5** % |
| 11. Maximum Dry Standard Flow Rate: **895,403** dscfm | 12. Nonstack Emission Point Height: feet | |
| 13. Emission Point UTM Coordinates... Zone: **17** East (km): **441.871** North (km): **3365.587** | 14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS) | |

15. Emission Point Comment:

**The 3 CFB boilers share a common stack designated as point B1. Flue gas from the boilers is discharged through this stack. Prior to the stack, each flue gas stream is passed through a baghouse which removes fly ash.**

**Stack information based on Title V Application.**

**See Attachment CB-EU1-C15 for Applicable Regulations.**

## D. SEGMENT (PROCESS/FUEL) INFORMATION

**Segment Description and Rate:** Segment 1 of 2

| | | |
|---|---|---|
| 1. Segment Description (Process/Fuel Type): **Segment 1 of 2: Bituminous coal used in boiler.** | | |
| 2. Source Classification Code (SCC): **1-01-002-17** | 3. SCC Units: **Tons Burned** | |
| 4. Maximum Hourly Rate: **52** | 5. Maximum Annual Rate: **390,000** | 6. Estimated Annual Activity Factor: |
| 7. Maximum % Sulfur: **2%** | 8. Maximum % Ash: **11.6% (typical)** | 9. Million Btu per SCC Unit: **24** |
| 10. Segment Comment: **Maximum sulfur will be based on an equivalent 3.2 lb/ $SO_2$/MMBtu. See Part II.** | | |

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

| | | |
|---|---|---|
| 1. Segment Description (Process/Fuel Type): **Segment 2 of 2: Tire-Derived Fuel (TDF)** | | |
| 2. Source Classification Code (SCC): **1-01-008-01** | 3. SCC Units: **Tons Burned** | |
| 4. Maximum Hourly Rate: **2.2** | 5. Maximum Annual Rate: **19,272** | 6. Estimated Annual Activity Factor: |
| 7. Maximum % Sulfur: **2% (typical)** | 8. Maximum % Ash: **5% (typical)** | 9. Million Btu per SCC Unit: **29.4** |
| 10. Segment Comment: **Based on 5% TDF (by weight). See Part II.** | | |

## 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 | 016 | 027 | EL |
| $PM_{10}$ | 016 | 027 | EL |
| $NO_x$ | 032/107 | 027 | EL |
| $SO_2$ | 041 | 027 | EL |
| CO | 033 | 027 | EL |
| VOC | 027 | | EL |
| SAM | 041 | 027 | 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: **PM (TSP)** | 2. Total Percent Efficiency of Control: **99.97** |
| 3. Potential Emissions: **19.1** lb/hour **78** tons/year | 4. Synthetically Limited? ☒ Yes ☐ No |
| 5. Range of Estimated Fugitive Emissions (as applicable): to tons/year | |
| 6. Emission Factor: **0.018 lb/MMBtu**<br>Reference: **PSD-FL-137A** | 7. Emissions Method Code: **0** |
| 8. Calculation of Emissions:<br>**1,063 MMBtu/hr x 0.018 lb/MMBtu = 19.1 lb/hr**<br>**19.1 lb/hr x 8,760 hr/yr x ton/2,000 lbs x 0.93 (capacity factor) = 78 TPY** | |
| 9. Pollutant Potential/Estimated Fugitive Emissions Comment:<br>**PSD-FL-137(A). Annual emissions limited for 3 boilers to not trigger PSD review. See Part II.** | |

## 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: **OTHER** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **See Part II** | 4. Equivalent Allowable Emissions: **19.1** lb/hour **78** tons/year |
| 5. Method of Compliance: **Method 5 or 17; 40 CFR, Appendix A** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **0.018 lb/MMBtu** **Annual emissions for 3 boilers limited to not trigger PSD review. See Part II.** | |

**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: **$PM_{10}$** | 2. Total Percent Efficiency of Control: **99.97** |
| 3. Potential Emissions: **19.1** lb/hour **78** tons/year | 4. Synthetically Limited? ☒ Yes ☐ No |
| 5. Range of Estimated Fugitive Emissions (as applicable): to tons/year | |
| 6. Emission Factor: **0.018 lb/MMBtu**<br>Reference: **PSD-FL-137(A)** | 7. Emissions Method Code: **0** |
| 8. Calculation of Emissions:<br>**1,063 MMBtu/hr x 0.018 lb/MMBtu = 19.1 lb/hr**<br>**19.1 lb/hr x 8,760 hr/yr x ton/2,000 lbs x 0.93 (capacity factor) = 78 TPY** | |
| 9. Pollutant Potential/Estimated Fugitive Emissions Comment:<br>**PSD-FL-137(A). Annual emissions for 3 boilers limited to not trigger PSD review. See Part II.** | |

## 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: **OTHER** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **See Part II** | 4. Equivalent Allowable Emissions: **19.1** lb/hour **78** tons/year |
| 5. Method of Compliance: **Method 5 or 17; 40 CFR, Appendix A** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **0.018 lb/MMBtu** **Annual emissions for 3 boilers limited when co-firing petroleum coke with coal to not trigger PSD review. See Part II.** | |

**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: **$SO_2$** | 2. Total Percent Efficiency of Control: |
| 3. Potential Emissions: **318.9** lb/hour **866** tons/year | 4. Synthetically Limited? ☒ Yes ☐ No |
| 5. Range of Estimated Fugitive Emissions (as applicable): to tons/year | |
| 6. Emission Factor: **0.30 lb/MMBtu* 0.20 lb/MMBtu**** Reference: **Permit PA-88-24A, PSD-FL-137B** | 7. Emissions Method Code: **0** |
| 8. Calculation of Emissions: **1,063 MMBtu/hr x 0.3 lb/MMBtu = 318.9 lb/hr** **1,063 MMBtu/hr x 0.2 lb/MMBtu x 8,760 hr/yr x ton/2,000 lb x 0.93 (capacity factor) = 866 TPY** | |
| 9. Pollutant Potential/Estimated Fugitive Emissions Comment: **PSD-FL-137(A). * 3-hour rolling average; ** 30-day rolling average. Annual emissions limited for 3 boilers to not trigger PSD review. Increase in coal sulfur limit requested. See Part II.** | |

## 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: **OTHER** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **See Comment.** | 4. Equivalent Allowable Emissions: **318.9** lb/hour **866** tons/year |
| 5. Method of Compliance: **Continuous Emissions Monitoring** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **3-hour rolling average for $SO_2$ = 0.30 lb/MMBtu** **30-day rolling average for $SO_2$ = 0.20 lb/MMBtu** **Annual emissions for 3 boilers limited to not trigger PSD review. See Part II.** | |

**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: **$NO_x$** | 2. Total Percent Efficiency of Control: **54% (estimated)** |
| 3. Potential Emissions: **180.7** lb/hour **736.1** tons/year | 4. Synthetically Limited? ☒ Yes ☐ No |
| 5. Range of Estimated Fugitive Emissions (as applicable): to tons/year | |
| 6. Emission Factor: **0.17 lb/MMBtu*** Reference: **PSD-FL-137(A)** | 7. Emissions Method Code: **0** |
| 8. Calculation of Emissions: **1,063 MMBtu/hr x 0.17 lb/MMBtu = 180.7 lb/hr** **180.7 lb/hr x 8,760 hr/yr x ton/2,000 lb x 0.93 (capacity factor) = 736.1 TPY** | |
| 9. Pollutant Potential/Estimated Fugitive Emissions Comment: **PSD-FL-137(A). * 30-day rolling average. Annual emissions limited for 3 boilers to not trigger PSD review. See Part II.** | |

## 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: **OTHER** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **See Part II.** | 4. Equivalent Allowable Emissions: **180.7** lb/hour **736.1** tons/year |
| 5. Method of Compliance: **Continuous Emissions Monitoring and Method 7, 7A, B, C, D, or E.** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **30-day rolling average for $NO_x$ = 0.17 lb/MMBtu** **Annual emissions for 3 boilers limited to not trigger PSD review. See Part II.** | |

**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: **CO** | 2. Total Percent Efficiency of Control: |
| 3. Potential Emissions: **186** lb/hour **649** tons/year | 4. Synthetically Limited? ☒ Yes ☐ No |
| 5. Range of Estimated Fugitive Emissions (as applicable): to tons/year | |
| 6. Emission Factor: **0.175 lb/MMBtu**<br>Reference: **PSD-FfL-137(A)** | 7. Emissions Method Code: **0** |
| 8. Calculation of Emissions:<br><br>**1,063 MMBtu/hr x 0.175 lb/MMBtu = 186 lb/hr**<br>**Annual potential emissions based on maximum emissions for 3 boilers so that PSD is not triggered. See Part II.** | |
| 9. Pollutant Potential/Estimated Fugitive Emissions Comment:<br><br>**Annual emissions limited for 3 boilers to not trigger PSD review. See Part II.** | |

## 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: **OTHER** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **See Part II.** | 4. Equivalent Allowable Emissions: **186** lb/hour **649** tons/year |
| 5. Method of Compliance: **Continuous Emissions Monitoring and Method 10.** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **Annual emissions limited for 3 boilers to not trigger PSD review. See Part II.** **8-hour rolling average for CO = 0.175 lb/MMBtu.** | |

**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: **VOC** | 2. Total Percent Efficiency of Control: |
| 3. Potential Emissions: **16.0** lb/hour **65**tons/year | 4. Synthetically Limited? ☒ Yes ☐ No |
| 5. Range of Estimated Fugitive Emissions (as applicable): to tons/year | |
| 6. Emission Factor: **0.015 lb/MMBtu**<br>Reference: | 7. Emissions Method Code: **0** |
| 8. Calculation of Emissions:<br>**1,063 MMBtu/hr x 0.015 lb/MMBtu = 16 lb/hr**<br>**See Part II.** | |
| 9. Pollutant Potential/Estimated Fugitive Emissions Comment:<br>**See Part II.** | |

## 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: **OTHER** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **See Part II.** | 4. Equivalent Allowable Emissions: **16.0** lb/hour **65**tons/year |
| 5. Method of Compliance: **Method 18 or 25.** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **See Part II. 0.015 lb/MMBtu VOC.** | |

**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: **SAM** | 2. Total Percent Efficiency of Control: |
| 3. Potential Emissions: **0.50** lb/hour **2.0** tons/year | 4. Synthetically Limited? ☒ Yes ☐ No |
| 5. Range of Estimated Fugitive Emissions (as applicable): to tons/year | |
| 6. Emission Factor: **4.66 x $10^{-4}$ lb/MMBtu** Reference: **PSD-FL-137(A)** | 7. Emissions Method Code: **0** |
| 8. Calculation of Emissions: **1,063 MMBtu/hr x 0.000466 lb/MMBtu = 0.5 lb/hr** | |
| 9. Pollutant Potential/Estimated Fugitive Emissions Comment: **PSD-FL-137(A). See Part II.** | |

## 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: **OTHER** | 2. Future Effective Date of Allowable Emissions: |
| 3. Allowable Emissions and Units: **See Part II.** | 4. Equivalent Allowable Emissions: **0.50** lb/hour **2.0** tons/year |
| 5. Method of Compliance: **Method 8.** | |
| 6. Allowable Emissions Comment (Description of Operating Method): **4.66 x 10-4 lb/MMBtu. See Part II.** | |

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: ☐ Rule ☒ Other |
| 3. Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: **27** % Maximum Period of Excess Opacity Allowed: **6** min/hour | |
| 4. Method of Compliance: **COM, Method 9.** | |
| 5. Visible Emissions Comment: **27% opacity for oil-burning during startup. PSD-FL-137(A)** | |

**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 _____ of _____

| | |
|---|---|
| 1. Parameter Code: **See Comment.** | 2. Pollutant(s): |
| 3. CMS Requirement: ☒ Rule ☐ Other | |
| 4. Monitor Information... Manufacturer: **Various** Model Number: Serial Number: | |
| 5. Installation Date: | 6. Performance Specification Test Date: |
| 7. Continuous Monitor Comment: **Baghouse flue has CEMs for $NO_x$, $SO_2$, CO, $CO_2$, and VE. Manufacturers, models, and serial numbers previously submitted.** | |

**Continuous Monitoring System:** Continuous Monitor _____ of _____

| | |
|---|---|
| 1. Parameter Code: | 2. Pollutant(s): |
| 3. CMS Requirement: ☐ Rule ☐ Other | |
| 4. Monitor Information... Manufacturer: 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)<br>☐ Attached, Document ID: _____ ☒ Previously Submitted, Date **Jan 2004** |
| 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)<br>☒ Attached, Document ID: **See Part II** ☐ 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)<br>☐ Attached, Document ID: _____ ☒ Previously Submitted, Date **Jan 2004** |
| 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)<br>☐ Attached, Document ID: _____ ☐ Previously Submitted, Date _____<br>☒ 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)<br>☐ Attached, Document ID: _____ ☐ Previously Submitted, Date _____<br>☒ 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: **See Part II** ☐ 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: _____ ☒ Not Applicable | |
| 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

| |
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| |

# PART II

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APPENDICES

# 1.0 INTRODUCTION

Cedar Bay Generating Company, L.P. (Cedar Bay), is seeking authorization from the Florida Department of Environmental Protection (FDEP) to co-fire up to 5 percent (by weight) of tire-derived fuel (TDF) with coal and change the coal sulfur limitation at the Cedar Bay Cogeneration Facility (Facility). Cedar Bay is also requesting an administrative change of the production limit for co-firing short fiber rejects (SFR) from a volume basis to a weight basis. Specifically, Cedar Bay requests that FDEP change the Prevention of Significant Deterioration (PSD) permit for the Facility [PSD-FL-137(A)] and the Title V permit for the facility (Permit No. 0310337-007-AV) to modify the Conditions of Certification that were issued for the Facility under the Florida Electrical Power Plant Siting Act [(PPSA); PA 88-24]. Although a change to the Facility's PSD permit is being requested to allow the co-firing of TDF and change the coal sulfur limit, there will not be any significant net emissions increase at the Facility, and thus the requirements of the PSD review process are not triggered.

Cedar Bay received authorization to conduct a test burn to co-fire 5 percent of TDF with coal (FDEP Letter Authorization dated December 7, 2004). The co-firing test was performed using Boiler C during a 30-day test burn period. The results of the test burn indicated that TDF could be successfully co-fired with coal without any changes in operation or emissions performance.

Cedar Bay received authorization to co-fire petroleum coke with coal [PSD-FL-137 (A); 12/20/02]. This authorization limited the sulfur content of the blended fuel to an equivalent sulfur dioxide ($SO_2$) content of 3.2 pounds per million British thermal units (lb/MMBtu) (Title V Final Permit Condition A.7.). The sulfur limit for coal is 1.7 percent, by weight, on a shipment (train load) basis and 1.2 percent, by weight, on an annual basis. Cedar Bay is requesting that these limits be changed to an equivalent $SO_2$ content of 3.2 lb/MMBtu.

The existing Cedar Bay Cogeneration Facility is located at 9640 Eastport Road, Jacksonville, Duval County, Florida (Figure 1). The cogeneration facility consists of three circulating fluidized bed (CFB) boilers and associated facilities. The CFB boilers, designated as Boilers A, B, and C, use coal as the primary fuel. No. 2 fuel oil is only used as a supplemental fuel, primarily for start-ups. $SO_2$ emissions are controlled using limestone injection into the CFB boilers and emissions of nitrogen oxides ($NO_x$) are controlled using selective non-catalytic reduction (SNCR). The reaction products of the limestone and $SO_2$, as well as particulate matter (PM) generated from combustion are controlled with baghouses.

Golder Associates Inc. (Golder) was contracted to prepare the necessary air permit application seeking authorization to co-fire up to 5 percent (by weight) of TDF with coal and change the coal sulfur content limitation. The air permit application consists of the appropriate application form [FDEP Form 62-210.900(1)], a technical description of the project (Part II Section 2.0), and rule applicability for the project (Part II Section 3.0).

# 2.0 PROJECT DESCRIPTION

## 2.1 CO-FIRING TDF

The disposal of used tires has been a significant environmental issue due to their resistance to degradation and poor compatibility with land filling. Indeed, in 1989, Florida implemented a waste tire management program resulting in the FDEP promulgating Chapter 62-711 to regulate the disposal of tires in Florida. Since 1990, significant progress has been made toward this environmental issue. However, Florida generates 19.5 million waste tires per year and disposal/recycling is still an on-going issue. This is summarized in FDEP's publication *Waste Tires in Florida*, State of the State Report, March 24, 2004 (see Attachment A). Although recycling opportunities are available, the market is currently insufficient to handle the large number of stockpiled tires. As such, the Bureau of Solid and Hazardous Waste of the FDEP identified Cedar Bay's boilers as being a suitable candidate to utilize processed tire chips as a supplementary fuel in the CFB boilers due to the inherent design to utilize various solid fuels.

TDF has useful energy and as shown in Table 1, with higher heat content and lower ash than coal, with only slightly higher sulfur content. Cedar Bay received authorization from FDEP and conducted a 30-day test burn of 5 percent TDF in Boiler C. The results of test burn are contained in Attachment B. The conclusions from this test burn are:

> "Based on the results of the emissions test at a 5% coal substitution, by weight, with TDF, the emissions of the existing permitted parameters in Cedar Bay's Title V and PSD permits are not different than when firing 100% bituminous coal.
>
> The operational results of the trial indicated essentially no changes to the operating characteristics of the boiler. No negative influences were noted due to the TDF substitution.
>
> These results indicate that Cedar Bay's Circulating Fluidized Bed Combustors can supplement their normal fuel (Bituminous Coal) with 5% TDF and achieve the environmental compliance emission limits. This substitution provides a viable supplemental fuel for Cedar Bay."

## 2.2 COAL SULFUR LIMITATION

Cedar Bay's Final Title V Permit (Permit No.:0310337-007-AV), Section A.7. (1) states:

> Sulfur Dioxide - Sulfur Content.
> 1. Coal. In order to ensure continuous compliance with the $SO_2$ limit stated in Specific Condition A.5, the coal sulfur content shall not exceed 1.7 percent, by weight, on a shipment (train load) basis and 1.2 percent, by weight, on an annual basis, as measured by applicable test methods (see Specific Condition A.36). When co-firing coal and petcoke, the blended fuel input to the CFBs shall not exceed 3.2 lb/MMBtu equivalent $SO_2$ content. Compliance shall be determined on a monthly basis via a composite of daily fuel samples.

Cedar Bay desires to remove the coal sulfur limitation of 1.7 percent, by weight, on a shipment (train load) basis and 1.2 percent, by weight, on an annual basis. Cedar Bay is requesting that these limits be changed to an equivalent $SO_2$ content of 3.2 lb/MMBtu, which is the same sulfur input limitation previously approved by FDEP for the co-firing of petroleum coke with coal. Cedar Bay was authorized to co-fire up to 35 percent petroleum coke with coal [PSD-FL-137(A)] in 2002 by supplying technical information that demonstrated that the CFB units could remove $SO_2$ in the blended fuel with an equivalent sulfur content of 3.2 lb/MMBtu. This demonstration included information from the manufacturer of the CFB units, Foster Wheeler Energy Services, Inc. (Foster Wheeler). A feasibility study was conducted by Foster Wheeler for co-firing petroleum coke with coal in the three Cedar Bay CFB boilers (see Attachment C).

Table 2 provides information on the sulfur removal required with a coal sulfur limit equivalent to 3.2 lb/MMBtu. As shown, the sulfur content based on the typical coal heat content of 12,000 British thermal units per pound (Btu/lb) is about 2 percent, resulting in a removal of about 94 percent to achieve an $SO_2$ emission limit of 0.2 lb/MMBtu (Condition A.5, 12-month rolling average). Based on the Foster Wheeler report, an uncontrolled sulfur limit of 3.2 lb/MMBtu for coal is equivalent to co-firing 20 percent petroleum coke with coal (refer to Figure 3 of the Foster Wheeler report). On this basis, the amount of limestone required is 17,000 pounds per hour per unit (lb/hr/unit) (see Figure 4 of the Foster Wheeler Report). Note that the Foster Wheeler projections are based on an $SO_2$ emission limit of 0.16 lb/MMBtu. This provides a conservative basis for limestone use. As shown in Figure 3 of the Foster Wheeler report, at an input sulfur equivalent to 3.2 lb/MMBtu represents co-firing about 15-percent petroleum coke with coal, further demonstrating the conservative nature of the limestone use.

Table 2 also presents the calculations of the annual limestone and ash production. As shown, the projected limestone and ash production is within the limits in the Final Title V Permit (Condition B.1.b). The annual amounts were based on 90-percent heat input capacity factor, which is 90 percent of the maximum permitted heat input of 1,063 million British thermal units per hour (MMBtu/hr). The heat input capacity factors has averaged 81 percent based on the Annual Operating Report (AOR) data with a range of 78 to 83 percent. (Note: The heat input capacity in this calculation is different from electrical capacity.)

Table 3 was prepared based on the maximum heat input limit of 1,063 MMBtu/hr (Condition A.1) and the coal production limit 104,000 pounds per hour (lb/hr) [Condition A.3.(b)]. This results in a coal heat content of about 10,200 Btu/lb and a sulfur content of about 1.6 percent, for an equivalent uncontrolled $SO_2$ emission rate of 3.2 lb/MMBtu. Table 3 demonstrates that the limestone and ash will be within the limits.

Table 4 shows the effect of co-firing TDF with higher percent sulfur coal. As previously shown in Table 1, TDF co-fired at 5 percent by weight, will only change the $SO_2$ emission rate by 0.1 lb/MMBtu. TDF has an equivalent uncontrolled $SO_2$ emission rate of about 2.5 lb/MMBtu, which is less than that requested for coal and thus there will be no increase in the uncontrolled emission rate of the blend.

### 2.3 SHORT FIBER REJECTS (SFR)

The current condition for short fiber rejects states (Condition A.3):

(c) Short Fiber Rejects. The maximum charging rate to CFB Boilers B & C of short fiber recycle rejects from the SCC recycling process shall not exceed 210 $yd^3$/day (wet) and 69,588 $yd^3$/yr (wet). This reflects a combined total of 420 $yd^3$/day (wet) and 139,176 $yd^3$/yr (wet) for the two CFB boilers that fire recycle rejects. CFB Boiler A will not utilize recycle rejects, nor will it be equipped with handling and firing equipment for recycle rejects.

Cedar Bay requests an administrative change in the limitation from a volume basis to a mass basis. While the material is provided in 30 cubic yard boxes, accounting for the amount on a volume basis is not practical for determining operational and environmental parameters.

SFR is a by-product of the Smurfit Stone recycling process. Bales of corrugated cardboard are shredded, mixed with water and reduced to a pulp. Heavy trash material such as staples, glass, metal and stones sink to the bottom of the pulp slurry and are removed. The slurry is then spun in a centrifuge to remove any additional heavy material. From the centrifuge, the slurry passes through a coarse screen, which removes additional contaminants such as wax or plastic. The slurry passes on to another centrifuge and then short and long fibers are separated using two fine mesh screens and a reverse cleaner. The short fibers are pressed to remove liquids and the SFR is transferred to roll-off containers for disposal.

The Cedar Bay facility was constructed to support combustion of the SFR in two boilers (Boilers B and C) with a dedicated material handling and conveyance system to transport the SFR to the boilers. A detailed description of the process and equipment is found in the facility's operating procedures.

SFR is collected from Smurfit Stone's process in dedicated 30 cubic yard capacity roll-off boxes for disposal. The roll-off boxes will be transported within Smurfit Stone's property to the location of Cedar Bay's fiber waste handling system. The SFR is unloaded into a receiving hopper. The receiving hopper is equipped with a live bottom via drag chain feeder and interfaces with Cedar Bay's distributed control system (DCS). The DCS system allows this system, as well as most of the Cedar Bay plant, to be controlled and monitored from Cedar Bay's Control Room.

SFR is discharged from the receiving hopper by a variable speed drag conveyor to a 24-inch wide conveyor belt (SFR conveyor). This conveyor is rated at 16 tons per hour at a belt speed of 75 feet per minute. The conveyor is equipped with skirt boards; hood covers, automatic vertical gravity take-up with grab safety devices, speed switch, and pull cord switches and belt alignment switches. Additionally, the conveyor is equipped with a Thermo Ramsey Belt Scale/Integrator System that measures the fiber reject materials in tons and communicates the tonnage to the boiler DCS and CEM systems.

SFR is discharged from the SFR conveyor into the SFR surge hopper. The surge hopper is sized for a minimum capacity of 20 cubic yards and is equipped with four variable speed screw conveyors, each with their own speed switch. The surge hopper also has three capacitance-type level switches. One switch monitors low level, one switch to monitor high level, and one switch for emergency high level. Upon actuation of the high level switch, the DCS system automatically run the drag chain feeder in the receiving hopper in low speed to prevent overfill of the surge hopper. The feeder returns to high speed when the high level switch is no longer actuated. The emergency high-level switch stops both conveyor and feeder immediately after actuation.

The feed system feeds the SFR to the loop seal feed points of Boiler C and discharges through air locks (rotary valves) to the coal drag chain conveyors feeding the loop seals. The coal conveyors introduce the coal/fiber waste mix into the loop seal fuel feed port.

The fiber waste provides less than 5 percent of the heat input to C boiler when the feed rate is 150 tons/day and the boiler is at full load.

## 2.4 HISTORICAL EMISSIONS FOR CEDAR BAY COGENERATION FACILITY

The production information and actual emissions reported in the Annual Operating Reports submitted to FDEP for the years 2000 through 2004 are summarized in Table 5. The reported emissions are for carbon monoxide (CO), nitrogen oxides ($NO_x$), $SO_2$, particulate matter (PM), volatile organic compounds (VOC), and sulfuric acid mist (SAM). These reported emissions are based on continuous emission monitoring (CEM) systems for CO, $NO_x$, and $SO_2$. Testing is conducted annually for the other pollutants.

As shown in the table, the emissions have been relatively constant over the last 4 years.

Cedar Bay is proposing that the last two years (2003-2004) be used as the emissions for future comparisons.

## 3.0 RULE APPLICABILITY AND PROPOSED CHANGES

Under Federal and State of Florida PSD review requirements, all major new or modified sources of air pollutants regulated under the Clean Air Act (CAA) must be reviewed and a pre-construction permit issued. EPA has approved Florida's State Implementation Plan (SIP), which contains PSD regulations, therefore, PSD approval authority has been granted to the FDEP. For projects approved under the Florida PPSA, the PSD program is delegated.

A "major facility" is defined as any 1 of 28 named source categories that have the potential to emit 100 tons per year (TPY) or more, or any other stationary facility that has the potential to emit 250 TPY or more of any pollutant regulated under CAA. "Potential to emit" means the capability, at maximum design capacity, to emit a pollutant after the application of control equipment. Once a new source is determined to be a "major facility" for a particular pollutant, any pollutant emitted in amounts greater than the PSD significant emission rates is subject to PSD review. For an existing source for which a modification is proposed, the modification is subject to PSD review if the net increase in emissions due to the modification is greater than the PSD significant emission rates.

PSD review is used to determine whether significant air quality deterioration will result from the new or modified facility. Federal PSD requirements are contained in 40 Code of Federal Regulations (CFR) 52.21, *Prevention of Significant Deterioration of Air Quality*. The State of Florida has adopted the federal PSD regulations by reference [Rule 62-212.400, Federal Administrative Code (F.A.C.)]. Major facilities and major modifications are required to undergo the following analysis related to PSD for each pollutant emitted in significant amounts:

- Control technology review,
- Source impact analysis,
- Air quality analysis (monitoring),
- Source information, and
- Additional impact analyses.

The Cedar Bay Cogeneration Facility is a major source. Co-firing of TDF and changing the uncontrolled sulfur limit is an operational change based on past FDEP determinations. Therefore, the project is a modification as defined in the FDEP rules in 62-210.200, F.A.C., and under the PSD rules in 62-212.400, F.A.C. PSD review would be required for the project if there were a significant net increase in emissions. For the proposed requested changes, there will be no significant net increase in actual emissions based on the requested conditions.

Determining the amount of the change, if any, in the Facility's emission should be performed by following the requirements in 40 CFR Parts 52.21(b)(21)(v) and 52.21(b)(33). These applicable rules are stated below:

> **52.21(b)(21)(v)** For an electric utility steam generating unit (other than a new unit or the replacement of an existing unit) actual emissions of the unit following the physical or operational change shall equal the representative actual annual emissions of the unit, provided the source owner or operator maintains and submits to the Administrator on an annual basis for a period of 5 years from the date the unit resumes regular operation, information demonstrating that the physical or operational change did not result in an emissions increase. A longer period, not to exceed 10 years, may be required by the Administrator if he determines such a period to be more representative of normal source post-change operations.
>
> **52.21(b)(33)** Representative actual annual emissions means the average rate, in tons per year, at which the source is projected to emit a pollutant for the two-year period after a physical change or change in the method of operation of a unit, (or a different consecutive two-year period within 10 years after that change, where the Administrator determines that such period is more representative of normal source operations), considering the effect any such change will have on increasing or decreasing the hourly emissions rate and on projected capacity utilization. In projecting future emissions the Administrator shall:
>
> **(i)** Consider all relevant information, including but not limited to, historical operational data, the company's own representations, filings with the State or Federal regulatory authorities, and compliance plans under title IV of the Clean Air Act; and
>
> **(ii)** Exclude, in calculating any increase in emissions that results from the particular physical change or change in the method of operation at an electric utility steam generating unit, that portion of the unit's emissions following the change that could have been accommodated during the representative baseline period and is attributable to an increase in projected capacity utilization at the unit that is unrelated to the particular change, including any increased utilization due to the rate of electricity demand growth for the utility system as a whole.

These requirements have been included in many permits authorized by FDEP for operational changes. Cedar Bay requests that these requirements be included in a federally enforceable modification to the existing PSD and Title V permits for the Facility, and included in the PPSA Conditions of Certification for the Facility. The Facility has CEM systems for $SO_2$, $NO_x$, and CO that would demonstrate compliance with the requested condition. Individual stack tests, pursuant to the existing permit conditions, would be conducted for PM, particulate matter with aerodynamic size of

10 micrometers or less ($PM_{10}$), VOCs, and SAM when co-firing TDF. This mixture would not exceed 5 percent (by weight) TDF with coal.

The conditions requested are proposed as follows:

**TDF Co-firing (Condition A.3 Method of Operation)**:

(b) Fuels.

1. Coal. The maximum coal charging rate of each CFB shall neither exceed 104,000 lbs/hr, 39,000 tons per month (30 consecutive days), nor 390,000 tons per year (TPY). This reflects a combined total of 312,000 lbs/hr, 117,000 tons per month, and 1,170,000 TPY for all three CFBs. Petroleum coke (pet coke) may be utilized as a co-firing fuel, and shall not exceed 35 % fuel input by weight on a daily basis. Tire derived fuel (TDF) may be utilized as a co-firing fuel, and shall not exceed 5% fuel input by weight on a daily basis. {Permitting Note: The limitations on the coal charging rate include both coal, TDF and pet coke.}

**Sulfur Coal Content (Condition A.7):**

Sulfur Dioxide - Sulfur Content.

1. ~~Coal~~ Fuel. ~~In order to ensure continuous compliance with the $SO_2$ limit stated in Specific Condition A.5, the coal sulfur content shall not exceed 1.7 percent, by weight, on a shipment (train load) basis and 1.2 percent, by weight, on an annual basis, as measured by applicable test methods (see Specific Condition A.36). When co-firing coal and petcoke, the blended~~ The fuel input to the CFBs shall not exceed 3.2 lb/MMBtu equivalent $SO_2$ content. Compliance shall be determined on a monthly basis via a composite of daily fuel samples.

**PSD Applicability**: The proposed permit condition for demonstrating no significant increase is listed as follows:

Condition A.66. Upon co-firing TDF or implementing the 3.2 lb $SO_2$/MMBtu coal sulfur limit, the applicant shall maintain and submit to the Department on an annual basis for a period of five years from the date the units are initially co-fired with petroleum coke with coal greater than a 20 to 80 percent blend, information demonstrating in accordance with 40 CFR 52.21(b)(21)(v) and 40 CFR 52.21(b)(33) that operational changes did not result in emission increases of particulate matter, nitrogen oxides, carbon monoxide and sulfuric acid mist.

To provide guidance for this condition, Cedar Bay proposes that the following table be added to the technical evaluation. The annual emissions are based on actual emissions from 2003 and 2004 plus the PSD significant emission rate. For VOC and SAM, the annual emissions are based on the permit limits as the actual emissions plus significant emission rates are higher than the FDEP-authorized emission limits for these pollutants.

| Pollutant | Compliance Procedures |
|---|---|
| $NO_x$ | Five years of annual reporting by CEMS demonstrating annual emissions do not exceed 1,792.0 TPY |
| CO | Five years of annual reporting by stack test demonstrating annual emissions do not exceed 541.3TPY |
| VOC | Five years of annual reporting by stack test demonstrating annual emissions do not exceed 65 TPY |
| $SO_2$ | Five years of annual reporting by CEMS demonstrating annual emissions do not exceed 2,012.5 TPY |
| SAM | Five years of annual reporting by stack test demonstrating annual emissions do not exceed 2 TPY |
| PM | Five years of annual reporting by stack test demonstrating annual facility emissions do not exceed 126.9 TPY |

**Short Fiber Rejects:**

Condition A.3.(c) Short Fiber Rejects. The maximum charging rate to CFB Boilers B & C of short fiber recycle rejects from the SCC recycling process shall not exceed 420,000 lb/day and 69,600 tons/yr ~~210 yd³/day (wet) and 69,588 yd³/yr (wet)~~. This reflects a combined total of 840,000 lb/day and 139,200 tons/year~~420 yd³/day (wet) and 139,176 yd³/yr (wet)~~ for the two CFB boilers that fire recycle rejects. CFB Boiler A will not utilize recycle rejects, nor will it be equipped with handling and firing equipment for recycle rejects.

Note: The tonnage of SFR was based on a conservative density of 1 ton per cubic yard due to the potential range of moisture that can be included. Actual density was determined for several loads to be 0.6 tons per cubic yard. Thus, the 1-ton-per-cubic-yard density provides a worst-case estimate for SFR.

Table 1. Comparative Chemical and Emissions Characteristics for Coal and TDF

| Characteristic | Cedar Bay Coal | TDF | Combination |
|---|---|---|---|
| Proximate Analysis (% as received) | 2003 annual average | | |
| Moisture | 6.49 | 0.62 | 6.20 |
| Ash | 10.89 | 4.78 | 10.59 |
| Volatile | 33.21 | 66.64 | 34.87 |
| Fixed Carbon | 49.35 | 27.96 | 48.29 |
| | | | |
| Ultimate Analysis (% as received) | | | |
| Carbon | 68.85 | 83.27 | 69.56 |
| Hydrogen | 4.35 | 7.09 | 4.49 |
| Nitrogen | 1.32 | 0.24 | 1.27 |
| Sulfur | 0.96 | 1.83 | 1.00 |
| Ash | 11.14 | 4.78 | 10.83 |
| Moisture | 7.05 | 0.62 | 6.73 |
| Oxygen | 6.41 | 2.17 | 6.20 |
| | | | |
| **CFB Performance** | | | |
| Heat Content (Btu/lb) | 12,000 | 14,700 | 12,135 |
| Mass Percentage | 95.0% | 5.0% | 100.0% |
| Heat Input by Fuel (tons/hr) | 41.6 | 2.2 | 43.8 |
| Percentage by Heat Input | 94% | 6% | 100% |
| Heat Input by Fuel (MMBtu/hr) | 999.2 | 63.8 | 1,063.0 |
| Unit heat Input (MMBtu/hr) - permitted | 1,063 | | |

Table 2. Coal Sulfur Content and $SO_2$ Removal, Limestone and Ash Amounts
Typical Coal Heat Content

| Parameter | Units | Data | Basis and Limits [a] |
|---|---|---|---|
| Heat Input | MMBtu | 1,063 | Limit in Condition A.1. |
| Heat Content | Btu/lb | 12,000 | Typical heat content of coal |
| Coal Usage | lb/hr | 88,583 | Limit of 104,000 lb/hr, Condition A.3.(b) |
| Coal $SO_2$ | lb/MMBtu | 3.2 | Proposed |
| Coal Sulfur | % | 1.92 | Calculated sulfur content |
| Coal Ash | % | 11.55 | Tyical ash |
| $SO_2$ Emission LImit | lb/MMBtu | 0.2 | Limit in Condition A.5. |
| $SO_2$ Removal | % | 93.8% | Calculated removal |
| $SO_2$ Removed | lb/hr | 3,189 | (3.2 - 0.2) x 1,063 lb/MMBtu |
| Limestone | lb/hr | 17,000 | Based on Foster Wheeler Report Figure 4 |
| Ash | lb/hr | 10,231 | Ash % x Fuel Usage |
| Total Ash | lb/hr | 27,231 | Limestone + Ash |
| Annual | | | |
| Limestone | tons/yr/unit | 67,014 | Based on 90% heat input capacity factor [b] |
| | tons/yr/plant | 201,042 | 275,000 tons/yr limit in Condition B.1.b. |
| Total Ash | tons/yr/unit | 107,346 | Based on 90% heat input capacity factor [b] |
| | tons/yr/plant | 322,038 | 424,000 tons/yr fly ash and bed ash |
| Fly Ash [c] | tons/yr/plant | 293,055 | 336,000 tons/yr limit in Condition B.1.b. |
| Bed Ash [c] | tons/yr/plant | 28,983 | 88,000 tons/yr limit in Condition B.1.b. |

[a] Conditions refer to Final Title V Permit No. 0310337-007-AV

[b] Conservative maximum based on historical average of 81% from 1997 through 2004; maximum was 84%

[c] Based on average 2002 through 2004 of 91% fly ash and 9% bed ash of total ash; data based on truck scales.

Table 3. Coal Sulfur Content and $SO_2$ Removal, Limestone and Ash Amounts
Low Coal Heat Content

| Parameter | Units | Data | Basis and Limits |
|---|---|---|---|
| Heat Input | MMBtu | 1,063 | Limit in Condition A.1. |
| Heat Content | Btu/lb | 10,221 | Typical heat content of coal |
| Coal Usage | lb/hr | 104,000 | Limit of 104,000 lb/hr, Condition A.3.(b) |
| Coal $SO_2$ | lb/MMBtu | 3.2 | Proposed |
| Coal Sulfur | % | 1.64 | Calculated sulfur content |
| Coal Ash | % | 11.55 | Typical ash |
| $SO_2$ Emission LImit | lb/MMBtu | 0.2 | Limit in Condition A.5. |
| $SO_2$ Removal | % | 93.8% | Calculated removal |
| $SO_2$ Removed | lb/hr | 3,189 | (3.2 - 0.2) x 1,063 lb/MMBtu |
| Limestone | lb/hr | 17,000 | Based on Foster Wheeler |
| Ash | lb/hr | 12,012 | Ash % x Fuel Usage |
| Total Ash | lb/hr | 29,012 | Limestone + Ash |
| Annual | | | |
| Limestone | tons/yr/unit | 67,014 | Based on 90% heat input capacity factor [b] |
| | tons/yr/plant | 201,042 | 275,000 tons/yr limit in Condition B.1.b. |
| Total Ash | tons/yr/unit | 114,365 | Based on 90% heat input capacity factor [b] |
| | tons/yr/plant | 343,096 | 424,000 tons/yr fly a fly ash 88,000 bed ash |
| Fly Ash [c] | tons/yr/plant | 312,217 | 336,000 tons/yr limit in Condition B.1.b. |
| Bed Ash [c] | tons/yr/plant | 30,879 | 88,000 tons/yr limit in Condition B.1.b. |

[a] Conditions refer to Final Title V Permit No. 0310337-007-AV

[b] Conservative maximum based on historical average of 81% from 1997 through 2004; maximum was 84%

[c] Based on average 2002 through 2004 of 91% fly ash and 9% bed ash of total ash; data based on truck scales.

Table 4. Comparative Chemical and Emissions Characteristics for Typical Coal and TDF (With Proposed Coal Sulfur Limit Equivalent to 3.2 lb/MMBtu)

| Characteristic | Cedar Bay Coal | TDF | Combination |
|---|---|---|---|
| Proximate Analysis (% as received) | | | |
| Moisture | 6.49 | 0.62 | 6.20 |
| Ash | 10.89 | 4.78 | 10,59 |
| Volatile | 33.21 | 66.64 | 34.87 |
| Fixed Carbon | 49.35 | 27.96 | 48.29 |
| Ultimate Analysis (% as received) | | | |
| Carbon | 68.85 | 83.27 | 69.56 |
| Hydrogen | 4.35 | 7.09 | 4.49 |
| Nitrogen | 1.32 | 0.24 | 1.27 |
| Sulfur | 1.9 | 1.83 | 1.90 |
| Ash | 11.14 | 4.78 | 10.83 |
| Moisture | 7.05 | 0.62 | 6.73 |
| Oxygen | 6.41 | 2.17 | 6.20 |
| **CFB-C Performance** | | | |
| Heat Content (Btu/lb) | 12,000 | 14,700 | 12,135 |
| Mass Percentage | 95.0% | 5.0% | 100.0% |
| Heat Input by Fuel (tons/hr) | 41.6 | 2.2 | 43.8 |
| Percentage by Heat Input | 94% | 6% | 100% |
| Heat Input by Fuel (MMBtu/hr) | 999.2 | 63.8 | 1,063.0 |
| Unit heat Input (MMBtu/hr) - permitted | 1,063 | | |
| **Sulfur Dioxide Emissions** | | | |
| Sulfur dioxide (uncontrolled; lb/hr with TDF) | 3,164.2 | 158.8 | 3,323.0 |
| Sulfur dioxide Uncontrolled Emission Rate (lb/MMBtu) | 3.2 | 2.5 | 3.1 |
| Sulfur dioxide (uncontrolled; lb/hr coal only) | 3,366.2 | 0.0 | 3,366.2 |
| Difference (lb/hr) | | | -43.2 |

Table 5. Annual Emissions for Cedar Bay Cogeneration Facility

| Parameter | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|
| | | | **Boiler A (TPY)** | | |
| Particulate Matter | 58.72 | 64.36 | 22.63 | 13.43 | 21.46 |
| $PM_{10}$ | 48.09 | 21.34 | 21.24 | 8.51 | 29.70 |
| Sulfur Dioxide | 650.52 | 631.20 | 649.80 | 677.90 | 659.55 |
| Nitrogen Oxides | 594.40 | 551.40 | 561.80 | 581.10 | 618.14 |
| Carbon Monoxide | 179.16 | 177.60 | 173.79 | 189.28 | 178.32 |
| Volatile Organic Compounds | 4.97 | 25.02 | 24.19 | 26.41 | 25.92 |
| Sulfuric Acid Mist | 0.11 | 0.11 | 0.16 | 0.18 | 0.17 |
| | | | **Boiler B (TPY)** | | |
| | 2000 | 2001 | 2002 | 2003 | 2004 |
| Particulate Matter | 66.06 | 68.41 | 27.72 | 50.38 | 67.52 |
| $PM_{10}$ | 60.22 | 32.48 | 22.53 | 48.29 | 62.16 |
| Sulfur Dioxide | 670.98 | 624.50 | 641.20 | 661.57 | 638.45 |
| Nitrogen Oxides | 597.58 | 544.64 | 534.40 | 555.06 | 571.30 |
| Carbon Monoxide | 157.65 | 150.70 | 137.81 | 114.61 | 126.07 |
| Volatile Organic Compounds | 8.93 | 11.70 | 21.57 | 22.61 | 22.28 |
| Sulfuric Acid Mist | 0.12 | 0.11 | 0.16 | 0.16 | 0.16 |
| | | | **Boiler C (TPY)** | | |
| | 2000 | 2001 | 2002 | 2003 | 2004 |
| Particulate Matter | 63.42 | 69.15 | 21.56 | 28.70 | 22.26 |
| $PM_{10}$ | 56.91 | 38.54 | 20.12 | 18.03 | 21.23 |
| Sulfur Dioxide | 643.63 | 645.80 | 627.80 | 654.40 | 653.14 |
| Nitrogen Oxides | 587.06 | 560.90 | 546.00 | 571.79 | 606.62 |
| Carbon Monoxide | 179.20 | 156.20 | 145.03 | 135.29 | 138.96 |
| Volatile Organic Compounds | 3.35 | 11.96 | 11.75 | 12.45 | 12.00 |
| Sulfuric Acid Mist | 0.12 | 0.11 | 0.16 | 0.17 | 0.16 |
| | | | **Boilers A, B, and C (TPY)** | | |
| | 2000 | 2001 | 2002 | 2003 | 2004 |
| Particulate Matter | 188.20 | 201.93 | 71.90 | 92.52 | 111.24 |
| $PM_{10}$ | 165.22 | 92.36 | 63.89 | 74.83 | 113.09 |
| Sulfur Dioxide | 1965.13 | 1901.50 | 1918.80 | 1993.87 | 1951.14 |
| Nitrogen Oxides | 1779.04 | 1656.94 | 1642.20 | 1707.95 | 1796.06 |
| Carbon Monoxide | 516.01 | 484.50 | 456.62 | 439.18 | 443.35 |
| Volatile Organic Compounds | 17.25 | 48.68 | 57.51 | 61.46 | 60.19 |
| Sulfuric Acid Mist | 0.35 | 0.34 | 0.48 | 0.51 | 0.50 |
| | | | **Boilers A, B, and C (TPY)** | | |
| | | 2000-2001 | 2001-2002 | 2002-2003 | 2003-2004 |
| Particulate Matter | | 195.06 | 136.91 | 82.21 | 101.88 |
| $PM_{10}$ | | 128.79 | 78.13 | 69.36 | 93.96 |
| Sulfur Dioxide | | 1,933.32 | 1,910.15 | 1,956.34 | 1,972.51 |
| Nitrogen Oxides | | 1,717.99 | 1,649.57 | 1,675.08 | 1,752.01 |
| Carbon Monoxide | | 500.26 | 470.56 | 447.90 | 441.27 |
| Volatile Organic Compounds | | 32.96 | 53.10 | 59.49 | 60.83 |
| Sulfuric Acid Mist | | 0.34 | 0.41 | 0.49 | 0.50 |

Source: 2001 through 2004 Annual Operating Reports.

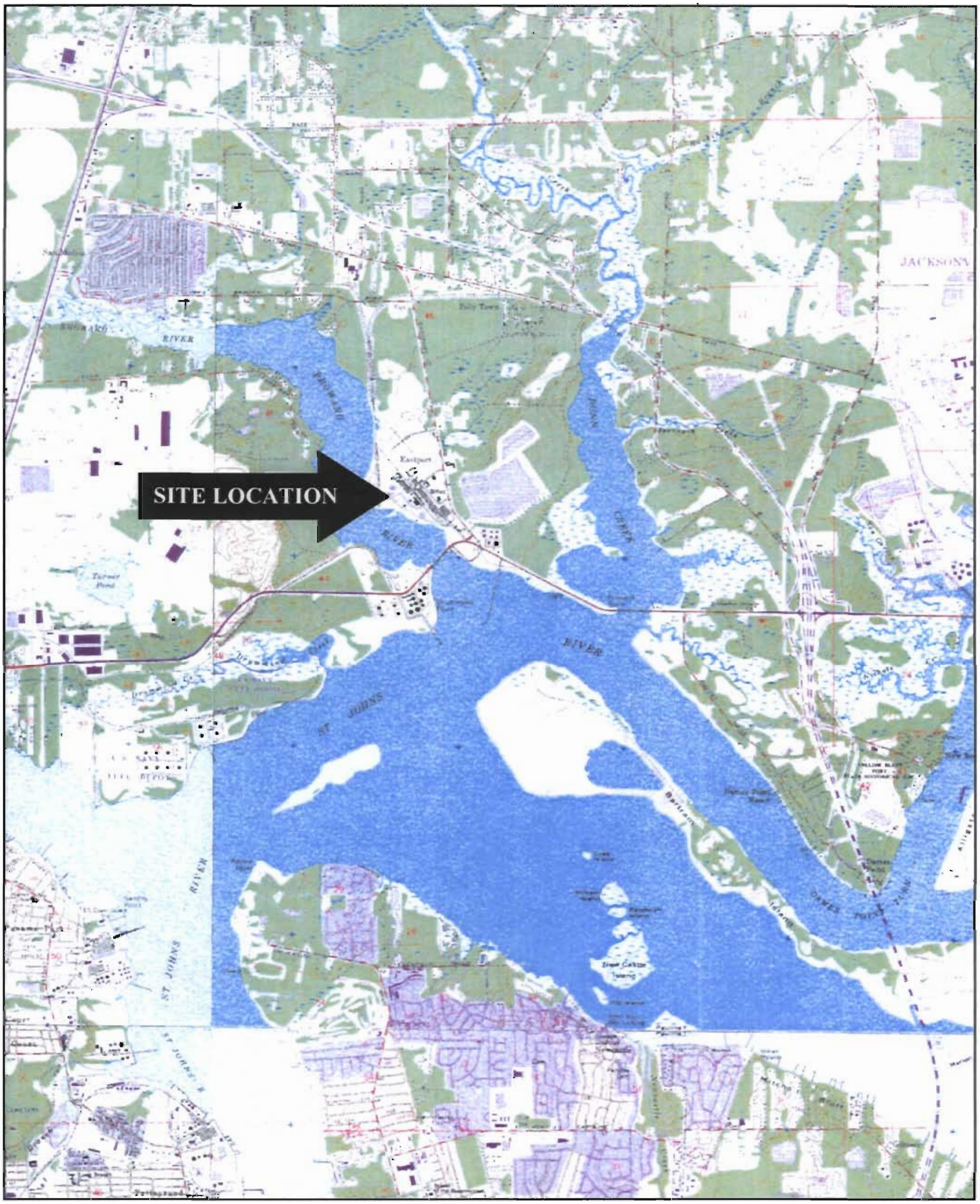
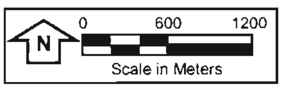



Figure 1
Cedar Bay Cogeneration Facility - Site Location

Source: Golder, 2001.




Golder Associates

# APPENDIX A

## FDEP PUBLICATION:
## STATE OF THE STATE REPORT,
## *WASTE TIRES IN FLORIDA*

# WASTE TIRES IN FLORIDA
## STATE OF THE STATE
## MARCH 24, 2004

## I. GENERATION RATE

Annually, 15,000,000 automobile, light truck, and smaller tires plus 900,000 medium truck and larger tires are removed from vehicles in Florida. Adjusted for weight, this is 19,500,000 passenger tire equivalents (PTE) or an estimated 195,000 tons of waste tires.[1] Throughout this report, all tire quantities are stated as passenger tire equivalents.

## II. MARKETS

Before Florida's waste tire management program was implemented in 1989, almost all waste tires in the state were landfilled or stockpiled. Starting in 1989, tires had to be cut or shredded into at least 8 pieces prior to landfill disposal, thereby encouraging development of alternative uses. An increasing percentage has been diverted to a broad range of constructive applications. Table I shows the 2003 estimated usage of waste tires generated in Florida based on a detailed market survey. In total, 16.4 million (84.1%) of the 19.5 million waste tires generated in Florida in 2003 were constructively utilized. The 3.2 million tires listed within the disposal classification include 1.5 million tires landfilled in Dade County and 380,000 tires landfilled in Alabama due to its allowance of low-cost tire monofills. A limited quantity of shredded tires was imported into Florida from neighboring states for processing feedstock.

Florida's crumb rubber markets include asphalt modification, playground/sports surfacing, soil modification/cover and molded products. The Florida Department of Transportation (FDOT) consumes over 8,400 tons of crumb rubber annually as part of the interlayer, friction course and crack sealants used in roadway construction and maintenance. Manufacturing crumb rubber for this market consumes about 1.25 million tires. Florida is the only state that specifies rubber modified asphalt (RMA) for friction course pavement on all state-maintained roads, but polymers may soon displace crumb rubber in some road classes.

Playground surfacing, both loose-filled and poured-in-place, is a significant use of crumb rubber. This market increased significantly in 2001 as a result of new state grants supporting up to 50% of crumb rubber purchase costs associated with surfacing materials intended to enhance safety and accessibility of playgrounds. Although this market declined after completion of the grant program, innovative athletic fields utilizing crumb rubber within artificial turf surfaces increased significantly in 2003, partially off-setting playground losses. Crumb rubber is also used for soil modification to decrease compaction and enhance drainage on sports fields and other high-traffic grassed areas. Florida producers have also increased sales of crumb rubber to regional manufacturers of molded rubber products, such as tiles and mats.

1 A 20 pound passenger tire is 1 PTE; a 100 pound truck tire is 5 PTE.

Florida utilized an estimated 4,200,000 waste tires in crumb rubber applications during 2003, representing 21.5% of total generation. National crumb rubber markets have not developed as rapidly. The crumb rubber industry has historically experienced excess capacity. There have been many business failures throughout the country, and some of the remaining companies are struggling to survive.

**TABLE 1: 2003 ESTIMATED WASTE TIRE USAGE (in PTEs)**

| MARKET | 2003 USAGE OF WASTE TIRES GENERATED IN FLORIDA (PTE) | APPLICATIONS | STATUS |
|---|---|---|---|
| Export of Used Tires | 250,000 | Primarily to Caribbean/Latin countries | Declining – now sold in US markets |
| Crumb Rubber Applications | | | |
| Highway Uses | 1,250,000 | Rubberized asphalt, crack sealants | Declining |
| Playground/Sports Safety Surfaces | 800,000 | Cushioning material | Increasing artificial sports fields offset by lower playground use |
| On-ground Uses | 1,000,000 | Soil amendments and mulch | Colored mulch is growing |
| Molded Products | 1,150,000 | Mats, tiles, outdoor tables | New markets being developed |
| Subtotal-Crumb Rubber | 4,200,000 | | |
| Energy Use | | | |
| In-State Industrial TDF | 4,830,000 | Includes Ridge Generating, Rinker, Southdown and Florida Rock | Will increase if Cemex and Florida Rock optimize usage |
| In-State WTE Use | 1,050,000 | Supplemental energy use by 7 facilities | Variable |
| Out-of -State TDF | 3,220,000 | Paper/cement in Georgia and Alabama | Stable, but vulnerable to local suppliers |
| Subtotal-TDF | 9,100,000 | | |
| Civil Engineering | | | |
| Drainfield Aggregate | 740,000 | Replaces rock/aggregate | Stabilizing after initial rapid growth |
| Landfill Daily Cover | 840,000 | Displaces soil | Low-value use |
| Other CE Uses | 1,510,000 | Drainage layer, gas collection | Continuing growth |
| Subtotal-CE | 3,090,000 | | |
| Disposal | 3,110,000 | Landfill disposal of shredded tires, including 1,500,000 in Dade County | Will decrease as additional markets develop |
| **TOTAL** | **19,500,000** | | |

As shown in Table 1, use of the hydrocarbon resources contained in waste tires as a supplemental energy resource was the largest application, consuming 46.7% of Florida's waste tire generation. Seven waste-to-energy facilities consume tires to enhance their combustion temperature control and/or optimize electricity generation. Other industrial facilities utilizing tires as fuel within Florida and in neighboring states are economically supplied by Florida's well-developed tire collection and processing industry. Nationally, use of waste tires as an energy resource is by far the largest application, mirroring Florida's experience.

Florida has been one of the pioneers in large-scale use of shredded tires as a replacement for natural soil and aggregate in civil engineering applications such as landfill drainage layers, methane gas collection systems, and septic system drainage trenches. These uses consumed approximately 3.09 million, or about 15.8%, of Florida's waste tires in 2003. As tire chips have become a proven, technically acceptable material for these applications, further market growth for tire chips will be dependent on comparative economics.

Continued market development is the controlling factor in diverting the remainder of unutilized waste tires from landfills and stockpiles. Cemex has interrupted tire usage as a supplemental energy resource at its cement facility in Brooksville, but could potentially use over 1,000,000 tires/year initially and up to 2,000,000 tires/year if both kilns ultimately use tires. Florida Rock Industries' new cement kiln in Alachua County has initiated use of waste tires and is capable of consuming 1,000,000 tires per year.

The Florida Department of Environmental Protection (DEP) is clearly interested in defining and initiating additional measures to enhance product markets in Florida. Possible examples intended to accelerate market development include identification and preliminary screening of manufacturing industries capable of utilizing crumb rubber, as well as paper mills capable of using tire-derived fuel (TDF) in a technically, economically and environmentally acceptable manner. DEP is also exploring obstacles to civil engineering applications such as drain field aggregate and highway construction applications. Constructive utilization of all waste tires generated in Florida remains a sound objective, and significant progress has been made toward this objective since the waste tire program was established.

## III. RESEARCH, DEMONSTRATION AND SPECIAL PROJECTS

### A. STATE SPONSORED RESEARCH AND DEMONSTRATION

1. Crumb rubber made from a small part of the tires from the Polk City Waste Tire Site was used to produce RMA for paving the Withlacoochee and Van Fleet trails in 1995. This was the first use of RMA for a trail in the U.S.

2. Research into the safety and effectiveness of using crumb rubber as a parking lot surface at a Florida Community College at Jacksonville facility in Nassau County was completed. The final report, issued in October 1999, found that this application is environmentally sound and identifies some design considerations, maintenance needs, and practical limitations of crumb rubber parking lots.

3. RMA was used to pave sections of the Nature Coast Trail in Dixie, Gilchrist, and Levy counties. A test section combining RMA with fine recycled glass cullet was completed in October 2000, demonstrating the first combined use of RMA and glass in paving.

### B. SPECIAL PROJECT – 2003 SUPPLEMENTAL PROGRAM FOR ACCELERATED WASTE TIRE SITE REMOVAL

In 2003, a total of 30 Florida counties were placed under a medical alert for potentially serious diseases, namely West Nile Virus (WNV), Eastern Equine Encephalitis (EEE) and St. Louis Encephalitis (SLE). These diseases can be communicated to humans by mosquito species known to breed in stagnant water in outdoor containers, such as waste tires. To remove small waste tire accumulations in counties affected by the medical alert, DEP continued its supplemental program in 2003 to enhance cooperative efforts by state and county governments.

The program uses the strengths of state and local governments to accelerate collection, transportation, and processing of waste tires. DEP used existing contracts with processors to provide trailers, transport and process collected waste tires for constructive applications. County governments used their capabilities to advertise the program, secure local collection sites and load trailers. The following table shows the three participating counties, tire quantities removed, and money expended for the program during 2003 program operation. Since 2001, almost 200,000 tires have been removed from 10 counties under this program during medical alerts.

**TABLE 2: RESULTS OF SUPPLEMENTAL PROGRAM IN 2003**

| COUNTY | TRAILERS | TONS | TIRES (100 per TON) | COST | COMMENTS |
|---|---|---|---|---|---|
| Marion | 22 | 315.19 | 31,519 | $41,605 | |
| Nassau | 2 | 23.88 | 2,388 | $3,080 | |
| Holmes | 6 | 78.35 | 7,835 | $9,480 | |
| **TOTALS** | **30** | **417.42** | **41,742** | **$54,165** | **Avg. $130/ton or $1.30/tire** |

Merging the capabilities of governments in this partnership accelerated waste tire removal from small accumulations and reduced this breeding ground for dangerous mosquitoes. West Nile Virus is expected to be present in Florida again in 2004. As counties are designated with medical alert status, the waste tire resources available to the Department will be used for this program again.

C. SPECIAL PROJECT – MATCHING GRANTS FOR PLAYGROUND SURFACING PRODUCTS

The 2000 Legislature provided $ 1.5 million for matching grants to counties to purchase surfacing products made from Florida waste tires. The objective was to improve playground safety in Florida parks and schools while also promoting waste tire recycling. Surfacing products purchased under these grants had to meet applicable national safety and accessibility guidelines and be made from whole waste tires collected and processed in Florida.

The funds were distributed to participating counties on the basis of population, with a $4,000 minimum grant. A 50/50 match of funds was required. Only the direct costs of playground surfacing materials derived from recycled waste tires were reimbursed from grant funds, and not other materials, installation, or equipment. The grants were passed through to other local governments, school boards, and non-profit organizations via a competitive process.

At the end of the program in December, 2001, 22 counties had spent $343,265 in state matching grant funds. The program was responsible for the purchase of 3,620,154 pounds of loose fill rubber granules and 37,896 square feet of poured-in-place surfacing containing crumb rubber. This represents the use of about 310,000 passenger tire equivalents based on average manufacturing yields and surfacing composition.

## IV. LAW AND RULE CHANGES

The laws and rules governing Florida's waste tire management program have evolved since program inception. The 1995 Legislature expanded the allowable uses for waste tire grants-in-aid to counties to include operation of waste tire recycling and education programs, enforcement, and purchase of materials and products made from waste tires collected and recycled within the state. Small counties (under 100,000 population) were allowed to use their waste tire grants for any solid waste related purpose. The Waste Tire Rule, Chapter 62-711, Florida Administrative Code (F.A.C.), was changed in 1996 to reduce the number of rules. In 1999, the definition of a waste tire site was changed from 1,000 to 1,500 waste tires in one location. Facilities that consume processed tires as a fuel or as a material for making a product were no longer required to obtain a permit if the tire material, inventory management practices, and storage configuration meet the standards in the rule.

In 2001, the Legislature significantly reduced funding levels for waste tire grants from $7.9 million in 2000 to $1.2 million in 2001. In addition, the number of counties eligible to receive these grants was reduced from all 67 counties to those 34 "small" counties with under 100,000 in population. The Legislature also provided $1.5 million for matching grants to counties to purchase surfacing products made from Florida waste tires, as discussed in the preceding section. The funding level for waste tire grants was increased to $3.4 million in 2002 and these grants were made available to all 67 counties again. The program was modified again in 2003, dividing $4 million dollars equally among 34 small counties to be used for general recycling purposes, including waste tire management.

## V. PERMITS AND REGISTRATION

There are 19 permitted waste tire processors operating at landfills and other waste tire sites. Of the 19 processors, 13 are fixed site facilities and 6 are mobile. There were 745 companies registered as waste tire collectors, using 1760 trucks to haul waste tires in 2003.

## VI. ABATEMENT

Currently, there are nine known illegal waste tire sites in Florida with a total of 60,500 tires, as summarized in Table 3. None of these sites contain over 5,000 waste tires. Abatement of the last known sites containing over 5,000 tires was completed in 2003, including one auto salvage yard with 140,000 waste tires.

Owners and operators of illegal waste tire sites are required to abate their own sites, and many have done so. A partial list of sites containing over 40,000 tires that have been abated by landowners or operators without expenditure of public waste tire account funds is provided in Table 4. Sites abated by owners are not necessarily reported to DEP if the action is taken in response to local government encouragement without DEP assistance.

In addition, counties have used waste tire grant funds to remove waste tires from public property and from the property of illegal dumping victims. Some counties have even abated major stockpiles, as illustrated by Table 5.

## TABLE 3: EXISTING ILLEGAL SITE STATUS

| SITE NAME | COUNTY | ESTIMATED TIRES | TIRES ABATED | REMAINING TIRES | STATUS |
|---|---|---|---|---|---|
| Budget Auto | Bay | 27,500 | 24,500 | 3,000 | Owner abating began 12/01 |
| A-1 Tires | Manatee | 5,000 | 0 | 5,000 | Enforcement pending |
| A & A Auto | Manatee | 5,000 | 0 | 5,000 | Enforcement pending |
| Casey | Okaloosa | 5,000 | 0 | 5,000 | Enforcement pending |
| Central Discount | Manatee | 5,000 | 0 | 2,500 | Enforcement pending |
| Suggs Salvage | Desoto | 5,000 | 0 | 5,000 | Enforcement in progress |
| County Wide Tire | Levy | 4,500 | 0 | 4,500 | Enforcement pending |
| Hemandez | Hardee | 3,000 | 0 | 3,000 | Enforcement pending |
| Royal Auto | Manatee | 3,000 | 0 | 3,000 | Enforcement pending |
| **TOTALS** | | **60,500** | **24,500** | **36,000** | |

## TABLE 4: SITE ABATEMENT BY OWNERS OR OPERATORS WITHOUT WASTE TIRE FUNDS
### (Sites over 40,000 tires known to DEP)

| SITE | ESTIMATED TIRE QUANTITY | MARKET |
|---|---|---|
| Florida Tire Recycling | 4,650,000 | Landfill/fuel |
| Environmental Research | 1,200,000 | Landfilled |
| Anello - Celery Avenue | 500,000 | Unknown |
| OK Tire | 350,000 | Boiler Fuel |
| Conner Land | 323,000 | Waste to Energy |
| Shooting Range | 250,000 | Unknown |
| Caesar Street Warehouse | 250,000 | Unknown |
| Overland Road | 200,000 | Unknown |
| Calabrese | 160,000 | Landfilled |
| Pt. Everglades Warehouse | 150,000 | Landfill Cover |
| Burlington Street | 150,000 | Waste to Energy |
| Universal Tire | 135,000 | Waste to Energy |
| B & D Recycling | 110,000 | Waste to Energy |
| AB&B Auto Parts | 90,000 | Fuel |
| Florida Coastal Tire | 90,000 | Boiler Fuel |
| Tire Eagle | 80,000 | Landfilled |
| Snake Road Auto Parts | 61,000 | Landfilled |
| Anello | 50,000 | Unknown |
| Rainbow Industries | 60,000 | Unknown |
| Boehm's Warehouse | 43,000 | Waste to Energy |
| **TOTAL** | **8,902,000** | |

### TABLE 5: SITE ABATEMENT BY COUNTIES USING WASTE TIRE GRANT FUNDS (Sites over 100,000 tires)

| SITE | TIRE QUANTITY | MARKET |
|---|---|---|
| Benton Yards | 250,000 | Landfill Cover |
| 36th Street Acquisition | 250,000 | Landfill Cover |
| Port Everglades | 250,000 | Landfill Cover |
| Ricker Road | 187,000 | Landfill Cover |
| RC's Tri-county | 130,000 | Landfill Cover |
| **TOTAL** | **1,067,000** | |

When the Department is forced to abate a site, it gains legal access and then assigns an experienced contractor the task of stabilizing and abating the site. When the contractor has completed the task, the Department must seek cost recovery from the owner and operator. In some cases, counties assist DEP by performing local contract/site management services. Table 6 lists sites abated under Department contracts.

### TABLE 6: SITE ABATEMENT UNDER DEPARTMENT CONTRACTS

| SITE | TIRE QUANTITY | COST | MARKET |
|---|---|---|---|
| Polk City | 1,948,557 | $2,593,000 | Boiler Fuel |
| National Tire Recycling | 1,021,695 | $945,000 | Boiler Fuel |
| Danco AQ | 838,445 | $872,000 | Boiler Fuel |
| Import Auto Parts | 390,275 | $344,000 | Landfill Construction |
| Narcoossee Road | 176,939 | $187,000 | Landfill Construction |
| Coast Auto Parts | 172,874 | $218,000 | Kiln Fuel |
| Gilliard Bros. | 155,117 | $154,000 | Boiler Fuel |
| A Auto Parts | 145,000 | $202,000 | Boiler Fuel |
| Bob's Garage | 58,263 | $118,000 | Kiln Fuel |
| Burke Site | 45,038 | $47,000 | Waste to Energy |
| Register | 44,624 | $51,162 | Kiln Fuel |
| Draper | 42,457 | $59,824 | Boiler Fuel |
| Florida State Tire | 41,121 | $78,000 | Road Base |
| Old Bradenton Road | 24,887 | $33,590 | Boiler Fuel |
| Thaggard | 23,933 | $83,053 | Boiler Fuel |
| Oxborough Property | 18,497 | $51,000 | Kiln Fuel |
| Curry | 17,270 | $27,000 | Landfill Construction |
| Pioneer Mat | 14,051 | $19,521 | Boiler Fuel |
| Griffin | 13,847 | $16,111 | Landfill Construction |
| Reynolds Road | 4,734 | $7,158 | Boiler Fuel |
| Swindle | 2,035 | $963 | Drainfield Chips |
| TOTAL | 5,199,659 | $6,107,382 | |

Total waste tire site abatement activity from the preceding tables is summarized in Table 7. Over 15,168,659 waste tires have been removed from waste tire sites in Florida since program inception. Approximately 59% have been removed by landowners or operators, often with encouragement from impending state and/or local enforcement action. Counties have removed 7% of the abated waste tires utilizing waste tire grant funds from the program. When other alternatives had been fully exhausted, over 5 million tires (representing 34%) have been abated under DEP contracts at a total cost of $6,107,382.

**TABLE 7: SITE ABATEMENTSUMMARY**
**(From Tables 4-6)**

| ABATED BY | QUANTITY | % OF TOTAL TIRES |
|---|---|---|
| DEP | 5,199,659 | 34% |
| County | 1,067,000 | 7% |
| Owner or Operator | 8,902,000 | 59% |
| **TOTAL** | **15,168,659** | **100%** |

## VII. SUMMARY

The Florida waste tire management program has made exceptional progress. Over 84% of the 19.5 million waste tires generated annually in Florida are constructively utilized in diverse applications, compared to virtually no usage in 1990. Use of tire shreds in septic tank drain fields has stabilized. High fuel prices have attracted additional use of tires as a supplemental energy resource in new and retrofitted cement kilns, with additional growth probable. The Department continues to explore methods of encouraging and accelerating additional market development to achieve full utilization of this resource.

Waste tire stockpiles have been reduced by more than 15 million tires through persuasion of site owners, financing of county abatement actions, or abatement under department contracts. With continuing permitting and enforcement activity on both state and local levels, few new stockpiles have been created and existing stockpiles are continuing to be abated. Stockpiles have declined dramatically over the years, with the current list of known stockpiles containing approximately 60,500 waste tires. The Department is continuing its efforts to identify and abate all remaining stockpiles.

# APPENDIX B

# RESULTS OF TEST BURN

# Cedar Bay Tire Derived Fuel Test Burn

## Executive Summary

Upon authorization from the Florida Department of Environmental Protection (FDEP), Cedar Bay Generating Plant conducted a performance test of burning a blend of 5% tire derived fuel (TDF) with coal in Boiler C designed to ascertain whether Cedar Bay's circulating fluidized bed boilers can burn the TDF as supplemental fuel without exceeding any of the limitations on air emissions and without violating any other environmental requirements. Per the Department's allowance of 30 full power burn days, the TDF performance test commenced February 9$^{th}$, 2005 and concluded March 19$^{th}$. Upon review of the data there were neither exceedances of environmental permit conditions nor any operational problems that would affect reliable operation of the circulating fluidized boilers.

Used tire disposal is problematic due to their resistance to degradation and are poorly compatible with land filling. Although recycling opportunities are available, the market is currently insufficient to handle the large number of stockpiled tires. As such, the Bureau of Solid and Hazardous Waste of the FDEP identified Cedar Bay's boilers as being a suitable candidate to utilize processed tire chips as a supplementary fuel in the circulating fluidized boilers due to the inherent design to utilize various solid fuels.

In October 22, 2004, after research and consultation with combustion consultants, Cedar Bay requested approval from the Department to perform a 30-day test burn of 5 percent tire derived fuel in Boiler C. Accompanying the request was a detailed Test Burn Protocol that Cedar Bay proposed to follow that included testing and analyses of fuel, ash and air parameters. On November 1, 2004, the Department issued a draft Air Construction Permit relative to Cedar Bay's request to test burn the tire derived fuel. The Public Notice of Intent to Issue Air Construction Permit was published in Jacksonville's Florida Times Union on November 22, 2004. The Department issued a final permit (attached) to conduct a performance test of tire derived fuel on December 7, 2004.

## Conclusions

Based on the results of the emissions test at a 5 % coal substitution, by weight, with TDF, the emissions of the existing permitted parameters in Cedar Bay's Title V and PSD permits are not different than when firing 100% bituminous coal.

The operational results of the trial indicated essentially no changes to the operating characteristics of the boiler. No negative influences were noted due to the TDF substitution.

These results indicate that Cedar Bay's Circulating Fluidized Bed Combustors can supplement their normal fuel (Bituminous Coal) with 5% TDF and achieve the environmental compliance emission limits. This substitution provides a viable supplemental fuel for Cedar Bay.

# Results

**Criteria Pollutants – Sulfur Dioxide, Nitrogen Oxides and Carbon Monoxide**
Cedar Bay utilizes a Continuous Emission Monitoring (CEM) system to monitor and record the emissions of Sulfur Dioxide (SOx), Nitrogen Oxide (NOx) and Carbon Monoxide (CO). Boiler C's CEM data for the TDF test burn indicates no changes in any of these parameters

**SOx**
Prior to the test burn, the stoichiometric calculations indicated that the 5 per cent TDF fuel would have a theoretical increase of 6.86 lbs/hr of SOx. However, the data indicates that there was no change in hourly Sox lbs/MMBTU or lbs/hr emissions. Subsequently, there was no change in either of the actual 3-hour rolling or 30-day rolling averages. The limestone feed system is controlled as a major loop of the total combustion control system. The speed of the limestone belt feeder is regulated in proportion to the rate of fuel feed to maintain the ratio of solid fuel feed to limestone as constant as possible. A control trimming action to adjust limestone feed is provided by the SOx value from the CEM system. Any potential increase in SOx production is compensated by a simultaneous increase in limestone feed. Additionally, as the 5 per cent TDF increment had, the nominal increase in the boiler SOx inlet the SOx reduction requirements were similarly enhanced.

**NOx**
The TDF/Coal feed had no affect on Boiler C's NOx emissions on either a lbs/MMBTU or lbs/hr basis. Cedar Bay uses a non-selective catalytic reduction system (SNCR) to control NOx emission through the injection of 29 per cent ammonium hydroxide. The NOx SNCR system is controlled as a loop of the combustion control system. The CEM system NOx value will bias the ammonia feed pumps to maintain the appropriate NOx levels below the permitted 0.17 lbs/MMBTU and 180.7 lbs/hr 30-day rolling averages.

**CO**
The TDF/Coal performance test had no noticeable impact on the actual CO emissions. Inherently, circulating fluidized combustors generate low levels of CO. The solid fuel is delivered to the combustion chamber by four variable speed coal feeders. The boiler demand signal developed by the boiler master is cross-limited with total air flow to assure an air-rich air/fuel ratio for it's demand set point to the solid fuel master. There were no exceedances of either the 0.17 lbs/MMBTU or 186.7 lbs/hr permitted limits, 8-hour rolling average. The brief excursions of these values occurred during two start-ups following shutdowns to repair two water wall tube leaks.

**VOC's, Metals, Sulfuric Acid Mist/Stack Testing Parameters & Material Balance**

TDF Metals and Stack Emissions Comparison

Table A summarizes the trace metal concentrations in TDF, the TDF/coal blend and in the coal from samples taken during the TDF/coal test period. Statistical parameters including the average, median, standard deviation (STDEV) and upper 95 percent confidence interval were determined. The procedure used to evaluate the differences between the TDF, and the TDF/coal blend and coal data was the same as specified in 40 CFR Part 60 Appendix C for determining an emission change under EPA New Source Performance Standard (NSPS) regulations. The upper and lower confidence intervals were determined using Student's "t" test, which is commonly used to compare the means of small sample sizes. This procedure can account for operational variability associated with emission rates and provide statistical comparisons for determining whether differences between mean values exist at a specified confidence level. The results of the analysis indicate that the only trace metals higher in TDF than in the TDF/coal blend or coal is zinc. Zinc oxide is used in tires and can be found in the analyses conducted for the test burn. These results are similar to that found by EPA (1997). However, zinc is not a Hazardous Air Pollutant (HAP) and the air pollution control equipment is extremely effective in removing zinc since it is not a volatile metal. It should be noted that there were several parameters where the amount in the TDF/coal blend was higher than the TDF. These included chromium, arsenic, and selenium which are regulated as HAPs.

Table B presents a summary of the emissions observed for the TDF/coal test burn as well as a summary of previous test data obtained for the various parameters since the Cedar Bay facility began operation. The comparison of the observed test data clearly indicates that the emissions are not statistically different from the previous tests with coal only. Indeed, for most parameters the observed emissions were well below the averages observed for previous tests and well within the 95 percent confidence interval for all parameters.

There were no previous data on zinc emissions when firing coal. Given the higher concentration of zinc in the TDF than coal it is likely that the zinc emissions increased from that of coal firing. As mentioned previously, zinc is not a volatile metal and is effectively removed with the air pollution control equipment on the Cedar Bay facility. The data taken during the test burn indicate the uncontrolled potential zinc emission rate would be 0.0174 lb/MMBtu (based on average zinc concentration and heat contact in combined TDF/coal blend). The zinc emission rate observed during the test burn was 1.2 x $10^{-6}$ lb/MMBtu suggesting a control efficiency of 99.99+ percent through the entire system.

## Operational Assessment

### TDF Supply

The TDF was supplied by two suppliers for the trial. Product was shipped from Atlanta, Augusta and Jackson, Georgia and was of two different qualities.

The initial product, considered wire free, was a nominal 2" minus product with 90+% of the wire removed. This product was easily held in your hand without getting a wire stick and very few wires were visible. The supplier of this product has about a 60% yield on this product (40% is wire and entrained rubber to be sold off or disposed of.) The processing of this product through cutting and magnetic separation tends to produce fines (1/2" minus), which along with the 2" minus pieces make a very nice product. This product accounted for the first 1,000 tons consumed during the trial.

The second product was a nominal 2" minus product with 80 to 90% of the wire removed. This product could not be held in your hand without getting a wire stick and wires were visible. The supplier of this product has about an 80% yield on this product (20% is wire and entrained rubber to be sold off or disposed of.) Reducing the current on the magnet and not removing as much wire accomplish the processing of this product. The rim wire or bead wire is a large piece of wire with two in every tire and is typically the first picked up by the magnet. Very little bead wire was seen in this second product. This product accounted for the last 500 tons consumed during the trial.

A third product was available with no wire removed. It was elected not to trial this product due to the wire contaminants, predominantly the bead wire.

Cedar Bay burns approximately 1,000,000 tons per year of coal. At a 5% substitution, the 50,000 tons of tires is equivalent to the use of 1.2 to 1.6 million tires per year. This is the amount generated annually by a comparable amount of people.

### Fuel Blending

The target blend ratio was 5%, by weight, with the coal feed to C Boiler. The typical crushing and bunkering rate is 300 tons per hour (TPH.) A TDF feeder was employed that could feed up to 30 TPH (variable speed) but was ran at 15 TPH during the blending operations. The discharge of the metering feeder was sent directly to the coal stream leaving the crusher to the bunkers (2) for C Boiler.

The coal from these two bunkers are used to feed four coal feeders that feed a total of six coal feed points of the boiler. Samples were evaluated from these coal feeders and showed that the silos were supplying a reasonable blend of Coal and TDF from the silos. The blending operation was very successful during the trial.

### Boiler Operation and Combustion

The boiler operation before, during and after the trial was essentially seamless. The blend rate (5% by weight) would create a fuel that would be about 125 BTU/lb higher than the typical 12,000 BTU/lb Bituminous Coal. This change in BTU is not unusual to see as the range of the Cedar Bay coal supply is typically from 11,700 to 12,300. The boiler master (as seen in Table C) reacted during the trial to the richer fuel and dropped.

Temperatures throughout the boiler remained nearly the same. Control of SOx and NOx was not difficult and in fact the usage rates for limestone and ammonia was slightly lower that the pre and post trial averages. This indicates the richer fuel did not create hot spots of combustion, which increase NOx production and lower the limestone reaction rates (SOx.)

The operational impact of the TDF:Coal blend were minimal and easily within the typical variations seen in fuel feed. This method of operation was very successful and poses no problem at this time.

**Ash Removal**
The ash removal considerations of the trial included the volume of ash produced, the tread wire from the TDF pieces and the loss of the TDF pieces themselves. The ash content of TDF is around 12 to 13%, whereas our coal may vary from 10% to 17%, therefore, the ash generation impact was not noticed.

The tread wire from passenger car tires is a small diameter and would only be an inch or two long in the TDF supplied. Other TDF burning facilities have seen these wires in the bottom ash system depending on the volume fed. These wires can cause problems by becoming entangled with each other and forming balls in the discharge piping. Cedar Bay has seen no wire or wire remnants in the ash system. The combustion chamber temperature of around 1,650 Deg. F is ideal for iron to turn from ferrite to austenite (softer material) and be broken down due to the agitation in the combustion zone. This along with the low coal substitution rate prevents the wire from accumulating.

Related to the low substitution rate is the absence of TDF pieces in the bottom ash at Cedar Bay. Some locations with high TDF feed rates have seen some TDF to be removed from the boiler via the ash drains with just the edges charred at other locations. This was not the case at Cedar Bay.

**Physical Impacts on Boiler Internals**
The Spring Outage was begun at Cedar Bay in early April soon following the TDF trial and afforded the opportunity to evaluate the impacts of the TDF on the boiler internals. Of particular interest was the impact of the wire. Evaluation of the three boilers during the outage showed all three to be free of the build-up or "pottery" normally found in an outage. At this time, this has been attributed to the coarse solids being circulated in all three boilers over the last several months due to Limestone Processing changes.

No additional changes could be directly attributed to the TDF at this time, but additional monitoring will be performed.

Table A. Summary of Trace Metal Analysis and Statistical Parameters

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TDF** | | | | | | | | | | | | |
| | CB-TDF-5(T) | CB-TDF-7(T) | CB-TDF-9 | CB-TDF-10 | -TDF | Maximum | Average | Median | STDEV | Upper CI[a] | Lower CI[a] | Significant |
| Dry Basis, ug/g | | | | | | | | | | | | Difference? |
| Cadmium, Cd | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.000 | NA | NA | |
| Chromium, Cr | 4 | 2 | 8 | 17 | 5 | 17 | 7.2 | 5 | 5.891 | 12.82 | 1.58 | |
| Silver, Ag | 4 | 4 | 0.5 | 0.5 | 0.5 | 4 | 1.9 | 0.5 | 1.917 | 3.73 | 0.07 | |
| Lead, Pb | 4 | 8 | 8 | 10 | 6 | 10 | 7.2 | 8 | 2.280 | 9.37 | 5.03 | |
| Copper, Cu | 47 | 29 | 36 | 22 | 62 | 62 | 39.2 | 36 | 15.738 | 54.21 | 24.19 | |
| Beryllium, Be | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.000 | NA | NA | |
| Zinc, Zn | 3132 | 2548 | 5048 | 2072 | 2748 | 5048 | 3109.6 | 2748 | 1148.984 | 4205.11 | 2014.09 | |
| Arsenic, As | 9 | 7 | 0.5 | 0.5 | 0.5 | 9 | 3.5 | 0.5 | 4.168 | 7.47 | -0.47 | |
| Mercury, Hg | 0.06 | 0.06 | 0.07 | 0.1 | 0.02 | 0.1 | 0.062 | 0.06 | 0.029 | 0.09 | 0.03 | |
| Selenium, Se | 0.5 | 0.5 | 0.5 | 1 | 0.5 | 1 | 0.6 | 0.5 | 0.224 | 0.81 | 0.39 | |
| < is less than detection limit and assumed to be 0.5 of detection limit | | | | | | | | | | | | |
| **TDF/Coal** | CB-TDF-1 | CB-TDF-3 | CB-TDF-5 | CB-TDF-7 | | Maximum | Average | Median | STDEV | | | |
| Dry Basis, ug/g | | | | | | | | | | | | from TDF |
| Cadmium, Cd | 0.5 | 0.5 | 0.5 | 0.5 | | 0.5 | 0.5 | 0.5 | 0.000 | NA | NA | No difference |
| Chromium, Cr | 21 | 23 | 21 | 25 | | 25 | 22.5 | 22 | 1.915 | 24.75 | 20.25 | Higher |
| Silver, Ag | 0.5 | 0.5 | 1 | 1 | | 1 | 0.75 | 0.75 | 0.289 | 1.09 | 0.41 | No difference |
| Lead, Pb | 12 | 27 | 11 | 9 | | 27 | 14.75 | 11.5 | 8.261 | 24.47 | 5.03 | No difference |
| Copper, Cu | 0 | 29 | 28 | 23 | | 29 | 20 | 25.5 | 13.589 | 35.99 | 4.01 | No difference |
| Beryllium, Be | 0.5 | 0.5 | 0.5 | 0.5 | | 0.5 | 0.5 | 0.5 | 0.000 | NA | NA | No difference |
| Zinc, Zn | 448 | 38 | 244 | 135 | | 448 | 216.25 | 189.5 | 175.929 | 423.23 | 9.27 | Lower |
| Arsenic, As | 11 | 17 | 16 | 15 | | 17 | 14.75 | 15.5 | 2.630 | 17.84 | 11.66 | Higher |
| Mercury, Hg | 0.05 | 0.06 | 0.05 | 0.04 | | 0.06 | 0.05 | 0.05 | 0.008 | 0.06 | 0.04 | No difference |
| Selenium, Se | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 0.000 | NA | NA | Higher |
| < is less than detection limit and assumed to be 0.5 of detection limit | | | | | | | | | | | | |
| **COAL** | CB-TDF-5 | CB-TDF-7 | | | | Maximum | Average | Median | STDEV | | | |
| Dry Basis, ug/g | | | | | | | | | | | | from TDF |
| Cadmium, Cd | 0.5 | 0.5 | | | | 0.5 | 0.5 | 0.5 | 0.000 | NA | NA | No difference |
| Chromium, Cr | 22 | 26 | | | | 26 | 24 | 24 | 2.828 | 41.86 | 6.14 | No difference |
| Silver, Ag | 1 | 1 | | | | 1 | 1 | 1 | 0.000 | NA | NA | No difference |
| Lead, Pb | 11 | 9 | | | | 11 | 10 | 10 | 1.414 | 18.93 | 1.07 | No difference |
| Copper, Cu | 27 | 23 | | | | 27 | 25 | 25 | 2.828 | 42.86 | 7.14 | No difference |
| Beryllium, Be | 0.5 | 0.5 | | | | 0.5 | 0.5 | 0.5 | 0.000 | NA | NA | No difference |
| Zinc, Zn | 27 | 22 | | | | 27 | 24.5 | 24.5 | 3.536 | 46.82 | 2.18 | Lower |
| Arsenic, As | 16 | 15 | | | | 16 | 15.5 | 15.5 | 0.707 | 19.96 | 11.04 | Higher |
| Mercury, Hg | 0.05 | 0.04 | | | | 0.05 | 0.045 | 0.045 | 0.007 | 0.09 | 0.00 | No difference |
| Selenium, Se | 1 | 1 | | | | 1 | 1 | 1 | 0 | | NA | Higher |
| < is less than detection limit and assumed to be 0.5 of detection limit | | | | | | | | | | | | |

[a] Confidence Interval (C.I.) = $x \pm t_{a/2} \times s/(n)^{-0.5}$

where: x = average; t = "Students-t" statistic at n-1 degrees of freedom (95%)

s = standard deviation; n = number of data points

Table B. Summary of TDF Tests, Boiler A, B and C Tests and Statistical Parameters

| Parameter | Concentration | Permit Limit | Feb-05 Boiler C-TDF 5% | Boiler A Average | Boiler B Average | Boiler C Average w/o rejects | Boiler C Maximum w/o rejects | Boiler C Minimum w/o rejects | Boiler C Stdev w/o rejects | Boiler C Count w/o rejects | Boiler C Upper CI[a] | Boiler C Lower CI[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VOC | LBS/HR | 16 | **0.9403** | 4 | 4.105 | 2.01 | 3.15 | 0.87 | 1.61220346 | 2 | 9.2080 | -5.1880 |
| VOC | LBS/mmBTU | 0.015 | **0.0008** | 0.0036 | 0.0036 | 0.0019 | 0.0030 | 0.0008 | 0.0015 | 2 | 0.0088 | -0.0049 |
| Particulate (PM) | (LBS/HR) | 19.1 | **4.49** | 12.2123 | 14.0863 | 12.6551 | 18.4500 | 5.8200 | 5.0898 | 11 | 15.4358 | 9.8743 |
| Particulate (PM) | (LB/MMBTU) | 0.018 | **0.004** | 0.0111 | 0.0123 | 0.0116 | 0.0170 | 0.0050 | 0.0050 | 11 | 0.0144 | 0.0089 |
| PM10 | (LBS/HR) | 19.1 | **4.45** | 8.7445 | 11.0628 | 8.3778 | 14.7900 | 3.5500 | 4.2257 | 6 | 11.8540 | 4.9017 |
| PM10 | (LB/MMBTU) | 0.018 | **0.004** | 0.0077 | 0.0093 | 0.0076 | 0.0150 | 0.0030 | 0.0043 | 6 | 0.0112 | 0.0041 |
| Sulfuric Acid Mist | (LBS/HR) | 0.5 | **0.062** | 0.0450 | 0.0430 | 0.0365 | 0.0430 | 0.0300 | 0.0092 | 2 | 0.0775 | -0.0045 |
| Sulfuric Acid Mist | (LBS/mmBtu) | 4.6x10-4 | **0.0000413** | | | | | | | | | |
| Lead | (LB/HR) | 0.06 | **0.0019** | 0.00416 | 0.00353 | 0.00124 | 0.00180 | 0.00022 | 0.00088 | 3 | 0.0027 | -0.0003 |
| Lead | (LB/mmBTU) | 6.03x10(-5) | **1.18X(10-6)** | | | | | | | | | |
| Mercury | (LB/HR) | 0.03 | **<0.0013** | 0.00140 | 0.00315 | 0.00140 | 0.00150 | 0.00130 | 0.00014 | 2 | 0.0020 | 0.0008 |
| Mercury | (LB/mmBTU) | 2.89x10(-5) | **<8.45x(10-7)** | | | | | | | | | |
| Beryllium | (LB/HR) | 0.01 | **0.0001** | 0.00004 | 0.00025 | 0.00010 | 0.00023 | 0.00002 | 0.00010 | 3 | 0.0003 | -0.0001 |
| Beryllium | (LB/mmBTU) | 8.7x10(-6) | **4.18x(10-8)** | | | | | | | | | |

[a] Confidence Interval (C.I.) = $x +/- t_{a/2} \times s/(n)^{-0.5}$

where: x = average; t = "Students-t" statistic at n-1 degrees of freedom (95%)

s = standard deviation; n = number of data points

# Table C

## CEDAR BAY OPERATING DATA - C Boiler

(TDF TRIAL DATES - FEB 9, 2005, Midnight to FEB 26, 2005, Noon and
MAR 1, 2005, 0800 to MAR 19 at 2400 (Break in trial for air testing without TDF)

**Full Day Data**

| | Fuel | | | Main Steam | | | Reheat Steam | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Coal Total KPPH | TDF Flow KPPH | Boiler Master % | Flow KPPH | Temp Deg. F | Press psig | Flow KPPH | Temp Deg. F | Press psig | Spraywater KPPH |
| Pre-Trial Feb 2-7, 2005 | 83.3 | - | 89.09 | 765 | 1,005 | 1,817 | 520 | 1,005 | 448 | 22.1 |
| Trial Period #1 Feb 8-25, 2005 | 77.7 | 3.85 | 86.19 | 740 | 1,005 | 1,799 | 513 | 1,006 | 437 | 19.3 |
| Trial Period #2 Mar 2-19, 2005 | 78.5 | 4.13 | 85.54 | 731 | 1,005 | 1,795 | 505 | 1,005 | 436 | 20.1 |
| Post-Trial Mar 21-26, 2005 | 85.3 | - | 88.42 | 763 | 1,005 | 1,816 | 515 | 1,005 | 452 | 21.8 |

| | Combustion Air | | | | | | Combustor | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | PA | | SA | | Bed | Lower | Middle | Upper | Cyclone Out |
| | Total Air | to Grid | Temp. | Flow | Temp. | Pressure | Temperaure | | | |
| | KPPH | KPPH | Deg. F | KPPH | Deg. F | In. WC | Deg F | Deg F | Deg F | Deg F |
| Pre-Trial Feb 2-7, 2005 | 1,065 | 612 | 428 | 293 | 415 | 36.1 | 1,653 | 1,604 | 1,685 | 1,620 |
| Trial Period #1 Feb 8-25, 2005 | 1,055 | 602 | 426 | 278 | 419 | 37.1 | 1,642 | 1,616 | 1,670 | 1,620 |
| Trial Period #2 Mar 2-19, 2005 | 1,049 | 586 | 425 | 280 | 417 | 38.3 | 1,589 | 1,652 | 1,650 | 1,637 |
| Post-Trial Mar 21-26, 2005 | 1,087 | 607 | 432 | 286 | 422 | 38.4 | 1,655 | 1,642 | 1,701 | 1,659 |

| | Backpass | | | | Emissions/Control | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | RH II Out | RH I Out | Econ. Out | A/H Out | Baghouse DP | Opacity | Limestone | SO2 lbs per | Ammonia Flow | NOx lbs per |
| | Gas Temperature | | | | | | | | | |
| | Deg F | Deg F | Deg F | Deg. F | INWC | % | KPPH | MMBTU | GPM | MMBTU |
| Pre-Trial Feb 2-7, 2005 | 1,230 | 980 | 737 | 300 | 6.25 | 3.48 | 13,808 | 0.18 | 2.02 | 0.16 |
| Trial Period #1 Feb 8-25, 2005 | 1,217 | 977 | 737 | 299 | 6.35 | 3.86 | 13,440 | 0.18 | 1.73 | 0.16 |
| Trial Period #2 Mar 2-19, 2005 | 1,216 | 974 | 727 | 298 | 6.17 | 4.06 | 13,533 | 0.19 | 1.74 | 0.16 |
| Post-Trial Mar 21-26, 2005 | 1,234 | 981 | 757 | 306 | 6.72 | 4.42 | 16,032 | 0.21 | 1.83 | 0.16 |

# APPENDIX C

# FEASIBILITY STUDY FOR CO-FIRING PETROLEUM COKE WITH COAL IN THE THREE CEDAR BAY CFB BOILERS BY FOSTER WHEELER ENERGY SERVICES, INC.

FOSTER WHEELER ENERGY SERVICES, INC.

# Report on Feasibility Study for Co-firing Petroleum Coke in Cedar Bay CFB Boilers

for

PG&E National Energy Group
Cedar Bay Generating Company, L.P.
Jacksonville, Florida

# Report on Feasibility Study for Co-firing Petroleum Coke in Cedar Bay CFB Boilers

for

## PG&E National Energy Group
## Cedar Bay Generating Company, L.P.
## Jacksonville, Florida

Prepared by:

______________________________

Song Wu, Principal Engineer

Engineering Technology Department, FWDC

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PK Chelian

Manager Engineering / FWESI

# EXECUTIVE SUMMARY

This is an engineering study by Foster Wheeler Energy Services Inc for the co-firing of petroleum coke and bituminous coal in the CFB boilers at PG&E National Energy Group's Cedar Bay Plant. The plant provided the fuel analyses of four candidate petroleum cokes for this study. The main objective of the study is to evaluate the potential impact of co-firing on the boiler capacity, emissions, CFB process as well as on the major auxiliary equipment.

Boiler "C" was designated for the study. Boilers A, B and C are similar. The process and operating conditions of the May 22, 1999 performance evaluation test on this boiler form the basis for the study.

The following are highlights of the study:

The boiler can deliver the same MCR capacity while co-firing petroleum coke at different blend ratios subject to equipment modifications / system improvements identified in this report. While co-firing petroleum coke all the emissions ($SO_2$, NOx, CO and particulate matter) can be maintained at the current levels. Due to the usually low concentrations of trace elements in the petroleum coke, the trace element emissions including mercury are also expected to be at the current level or lower.

The boiler as such can readily co-fire up to 20% petroleum coke by heat input. The equipment upgrades proposed for co-firing higher blend ratios are as explained below. For co-firing ratio in the range of 20% to 35% coke by heat input the changes are limited to limestone feed system. For blend ratio in the range of 35% to 65% modification to loopseal configuration and loopseal fluidizing nozzles would be necessary to increase the solids flow capacity. For blend ratios higher than 65% modification to boiler heating surfaces, upgrading of limestone preparation and transport system as well as bottom ash handling system would be required.

The conclusion of this study is co-firing petroleum coke up to 80% by heat input would be feasible by appropriate modifications to the present equipment. The boiler as such can co-fire petroleum coke up to 20% by heat input. All the emissions including trace elements could be maintained at the present level while firing coal only.

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## 1.0 INTRODUCTION

Foster Wheeler Energy Services, Inc. (FWESI) was awarded a contract for engineering study by Cedar Bay Generating Company, L.P. (CBGC) to evaluate co-firing of petroleum coke and bituminous coal in the CFB boilers at the Cedar Generating Plant. CBGC provided the fuel analyses of four candidate petroleum cokes for this study. The main objective of the study is to evaluate the potential for co-firing petroleum coke at different proportions without impacting the present level of boiler emissions. The limitations if any on the boiler process as well as on the major auxiliary equipment were identified to facilitate co-firing petroleum coke at the maximum proportion.

The plant has three identical CFB boilers (A, B & C). Boiler "C" performance data from the last performance evaluation test was selected as the basis for this study.

## 2.0 BOILER DESCRIPTION

PG&E national energy group operates three 745,000 lb/hr, 1005 °F main steam, 1005 °F reheat steam and 1980 psig Foster Wheeler CFB boilers at the Cedar Bay Cogeneration Facility in Jacksonville, Florida. The steam is used to generate power for sale to Florida Power and Light Co. Process steam is also sold to an adjacent recycled-liner board mill owned by Seminole Kraft Corp. The power plant is operated in an automatic dispatch mode which requires the plant to cycle load on a daily basis.

Each boiler has two cyclones with fuel being fed to the furnace from four 50% capacity feed systems through six feed points. Four feed points are located in the loopseal return legs and two are on the front wall. Limestone is pneumatically fed to the furnace through eight (8) injection points to control the $SO_2$ emission (permit level: 0.3 lb/MMBtu 3-hour average and 0.2 lb/MMBtu 30 day average and 318.9 lb/hr 30 day average). Bottom ash removal from the furnace is through three water-cooled screw coolers. Fly ash collected by the baghouse is transported to the main flyash silo. The boiler is also equipped with a fly ash reinjection system to improve sorbent utilization. An aqueous ammonia injection system is used to control the NOx emissions (permit level 0.17 lb/MMBtu 30 day average and 180.7 lb/hr 30 day average).

## 3.0 BASIS FOR STUDY

The reference point for the study is the four-hour average data from the performance evaluation test on Boiler "C". The following are the main assumptions used for the study,

- Boiler load at 100% MCR corresponds to a main steam flow of 767,160 lb/hr;
- Coal and limestone analyses from the last test is used for this study;
- One coke (CBGC supplied analysis coke #4) is selected to be studied for 6 coke blend ratios (0%, 20%, 40%, 50%, 60%, 80% coke by heat input).
- Heat and mass balance data is provided for the case of 50% blend using coke #4 at the boiler

load of 745,000 klb/hr and 700,000 klb/hr .

- Heat and mass balance data is also provided for 50% coke/coal blend using Coke #1 and coke #3 at 767,160 lb/hr.

## 4.0 FEED STOCK EVALUATION

### 4.1 Petroleum Coke Analyses

The chemical analyses of four candidate coke samples are summarized in Table 1.

**Table 1 Fuel Analysis Data (%as fired unless otherwise indicated)**

| FUEL TYPE | Coke #1 | Coke #2 | Coke #3 | Coke #4 | CB Bit Coal |
|---|---|---|---|---|---|
| Fixed C | 84.83 | 80.57 | 85.89 | 82.34 | 49.98 |
| Volatile | 9.46 | 9.46 | 11.32 | 9.51 | 34.30 |
| Ash | 0.57 | 0.37 | 0.58 | 0.37 | 8.72 |
| Moisture | 5.14 | 9.6 | 2.21 | 7.78 | 7 |
| Total. | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| S | 4.09 | 5.84 | 5.17 | 5.45 | 1.52 |
| H | 3.53 | 3.52 | 3.76 | 3.37 | 4.94 |
| C | 84.58 | 80.57 | 85.88 | 81.23 | 72.79 |
| N | 1.59 | | 1.61 | 1.66 | 1.35 |
| O | 0.50 | | 0.78 | 0.14 | 3.68 |
| Ash | 0.60 | 0.37 | 0.58 | 0.37 | 8.72 |
| H2O | 5.14 | 9.60 | 2.21 | 7.78 | 7.00 |
| Total | 100.00 | 99.90 | 100.00 | 100.00 | 100.00 |
| V, ppm | 2410* | 1815 | 808* | 683* | |
| Ni, ppm | 316* | 340 | 217* | 167* | |
| HHV, as fired, Btu/lb | 14512.0 | 13712.0 | 14557.0 | 13923.0 | 12557.0 |
| HHV, dry basis, Btu/lb | 15298 | 15168 | 14886 | 15098 | 13502 |
| VM, %daf | 10.03 | 10.51 | 11.64 | 10.35 | 40.70 |
| C/H Ratio, - | 23.96 | 22.89 | 22.84 | 24.10 | 14.73 |
| $SO_2$ input, lb/MMBtu | 5.64 | 8.52 | 7.10 | 7.83 | 2.42 |

*Calculated based on fuel ash analyses; may be lower than actual content in fuel

The four petroleum cokes have fairly similar C/H ratios and volatile matter contents (% daf) that are typical of delayed coke. The heating values on a dry basis also fall into a very narrow range (less than 3.0 % difference).

The main difference lies in the sulfur content, which in terms of lb/MMBtu of $SO_2$ input for coke #2 is 15% higher than coke #1. High sulfur content in the coke will require a high percent sulfur capture and greater limestone usage than current level.

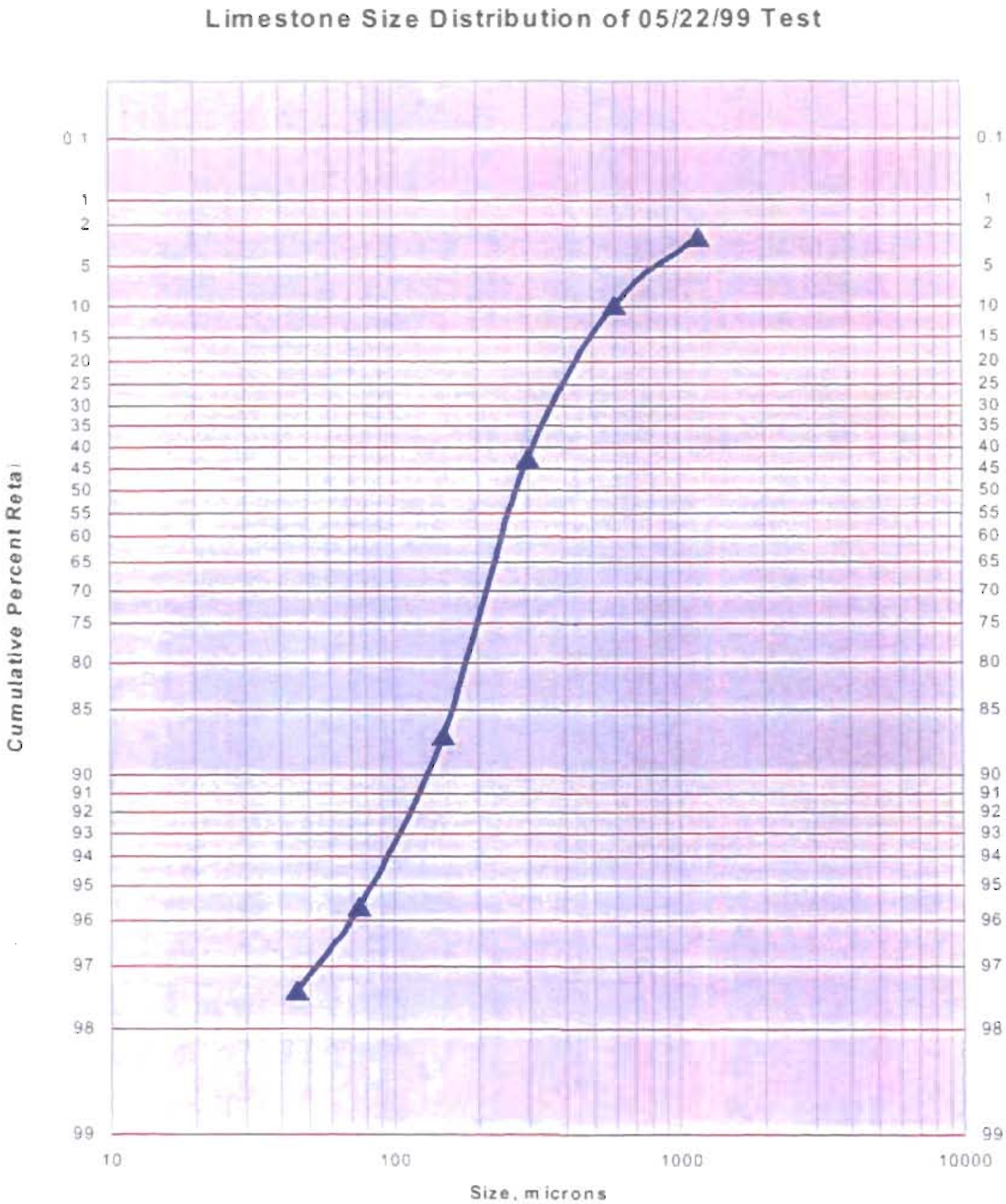
In this project, since petroleum coke is co-fired with coal, the risk of vanadium related problems is low. Since all four petroleum cokes are similar in terms of fuel analysis, coke #4 is selected for detailed study because it has a typical and more complete chemical analysis. Coke #1 and coke #3 are studied only for a blend ratio of 50% coke by heat input.

### 4.2 Coal and Limestone

The coal and limestone compositions as determined based on the May 22, 1999 performance evaluation test are used for this study. The coal analysis is shown in Table 1. Table 2 gives the limestone analysis. Figure 1 is the size distribution of the limestone.

**Table 2 Limestone Analyses**
**(wt% as received)**

| | Reference Limestone |
|---|---|
| CaCO3 | 95.84 |
| MgCO3 | 0.52 |
| Inert | 3.28 |
| Moisture | 0.37 |
| Total | 100.00 |
| | |
| RI, mol/mol | 2.70 |


Limestone Size Distribution of 05/22/99 Test
Cumulative Percent Retai
Size, microns
0.1
1
2
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10
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35
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70
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97
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99
10
100
1000
10000

Figure 1

## 5.0 IMPACT ON BOILER PROCESSES

### 5.1 Boiler Emissions Overview

The projected stack emission levels of $SO_2$, NOx, and CO are plotted in Figure 2. The SO2 emission is controlled by limestone addition and the current level can be maintained for the entire range of blend ratios. More discussion on sulfur capture and limestone consumption is given in the next section.

The current level of NOx can also be maintained with the existing ammonia injection system.

The predicted CO emission is lower while co-firing coke than the case of firing coal only. As shown in Figure 2, when firing 50% coke blend, about 40% reduction in CO can be expected, as compared to coal firing.

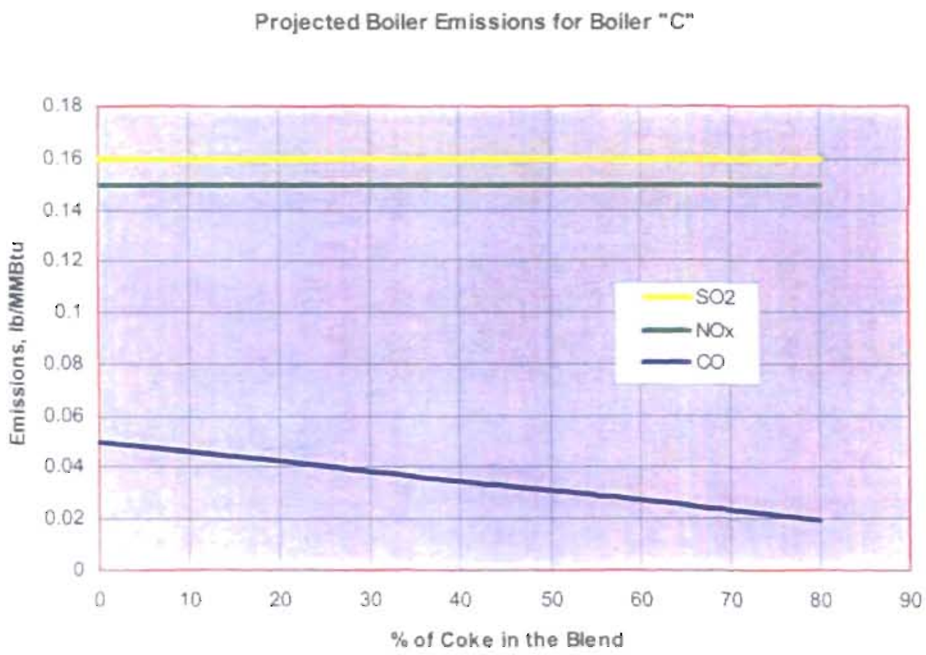


Figure 2

There should be no problem in maintaining the particulate matter emission rate when co-firing petcoke with coal. A detailed examination of the baghouse performance is given in section 6.5.

Currently, the plant is running with coal only and with very low levels of trace element emissions Due to the various thermal processes occurring in an oil refinery, the trace element concentrations, such as mercury, lead and fluoride in the heavy residue coke are extremely low (very significantly lower than that of typical coal). Considering the very low concentrations in petroleum coke, it is expected the trace elements emissions while co-firing petcoke will be lower than the present level.

## 5.2 Sulfur Capture and Limestone Requirement

Due to the high sulfur content in coke, the sulfur input increases rapidly while co-firing. Figure 3 shows the uncontrolled $SO_2$ levels and sulfur capture requirement for different blend ratios. For high blend ratios the percent sulfur capture in the high nineties are necessary in order to maintain the present level of emission.

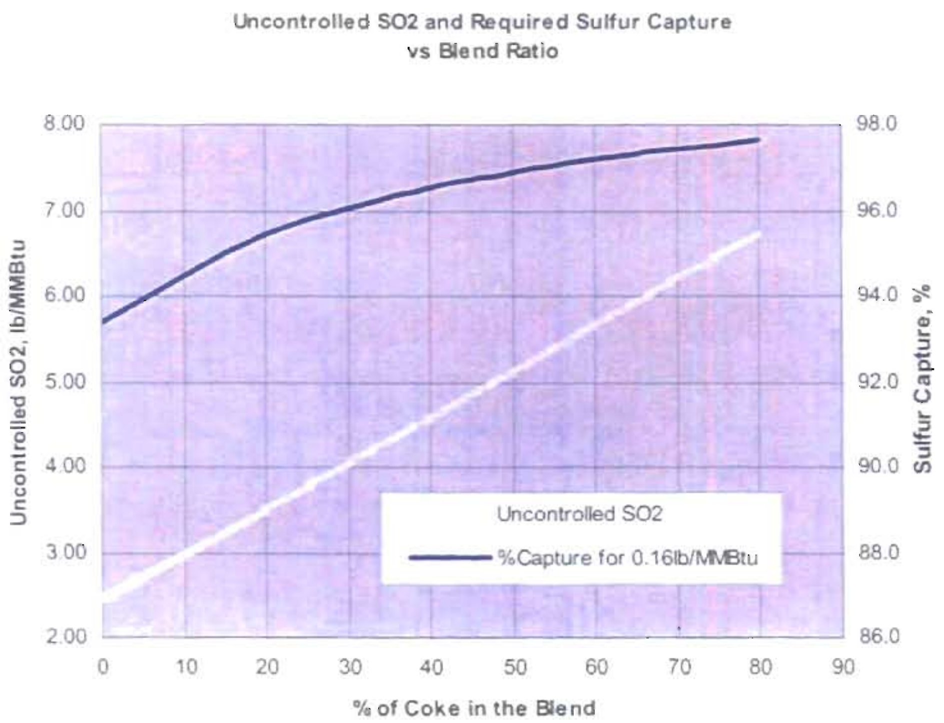


Figure 3

Figure 4 shows the projected limestone requirements at different blend ratios. When firing a 50% blend, the limestone flow rate is 25,600 lb/hr, or, 210% of the limestone flow when firing 100% coal.

Currently, the plant is controlling average $SO_2$ emissions at about 0.16 lb/MMBtu, or 80% of the permit level (0.20 lb/MMBtu). This control target is quite conservative. With a properly tuned $SO_2$ trim mechanism of the limestone feed rate control it is possible to smooth out the fluctuations in the feed rate. With these considerations, Foster Wheeler believes that the current level of $SO_2$ emission can be maintained.

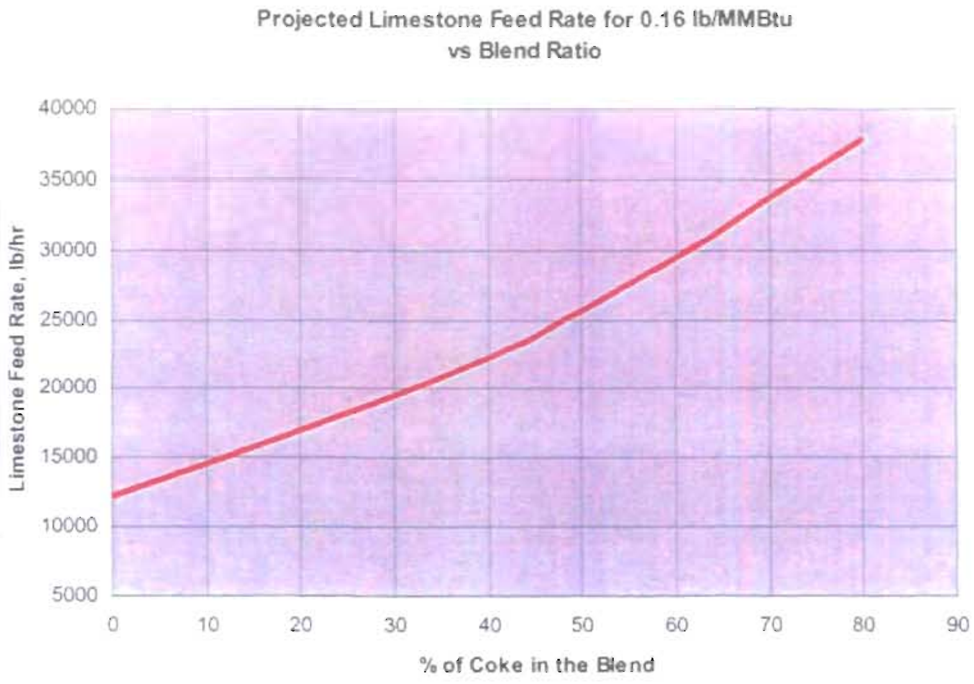


Figure 4

### 5.3 NOx Emissions and $NH_3$ Consumption

Due to its low volatile matter content, petroleum coke combustion in CFBs usually generates low NOx emissions. It is anticipated that NOx emissions while co-firing will be lower than firing 100% bituminous coal. Figure 5 presents the projected uncontrolled NOx emission levels developed based on commercial experience of CFB boilers firing petroleum coke. Also plotted in Figure 5 is the current control target of 0.15 lb/MMBtu of NOx (permit level: 0.17 lb/MMBtu).

Figure 5 indicates that at higher coke blending ratios, the NOx level before $NH_3$ injection and the required NOx reduction percentage is lower. Therefore less ammonia injection is needed when more coke is fired. Figure 6 depicts the projected aqueous ammonia (30.3% purity) flow at various blend ratios. A 35% reduction in ammonia consumption can be expected by firing a 50% coke, 50% coal blend.

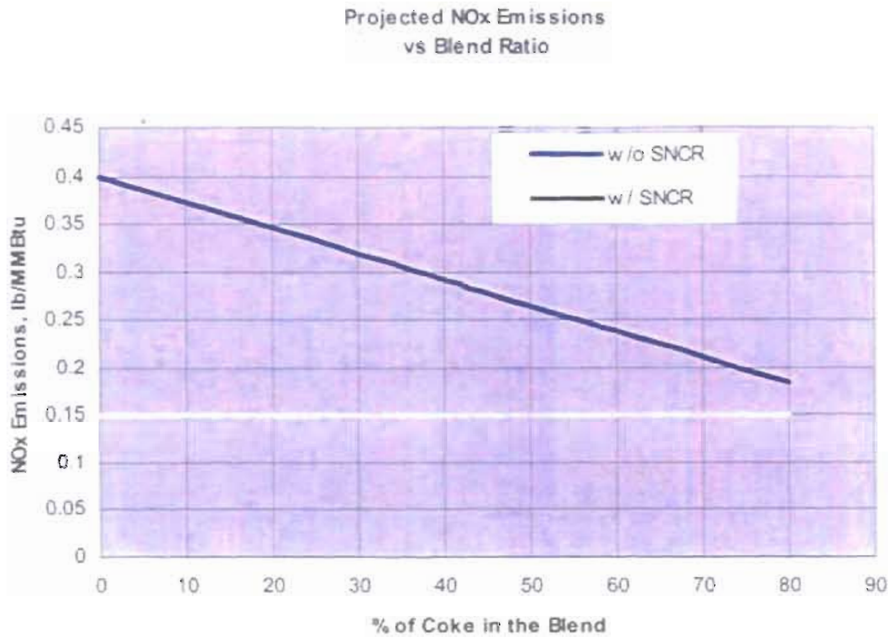


Figure 5

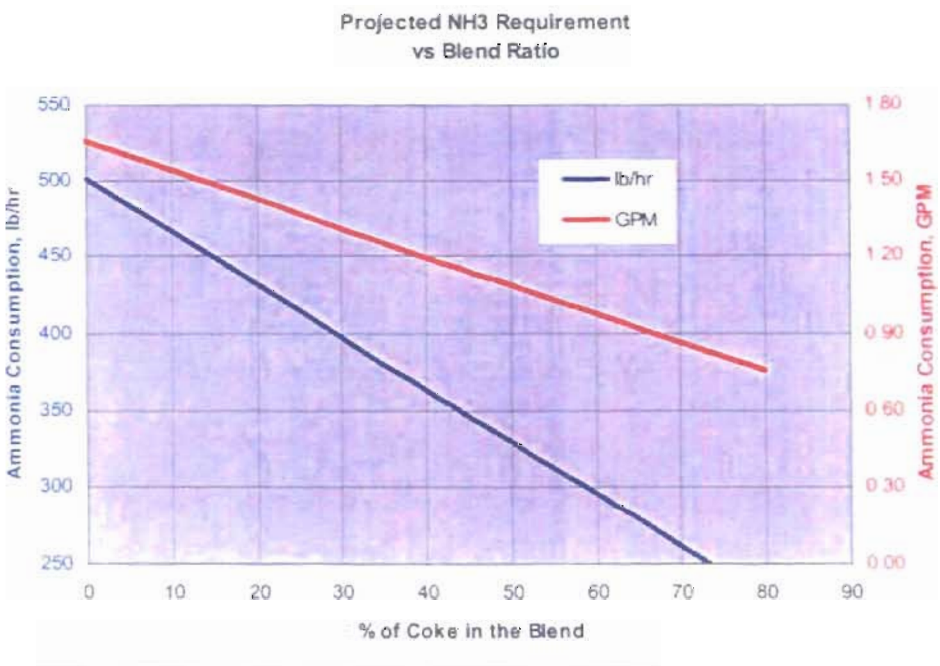


Figure 6

## 5.4 Other Process Impact

**Solids Throughput and Ash Split:** Due to the high sulfur content and large limestone requirement related to petroleum coke, the solids throughput of the CFB system will increase when co-firing coke (see Figure 7 for solids throughput). Therefore during co-firing, there is adequate amount of circulating material. However, because an increased portion of the circulating bed material will be limestone products, the limestone sizing becomes more critical. The limestone size distribution indicated in Figure 1 is suggested for the coke firing. The existing equipment should be capable of producing limestone of the appropriate size distribution.

The bottom ash fraction is also predicted and the results are shown in Figure 7.

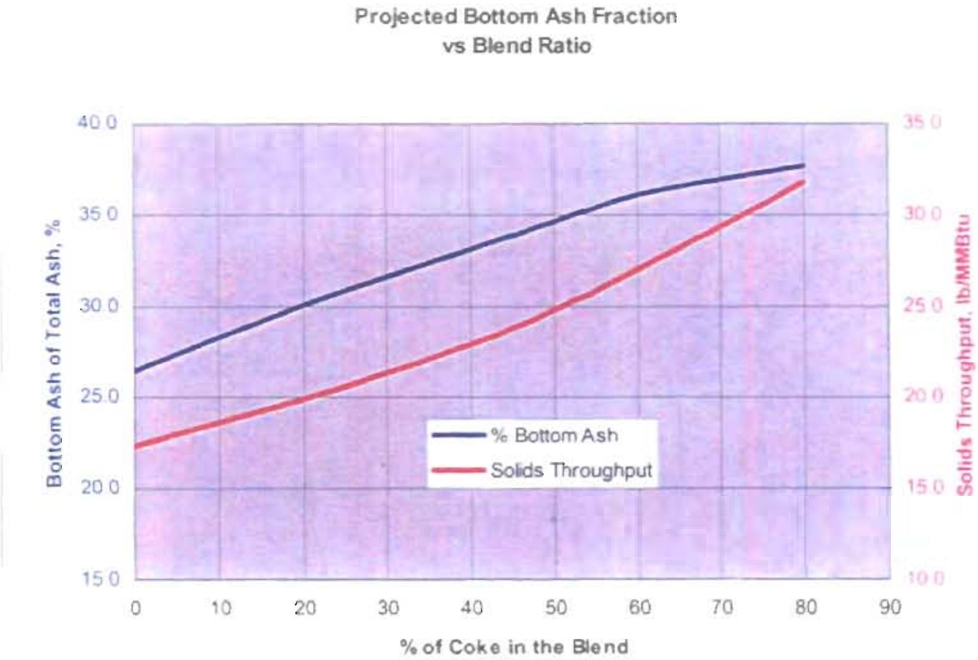


Figure 7

**Furnace and Backend Heat Transfer, Temperatures and Fouling:** On one hand, as discussed above, there will be an increased amount of solids throughput with coke co-firing, which should lead to higher solids circulating rate and better heat transfer, and thus lower furnace temperatures. On the other hand, coke-fired CFB boilers are known to have greater fouling tendency in the heat transfer surfaces than CFB boilers fired with only coal. Although in the furnace, the circulating material tends to scrub the tube surfaces to keep them clean, fouling could lead to reduced heat transfer and higher combustor temperature. Considering the above competing factors, it is expected that the combustor temperature will not be much different as compared to the 100% coal fired case. Other factors such as load, excess air and primary air to total air ratio will have more dominant impact on furnace temperature.

When co-firing coke, deposit formation on tubes in the back pass may increase, more frequent sootblowing may be necessary to maintain adequate heat transfer.

**Erosion Tendency:** The main factors determining surface erosion rates are particle velocity (which depends on gas velocity), particle abrasiveness and solids loading. There is a slight reduction in gas velocity due to co-firing. Although solids throughput is higher for co-firing cases, because of the low ash content of the coke, the additional solids products are mainly spent limestone particles that are relatively soft. Therefore, surface erosion is not expected to accelerate during coke co-firing.

## 6.0 IMPACT ON BOILER AUXILARY EQUIPMENT

### 6.1 Fuel Handling Equipment

The fuel feeding system consists of two fuel silos and four gravimetric belt feeders, of which two feed the two front wall feed points, the other two feed into chain conveyers (two for each side) which deliver fuel to the four feed chutes on the loopseal return legs. The maximum feeder capacity is 50,000 lb/hr per feeder. Each fuel silo feeds to one front wall and one rear wall feeder on the side of the boiler where the silo is located.

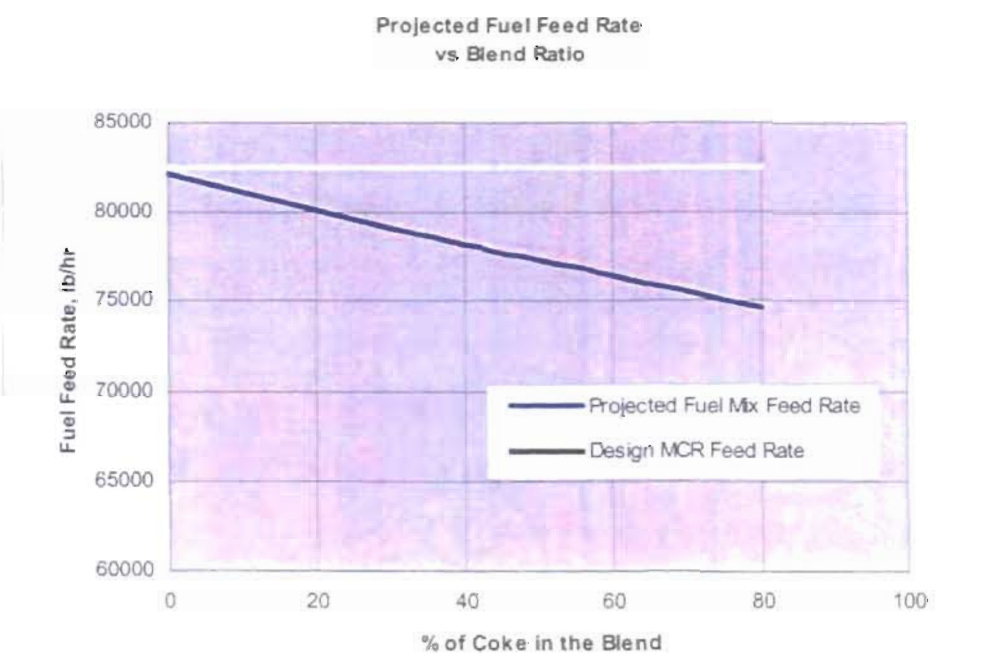


Figure 8

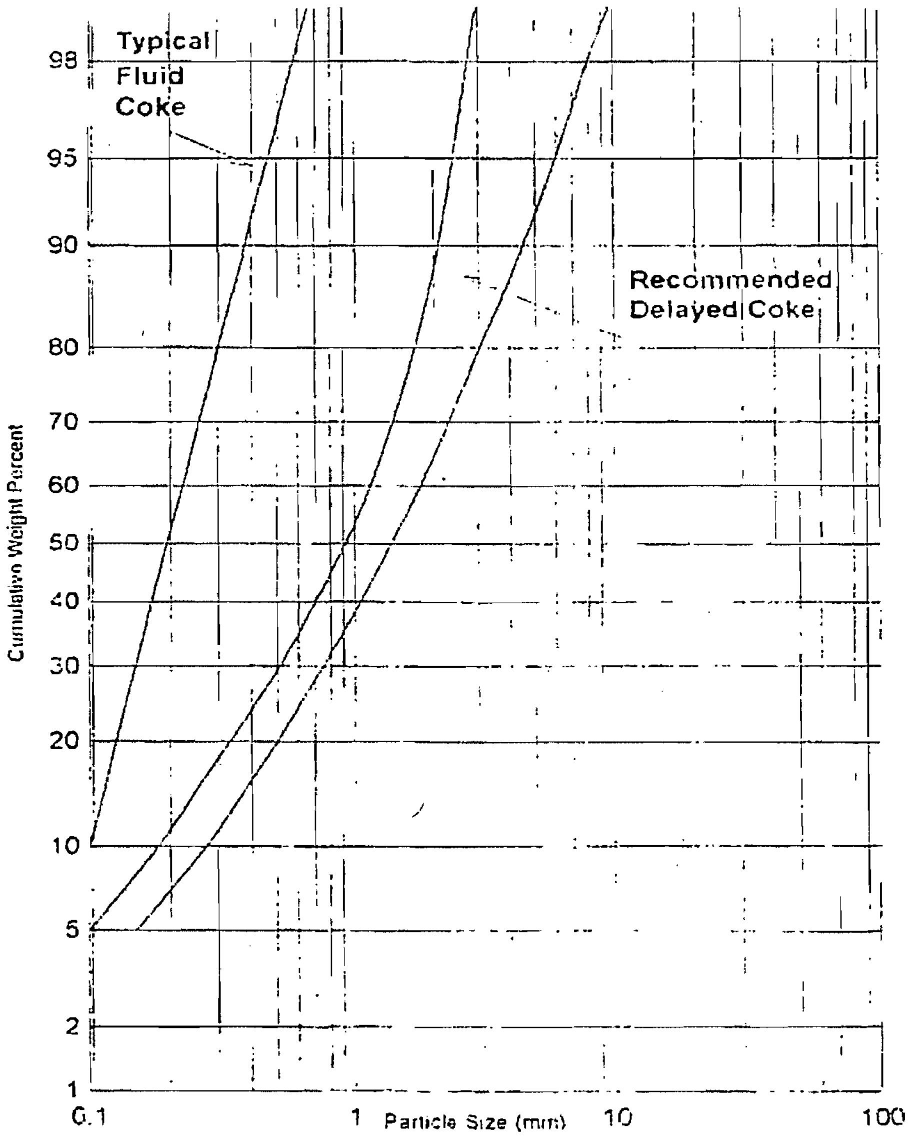


Figure 9 Typical Petcoke Size Distribution

Projected fuel feeding rates are plotted in Figure 8. Because coke has higher heating value, the feed rate reduces with increasing blending ratio and for all blend ratios the fuel feed rates are less than the design MCR coal feed rate. Therefore fuel feeding system capacity has plenty of redundancy for co-firing.

Handling of delayed coke is similar to that of coal. The main difference lies in the heating value, volatile matter and sulfur content. Ideally, in order to have good feed material consistency, the coal and coke should be premixed before loading to the fuel silo. This way all six feed points of the boiler will receive the same fuel blend to ensure uniform conditions in the furnace. Premixed fuel feeding is recommended for a co-firing test.

Figure 9 provides recommended size distribution range for delayed coke.

## 6.2 Limestone Handling System

The limestone system consists of limestone crushers, a limestone silo, two gravimetric belt feeders and two pneumatic transport trains that deliver limestone to eight feed points of the boiler (three front, three rear, one on each side). The design capacity of each feed chain is 16,000lb/hr (8 ton/hr). However, the plant has reported that the actual feed rate is limited at 4.2 ton/hr per feeder by the rotary valve capacity.

The limestone feed rates for different blend ratios are shown in Figure 4. The current set up can provide limestone for a co-firing blend ratio of about 20%. For higher blend ratios, the rotary valves downstream of the belt feeders have to be modified to match the design capacity of the rest of the feed system (16,000 lb/hr each chain). The maximum feed capacity can cover the projected limestone feed rates for up to 65% coke co-firing.

As an alternative, a base amount of limestone can be premixed with fuel and fed through the fuel feeders (which has plenty of capacity), the rest of the required limestone can be fed through the limestone system for $SO_2$ emissions control. For long-term co-firing, the rotary valves need to be upgraded in capacity. A third limestone feed train of same capacity may be installed to provide necessary redundancy.

## 6.3 PA, SA and ID Fans

Projected flow rate requirements for the three fans are plotted in Figure 10. Air and gas flow decrease slightly with the increasing blend ratio. Therefore at the max load (767,000lb/hr main steam flow), the fans are not expected to be a limiting factor.

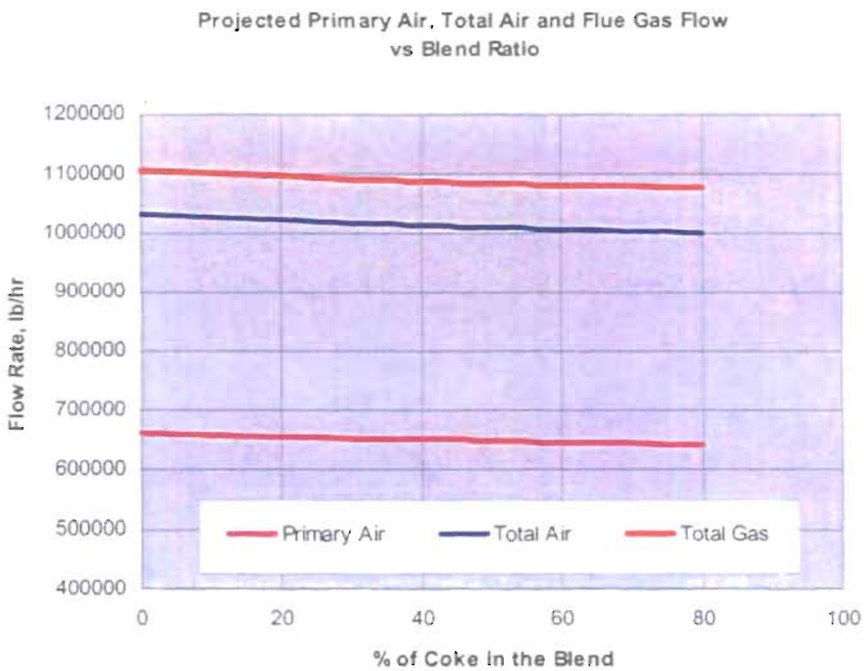


Figure 10

The flow requirement of high-pressure blowers for loopseals would be same as the current operation up to a coke blend of 35%.

## 6.4 Bottom Ash Handling

Bottom ash handling system consists of ash drains (3), ash cooling screws (3) and ash conveyers to transport ash to the ash silo. The ash drain/cooling screw design capacity is 2,950 lb/hr, and maximum capacity is 5,500 lb/hr.

The ash handling capacity of two cooling screws in service (with the third screw in standby) is used as reference in comparison with the projected bottom ash flow rates in Figure 11.

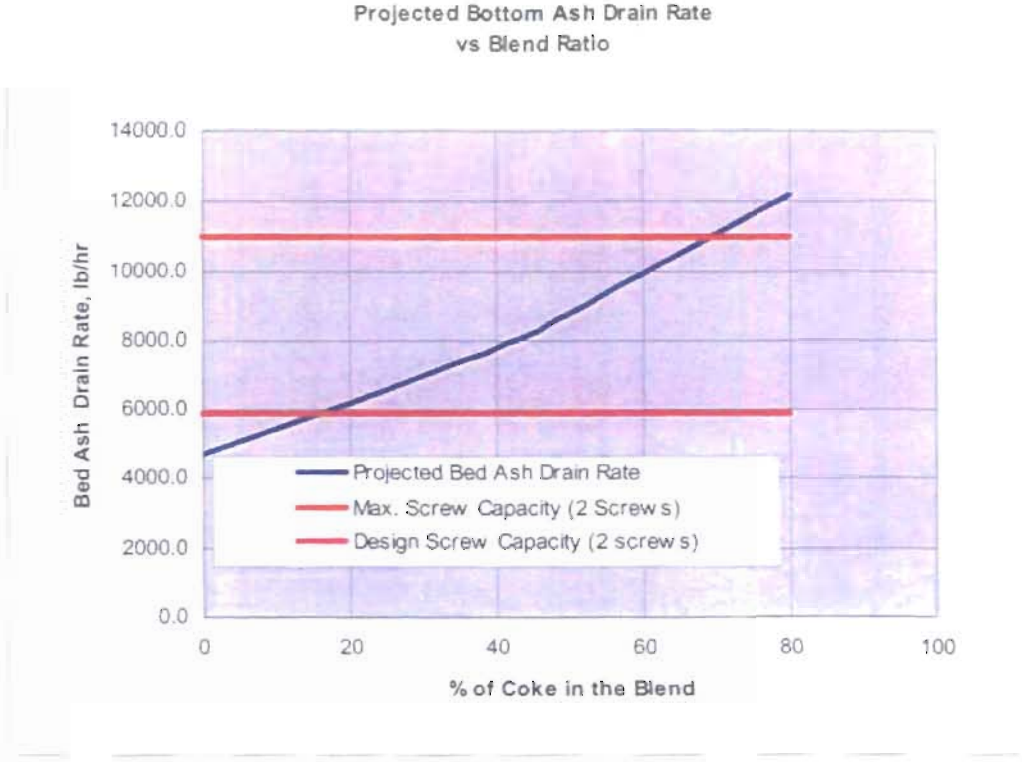


Figure 11

It appears that the maximum capacity of the two screws will allow up to 70% coke co-firing.

### 6.5 Flyash Handling Equipment

Fly ash system consists of the air heater hopper, baghouse, and pneumatic (vacuum) transport system that transport ash to the ash silo.

The impact on baghouse can be judged from the ash and gas flows. Figure 12 shows that the projected fly ash flow increases with increasing blend ratio, but the flue gas volume flow reduces slightly with co-firing. Although the flue gas volumes are higher than design flue gas volume ( 297,700 ACFM), the plant had often run with even higher volume flow without problems. The particulate loading for the 80% coke blend is 6.7 grains/ACF which is very low as compared to the design loading of 19.5 grains ACF specified by the baghouse vendor. The high design solids inlet loading of baghouse included the additional loading from fly ash re-injection (FAR) system. The FAR system is not being used at the plant. Based on the above, it is expected that the existing baghouse can maintain current emission levels, although more frequent back-purging/cleaning cycles may be necessary.

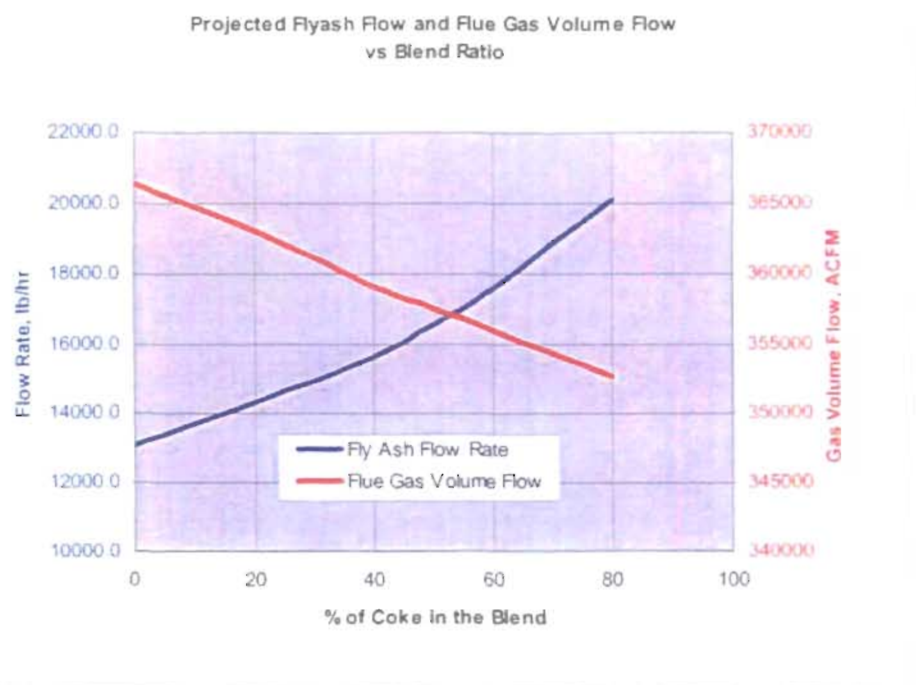


Figure 12

### 6.6 Start Up Burners

There are currently six #2 oil fired start up burners (1 on front wall, 3 on rear wall and 1 on each side wall). Each burner is 68 MMBtu/hr in capacity, making the total SUB capacity of 384 MMBtu/hr, or 37% of the heat input at the reference load. The burner capacity will be adequate for start-up.

## 7.0 CONCLUSIONS AND RECOMMENDATIONS

An engineering study has been completed for the co-firing of petroleum coke at PG&E National Energy Group's Cedar Bay Plant. Boiler "C" is designated for the study. The process and operating conditions of the May 22, 1999 performance evaluation test, including the test coal and limestone, form the basis for the study. Four candidates of petroleum coke were evaluated and one (coke #4) was selected for detailed engineering study. The following conclusions can be made,

1. On a dry basis, all four coke analyses have similar chemical compositions that are typical of delayed coke, except sulfur content, which has significant variation. Lower sulfur content is desirable due to associated limestone cost. On a normalized lb/MMBtu basis, coke #1 has the lowest sulfur content; #3 and #4 are higher; and #2 has the highest sulfur content.

2. When co-firing petroleum coke, $SO_2$, NOx and particulate matter emissions can be maintained at the current levels with existing equipment. Reductions in CO emissions are expected for coke

co-firing. Due to the usually very low concentrations of trace elements in the petroleum coke, the trace element emissions, including mercury, are also expected to be similar to or less than the current levels.

3. Due to high sulfur content in coke, percent sulfur capture in the mid to high nineties will be required to meet $SO_2$ compliance for co-firing, which should not be a problem. Limestone feed rates will be much higher than the current level. For 50% coke by heat input case, the projected limestone flow is 210% of the current consumption rate.

4. The uncontrolled NOx concentration before the DeNOx system will be lower when co-firing coke. Thus a smaller percentage reduction is required for the DeNOx system, resulting in a smaller ammonia consumption rate. A 35% reduction in ammonia consumption can be expected when firing a 50% coke blend.

5. The solids throughput and bottom ash fraction are expected to increase with higher coke blend ratios.

6. Furnace temperatures are expected to be close to the current levels. High levels of coke co-firing are known to have increased fouling tendency. The surfaces in the backpass are likely to have more ash deposit and more vigorous sootblowing may be needed.

7. Erosion rate of heat transfer surfaces when co-firing coke is not expected to exceed the current level at comparable boiler load.

8. Coke co-firing will require a lower fuel feed rate and slightly less combustion air and generates less flue gas. Therefore, fuel feeding system, PA, SA and ID fans are not expected to be limiting factors for co-firing at the reference load.

9. Startup burner capacity is adequate for start with coke blend.

10. Rotary valves downstream of the limestone feeders is a limiting factor in the limestone handling system which limit feeder capacity to 4.3 ton/hr, as compared to feeder design capacity of 8 ton/hr. The current limestone feeding system can support up to about 20% coke-co-firing. If the rotary valves are upgraded, the system maximum capacity could cover up to 65% coke co-firing. If all three boilers are co-firing coke in the future, capacity of limestone crushing and transport to the boiler house would also need to be upgraded.

11. Baghouse is expected to maintain the particulate emissions at current emission levels even though the solid loading at the baghouse inlet will be much higher than the current levels. More frequent back purging/cleaning is expected but is within the design capacity.

12. Bottom ash drain and cooling screw capacities are expected to be adequate for co-firing up to 70% coke by heat input.