DEP ROUTING AND TRANSMITTAL SLIP

TO: (NAME, OFFICE, LOCATION)

1. Al Linero
2. Air - MS 5500
3.
4. Clay
5.

PLEASE PREPARE REPLY FOR:

____ SECRETARY'S SIGNATURE

____ DIV/DIST DIR SIGNATURE

____ MY SIGNATURE

____ YOUR SIGNATURE

____ DUE DATE _____

ACTION/DISPOSITION

____ DISCUSS WITH ME

____ COMMENTS/ADVISE

____ REVIEW AND RETURN

____ SET UP MEETING

____ FOR YOUR INFORMATION

____ HANDLE APPROPRIATELY

____ INITIAL AND FORWARD

____ SHARE WITH STAFF

____ FOR YOUR FILES

COMMENTS:

File # 0990332-007-AC
Osceola

FROM: Jeff Brown DATE: 7-20 PHONE: 8-930

DEP 15-026 (12/93)

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

OSCEOLA POWER LIMITED
PARTNERSHIP,

Petitioner,

vs. OGC File No. 98-1245

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION,

Respondents.
_____/

ORDER DENYING REQUEST FOR EXTENSION
OF TIME TO FILE PETITION FOR HEARING

This cause has come before the Florida Department of Environmental Protection (Department) on receipt of a request made by Petitioner, OSCEOLA POWER LIMITED PARTNERSHIP, to grant an extension of time to file a petition for administrative proceeding regarding application number 0990332-007-AC. See Exhibit 1.

Counsel for Petitioner has represented that permit changes have resolved the Petitioner's concerns.

IT IS ORDERED:

Accordingly, the motion will be DENIED but, in an abundence of caution, Petitioner will be afforded leave to file a petition for administrative hearing within 15 days from the date set forth in the certificate of service on the last page of this order. The petition must be filed (received) in the Office of General Counsel, 3900

Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000.

DONE and ORDERED this 17th day of July, 1998, in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

F. PERRY ODOM
General Counsel

3900 Commonwealth Boulevard
Mail Station 35
Tallahassee, FL 32399-3000
Telephone: (850) 488-9314

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to S.120.52 Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Heather Chapman
CLERK

7/20/98
DATE

CERTIFICATE OF SERVICE

I CERTIFY that a copy of the foregoing was mailed to David S. Dee, 310 West College Avenue, Post Office Box 271, Tallahassee, Florida 32302, on this 20 day of July, 1998.

Jeffrey Brown
Assistant General Counsel
Florida Bar No.: 0843430

3900 Commonwealth Boulevard
Mail Station 35
Tallahassee, FL 32399-3000
Telephone: (850) 488-9730

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

OSCEOLA POWER LIMITED PARTNERSHIP, Petitioner, v. FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION, Respondent.	)	OGC Case No. 98-1245 DEP File No. 0990332-007-AC (PSD-FL-197)

OSCEOLA POWER'S MOTION FOR A SECOND EXTENSION OF TIME TO FILE PETITION FOR FORMAL ADMINISTRATIVE HEARING

Petitioner, Osceola Power Limited Partnership ("Osceola Power"), by and through its undersigned counsel, and pursuant to Rule 28-106.111, Florida Administrative Code, hereby requests the Respondent, Department of Environmental Protection ("Department"), to grant an extension of time for filing a petition for a formal administrative hearing under Section 120.569(1) and 120.57(1), Florida Statutes. In support of this motion, Osceola Power says:

1. On or about March 30, 1998, Petitioner received a copy of the Department's notice of "Intent To Issue Air Construction Permit Modification" for Osceola Power's cogeneration facility in Palm Beach County, Florida. The Department's notice of intent was attached to a draft permit modification ("Draft Permit").

2. In general, the Department's Draft Permit grants the modification that was requested by Osceola Power. However, the

EXHIBIT 1

Draft Permit also contains proposed new language which needs to be revised and clarified.

3. Osceola Power believes that the Department and Osceola Power will agree to revise the Draft Permit in a manner that is mutually acceptable to both parties. As a result, Osceola Power does not expect to file a petition for a formal administrative hearing concerning the Draft Permit.

4. Nonetheless, Osceola Power recognizes that the Department may receive public comments concerning the Draft Permit for thirty days. The Department also may receive a petition for a formal administrative hearing from a third party. It is possible that the Department may receive a public comment or a petition that results in other changes to the Draft Permit that may be unacceptable to Osceola Power.

5. Osceola Power does not wish to waive its right to file a petition for a formal administrative hearing until Osceola Power can determine with certainty whether the Department's final permit modification will be issued in a form that is acceptable to Osceola Power. Accordingly, Osceola Power wishes to obtain an extension of time for filing a petition, if necessary.

6. Osceola Power previously received an extension until May 11, 1998. The first extension is inadequate because it will expire before the deadline for filing public comments. This second request will extend Osceola Power's deadline beyond the deadline for filing public comments.

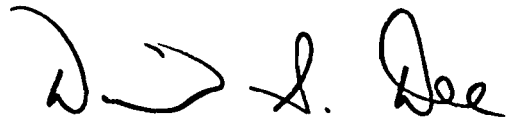
7. The undersigned counsel for Osceola Power has discussed

this request with Mr. Jeff Brown, the attorney representing the Department in this case. Undersigned counsel is authorized to represent that Mr. Brown has no objection to this request for an extension of time.

WHEREFORE, Petitioner, Osceola Power, respectfully requests the Department to grant a thirty day extension of time for filing a petition for a formal administrative hearing concerning the Draft Permit.

Respectfully submitted this 11th day of May, 1998.

LANDERS & PARSONS



DAVID S. DEE
Florida Bar No. 281999
310 West College Avenue
Post Office Box 271
Tallahassee, Florida 32302
Phone: 850/681-0311
FAX: 850/224-5595

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that the original and one copy of Osceola Power's Motion For A Second Extension of Time To File Petition For Formal Administrative Hearing have been served by hand delivery to the Clerk, Department of Environmental Protection, 3900 Commonwealth Boulevard, Douglas Building, Tallahassee, Florida 32399; and true and correct copies of the foregoing have been served by U.S. Mail to: Mr. Jeff Brown, Assistant General Counsel, Department of Environmental Protection, 2600 Blair Stone Road, Twin Towers Office Building, Tallahassee, Florida 32399 this 11th day of May, 1998.

Attorney

cc: Bill Tarr
Silvia Alderman

LANDERS & PARSONS, P.A.
ATTORNEYS AT LAW

CINDY L. BARTIN
DAVID S. DEE
JOSEPH W. LANDERS, JR.
JOHN T. LaVIA, III
FRED A. McCORMACK
PHILIP S. PARSONS
ROBERT SCHEFFEL WRIGHT

HOWELL L. FERGUSON
OF COUNSEL

VICTORIA J. TSCHINKEL
SENIOR CONSULTANT
(NOT A MEMBER OF THE FLORIDA BAR)

310 WEST COLLEGE AVENUE
POST OFFICE BOX 271
TALLAHASSEE, FLORIDA 32302
TELEPHONE (904) 681-0311
TELECOPY (904) 224-5595

May 6, 1997

Mr. Howard Rhodes
Division of Air Resources Management
Florida Department of Environmental Protection
2600 Blair Stone Road
Twin Towers Office Building
Tallahassee, Florida 32399

Re: Okeelanta Power Limited Partnership;
AC 50-219413; PSD-FL-196

0990332-007-AC

Dear Mr. Rhodes:

This law firm assists the Okeelanta Power Limited Partnership ("Okeelanta Power") with certain environmental law issues affecting Okeelanta Power's cogeneration facility ("Facility") in Palm Beach County, Florida. On behalf of Okeelanta Power, I am sending this letter to the Florida Department of Environmental Protection ("DEP") to request a minor amendment to the above-referenced permit for the Facility.

Specific Condition No. 11 of the permit provides:

> . . . The facility shall not exceed 74.9 (gross) megawatt generating capacity, 1 hour average, except during emission compliance and equipment performance tests. Equipment performance testing shall be limited to a 180-day calendar period after initial firing of each boiler. . . .

Okeelanta Power has not yet conducted the equipment performance tests for the Facility. Okeelanta Power plans to commence the equipment performance tests within the next few weeks and will complete the tests no later than July 1, 1997. Since Okeelanta Power initially fired the Facility's boilers more than 180 days ago, Okeelanta Power respectfully requests the DEP to amend the above-referenced permit to allow equipment performance tests through July 1, 1997.

Okeelanta Power's request will not result in any increase in the Facility's emissions. There will not be any adverse environmental impacts associated with this request. Therefore, Okeelanta Power believes this request should be approved as an administrative amendment to the permit.

On May 7, 1997, Okeelanta Power will hand-deliver a check in the amount of $250 to the Department to pay the Department's processing fee for the permit amendment.

Given the short time available before Okeelanta Power commences its test program, we would be very grateful if the Department would expedite its review and approval of this request.

If you have any questions about this request, please call me at (904)681-0311 or Mr. James Meriwether, Okeelanta Power's environmental compliance officer, at (561) 993-1003. Thank you for your assistance and cooperation with this matter.

Sincerely,

David S. Dee

James Meriwether
Clair Fancy

Proposed Amendment to Okeelanta Power Permit

11. . . . Equipment performance testing shall be completed by July 1, 1997. ~~limited to a 180-day calendar period after initial firing of each boiler~~. . . .

OKEELANTA POWER LTD. PARTNERSHIP

DATE	INVOICE NO.	DESCRIPTION	INVOICE AMOUNT	DEDUCTION	BALANCE
5/6/97	AC 50-219413	PSD FL 196	$250.00		$250.00

CHECK DATE	5/6/97	CHECK NUMBER	5466	TOTALS	$250.00		$250.00

PLEASE DETACH THIS PORTION AND RETAIN FOR YOUR RECORDS

5466

OKEELANTA POWER LTD. PARTNERSHIP
6 MILES SOUTH OF SOUTH BAY
ON US HWY. 27
SOUTH BAY, FL 33493

FIRST UNION NATIONAL BANK
OF FLORIDA
FT. LAUDERDALE, FLORIDA 33301
63-643-670

Pay: * * * * * * * * * *Two hundred fifty dollars and 00 cents* * * * * * ** *

DATE	CHECK NO.	AMOUNT
5/6/97	5466	$250.00

PAY TO THE ORDER OF Florida Department of Environmental Protection

[redacted]

FLORIDA DEPARTMENT OF HEALTH & REHABILITATIVE SERVICES

Working in partnership with local communities to help people be self-sufficient, experience good health and live in stable families and communities.

October 28, 1996
(Faxed)

Willard Hanks, Air Permit Engineer
New Source Review Section
Bureau of Air Regulation
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399-2400
(904) 922-6979

Re: Comments on Proposed Trial Burn
Cogeneration Power Plants - Tire Derived Fuel (TDF)
Okeelanta Power Ltd. and Osceola Power Ltd.

Dear Mr. Hanks:

The Department is considering a proposal to test burn tire derived fuels (TDF) at these facilities. The Health Department believes this is reasonable and would provide information needed to make a final determination on these applications. We request the following conditions be considered in the Department's approval for a trial burn:

(1) Trial Burn Window: The trial burn is approved for a period of (60) consecutive calendar days from the initial burning of TDF.

(2) Notification: The facility shall notify the Health Department at least (1) day prior to the initial burning of TDF. The facility shall notify the Health Department at least (15) days prior to conducting any requested stack testing.

(3) Continuous Monitoring Requirements: During the entire trial burn period, the facility shall continuously monitor and record the SO_2, NOx, and CO concentrations, the opacity, and the heat input rates from each operating boiler with the certified monitors required by permit. In addition, the facilities shall continuously monitor and record the TDF, biomass, bagasse, and fuel oil feed rates during the entire test burn period.

(4) Requested Stack Testing:

(a) *Hydrochloric Acid Emissions*: At least one boiler at each facility shall stack test for HCl emissions during the test burn period.
- Test Method shall be EPA Method 26 or 26A.
- Test shall consist of a minimum of (3), one-hour runs while burning at least 90% of the requested maximum TDF feed rate.
- Emissions shall be reported in pounds of HCl per hour.

(b) *Dioxin/Furan Emissions*: At least one boiler at each facility shall stack test for dioxin/furan emissions during the test burn period.
- Test Method shall be EPA Method 23.
- Test shall consist of a minimum of (3), four-hour runs while burning at least 90% of the requested maximum TDF feed rate.

DISTRICT IX
PALM BEACH COUNTY PUBLIC HEALTH UNIT - P.O. BOX 29 - WEST PALM BEACH, FL 33402
LAWTON CHILES, GOVERNOR

- Emissions shall be reported in ng/dscm for total mass dioxins/furans AND ng/dscm for the 2,3,7,8-tetrachlorinated dibenzo-p-dioxin toxic equivalents based on the 1989 international toxic equivalency factors.
- The activated carbon feed rate (in pounds per hour) shall be monitored and recorded at least at (15) minute intervals during each test run.

(5) Test Burn Reports: Within (60) days of completion of the test burn period, the facilities shall provide the DEP and the Health Department with a report, including:

- A summary of the over all project including a description of the equipment used to handle, transfer, and burn TDF.
- Any changes in boiler operations required to accommodate TDF.
- Any problems identified during the trial burn period.
- A summary of the emissions of SO_2, NOx, CO, the opacity, the heat input rates, and the fuel feed rates as determined from the continuous monitoring records.
- A summary of the emissions of HCl and dioxins/furans, including a comparison of the measured results with the predicted emissions.
- A comparison of the measured dioxin/furan results with the new emission guidelines for municipal waste combustors.
- A summary of the compliance status with regard to the current permit limits.

If you have any questions on these comments, please contact me at the numbers below.

Sincerely,

For the Division Director
Environmental Health and Engineering

Jeffery F. Koerner, Air Permit Engineer
Air Pollution Control Section
Phone: (407) 355-4549 Suncom: 273-4549
FAX: (407) 355-2442

Filename: COGEN_3.CMT

CC: D. Knowles, SD
K. Anderson, DEP
EPA
NPS
S. Arif, BAR
W. Hanks, BAR

P 339 251 142

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to Don Schabers	
Street & Number Osceola Power, LP	
Post Office, State, & ZIP Code Pahokee, Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 1UF 8-16-96 PSD-Fl-197C	

PS Form **3800**, April 1995

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- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
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- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Mr. Don Schabers, V.P.
Osceola Power, LP
P.O. Box 606
Pahokee, Fl 33476

4a. Article Number
P 339 251 142

4b. Service Type
☐ Registered ☐ Insured
☑ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery
8/20/96 (MO)

5. Signature (Addressee)

8. Addressee's Address (Only if requested and fee is paid)

6. Signature (Agent)
Vivian Davis

PS Form **3811**, December 1991 ☆U.S. GPO: 1993—352-714 **DOMESTIC RETURN RECEIPT**

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RECEIVED

AUG 23 1996

BUREAU OF
AIR REGULATION

Print your name, address and ZIP Code here

Department of Environmental Protection
Mail Station 5505 -- NSRS
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

August 16, 1996

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Don Schaberg
General Manager
Osceola Power Limited Partnership
Post Office Box 606
Pahokee, Florida 33476

Re: Osceola Power Limited Partnership
Tire Derived Fuel Permit Amendment
Permit File No. AC50-269980, PSD-FL-197C

Dear Mr. Schaberg:

The Department has received the responses to our incompleteness letter for incorporating the use of Tire Derived Fuel (TDF) as a supplemental fuel at Osceola Power in Palm Beach County. Based on our review of the responses, we have determined that additional information is needed in order to continue processing this application package. Please submit the information requested below to the Department's Bureau of Air Regulation:

1. Attached are concerns raised by the Bureau of Solid and Hazardous waste pertaining to air and ash issues. Please respond to their concerns. If there are any questions on these issues, please contact Kathy Anderson at (904) 488-0300.

2. The corrected application pages submitted with the response indicates TDF firing to be 25 percent on an annual basis. The original application stated TDF firing to be limited to 16.5 percent annually. Please explain the discrepancy between the two numbers.

3. Please indicate if a waiver has been approved for an extension of the initial performance test. When will the initial performance test take place?

The Department will resume processing this application after we receive the requested information. Should you have any questions, please contact Syed Arif at 904-488-1344.

Sincerely,

for
A. A. Linero, P.E.
Administrator
New Source Review Section

AAL/sa/t

cc: D. Knowles, SD
J. Koerner, PBCHU
K. Anderson, DEP
J. Harper. EPA
J. Bunyak, NPS
D. Buff, KBN

Florida Department of
Environmental Protection

Memorandum

TO: Syed Arif

FROM: Kathy Anderson, Solid Waste Section SKA 8/12/96

DATE: August 12, 1996

SUBJECT: Osceola & Okeelanta Sugar Mill Cogeneration Facility
Tire Derived Fuel Permit Amendment

I have reviewed the July 17,1996 response that Okeelanta and Osceola had to your first RAI on Permit Amendment # AC50-269980. The following is a list of questions that I would like to see addressed pertaining to air and ash :

1. The current permit requires that the concentration of heavy metals be measured in the wood fuel prior to incineration and in the ash prior to disposal. Please provide mass balance calculations for heavy metals in the ash and wood fuel. For example, since the average concentration of arsenic is known in the fly ash, back calculate the concentration of arsenic in the wood fuel prior to incineration. How do the calculated numbers compare to the actual concentrations observed in the wood fuel ? Submit summary tables of actual data collected for heavy metals in ash and wood fuel to validate the use of average concentrations numbers used in the mass balance calculations.
2. Compare the calculated concentration of arsenic in the wood fuel with the <3% CCA treated wood by volume assumption used in the 5/2/96 Okeelanta submittal (see Table 2-11). Explain any significant differences.
3. Compare the calculated concentration of arsenic in the wood fuel with the <2.4% CCA treated wood by volume assumption used in the 4/18/95 Osceola submittal (see Table 2-9) ?
4. The TDF data presented is for TDF fuel only, what are that anticipated concentrations of heavy metals in the wood fuel combined with TDF ? What are the anticipated concentrations of heavy metals in the ash ? Please present mass balance calculations supporting the anticipated concentrations of heavy metals.

I have many more questions pertaining to ash that will be dealt with in the solid waste tire permit which is currently being processed in South District, but I felt like these questions pertained to air permit conditions and could be addessed through your RAI.

These question may have been addressed in the original application, if so please fax me a copy of the information. Additionally, please send me a copy of the portion of the facility's air permit that addresses the wood waste and TDF fuel being received and incinerated for each facility and the current ash handling requirements, i.e. wood waste sampling & storage requirements.

P 339 251 104

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to: Dennis Space	
Street & Number: Okeelanta Power	
Post Office, State, & ZIP Code: South Bay, Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 6-12-96	

AC50-219443
PSD-FI-196A

PS Form **3800**, April 1995

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- Complete items 3, and 4a & b.
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- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Dennis Space, Gen. Mgr.
Okeelanta Power, LP
P O Box 8
South Bay, Fl
33493

4a. Article Number
P 339 251 104

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery
6-17-96

5. Signature (Addressee)

8. Addressee's Address (Only if requested and fee is paid)

6. Signature (Agent)

PS Form **3811**, December 1991 ☆U.S. GPO: 1993—352-714 **DOMESTIC RETURN RECEIPT**

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BUREAU OF AIR REGULATION

Print your name, address and ZIP Code here

Department of Environmental Protection
Division of Air Resources Management
Bureau of Air Regulation, NSRS
2600 Blair Stone Road, MS 5505
Tallahassee, Florida 32399-2400

Department of
Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

June 12, 1996

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Dennis Space
General Manager
Okeelanta Power Limited Partnership
Post Office Box 8
South Bay, Florida 33493

Re: Okeelanta Power Limited Partnership
Tire Derived Fuel Permit Amendment
Permit File No. AC50-219413, PSD-FL-196A

Dear Mr. Space:

The Department has received the application for incorporating the use of Tire Derived Fuel (TDF) as a supplemental fuel at Okeelanta Power in Palm Beach County. Based on our initial review of the proposed project, we have determined that additional information is needed in order to continue processing this application package. Please submit the information requested below to the Department's Bureau of Air Regulation:

1. 40 CFR 60.8(a) requires that owners and operators of NSPS facilities conduct an initial performance test no later than 60 days after reaching maximum production or 180 days after initial startup, whichever comes first. Specific Condition No. 21 (a) of the above referenced permit also requires the same. The application states that first firing in the boilers occurred in October, 1995. Based on this, the initial performance test should have been conducted at the latest by April, 1996. If the test was conducted, please submit the results for the same. If the test was not conducted, please explain the reasons for the variance from 40 CFR 60.8(a) and Specific Condition No. 21(a) requirements.

2. 40 CFR 60, Subpart Ea defines Cofired combustor as a unit combusting 30 percent or less by weight municipal solid waste (MSW) with a non-MSW fuel as measured on a calendar quarter basis. What measures will be taken by the

facility to comply with the 30 percent by weight requirements, particularly noting that yard wastes and tires are considered MSW , and will be used as fuel for the boilers.

3. Please quantify increases in lead emissions, if any, due to TDF burning.

4. Please quantify ash content (bottom, siftings and fly) generated from TDF combustion, and provide the chemical analyses for each element. What measures will be taken for offsite disposal, and where will be the final destination.

The Department will resume processing this application after we receive the requested information. Should you have any questions, please contact Syed Arif (engineering) or Cleve Holladay (modeling) at 904-488-1344.

Sincerely,

6/12

A. A. Linero, P.E.
Administrator
New Source Review Section

AAL/sa/t

cc: D. Knowles, SD
J. Koerner, PBCHU
J. Harper, EPA
J. Bunyak, NPS
D. Buff, KBN

MEMORANDUM

DATE: July 17, 1997

TO: Frank J. Gargiulo, PE, Director
Environmental Health and Engineering - PBCHD

FROM: Jeff Koerner, PE, Air Pollution Control Section
Environmental Health and Engineering - PBCHD

RE: Update on Cogeneration Plants

The following is provided as an update on the changes being made to the cogeneration plants operated by the Okeelanta Power and Osceola Power Limited Partnerships. This information was compiled from telephone conversations with the environmental managers of these plants and an inspection of the Okeelanta Power site on July 9, 1997.

Power Generation

Both cogeneration plants are on line and generating electricity. FPL has recently filed a law suit against the cogeneration plants to have these contracts considered invalid. FPL alleges that the cogeneration plants did not deliver sufficient, dependable electrical power by the deadline and in accordance with the contracts.

During the site inspection, Okeelanta Power was firing two boilers and generating about 60 MW of electrical power which is about 80% of the facility's permitted capacity of 74.9 MW. This facility is designed to generate 74.9 MW with two boilers and uses the third to provide steam for the sugar mill during cane grinding season and to provide backup for the other two boilers.

The Conveyor Feed System

The original fuel feed system was designed to handle both bagasse and wood waste. However, initial operation indicated that the dual purpose vibrating feeders were inappropriate for bagasse resulting in frequent feeder jams. A separate bagasse feed system was installed which improved reliability and reduced feeder jamming.

Also, several other factors such as oversized materials, tramp metal, incorrect feed rates, and high moisture content of the bagasse and wood waste have contributed fuel feed problems. Although each boiler is fueled by several feeders, a problem with a single feeder can disrupt the current combustion characteristics and possibly lead to excess emissions. Operators are being trained to thoroughly blend fuels to provide a more homogenous mixture.

Seals and Expansion Joints

Bagasse and wood waste fuels are fed onto a vibrating grate in the boiler. High boiler operating temperatures cause certain pieces of equipment to expand several inches. The original design included expansion joints and seals to prevent air infiltration into these areas. However, leaks developed that allowed air infiltration which disrupts efficient combustion. The facility attempted to seal these leaks, but later determined that a retrofit would be required to solve this problem. Also, sagging water wall boiler tubes were contacting the vibrating grates which resulted in inadequate combustion, clinkers, slagging, and poor ash load out. A revised design using new materials is currently being installed in one boiler at Okeelanta. The remaining boilers will be shut down in turn and likewise modified before the new cane grinding season which begins in October. Osceola Power has completed this work.

Induced Draft Fans (I.D. Fans)

I.D. fans move exhaust gases through the boilers, duct work, control equipment and out the stacks. The original design placed them before the Electrostatic Precipitators (ESPs) which control particulate matter emissions. However, the combustion flue gases proved to be higher in abrasive particulates than anticipated and caused erosion of the duct work and the fan impeller blades. This caused air infiltration, changed the characteristics of the fan performance, and reduced the boiler draft resulting in poor combustion and upsets. The fans were then moved to the down stream side of the ESPs so that the exhaust gases were cleaned of particulate before entering the fans. Although this helped eliminate the abrasion of this equipment, it decreased the

PALM BEACH COUNTY HEALTH DEPARTMENT • P. O. BOX 29 • WEST PALM BEACH, FL 33402-0029

ability of the system to be able to respond to problems and corrections by the control system. This increased the frequency of the boilers going positive and tripping off line. Dampers are being modified and adjusted to regain control and response of the system.

Distributive Control System (DCS)

The Distributive Control System (DCS) is responsible for establishing good combustion by controlling the amounts of under-fire air, over-fire air, and fuel feed rates. Initial tests were performed to establish air-to-fuel ratios that result in good combustion of the fuels and therefore, lower pollutant emissions. However, due to the numerous problems already discussed, it is almost impossible to fine tune the system based on the original tests. The cogeneration plants intend to complete the above modifications, hire a specialist to perform the test to establish new air-to-fuel ratios for the modified system, and adjust the DCS accordingly. It is believed these actions will reestablish what "good operating characteristics" for these units should be and prevent frequent upset conditions.

Other Miscellaneous Equipment Problems

- Frequent upsets have been caused by the fly ash and bottom ash removal systems due to inferior equipment. Both of these systems are being "ruggedized" or replaced with new heavy duty equipment.
- Replaced blowers on the activated carbon feed system with new heavy duty units.
- Increased rapping frequency on Electrostatic Precipitators to prevent heavy fly ash accumulation and occasional opacity spikes.
- Replacing boilers tubes with new materials.

Permit Modifications

Both cogeneration plants have requested permit modifications to increase emission limits or averaging periods for certain pollutants. In each case, they have indicated that they are aware of the county zoning requirements and that these changes will not result in an exceedance of the county's emissions caps.

Ash Disposal

The cogeneration plants plan to field spread ash generated while burning bagasse, as do all of the sugar mills. However, ash generated from burning wood waste has tested high for cadmium and arsenic; higher than the industrial clean fill soil guidelines proposed by the Department of Environmental Protection (DEP). Wood waste ash is presently being stockpiled at the facilities in separate areas for fly ash and bottom ash as these have tested at different contaminant concentrations. The DEP is currently reviewing a risk analysis which considers field spreading the bottom ash as well as a proposal for the reuse of fly ash in building materials such as road beds, concrete products, etc. If the Department does not allow field spreading or reuse, it is most likely that the ash will be land-filled. Meanwhile, the ash is being stockpiled on site and run-off contained by the percolation systems. The external surface of the piles has combined with rain water to form a hard crust which prevents wind blown dust. No fugitive emissions from these piles were observed during the site inspection.

Tire-Derived Fuels (TDF)

The cogeneration plants received approval from the DEP to perform an initial trial burn of tire-derived fuel at one of the boilers. Although a small amount of TDF has been stockpiled at Okeelanta Power site, no TDF has yet been burned. Okeelanta Power is considering making a request to extend the testing deadline and possibly waiting until next year to perform the TDF trial burn.

CC: W. Hanks, BAR
H. Rhodes, DDO
J. Pennington, BAR
C. Fancy, BAR
A. Linero, BAR

Fold at line over top of envelope to

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
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- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
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Consult postmaster for fee.

3. Article Addressed to:
Dennis V. Space, H.M.
OKeelanta Power, LP
PO Box 8
South Bay, FL
33493

4a. Article Number
P 265 659 210

4b. Service Type
☐ Registered ☒ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery
5-13-97

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X P. Bourg

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PS Form **3811**, December 1994 Domestic Return Receipt

P 265 659 210

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to
Dennis Space
Street & Number
OKeelanta Power
Post Office, State, & ZIP Code
South Bay, FL

Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	5-8-97

0990332-007-AC
PSD-FI-196D

PS Form **3800**, April 1995

Department of
Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

May 8, 1997

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Dennis V. Space, General Manager
Okeelanta Power Limited Partnership
Post Office Box 8
South Bay, Florida 33493

Re: FINAL Permit Amendment No. 0990332-007-AC
PSD-FL-196D

Dear Mr. Space:

The Department has reviewed Landers & Parsons' May 6 letter requesting a permit amendment to authorize a new schedule for the performance test of your cogeneration boilers located near South Bay in Palm Beach County. This request is acceptable and the referenced permit is amended as follows:

Specific Condition No. 11

The proposed cogeneration facility steam generatiang units shall be constructed and operated in accordance with the capabilitites and specifications described in the application. The facility shall not exceed 74.9 (gross) megawatt generating capacity, 1 hour average, except during emission compliance and equipment performance tests. Equipment performance testing shall be ~~limited to a 180 day calendar period after initial firing of each boiler~~ completed by July 1, 1997. The hourly average generation rate shall be recorded in a log and the log retained for at least 2 years. The maximum heat input rate for each steam generator shall not exceed 715 MMBtu/hr when burning 100 percent biomass and 490 MMBtu/hr when burning 100 percent No. 2 fuel o il or low sulfur coal. Maximum heat input to the entire facility (total all three boilers) shall not exceed 11.5×10^{12} Btu per year. Steam production of each boiler shall not exceed an average of 455,418 lbs/hr at 1,500 psig, 975°F.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative hearing in accordance with Sections 120.569 and 120.57 F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000, telephone: 904/488-9730, fax: 904/487-4938. Petitions must be filed within fourteen days of receipt of this letter. A petitioner must mail a copy of the petition to the applicant at the address indicated above, at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-5.207 of the Florida Administrative Code.

A petition must contain the following information: (a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Permit File Number and the county in which the project is proposed; (b) A statement of how and when each petitioner received notice of the Department's action or proposed action; (c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action; (d) A statement of the material facts disputed by petitioner, if any; (e) A statement of the facts that the petitioner contends warrant reversal or modification of the Department's action or proposed action; (f) A statement identifying the rules or statutes that the petitioner contends require reversal or modification of the Department's action or proposed action; and (g) A statement of the relief sought by the petitioner, stating precisely the action that the petitioner wants the Department to take with respect to the action or proposed action addressed in this notice of intent.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice of intent. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

A copy of this letter shall be filed with the referenced permit and shall become part of the permit.

Sincerely,

Howard L. Rhodes, Director
Division of Air Resources
Management

HLR/wh/t

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this AMENDMENT was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 5-8-97 to the person(s) listed:

Mr. Dennis Space, Okeelanta Power L.P. *
Mr. David Knowles, SD
Mr. James Stormer, PBCPHU
Mr. David Dee, Landers and Parsons

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to §120.52(7), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

(Clerk) 5-8-97 (Date)

KBN
A GOLDER ASSOCIATES COMPANY

file

July 17, 1996

Mr. Al Linero, P.E.
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 33493

Re: Osceola Power Limited Partnership
Tire-Derived Fuel Permit Amendment
Facility ID No. 0990331
Permit File No. AC50-269980; PSD-FL-197C

Dear Mr. Linero:

KBN Engineering and Applied Sciences, Inc. (KBN) has prepared the following responses to your request for additional information concerning the request to utilize tire-derived fuel at the Osceola Power Limited Partnership cogeneration facility.

1. Stack testing no later than 60 days after reaching maximum production, as stated in Specific Condition No. 21 of permit AC50-269980 and required by 40 CFR 60.8(a), was not performed due to cogeneration boiler operational difficulties. Osceola Power is in the process of requesting an extension of the 60-day requirement in order to remain in compliance with its permit.

2. To comply with the 30 percent or less by weight limit on municipal solid waste (MSW) as stated in the definition of "cofired combustor" under 40 CFR 60, Subparts Ea and Cb, Osceola Power will set up a weigh scale specifically to meter and record the amount of tire-derived fuel (TDF) that is fed to the boilers. Due to the nature and the state in which Osceola Power receives yard waste (i.e., co-mingled yard waste and construction and demolition debris), Osceola Power plans to obtain supplier certification analysis documenting the percentage of yard waste it receives in each delivery. This information along with the weight of each delivery will be used to determine the weight of MSW in each delivery. This data will be compiled, along with the amount of other fuels burned, and totaled on a calendar quarter basis to demonstrate compliance with the 30 percent by weight limitation, as required by the New Source Performance Standards (NSPS).

3. A PSD source applicability analysis table (Table 1) for the facility is attached.

4. There will be no increase above the current allowable mercury emissions of 0.0045 lb/hr and 0.0168 TPY due to TDF burning. Maximum short-term emissions occur under maximum coal firing conditions. As shown in Table 2-5 of the application, the mercury emission factor for TDF of 6.5E-06 lb/MMBtu is lower than that for coal (8.4E-06 lb/MMBtu). As shown in Table 2-7, the annual mercury emissions are potentially the highest when burning the maximum amount of TDF (0.0175 TPY). However, pursuant to Specific Condition No. 24 of permit No. AC50-269980, after conducting the initial compliance tests, a fuel management plan will be submitted to the Department specifying the fuel types and fuel quantities to be burned in the facility in order to not exceed the allowable annual mercury emission limit of 0.0168 TPY.

6241 Northwest 23rd Street, Suite 500, Gainesville, Florida 32653-1500, 352-336-5600 FAX 352-336-6603
5405 West Cypress Street, Suite 215, Tampa, Florida 33607, 813-287-1717 FAX 813-287-1716
1801 Clint Moore Road, Suite 105, Boca Raton, Florida 33487, 407-994-9910 FAX 407-994-9393
7785 Baymeadows Way, Suite 105, Jacksonville, Florida 32256, 904-739-5600 FAX 904-739-7777
1616 'P' Street NW, Suite 350, Washington, DC 20036, 202-462-1100 FAX 202-462-2270

5. Individual fuels will be managed through record keeping and monitoring of continuous emissions, and based on compliance testing, the facility will remain within allowable emission limits established under Specific Condition No. 20 of permit No. AC50-269980. Due to emission limits for certain pollutants such as SO_2, it will not be possible to burn both the maximum annual amounts of coal and TDF. So, in this respect, there will be an tradeoff of coal burning emissions for TDF firing emissions. Osceola Power prefers to burn TDF, since it is a non-fossil fuel, a waste material, and is more cost-effective than coal.

6. The quantity of ash (bottom, siftings, and fly) generated from TDF combustion can be calculated from the TDF ash content of 4.78 percent and the maximum TDF usage of 43,867 TPY. This yields 2,097 TPY of ash due to TDF burning. The concentration of each element in the TDF ash is presented in Table 2. These calculations are based on the TDF fuel analysis (presented in Table 2-4 of the permit application), the maximum amount of TDF to be burned, the TDF ash content, and the electrostatic precipitator (ESP) removal efficiency.

   Please note that Table 2 presents concentrations of elements as if they were all incorporated into the TDF ash only. However, TDF will be burned in combination with biomass, which, on average, will generate about five times more ash than TDF burning will generate. Thus, actual trace element concentrations in the ash due to combined biomass/TDF firing will be much lower than those shown in Table 2.

   Tentatively, Osceola Power plans to dispose of the ash generated during TDF firing at the Chambers Landfill at Lake Okeechobee.

7. Osceola Power is not aware of any further measures available since the submittal of the April 1995 permit application that the facility could take that would limit the predicted arsenic impacts below the annual Florida Ambient Reference Concentration (FARC). Testing of actual arsenic concentrations in the wood waste received at Osceola is ongoing at this time. Further analysis is still needed to complete the results. However, at this point, testing does indicate that predicted arsenic impacts will possibly be below the annual FARC.

Presented below are responses to PBCPHU comments dated June 13, 1996.

1. The facility does not plan to receive any whole tires. All tires will be chipped offsite and shipped to Osceola Power by truck. The only additional equipment installed to accommodate TDF will be a feed hopper and conveyor belt. TDF unloaded in the TDF storage area will be moved by front-end loader and placed in the feed hopper. This hopper will feed to a conveyor belt, which will discharge onto the main biomass conveyor belt.

2. It is currently planned to relocate the ID fans to downstream of the ESPs. The relocation is scheduled to occur in July and August 1996. Both boilers have been taken offline to allow the facility to complete the modification as soon as possible. Currently, there are no plans to modify the fuel handling system to handle TDF fuel. The present system is considered adequate to handle the tire chips.

3. (a) The facility is requesting exemption from 40 CFR 60 Subpart Cb as a "cofired combustor." The rule citation is 40 CFR 60.32b(I). This exemption is the same exemption provided for under 40 CFR 60, Subpart Ea, which exempts all units which combust less than 30 percent by weight of MSW on a calendar quarter basis.

   (b) The facility is subject to 40 CFR 60, Subpart Da.

   (c) The statement is correct. The facility is requesting exemption from 40 CFR 60 Subpart Ea as a "cofired combustor." The rule citation is 40 CFR 60.50a(d). This provision exempts all units which combust less than 30 percent by weight of MSW on a calendar quarter basis.

4. Emissions of hydrochloric acid (HCl) from the Osceola Power facility are projected to increase with the burning of TDF. This is due to the chlorine content of the TDF. These emission estimates assume that all the chlorine in the TDF is emitted as HCl, and that none is removed in the air pollution control equipment. In reality, a portion of the acidic HCl gases should be absorbed into the alkaline fly ash. Studies performed by the National Council of the Paper Industry for Air and Stream Improvement, Inc. (NCASI) have demonstrated upwards of 25 percent to 75 percent removal of SO_2 due to alkaline fly ash. HCl gases should be absorbed in a similar manner. No specific control equipment is planned at this time for HCl. No detrimental effect due to HCl in the flue gases is expected. The potential HCl emissions are approximately an order of magnitude lower than potential SO_2 emissions, and no problems are expected due to SO_2 emissions.

5. It is emphasized that the facility will <u>not</u> be burning garbage (MSW or RDF) in the classic sense. The facility will be burning clean wood waste, which may have minor contaminants (plastics, fabrics, leather, metal, etc.) in trace amounts. The only reason that some of the wood waste burned at the facility is classified as MSW is because of the broad definition of MSW in the NSPS. The definition classifies "yard waste" as MSW. "Yard waste" is defined as any vegetative material generated from residential, commercial, retail, institutional or industrial sources. Some of the wood waste burned at the facility may originate from these sources.

   Dioxans and furans resulting from combustion of household garbage (MSW in the traditional sense of the word) or RDF are attributed primarily to the chlorine content of the MSW/RDF and combustion conditions. MSW contains approximately 0.5% chlorine. The MSW/RDF fuel is nonuniform in nature; the heating value, moisture content, and mixture of metals, non-metals, etc., varies considerably. These aspects result in incomplete combustion of the fuel and the resulting formation of dioxans/furans. In contrast, TDF is a very uniform, low-moisture fuel with a high heating value compared to MSW/RDF. In addition, the chlorine content is much lower, approximately 0.15 percent. Based on these aspects, as well as the fact that TDF will be burned in combination with biomass, at relatively low percentages, it was concluded that it is more appropriate to use emission factors based on wood waste firing. Also, the maximum annual dioxin impact predicted for the Osceola Power facility is 3 orders of magnitude below the Florida ambient reference concentration (FARC); therefore no threat to the public is anticipated due to TDF firing.

6. The current permit limit for sulfuric acid mist (SAM) is 0.005 lb/MMBtu for biomass. A higher emission rate was specified in the application for TDF to account for the higher sulfur in the fuel. The emission factor for TDF is 0.01 lb/MMBtu.

   Stack testing at Osceola Power has not yet been performed. However, testing results from Okeelanta Power Boiler A using a modified U.S. Environmental Protection Agency (EPA) Method 8 test for SAM have shown emissions to be well within compliance of permitted limits. A modified EPA Method 8 test was found to remove interferences from the combination of high moisture and SO_2 present in Okeelanta's cogen boiler flue gas. Osceola Power's boilers are very similar to those tested at Okeelanta and as such, upcoming stack tests performed at Osceola Power will use the modified EPA Method 8 for measuring SAM emissions.

   Using the modified EPA Method 8 test, SAM emissions from Okeelanta Boiler A were approximately one-third of their permitted limit while burning wood waste. Based on the Okeelanta results for wood waste combustion, Osceola Power predicts that SAM emissions from its boilers will also be below permitted limits. In addition, Osceola Power expects to achieve similar results while firing a mixture of biomass and TDF.

7. In the NCASI document cited, the term "ton wood residue" means the tons of wood waste burned in the boiler. NCASI sometimes terms woodwaste material as "wood residue," since in a paper mill, the wood waste can come from bark, sawdust, and wood chips.

It has also come to our attention that some of the pollutant pages in the application were incorrect in regards to some of the lb/hr and TPY potential emissions from each boiler. The confusion stemmed from the fact that the total emissions from all three boilers cannot exceed certain TPY limits, but each individual boiler may have additional flexibility. The corrected application pages are attached, along with the supportive emission tables for a single boiler operating at maximum (Tables 3, 4, and 5). These changes were incorporated into the recent Title V application for the facility.

If you have any questions or need other information, please call me.

Sincerely,

David A. Buff

David A. Buff
Prinicpal Engineer
Florida Registration 19011

cc: Don Schaberg, Osceola Power
James Meriwether, Okeelanta Power
Bill Tarr, Flo-Sun, Inc.
Paul Wesson, KBN
File (2)

CC: EPA
NPS
Palm Bch Co
SD
S. Arif, BAR

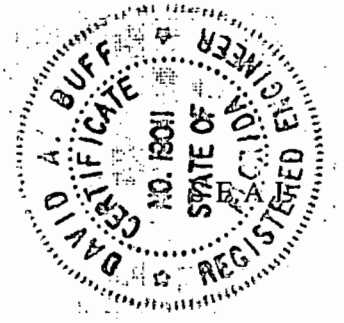

Table 1. PSD Source Applicability Analysis for Osceola Power Limited Partnership Facility

Regulated Pollutant	Original PSD Baseline Emissions (TPY)	Cogeneration Facility Annual Emissions (TPY)	Net Change (TPY)	Significant Emission Rate (TPY)	Current Permit Limit (TPY)	PSD Applies?	Permit Amendment Required?
Particulate (TSP)	357.7	144.2[a]	-213.5	25	144.2[a]	No	No
Particulate (PM10)	321.9	139.0[b]	-182.9	15	139.0[a]	No	No
Sulfur dioxide	178.5	339.0	160.5	40	339.0	No	No
Nitrogen oxides	437.8	477.1	39.3	40	477.1	No	No
Carbon monoxide	5,992.3	1,436.4	-4,555.9	100	1,436.4	No	No
Volatile org. compds.	208.6	219.2	10.6	40	219.2	No[c]	No
Lead	0.16	0.011	-0.15	0.6	0.011	No	No
Mercury	0.0158[d]	0.0168	0.0010	0.1	0.0168	No	No
Beryllium	0.00002	0.0013	0.00128	0.0004	0.0013	No	No
Fluorides	0.0079	5.25	5.24	3	5.25	No	No
Sulfuric acid mist	5.36	6.00	0.64	7	6.0	No	No
Total reduced sulfur	—	—	0	10	—	No	No
Asbestos	—	—	0	0.007	—	No	No
Vinyl Chloride	—	—	0	0	—	No	No

[a] Includes 123.1 TPY from boilers and 21.1 TPY from fugitive dust emission sources.
[b] Includes 123.1 TPY from boilers and 15.9 TPY from fugitive dust emission sources.
[c] Nonattainment review does not apply since the increase in VOC emissions is less than 40 TPY.

Table 2. Summary of Tire Derived Fuel Ash Chemical Analysis at Osceola Power L.P. Facility

Parameter	Reference 1 Analysis	Reference 2 Analysis	Average Value	ESP Control Eff. (%)	Ash Element Concentration (ppm)
	(% by wt.)	(% by wt.)			
Carbon	83.87	83.87	83.87	--	--
Hydrogen	7.09	7.09	7.09	--	--
Oxygen	2.17	2.17	2.17	--	--
Nitrogen	0.24	0.24	0.24	--	--
Sulfur (a)	1.23	1.23	1.23	--	--
Ash	4.78	4.78	4.78	--	--
	(ppm)	(ppm)	(ppm)		
Aluminum		900	900	99	18,640
Antimony	--	0.01	0.01	99	0
Arsenic	--	7	7	99	145
Barium	--	12	12	99	249
Beryllium	--	0.7	0.7	99	14
Cadmium	6	6	6	99	124
Chromium	97	100	98.5	99	2,040
Chlorine (b)	1,490	--	1490	0	31,172
Cobalt	--	500	500	99	10,356
Copper	--	950	950	99	19,676
Fluoride	10	--	10	0	209
Lead	65	--	65	99	1,346
Manganese	--	1,000	1000	99	20,711
Mercury	--	0.1	0.1	0	2
Molybdenum	--	70	70	99	1,450
Nickel	--	60	60	99	1,243
Selenium	--	105	105	99	2,175
Tin	--	0.01	0.01	99	0
Uranium	--	0.04	0.04	99	1
Vanadium (ppm)	--	1	1	99	21
Zinc (ppm)	15,200	13,000	14100	99	292,029

(a) Based on suflur capture achievable due to alkaline fly ash.
(b) Assumed to be emitted as hydrogen chloride (HCl).
References:

1. Waste Recovery, Inc. Bulletin 20.20.1C Dec. 1986.
2. Burning Tires for Fuel and Tire Pyrolysis: Air Implications. EPA-450/3-91-024.

Example Calculations

Ash Element Concentration (ppm) = (ppm of element * 1E-06 * Control Efficiency if applicable* 43,867 TPY of tires) ÷ (43,867 TPY of tires * 4.78% ash) *1E06

Total aluminium present = 900 * 1E-06 X 43,867 TPY of tires = 39.48 Tons Al
Total aluminium collected in ESP = 39.48 Tons X 0.99 = 39.09 Ton Al
Total ash generated = 43,867 TPY of tires X 4.78% ash = 2,097 Tons ash
Aluminum concentration in ash = 39.09 ÷ 2,097 * 1E06 = 18,640 ppm

Table 3. Maximum Annual Emissions for Any Single Boiler at Osceola Power Cogeneration Facility

Regulated Pollutant	Biomass Emission Factor (lb/MMBtu)	Biomass Activity Factor (E12 Btu/yr)	Biomass Annual Emissions (TPY)	Alternate Fuel Emission Factor (lb/MMBtu)	Alternate Fuel Activity Factor (E12 Btu/yr)	Alternate Fuel Annual Emissions (TPY)	Total Annual Emissions (TPY)
			100% Biomass				
Particulate (TSP)	0.03	6.658	99.87	--	--	--	99.87 a
Particulate (PM10)	0.03	6.658	99.87	--	--	--	99.87 a
Sulfur dioxide	0.02	6.658	66.58	--	--	--	66.58
Nitrogen oxides	0.116	6.658	386.16	--	--	--	386.16
Carbon monoxide	0.35	6.658	1,165.15	--	--	--	1,165.15 a
VOC - Bagasse	0.06	4.461 b	133.83	--	--	--	177.77 a
- Wood Waste	0.04	2.197 c	43.94				
Lead	2.7E-06	6.658	0.009	--	--	--	0.009
Mercury - Bagasse	5.70E-06	4.461 b	0.0127	--	--	--	0.0130
- Wood Waste	2.90E-07	2.197 c	0.00032				
Beryllium	--	--	--	--	--	--	--
Fluorides	--	--	--	--	--	--	--
Sulfuric acid mist	0.00098	6.658	3.26	--	--	--	3.26
			75.1% Biomass / 24.9% Fuel Oil				
Particulate (TSP)	0.03	4.707	70.61	0.03	1.561	23.42	94.02
Particulate (PM10)	0.03	4.707	70.61	0.03	1.561	23.42	94.02
Sulfur dioxide	0.02	4.707	47.07	0.05	1.561	39.03	86.10
Nitrogen oxides	0.116	4.707	273.01	0.12	1.561	93.66	366.67
Carbon monoxide	0.35	4.707	823.73	0.2	1.561	156.10	979.83
VOC - Bagasse	0.06	3.154 b	94.61	0.03	1.561	23.42	149.09
- Wood Waste	0.04	1.553 c	31.07				
Lead	2.7E-06	4.707	0.0064	8.9E-07	1.561	0.0007	0.007
Mercury - Bagasse	5.70E-06	3.154 b	0.0090	2.4E-06	1.561	0.0019	0.0111
- Wood Waste	2.90E-07	1.553 c	0.00023				
Beryllium	--	--	--	3.5E-07	1.561	0.00027	0.00027
Fluorides	--	--	--	6.27E-06	1.561	0.0049	0.0049
Sulfuric acid mist	0.00098	4.707	2.31	0.0025	1.561	1.95	4.26
			93.32% Biomass / 6.68% Coal				
Particulate (TSP)	0.03	6.110	91.65	0.03	0.4373	6.56	98.21
Particulate (PM10)	0.03	6.110	91.65	0.03	0.4373	6.56	98.21
Sulfur dioxide	0.02	6.110	61.10	1.2	0.4373	262.38	323.48 a
Nitrogen oxides	0.116	6.110	354.38	0.15	0.4373	32.80	387.18 a
Carbon monoxide	0.35	6.110	1,069.25	0.2	0.4373	43.73	1,112.98
VOC - Bagasse	0.06	4.094 b	122.81	0.03	0.4373	6.56	169.70
- Wood Waste	0.04	2.016 c	40.33				
Lead	2.7E-06	6.110	0.008	5.1E-06	0.4373	0.0011	0.0094
Mercury - Bagasse	5.70E-06	4.094 b	0.0117	8.4E-06	0.4373	0.0018	0.0138
- Wood Waste	2.90E-07	2.016 c	0.00029				
Beryllium	--	--	--	5.9E-06	0.4373	0.0013	0.0013 a
Fluorides	--	--	--	0.024	0.4373	5.25	5.25 a
Sulfuric acid mist	0.00098	6.110	2.99	0.010	0.4373	2.19	5.18 a
			79.66% Biomass / 20.34% Tire-Derived Fuel				
Particulate (TSP)	0.03	5.304	79.56	0.03	1.345	20.18	99.74
Particulate (PM10)	0.03	5.304	79.56	0.03	1.345	20.18	99.74
Sulfur dioxide	0.02	5.304	53.04	0.40	1.345	269.00	322.04
Nitrogen oxides	0.116	5.304	307.63	0.116	1.345	78.01	385.64
Carbon monoxide	0.35	5.304	928.20	0.35	1.345	235.38	1,163.58
VOC - Bagasse	0.06	3.554 b	106.61	0.04	1.345	26.90	168.52
- Wood Waste	0.04	1.750 c	35.01				
Lead	2.7E-06	5.304	0.007	4.2E-05	1.345	0.0282	0.0354 a
Mercury - Bagasse	5.70E-06	3.554 b	0.0101	6.5E-06	1.345	0.0044	0.0168 d
- Wood Waste	2.90E-07	1.750 c	0.00025				
Beryllium	--	--	--	4.5E-07	1.345	0.00030	0.00030
Fluorides	--	--	--	6.5E-04	1.345	0.44	0.44
Sulfuric acid mist	0.00098	5.304	2.60	0.0034	1.345	2.29	4.89

a Denotes maximum annual emissions for any fuel scenario.
b Represents 67% of total heat input.
c Represents 33% of total heat input.
d Maximum annual mercury emissions will be limited to 0.0168 TPY.

Note: No emissions of total reduced sulfur, asbestos, or vinyl chloride are expected.

Table 4. Maximum Annual Emissions of Hazardous/Toxic Air Pollutants per Boiler for Osceola Power Facility

Pollutant	Biomass Emission Factor (lb/MMBtu)	Biomass Activity Factor (E12 Btu/yr)	Biomass Annual Emissions (TPY)	Alternate Fuel Emission Factor (lb/MMBtu)	Alternate Fuel Activity Factor (E12 Btu/yr)	Alternate Fuel Annual Emissions (TPY)	Annual Emissions (TPY)
			100% Biomass				
Hazardous Air Pollutants							
Acetaldehyde	7.80E-04	6.658	2.60	--	--	--	2.60 a
Acetophenone	3.70E-06	6.658	0.012	--	--	--	0.012 a
Acrolein	6.50E-05	6.658	0.22	--	--	--	0.22 a
Antimony	UD	6.658	--	--	--	--	--
Arsenic	6.79E-05	6.658	0.23	--	--	--	0.23 a
Benzene	1.30E-03	6.658	4.33	--	--	--	4.33 a
Beryllium	--	6.658	--	--	--	--	--
Cadmium	8.40E-07	6.658	0.0028	--	--	--	0.0028
Carbon Disulfide	1.30E-04	6.658	0.43	--	--	--	0.43 a
Carbon Tetrachloride	6.00E-06	6.658	0.020	--	--	--	0.020 a
Chlorine	9.20E-04	6.658	3.06	--	--	--	3.06 a
Chloroform	4.70E-05	6.658	0.16	--	--	--	0.16 a
Chromium	8.27E-05	6.658	0.28	--	--	--	0.28 a
Chromium +6	1.65E-05	6.658	0.055	--	--	--	0.055 a
Cobalt	1.50E-07	6.658	5.0E-04	--	--	--	5.0E-04
Cumene	1.80E-05	6.658	0.06	--	--	--	0.06 a
Di - n - butyl Phthalate	5.80E-05	6.658	0.19	--	--	--	0.19 a
Ethyl Benzene	3.90E-06	6.658	0.013	--	--	--	0.013 a
Formaldehyde	1.30E-03	6.658	4.33	--	--	--	4.33 a
n Hexane	5.50E-04	6.658	1.83	--	--	--	1.83 a
Hydrogen Chloride	5.60E-04	6.658	1.86	--	--	--	1.86
Lead	2.70E-06	6.658	0.009	--	--	--	0.009
Manganese	9.50E-05	6.658	0.32	--	--	--	0.32
Mercury - Bagasse	5.70E-06	6.658	0.019	--	--	--	0.019
-Wood Waste	2.90E-07	6.658	0.0010	--	--	--	0.0010 a
Methanol	1.50E-03	6.658	4.99	--	--	--	4.99 a
Methyl Ethyl Ketone	1.20E-05	6.658	0.040	--	--	--	0.040 a
Methyl Isobutyl Ketone	8.60E-04	6.658	2.86	--	--	--	2.86 a
Methylene Chloride	1.50E-03	6.658	4.99	--	--	--	4.99 a
Napthalene	5.90E-04	6.658	1.96	--	--	--	1.96 a
Nickel	6.30E-06	6.658	0.021	--	--	--	0.021
Phenols	4.10E-05	6.658	0.14	--	--	--	0.14 a
Phosphorus	1.60E-06	6.658	0.0053	--	--	--	0.0053
POM (Polycyclic Org. Matter)	2.20E-07	6.658	0.0007	--	--	--	0.0007
Selenium	3.80E-06	6.658	0.013	--	--	--	0.013
Styrene	1.50E-05	6.658	0.050	--	--	--	0.050 a
2, 3, 7, 8 -TCDD (dioxin)	6.00E-12	6.658	2.0E-08	--	--	--	2.0E-08 a
Toluene	9.00E-05	6.658	0.30	--	--	--	0.30 a
1, 1, 1 Trichloroethane	1.70E-04	6.658	0.57	--	--	--	0.57 a
Trichloroethylene	7.60E-06	6.658	0.025	--	--	--	0.025 a
m&p Xylene	7.80E-06	6.658	0.026	--	--	--	0.026 a
o Xylene	2.60E-06	6.658	0.009	--	--	--	0.009 a
Total HAPs							36.024
112 (r) (non-HAPs)							
Ammonia	4.80E-02	6.658	159.79	--	--	--	159.79 a
Bromine	4.59E-05	6.658	0.15	--	--	--	0.15
Flourine	--	6.658	--	--	--	--	--
Sulfuric acid	9.80E-04	6.658	3.26	--	--	--	3.26
Other Air Toxics							
Acetone	3.80E-04	6.658	1.27	--	--	--	1.27 a
Barium	5.20E-06	6.658	0.02	--	--	--	0.02
Benzo(a)anthracene	7.53E-07	6.658	0.0025	--	--	--	0.0025
Benzo(a)pyrene	3.53E-08	6.658	1.18E-04	--	--	--	1.18E-04 a
Chrysene	3.53E-05	6.658	0.12	--	--	--	0.12 a
Copper	8.02E-05	6.658	0.27	--	--	--	0.27
Indium	1.27E-04	6.658	0.42	--	--	--	0.42 a
Iodine	2.12E-06	6.658	0.0071	--	--	--	0.0071 a
Isopropanol	9.20E-03	6.658	30.63	--	--	--	30.63 a
Molybdenum	2.24E-07	6.658	7.46E-04	--	--	--	7.46E-04
PAH	5.90E-10	6.658	1.96E-06	--	--	--	1.96E-06 a
Silver	1.40E-06	6.658	0.0047	--	--	--	0.0047 a
Thallium	UD	6.658	--	--	--	--	--
Tin	3.65E-08	6.658	1.2E-04	--	--	--	1.2E-04
Tungsten	1.29E-08	6.658	4.3E-05	--	--	--	4.3E-05 a
Uranium	--	6.658	--	--	--	--	--
Vanadium	1.41E-07	6.658	4.7E-04	--	--	--	4.7E-04
Yttrium	6.59E-08	6.658	2.2E-04	--	--	--	2.2E-04 a
Zinc	4.24E-04	6.658	1.41	--	--	--	1.41
Zirconium	4.12E-07	6.658	0.0014	--	--	--	0.0014 a

Table 4. Maximum Annual Emissions of Hazardous/Toxic Air Pollutants per Boiler for Osceola Power Facility

Pollutant	Biomass Emission Factor (lb/MMBtu)	Biomass Activity Factor (E12 Btu/yr)	Biomass Annual Emissions (TPY)	Alternate Fuel Emission Factor (lb/MMBtu)	Alternate Fuel Activity Factor (E12 Btu/yr)	Alternate Fuel Annual Emissions (TPY)	Annual Emissions (TPY)
			75.1% Biomass / 24.9% Fuel Oil				
Hazardous Air Pollutants							
Acetaldehyde	7.80E-04	4.707	1.84	--	1.561	--	1.84
Acetophenone	3.70E-06	4.707	0.009	--	1.561	--	0.009
Acrolein	6.50E-05	4.707	0.15	--	1.561	--	0.15
Antimony	UD	4.707	--	2.40E-07	1.561	0.0002	0.0002
Arsenic	6.79E-05	4.707	0.16	4.20E-08	1.561	3.3E-05	0.16
Benzene	1.30E-03	4.707	3.06	--	1.561	--	3.06
Beryllium	--	4.707	--	3.50E-07	1.561	2.7E-04	0.0003 a
Cadmium	8.40E-07	4.707	0.0020	1.10E-07	1.561	8.6E-05	0.0021
Carbon Disulfide	1.30E-04	4.707	0.31	--	1.561	--	0.31
Carbon Tetrachloride	6.00E-06	4.707	0.014	--	1.561	--	0.014
Chlorine	9.20E-04	4.707	2.17	--	1.561	--	2.17
Chloroform	4.70E-05	4.707	0.11	--	1.561	--	0.11
Chromium	8.27E-05	4.707	0.19	6.70E-07	1.561	0.0005	0.20
Chromium +6	1.65E-05	4.707	0.039	1.30E-07	1.561	1.0E-04	0.039
Cobalt	1.50E-07	4.707	3.5E-04	1.20E-05	1.561	0.009	0.010
Cumene	1.80E-05	4.707	0.042	--	1.561	--	0.042
Di - n - butyl Phthalate	5.80E-05	4.707	0.14	--	1.561	--	0.14
Ethyl Benzene	3.90E-06	4.707	0.009	--	1.561	--	0.009
Formaldehyde	1.30E-03	4.707	3.06	4.05E-04	1.561	0.32	3.38
n Hexane	5.50E-04	4.707	1.29	--	1.561	--	1.29
Hydrogen Chloride	5.60E-04	4.707	1.32	6.37E-04	1.561	0.50	1.81
Lead	2.70E-06	4.707	0.006	2.70E-06	1.561	0.0021	0.008
Manganese	9.50E-05	4.707	0.22	1.40E-07	1.561	1.1E-04	0.22
Mercury - Bagasse	6.30E-06	4.707	0.015	2.40E-06	1.561	0.0019	0.017
-Wood Waste	2.90E-07	4.707	0.0007	--	1.561	--	0.0007
Methanol	1.50E-03	4.707	3.53	--	1.561	--	3.53
Methyl Ethyl Ketone	1.20E-05	4.707	0.028	--	1.561	--	0.028
Methyl Isobutyl Ketone	8.60E-04	4.707	2.02	--	1.561	--	2.02
Methylene Chloride	1.50E-03	4.707	3.53	--	1.561	--	3.53
Napthalene	5.90E-04	4.707	1.39	--	1.561	--	1.39
Nickel	6.30E-06	4.707	0.015	1.70E-06	1.561	0.0013	0.016
Phenols	4.10E-05	4.707	0.10	--	1.561	--	0.10
Phosphorus	1.60E-06	4.707	0.0038	5.81E-05	1.561	0.045	0.049
POM (Polycyclic Org. Matter)	2.20E-07	4.707	0.0005	8.40E-06	1.561	0.007	0.007 a
Selenium	3.80E-06	4.707	0.009	3.80E-07	1.561	3.0E-04	0.009
Styrene	1.50E-05	4.707	0.035	--	1.561	--	0.035
2, 3, 7, 8 -TCDD (dioxin)	6.00E-12	4.707	1.4E-08	--	1.561	--	1.4E-08
Toluene	9.00E-05	4.707	0.21	--	1.561	--	0.21
1, 1, 1 Trichloroethane	1.70E-04	4.707	0.40	--	1.561	--	0.40
Trichloroethylene	7.60E-06	4.707	0.018	--	1.561	--	0.018
m & p Xylene	7.80E-06	4.707	0.018	--	1.561	--	0.018
o Xylene	2.60E-06	4.707	0.006	--	1.561	--	0.006
Total HAPs							26.351
112 (r) (non-HAPs)							
Ammonia	4.80E-02	4.707	112.97	1.48E-02	1.561	11.55	124.52
Bromine	4.59E-05	4.707	0.11	6.97E-07	1.561	0.0005	0.11
Flourine	--	4.707	--	6.30E-06	1.561	0.0049	0.0049
Sulfuric acid	9.80E-04	4.707	2.31	2.50E-03	1.561	1.95	4.26
Other Air Toxics							
Acetone	3.80E-04	4.707	0.89	--	--	--	0.89
Barium	5.20E-06	4.707	0.01	6.69E-07	1.561	0.0005	0.01
Benzo(a)anthracene	7.53E-07	4.707	0.0018	4.20E-05	1.561	0.033	0.03 a
Benzo(a)pyrene	3.53E-08	4.707	8.31E-05	--	1.561	--	0.00
Chrysene	3.53E-05	4.707	0.08	--	1.561	--	0.08
Copper	8.02E-05	4.707	0.19	--	1.561	--	0.19
Indium	1.27E-04	4.707	0.30	--	1.561	--	0.30
Iodine	2.12E-06	4.707	0.0050	--	1.561	--	0.0050
Isopropanol	9.20E-03	4.707	21.65	--	1.561	--	21.65
Molybdenum	2.24E-07	4.707	5.27E-04	4.88E-07	1.561	3.8E-04	0.0009
PAH	5.90E-10	4.707	1.39E-06	--	1.561	--	1.39E-06
Silver	1.40E-06	4.707	0.0033	--	1.561	--	0.0033
Thallium	UD	4.707	--	--	1.561	--	--
Tin	3.65E-08	4.707	8.6E-05	3.30E-06	1.561	0.0026	0.0027 a
Tungsten	1.29E-08	4.707	3.0E-05	--	1.561	--	3.04E-05
Uranium	--	4.707	--	--	1.561	--	--
Vanadium	1.41E-07	4.707	3.3E-04	--	1.561	--	3.32E-04
Yttrium	6.59E-08	4.707	1.6E-04	--	1.561	--	1.55E-04
Zinc	4.24E-04	4.707	1.00	6.69E-06	1.561	0.005	1.00
Zirconium	4.12E-07	4.707	0.0010	--	1.561	--	0.0010

Table 4. Maximum Annual Emissions of Hazardous/Toxic Air Pollutants per Boiler for Osceola Power Facility

Pollutant	Biomass Emission Factor (lb/MMBtu)	Biomass Activity Factor (E12 Btu/yr)	Biomass Annual Emissions (TPY)	Alternate Fuel Emission Factor (lb/MMBtu)	Alternate Fuel Activity Factor (E12 Btu/yr)	Alternate Fuel Annual Emissions (TPY)	Annual Emissions (TPY)
			93.32% Biomass / 6.68% Coal				
Hazardous Air Pollutants							
Acetaldehyde	7.80E-04	6.110	2.38	--	0.4373	--	2.38
Acetophenone	3.70E-06	6.110	0.011	--	0.4373	--	0.011
Acrolein	6.50E-05	6.110	0.20	--	0.4373	--	0.20
Antimony	UD	6.110	--	3.49E-05	0.4373	0.008	0.008 a
Arsenic	6.79E-05	6.110	0.21	5.40E-06	0.4373	0.0012	0.21
Benzene	1.30E-03	6.110	3.97	--	0.4373	--	3.97
Beryllium	--	6.110	--	3.50E-07	0.4373	7.7E-05	7.7E-05
Cadmium	8.40E-07	6.110	0.0026	4.30E-07	0.4373	9.4E-05	0.0027
Carbon Disulfide	1.30E-04	6.110	0.40	--	0.4373	--	0.40
Carbon Tetrachloride	6.00E-06	6.110	0.018	--	0.4373	--	0.018
Chlorine	9.20E-04	6.110	2.81	--	0.4373	--	2.81
Chloroform	4.70E-05	6.110	0.14	--	0.4373	--	0.14
Chromium	8.27E-05	6.110	0.25	1.66E-05	0.4373	0.004	0.26
Chromium +6	1.65E-05	6.110	0.050	3.10E-06	0.4373	0.0007	0.051
Cobalt	1.50E-07	6.110	4.6E-04	7.20E-05	0.4373	0.016	0.016
Cumene	1.80E-05	6.110	0.055	--	0.4373	--	0.055
Di - n - butyl Phthalate	5.80E-05	6.110	0.18	--	0.4373	--	0.18
Ethyl Benzene	3.90E-06	6.110	0.012	--	0.4373	--	0.012
Formaldehyde	1.30E-03	6.110	3.97	2.20E-04	0.4373	0.05	4.02
n Hexane	5.50E-04	6.110	1.68	--	0.4373	--	1.68
Hydrogen Chloride	5.60E-04	6.110	1.71	7.90E-02	0.4373	17.27	18.98
Lead	2.70E-06	6.110	0.008	5.10E-06	0.4373	--	0.008
Manganese	9.50E-05	6.110	0.29	3.10E-07	0.4373	6.8E-05	0.29
Mercury - Bagasse	6.30E-06	6.110	0.019	8.40E-06	0.4373	0.0018	0.021 a
-Wood Waste	2.90E-07	6.110	0.0009	--	0.4373	--	0.0009
Methanol	1.50E-03	6.110	4.58	--	0.4373	--	4.58
Methyl Ethyl Ketone	1.20E-05	6.110	0.037	--	0.4373	--	0.037
Methyl Isobutyl Ketone	8.60E-04	6.110	2.63	--	0.4373	--	2.63
Methylene Chloride	1.50E-03	6.110	4.58	--	0.4373	--	4.58
Napthalene	5.90E-04	6.110	1.80	--	0.4373	--	1.80
Nickel	6.30E-06	6.110	0.019	1.00E-05	0.4373	0.0022	0.021
Phenols	4.10E-05	6.110	0.13	--	0.4373	--	0.13
Phosphorus	1.60E-06	6.110	0.0049	8.60E-04	0.4373	0.19	0.193 a
POM (Polycyclic Org. Matter)	2.20E-07	6.110	0.0007	--	0.4373	--	0.0007
Selenium	3.80E-06	6.110	0.012	5.34E-05	0.4373	0.012	0.023
Styrene	1.50E-05	6.110	0.046	--	0.4373	--	0.046
2, 3, 7, 8 TCDD (dioxin)	6.00E-12	6.110	1.8E-08	--	0.4373	--	1.8E-08
Toluene	9.00E-05	6.110	0.27	--	0.4373	--	0.27
1, 1, 1 Trichloroethane	1.70E-04	6.110	0.52	--	0.4373	--	0.52
Trichloroethylene	7.60E-06	6.110	0.023	--	0.4373	--	0.023
m & p Xylene	7.80E-06	6.110	0.024	--	0.4373	--	0.024
o Xylene	2.60E-06	6.110	0.008	--	0.4373	--	0.008
Total HAPs							50.615
112 (r) (non-HAPs)							
Ammonia	4.80E-02	6.110	146.64	4.80E-02	0.4373	10.50	157.1
Bromine	4.59E-05	6.110	0.14	7.90E-04	0.4373	0.17	0.31 a
Flourine	--	6.110	--	2.40E-02	0.4373	5.25	5.25 a
Sulfuric acid	9.80E-04	6.110	2.99	0.010	0.4373	2.19	5.18 a
Other Air Toxics							
Acetone	3.80E-04	6.110	1.16	--	0.4373	--	1.16
Barium	5.20E-06	6.110	0.02	7.44E-05	0.4373	0.016	0.03 a
Benzo(a)anthracene	7.53E-07	6.110	2.30E-03	--	0.4373	--	2.30E-03
Benzo(a)pyrene	3.53E-08	6.110	1.08E-04	--	0.4373	--	1.08E-04
Chrysene	3.53E-05	6.110	0.11	--	0.4373	--	0.11
Copper	8.02E-05	6.110	0.25	--	0.4373	--	0.25
Indium	1.27E-04	6.110	0.39	--	0.4373	--	0.39
Iodine	2.12E-06	6.110	0.0065	--	0.4373	--	0.0065
Isopropanol	9.20E-03	6.110	28.11	--	0.4373	--	28.11
Molybdenum	2.24E-07	6.110	6.84E-04	8.83E-06	0.4373	0.0019	0.0026
PAH	5.90E-10	6.110	1.80E-06	--	0.4373	--	1.80E-06
Silver	1.40E-06	6.110	0.0043	--	0.4373	--	0.0043
Thallium	UD	6.110	--	--	0.4373	--	--
Tin	3.65E-08	6.110	1.1E-04	8.83E-06	0.4373	0.0019	0.0020
Tungsten	1.29E-08	6.110	3.9E-05	--	0.4373	--	3.94E-05
Uranium	--	6.110	--	--	0.4373	--	--
Vanadium	1.41E-07	6.110	4.3E-04	--	0.4373	--	4.31E-04
Yttrium	6.59E-08	6.110	2.0E-04	--	0.4373	--	2.01E-04
Zinc	4.24E-04	6.110	1.30	3.49E-04	0.4373	0.08	1.37
Zirconium	4.12E-07	6.110	0.0013	--	0.4373	--	0.0013

Table 4. Maximum Annual Emissions of Hazardous/Toxic Air Pollutants per Boiler for Osceola Power Facility

Pollutant	Biomass Emission Factor (lb/MMBtu)	Biomass Activity Factor (E12 Btu/yr)	Biomass Annual Emissions (TPY)	Alternate Fuel Emission Factor (lb/MMBtu)	Alternate Fuel Activity Factor (E12 Btu/yr)	Alternate Fuel Annual Emissions (TPY)	Annual Emissions (TPY)
			79.66% Biomass / 20.34% Tire-Derived Fuel				
Hazardous Air Pollutants							
Acetaldehyde	7.80E-04	5.304	2.07	--	1.354	--	2.07
Acetophenone	3.70E-06	5.304	0.010	--	1.354	--	0.010
Acrolein	6.50E-05	5.304	0.17	--	1.354	--	0.17
Antimony	UD	5.304	--	6.45E-09	1.354	4.4E-06	4.4E-06
Arsenic	6.79E-05	5.304	0.18	4.52E-06	1.354	0.003	0.18
Benzene	1.30E-03	5.304	3.45	--	1.354	--	3.448
Beryllium	--	5.304	--	--	1.354	--	--
Cadmium	8.40E-07	5.304	0.0022	3.87E-06	1.354	0.0026	0.0048 a
Carbon Disulfide	1.30E-04	5.304	0.34	--	1.354	--	0.34
Carbon Tetrachloride	6.00E-06	5.304	0.016	--	1.354	--	0.016
Chlorine	9.20E-04	5.304	2.44	--	1.354		2.44
Chloroform	4.70E-05	5.304	0.12	--	1.354	--	0.12
Chromium	8.27E-05	5.304	0.22	6.45E-06	1.354	0.0044	0.22
Chromium +6	1.65E-05	5.304	0.044	--	1.354	--	0.044
Cobalt	1.50E-07	5.304	4.0E-04	3.23E-04	1.354	0.22	0.22 a
Cumene	1.80E-05	5.304	0.048	--	1.354	--	0.048
Di - n - butyl Phthalate	5.80E-05	5.304	0.15	--	1.354	--	0.15
Ethyl Benzene	3.90E-06	5.304	0.010	--	1.354	--	0.010
Formaldehyde	1.30E-03	5.304	3.45	4.05E-04	1.354	0.27	3.72
n Hexane	5.50E-04	5.304	1.46	--	1.354	--	1.46
Hydrogen Chloride	5.60E-04	5.304	1.49	9.61E-02	1.354	65.1	66.5 a
Lead	2.70E-06	5.304	0.007	4.20E-05	1.354	2.8E-02	0.036 a
Manganese	9.50E-05	5.304	0.25	6.45E-04	1.354	0.44	0.69 a
Mercury - Bagasse	6.30E-06	5.304	0.017	5.00E-06	1.354	3.4E-03	0.020
-Wood Waste	2.90E-07	5.304	0.0008	--	1.354	--	0.0008
Methanol	1.50E-03	5.304	3.98	--	1.354	--	3.98
Methyl Ethyl Ketone	1.20E-05	5.304	0.032	--	1.354	--	0.032
Methyl Isobutyl Ketone	8.60E-04	5.304	2.28	--	1.354	--	2.28
Methylene Chloride	1.50E-03	5.304	3.98	--	1.354	--	3.98
Napthalene	5.90E-04	5.304	1.56	--	1.354	--	1.56
Nickel	6.30E-06	5.304	0.017	3.87E-05	1.354	0.026	0.043 a
Phenols	4.10E-05	5.304	0.11	--	1.354	--	0.11
Phosphorus	1.60E-06	5.304	0.0042	--	1.354	--	0.0042
POM (Polycyclic Org. Matter)	2.20E-07	5.304	0.0006	--	1.354	--	0.0006
Selenium	3.80E-06	5.304	0.010	6.77E-05	1.354	0.05	0.06 a
Styrene	1.50E-05	5.304	0.040	--	1.354	--	0.040
2, 3, 7, 8 TCDD (dioxin)	6.00E-12	5.304	1.6E-08	--	1.354	--	1.6E-08
Toluene	9.00E-05	5.304	0.24	--	1.354	--	0.24
1, 1, 1 Trichloroethane	1.70E-04	5.304	0.45	--	1.354	--	0.45
Trichloroethylene	7.60E-06	5.304	0.020	--	1.354	--	0.020
m & p Xylene	7.80E-06	5.304	0.021	--	1.354	--	0.021
o Xylene	2.60E-06	5.304	0.007	--	1.354	--	0.007
Total HAPs							94.803
112 (r) (non-HAPs)							
Ammonia	1.48E-02	5.304	39.25	4.80E-02	1.354	32.50	71.7
Bromine	4.59E-05	5.304	0.12	--	1.354	--	0.12
Flourine	--	5.304	--	6.50E-03	1.354	4.4005	4.40
Sulfuric acid	9.80E-04	5.304	2.60	3.40E-03	1.354	2.3018	4.90
Other Air Toxics							
Acetone	3.80E-04	5.304	1.01	--	1.354	--	1.01
Barium	5.20E-06	5.304	0.01	7.74E-06	1.354	0.0052	0.02
Benzo(a)anthracene	7.53E-07	5.304	2.00E-03	--	1.354	--	2.00E-03
Benzo(a)pyrene	3.53E-08	5.304	9.36E-05	--	1.354	--	9.36E-05
Chrysene	3.53E-05	5.304	0.09	--	1.354	--	0.09
Copper	8.02E-05	5.304	0.21	6.15E-04	1.354	0.42	0.63 a
Indium	1.27E-04	5.304	0.34	--	1.354	--	0.34
Iodine	2.12E-06	5.304	0.0056	--	1.354	--	0.0056
Isopropanol	9.20E-03	5.304	24.40	--	1.354	--	24.40
Molybdenum	2.24E-07	5.304	5.94E-04	4.52E-05	1.354	0.031	0.031 a
PAH	5.90E-10	5.304	1.56E-06	--	1.354	--	1.56E-06
Silver	1.40E-06	5.304	0.0037	--	1.354	--	0.0037
Thallium	UD	5.304	--	--	1.354	--	--
Tin	3.65E-08	5.304	9.7E-05	6.45E-09	1.354	4.37E-06	1.0E-04
Tungsten	1.29E-08	5.304	3.4E-05	--	1.354	--	3.4E-05
Uranium	--	5.304	--	2.58E-08	1.354	1.75E-05	1.7E-05 a
Vanadium	1.41E-07	5.304	3.7E-04	6.45E-07	1.354	0.00044	8.1E-04 a
Yttrium	6.59E-08	5.304	1.7E-04	--	1.354	--	1.7E-04
Zinc	4.24E-04	5.304	1.12	9.81E-03	1.354	6.64	7.77 a
Zirconium	4.12E-07	5.304	0.0011	--	1.354	--	0.0011

a Denotes maximum annual emissions for any fuel scenario.

Note: UD = undetectable levels in gas stream.

Table 5. Maximum Fuel Usage and Heat Input Rates per Boiler, Osceola Power Limited Partnership

Fuel	Heat Input	Heat Transfer Efficiency (%)	Heat Output	Fuel Firing Rate	
	Maximum Short-Term (per boiler)				
	(MMBtu/hr)		(MMBtu/hr)		
Biomass - Bagasse	760	68	517	178,824	lb/hr
- Wood Was	760	68	517	138,182	lb/hr
No. 2 Fuel Oil	600	85	510	4,348	gal/hr
Coal	530	85	451	44,167	lb/hr
Tire-Derived Fuel	370	68	252	23,871	lb/hr
	Annual Average (per boiler)				
	(Btu/yr)		(Btu/yr)		
NORMAL OPERATIONS					
Biomass	6.658E+12	68	4.527E+12	783,247	TPY^a
No. 2 Fuel Oil	0	85	0	0	gal/yr
Coal	0	85	0	0	TPY
Tire-Derived Fuel	0	68	0	0	TPY
TOTAL	6.658E+12		4.527E+12		
24.9% OIL FIRING					
Biomass	4.707E+12	68	3.201E+12	553,765	TPY
No. 2 Fuel Oil	1.561E+12	85	1.327E+12	11,309,008	gal/yr
Coal	0	85	0	0	TPY
Tire-Derived Fuel	0	68	0	0	TPY
TOTAL	6.268E+12		4.527E+12		
6.68% COAL FIRING					
Biomass	6.110E+12	68	4.155E+12	718,824	TPY
No. 2 Fuel Oil	0	85	0	0	gal/yr
Coal	4.373E+11	85	3.717E+11	18,221	TPY
Tire-Derived Fuel	0	68	0	0	TPY
TOTAL	6.547E+12		4.527E+12		
20.34% TIRE-DERIVED FUEL					
Biomass	5.304E+12	68	3.607E+12	482,182	TPY^b
No. 2 Fuel Oil	0	85	0	0	gal/yr
Coal	0	85	0	0	TPY
Tire-Derived Fuel	1.354E+12	68	9.207E+11	43,677	TPY
TOTAL	6.658E+12		4.527E+12		

^a Based on bagasse firing.
^b Based on wood waste firing.

Notes: Total heat output required = 4.527E+12 Btu/yr total both boilers.
Fuels may be burned in combination, not to exceed total heat outputs.
Based on fuel heating values as follows:
Bagasse - 4,250 Btu/lb
Wood Waste - 5,500 Btu/lb
No. 2 Fuel Oil - 138,000 Btu/gal
Coal - 12,000 Btu/lb
Tire-derived fuel - 15,500 Btu/lb

Basis for annual heat input

Grinding season: 440,000 lb/hr steam; 658 MMBtu/hr/boiler; 140 crop days
Heat input= 4.4218E+12 Btu/yr

Non-grinding season: 273,150 lb/hr steam; 369 MMBtu/hr/boiler; 225 crop days; 95% capacity
Heat input= 3.7859E+12 Btu/yr

Totals: Heat input= 8.2077E+12 Btu/yr

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Pollutant Detail Information:

1. Pollutant Emitted: **SO2**
2. Total Percent Efficiency of Control: %
3. Potential Emissions: **636** lb/hour **323.5** tons/year
4. Synthetically Limited? [**X**] Yes [ ] No
5. Range of Estimated Fugitive/Other Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/yr
6. Emission Factor: **1.2 lb/MMBtu** Reference: **40 CFR 60 Subpart Da**
7. Emissions Method Code: [**X**] 0 [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5
8. Calculation of Emissions (limit to 600 characters): **1.2 lb/MMBtu x 530 MMBtu/hr = 636.0 lb/hr**
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters): **339.0 TPY total for both boilers**

Emissions Unit Information Section 7 of 10

Allowable Emissions (Pollutant identified on front page)

A.

1. Basis for Allowable Emissions Code: RULE	
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units: 1.2 lb/MMBtu	
4. Equivalent Allowable Emissions: 636 lb/hour	323.5 tons/year
5. Method of Compliance (limit to 60 characters): Limit coal burning to 5.4% for facility fuel analysis	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): 40 CFR 60, Subpart Da. Based on coal firing	

B.

1. Basis for Allowable Emissions Code: OTHER	
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units: 0.05 lb/MMBtu	
4. Equivalent Allowable Emissions: 30 lb/hour	39 tons/year
5. Method of Compliance (limit to 60 characters): Limit fuel oil burning to 24.9% for any single boiler	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): Based on No.2 fuel oil firing and BACT.	

Emissions Unit Information Section 7 **of** 10

Allowable Emissions (Pollutant identified on front page)

A.

1. Basis for Allowable Emissions Code: **OTHER**		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units: **See Comment**		
4. Equivalent Allowable Emissions:	**76** lb/hour	**66.6** tons/year
5. Method of Compliance (limit to 60 characters): **Continuous SO2 monitor**		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): **Requested Allowable Emissions and Units: 0.1 lb/MMBtu 24-hr avg; 0.02 lb/MMBtu, annual average. Based on bagasse firing and fuel sulfur content.**		

B.

1. Basis for Allowable Emissions Code: **OTHER**		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units: **See Comment**		
4. Equivalent Allowable Emissions:	**444** lb/hour	**269** tons/year
5. Method of Compliance (limit to 60 characters): **Continuous SO2 monitor.**		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): **Requested allowable emissions: 1.2 lb/MMBtu, 24-hr avg.; 0.4 lb/MMBtu, annual avg. Based on tire-derived fuel firing.**		

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Pollutant Detail Information:

1. Pollutant Emitted: **NOx**
2. Total Percent Efficiency of Control: %
3. Potential Emissions: **88.2** lb/hour **387.2** tons/year
4. Synthetically Limited? [**x**] Yes [ ] No
5. Range of Estimated Fugitive/Other Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/yr
6. Emission Factor: **0.116 lb/MMBtu** Reference: **Based on NOx control**
7. Emissions Method Code: [**x**] 0 [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5
8. Calculation of Emissions (limit to 600 characters): **0.116 lb/MMBtu x 760 MMBtu/hr = 88.2 lb/hr**
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters): **477.1 TPY total for both boilers**

Emissions Unit Information Section 7 of 10
Allowable Emissions (Pollutant identified on front page)

A.

1. Basis for Allowable Emissions Code: **ESCPSD**	
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units: **0.116 lb/MMBtu**	
4. Equivalent Allowable Emissions: **88.2** lb/hour	**387.2** tons/year
5. Method of Compliance (limit to 60 characters): **Annual stack test using EPA Method 7 or 7E**	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): **Based on biomass firing**	

B.

1. Basis for Allowable Emissions Code: **ESCPSD**	
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units: **0.126 lb/MMBtu**	
4. Equivalent Allowable Emissions: **72** lb/hour	**93.7** tons/year
5. Method of Compliance (limit to 60 characters): **Limit fuel oil burning to 24.9% for any single boiler**	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): **Based on No.2 fuel oil firing**	

Emissions Unit Information Section 7 of 10
Allowable Emissions (Pollutant identified on front page)

A.

1. Basis for Allowable Emissions Code: **ESCPSD**	
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units: **0.15 lb/MMBtu**	
4. Equivalent Allowable Emissions: **79.5** lb/hour	**32.8** tons/year
5. Method of Compliance (limit to 60 characters): **Limit coal burning to 10.8% for any single boiler**	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): **Based on coal firing**	

B.

1. Basis for Allowable Emissions Code: **ESCPSD**	
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units: **0.116 lb/MMBtu**	
4. Equivalent Allowable Emissions: **42.9** lb/hour	**78** tons/year
5. Method of Compliance (limit to 60 characters): **See Comment**	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): **Method of Compliance: Annual stack testing using EPA Method 7 or 7E. Limit TDF Firing to 25% on an annual basis. Based on tire-derived fuel firing.**	

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Pollutant Detail Information:

1. Pollutant Emitted: CO
2. Total Percent Efficiency of Control: %
3. Potential Emissions: 266 lb/hour 1,165.1 tons/year
4. Synthetically Limited? [X] Yes [ ] No
5. Range of Estimated Fugitive/Other Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/yr
6. Emission Factor: 0.35 lb/MMBtu Reference: Boiler design
7. Emissions Method Code: [X] 0 [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5
8. Calculation of Emissions (limit to 600 characters): 0.35 lb/MMBtu x 760 MMBtu/hr = 266 lb/hr
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters): 1,436.4 TPY total for both boilers

Emissions Unit Information Section 7 of 10
Allowable Emissions (Pollutant identified on front page)

A.

1. Basis for Allowable Emissions Code: **OTHER**
2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.35 lb/MMBtu**
4. Equivalent Allowable Emissions: **266** lb/hour **1,165.1** tons/year
5. Method of Compliance (limit to 60 characters): **Continuous CO monitor**
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): **Based on biomass firing**

B.

1. Basis for Allowable Emissions Code: **OTHER**
2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.2 lb/MMBtu**
4. Equivalent Allowable Emissions: **120** lb/hour **156.1** tons/year
5. Method of Compliance (limit to 60 characters): **Limit fuel burning to 24.9% for any single boiler**
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): **Based on No.2 fuel oil firing**

Emissions Unit Information Section 7 of 10
Allowable Emissions (Pollutant identified on front page)

A.

1. Basis for Allowable Emissions Code: **OTHER**	
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units: **0.2 lb/MMBtu**	
4. Equivalent Allowable Emissions:	**106** lb/hour **43.7** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 10 annually**	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): **Based on coal firing. Limit coal burning to 5.4% entire facility; 10.8% for any single boiler.**	

B.

1. Basis for Allowable Emissions Code: **OTHER**	
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units: **0.35 lb/MMBtu**	
4. Equivalent Allowable Emissions:	**129.5** lb/hour **235.4** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 10 annually.**	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): **Based on tire-derived fuel firing. TDF limited to 25% for each boiler.**	

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Pollutant Detail Information:

1. Pollutant Emitted: VOC
2. Total Percent Efficiency of Control: %
3. Potential Emissions: 45.6 lb/hour 177.8 tons/year
4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive/Other Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/yr
6. Emission Factor: 0.06 lb/MMBtu Reference: Boiler design
7. Emissions Method Code: [x] 0 [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5
8. Calculation of Emissions (limit to 600 characters): 0.06 lb/MMBtu x 760 MMBtu/hr = 45.6 lb/hr
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters): Based on biomass firing

Emissions Unit Information Section 7 of 10
Allowable Emissions (Pollutant identified on front page)

A.

1. Basis for Allowable Emissions Code: **ESCNAA**	
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units: **0.03 lb/MMBtu**	
4. Equivalent Allowable Emissions: **15.9** lb/hour	**6.7** tons/year
5. Method of Compliance (limit to 60 characters): **Limit coal burning to 10.8% for any single boiler**	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): **Based on coal firing**	

B.

1. Basis for Allowable Emissions Code: **ESCNAA**	
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units: **0.04 lb/MMBtu**	
4. Equivalent Allowable Emissions: **14.8** lb/hour	**26.9** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 25 or 25A annually.**	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): **Based on tire-derived fuel firing. TDF limited to 25% for any single boiler.**	

Emissions Unit Information Section 7 of 10

Allowable Emissions (Pollutant identified on front page)

A.

1. Basis for Allowable Emissions Code: **ESCNAA**	
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units: **See Comment**	
4. Equivalent Allowable Emissions: **45.6** lb/hour	**177.8** tons/year
5. Method of Compliance (limit to 60 characters): **Annual stack test using EPA Method 25 or 25A**	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): **Based on biomass firing, 67% bagasse heat input - 33% wood waste heat input. Requested Allowable Emissions and Units: 0.06 lb/MMBtu bagasse; 0.04 lb/MMBtu wood waste.**	

B.

1. Basis for Allowable Emissions Code: **ESCNAA**	
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units: **0.03 lb/MMBtu**	
4. Equivalent Allowable Emissions: **18** lb/hour	**23.4** tons/year
5. Method of Compliance (limit to 60 characters): **Limit fuel burning to 24.9% for any single boiler**	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): **Based on No.2 fuel oil firing**	

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Pollutant Detail Information:

1. Pollutant Emitted: **FL**
2. Total Percent Efficiency of Control: %
3. Potential Emissions: **12.7** lb/hour **5.25** tons/year
4. Synthetically Limited? [**x**] Yes [ ] No
5. Range of Estimated Fugitive/Other Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/yr
6. Emission Factor: **0.024 lb/MMBtu** Reference: **See Part B**
7. Emissions Method Code: [**x**] 0 [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5
8. Calculation of Emissions (limit to 600 characters): **0.024 lb/MMBtu x 530 MMBtu/hr = 12.7 lb/hr**
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters): **Based on coal firing**

Emissions Unit Information Section 7 of 10

Allowable Emissions (Pollutant identified on front page)

A.

1. Basis for Allowable Emissions Code:	**OTHER**
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units:	**See Comment**
4. Equivalent Allowable Emissions:	**0.0038** lb/hour **0.005** tons/year
5. Method of Compliance (limit to 60 characters):	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):	**Allowable emissions: 6.3E-06 lb/MMBtu. Based on No.2 fuel oil firing.**

B.

1. Basis for Allowable Emissions Code:	**OTHER**
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units:	**0.024 lb/MMBtu**
4. Equivalent Allowable Emissions:	**12.7** lb/hour **5.25** tons/year
5. Method of Compliance (limit to 60 characters):	**EPA Method 13A or 13B once every 5 years.**
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):	**Based on coal firing.**

Emissions Unit Information Section 7 **of** 10

Allowable Emissions (Pollutant identified on front page)

A.

1. Basis for Allowable Emissions Code: **OTHER**	
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units: **See Comment**	
4. Equivalent Allowable Emissions: **0.24** lb/hour	**0.44** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 13A or 13B once every 5 years.**	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): **Based on tire-derived fuel firing**	

B.

1. Basis for Allowable Emissions Code:	
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units:	
4. Equivalent Allowable Emissions: lb/hour	tons/year
5. Method of Compliance (limit to 60 characters):	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):	

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Pollutant Detail Information:

1. Pollutant Emitted: **SAM**
2. Total Percent Efficiency of Control: %
3. Potential Emissions: **5.6** lb/hour **5.2** tons/year
4. Synthetically Limited? [**X**] Yes [ ] No
5. Range of Estimated Fugitive/Other Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/yr
6. Emission Factor: **0.01 lb/MMBtu** Reference: **See Part B**
7. Emissions Method Code: [**X**] 0 [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5
8. Calculation of Emissions (limit to 600 characters): **0.0049 lb/MMBtu x 390 MMBtu/hr = 1.91 lb/hr; 0.010 lb/MMBtu x 370 MMBtu/hr = 3.7 lb/hr. Total = 1.91 + 3.7 = 5.6 lb/hr**
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters): **Based on biomass/TDF firing.**

Emissions Unit Information Section 7 **of** 10

Allowable Emissions (Pollutant identified on front page)

A.

1. Basis for Allowable Emissions Code: OTHER	
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units: 0.01 lb/MMBtu	
4. Equivalent Allowable Emissions:	5.3 lb/hour 2.2 tons/year
5. Method of Compliance (limit to 60 characters):	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): Based on coal firing	

B.

1. Basis for Allowable Emissions Code: OTHER	
2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units: 0.01 lb/MMBtu	
4. Equivalent Allowable Emissions:	3.7 lb/hour 2.3 tons/year
5. Method of Compliance (limit to 60 characters): Method 8 once every 5 years	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): Based on tire derived fuel firing. Annual average based on 0.0034 lb/MMBtu.	

Emissions Unit Information Section 7 of 10
Allowable Emissions (Pollutant identified on front page)

A.

1. Basis for Allowable Emissions Code: **OTHER**
2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.0049 lb/MMBtu,24-hr**
4. Equivalent Allowable Emissions: **3.72** lb/hour **3.26** tons/year
5. Method of Compliance (limit to 60 characters): **Method 8 once every 5 years**
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): **Based on biomass firing. Annual average based on 0.00098 lb/MMBtu.**

B.

1. Basis for Allowable Emissions Code: **OTHER**
2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.0025 lb/MMBtu**
4. Equivalent Allowable Emissions: **1.5** lb/hour **1.95** tons/year
5. Method of Compliance (limit to 60 characters):
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): **Based on No.2 fuel oil firing**

KBN
A GOLDER ASSOCIATES COMPANY

October 8, 1996

Mr. Al Linero, P.E.
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 33493

Re: Osceola Power Limited Partnership
Tire-Derived Fuel Permit Amendment
Facility ID No. 0990331
Permit File No. AC50-269980; PSD-FL-197C

Dear Mr. Linero:

KBN Engineering and Applied Sciences, Inc. (KBN) has prepared the following responses to your August 16th request for additional information concerning the request to utilize tire-derived fuel at the Osceola Power Limited Partnership (OsPLP) cogeneration facility.

1. In reference to the maximum tire-derived fuel (TDF) input, there is no discrepancy between the values presented in the original application and the corrected application page submittals dated July 17, 1996. The original application (Table 2-2) presented the maximum TDF input on a short-term basis as 23,871 lb/hr and 370 MMBtu/hr. Based on the remaining heat input due to wood waste fuel (390 MMBtu/hr and 70,909 lb/hr), the total weight of fuel fired is 94,780 lb/hr. Thus, TDF represents approximately 25% by weight on a short term basis (23,871 ÷ 94,780 = 25.2%). In the July 17, 1996, application corrected application pages, Table 5 presents this identical information for fuel firing on a short term basis.

   Some confusion may stem from the annual average fuel usage figures. In Table 2-2 of the original application, TDF input from all three boilers was stated to be 6.6% on a weight basis. However, Table 5 of the July 17 submittal presented annual fuel usage on a per boiler basis. Each boiler can potentially burn the total amount of TDF that all three boilers combined can burn. This is reflected in Table 5 which shows each boiler can fire up to 43,687 TPY TDF, which equates to 20.34% on a heat input basis and 19.4% on a weight basis, annual average.

   For your convenience, Table 2-2 from the original application and Table 5 from the corrected application pages submittal are attached.

2. A waiver has been approved by the Florida Department of Health and Rehabilitative Services for an extension of the initial performance tests on the boilers at the OsPLP facility. A copy of the approval letter is attached. OsPLP tentatively plans on scheduling the initial performance tests during December 1996.

   Presented below are responses to the letter dated August 12, 1996 from the Bureau of Solid and Hazardous Waste pertaining to air and ash issues. Although OsPLP has not yet performed wood waste fuel and ash analysis similar to those performed at Okeelanta Power, the Okeelanta Power data can be

6241 Northwest 23rd Street, Suite 500, Gainesville, Florida 32653-1500, 352-336-5600 FAX 352-336-6603
5405 West Cypress Street, Suite 215, Tampa, Florida 33607, 813-287-1717 FAX 813-287-1716
1801 Clint Moore Road, Suite 105, Boca Raton, Florida 33487, 407-994-9910 FAX 407-994-9393
7785 Baymeadows Way, Suite 105, Jacksonville, Florida 32256, 904-739-5600 FAX 904-739-7777
1616 'P' Street NW, Suite 350, Washington, DC 20036, 202-462-1100 FAX 202-462-2270

used to answer the same questions posed by the Bureau for the OsPLP facility because the construction of the facilities are very similar and the wood waste suppliers are the same as for the Okeelanta Power facility.

1a. Wood Waste Mass Balance Analysis

Actual heavy metal concentrations in wood waste fuel delivered to Okeelanta Power were analyzed from samples taken between January and August of 1996. From this data, a representative average heavy metal concentration was obtained and is presented in the first two columns of Tables 1.

Mass balance calculations were then performed in order to derive theoretical heavy metal concentrations in the ash so that they may be compared to actual average ash concentrations. Utilizing the actual fly ash and bottom ash heavy metal concentration data, a partitioning factor was developed in order to theoretically predict the fraction of the heavy metal that would partition to fly ash and the fraction partitioning to bottom ash (see far right hand columns of Table 1).

The results of the mass balance are presented in Table 1. As shown, the theoretical ash element concentrations, except for lead, are within $\pm 20\%$ of the actual sampled ash data. The theoretical lead ash concentrations are within about 35% of the actual measured concentrations, with the actual average ash concentrations being higher than the theoretical value. Some metals that were in the ash were not sampled in the wood waste, therefore no mass balance comparison could be made for these compounds.

1b. Fly and Bottom Ash Mass Balance Analysis

Actual heavy metal concentrations in fly ash and bottom ash were analyzed from samples taken between November 1995 and July 1996. From this data, a representative average heavy metal concentration in the ash was obtained and is presented in the first two columns of Tables 2. Mass balance calculations were then performed in order to derive theoretical heavy metal concentrations in the wood waste so that they may be compared to actual average wood waste concentrations. The results are shown in the last two columns of Table 2. As shown, the theoretical arsenic, chromium and mercury concentrations in the wood waste are in close agreement with the actual measured values. However, larger differences are shown for lead.

Additional metals were sampled in the ash than were sampled in the wood waste, therefore actual barium, cadmium, copper, selenium and silver concentrations could not be compared to theoretical wood waste concentrations.

1c. Heavy Metals Concentration Analysis Summary

With the exception of lead, it has been shown that using actual wood waste heavy metal concentrations to back calculate through mass balance to theoretical ash heavy metal concentrations yields close approximations to actual ash heavy metal concentrations. Therefore, using mass balance calculations is a valid method to estimate concentrations of heavy metals in the ash from wood waste combustion.

Actual lead concentrations in the ash were shown to be higher than those based on mass balance calculations. The reason for this is not known. Therefore, further analysis of the lead content of fuel and ash may be warranted.

2. Comparison of Calculated Arsenic Concentration in Wood Waste to <2.4% CCA Treated Wood
Table 2-9 from the April 4, 1995 Osceola TDF submittal showed that the <2.4% CCA treated wood fuel mixture by volume contained 56.7 ppm (wet basis) of arsenic (the table is attached for reference). Concentrations of arsenic in wood waste fuel based on actual analysis and mass balance calculations for Okeelanta are approximately 21 ppm (wet basis). This demonstrates that Osceola would only be receiving less than 1.0% (wet basis) CCA treated wood in its deliveries of wood waste fuel. Ideally, no CCA treated wood should be mixed with the wood waste fuel, however, it is recognized that some CCA treated wood still ends up in the supplied fuel mix. Okeelanta's random fuel samples show that the Osceola facility would be burning considerably less CCA treated wood than they are permitted to burn.

3. Anticipated Heavy Metal Concentrations in Combined TDF/Wood Waste Fuel and Ash
The theoretical combined fuel analysis concentration is presented in column three of Table 3. These values are based on as-fired short term fuel usage of 75% wood waste and 25% TDF on a weight basis. Theoretical combined fuel ash concentrations are presented in the remainder of Table 3. Actual partitioning factors from Table 1 were used to predict theoretical combined fuel fly ash and bottom ash concentrations.

4. Additional Air Permit Information Requested by The Bureau
Copies of specific conditions 12 and 18 from permit number AC50-269980 pertaining to fuel receiving, handling, storage and sampling requirements are attached.

If you have any questions or need for other information than that given here, please let me know.

Sincerely,

David A. Buff

David A. Buff
Professional Engineer
Florida P.E. #19011

DB/vjp

Attachments

cc: Don Schaberg, OsPLP
James Meriwether, Okeelanta Power
Bill Tarr, Flo-Sun, Inc.
Paul Wesson, KBN
File (2)

CC: D. Knowles, SO
J. Koerner, PBCo.
K. Anderson, DEP
B. Beals, EPA
J. Bunyak, NPS
S. Arif, BAR

Table 2-2. Maximum Fuel Usage and Heat Input Rates, Osceola Power Limited Partnership

Fuel	Heat Input	Heat Transfer Efficiency (%)	Heat Output	Fuel Firing Rate	
	Maximum Short-Term (per boiler)				
	(MMBtu/hr)		(MMBtu/hr)		
Biomass - Bagasse	760	68	517	178,824	lb/hr
- Wood Waste	760	68	517	138,182	lb/hr
No. 2 Fuel Oil	600	85	510	4,348	gal/hr
Coal	530	85	451	44,167	lb/hr
Tire-Derived Fuel	370	68	252	23,871	lb/hr
	Annual Average (total two boilers)				
	(Btu/yr)		(Btu/yr)		
NORMAL OPERATIONS					
Biomass	8.208E+12	68	5.581E+12	965,647	TPY^a
No. 2 Fuel Oil	0	85	0	0	gal/yr
Coal	0	85	0	0	TPY
Tire-Derived Fuel	0	68	0	0	TPY
TOTAL	8.208E+12		5.581E+12		
24.9% OIL FIRING					
Biomass	5.803E+12	68	3.946E+12	682,706	TPY
No. 2 Fuel Oil	1.924E+12	85	1.635E+12	13,942,251	gal/yr
Coal	0	85	0	0	TPY
Tire-Derived Fuel	0	68	0	0	TPY
TOTAL	7.727E+12		5.581E+12		
5.4% COAL FIRING					
Biomass	7.661E+12	68	5.209E+12	901,294	TPY
No. 2 Fuel Oil	0	85	0	0	gal/yr
Coal	4.373E+11	85	3.717E+11	18,221	TPY
Tire-Derived Fuel	0	68	0	0	TPY
TOTAL	8.098E+12		5.581E+12		
16.5% TIRE-DERIVED FUEL (6.6% TDF, weight basis)					
Biomass	6.854E+12	68	4.660E+12	623,055	TPY^b
No. 2 Fuel Oil	0	85	0	0	gal/yr
Coal	0	85	0	0	TPY
Tire-Derived Fuel	1.354E+12	68	9.209E+11	43,687	TPY
TOTAL	8.208E+12		5.581E+12		

^a Based on bagasse firing.
^b Based on wood waste firing.

Notes: Total heat output required = 5.581E+12 Btu/yr total both boilers.
Fuels may be burned in combination, not to exceed total heat outputs.
Based on fuel heating values as follows:
Bagasse - 4,250 Btu/lb
Wood Waste - 5,500 Btu/lb
No. 2 Fuel Oil - 138,000 Btu/gal
Coal - 12,000 Btu/lb
Tire-derived fuel - 15,500 Btu/lb

Basis for annual heat input

Grinding season: 440,000 lb/hr steam; 658 MMBtu/hr/boiler; 140 crop days
Heat input= 4.4218E+12 Btu/yr

Non-grinding season: 273,150 lb/hr steam; 369 MMBtu/hr/boiler; 225 crop days; 95% capacity
Heat input= 3.7859E+12 Btu/yr

Totals: Heat input= 8.2077E+12 Btu/yr

Table 5. Maximum Fuel Usage and Heat Input Rates per Boiler, Osceola Power Limited Partnership

Fuel	Heat Input	Heat Transfer Efficiency (%)	Heat Output	Fuel Firing Rate	
	Maximum Short-Term (per boiler)				
	(MMBtu/hr)		(MMBtu/hr)		
Biomass - Bagasse	760	68	517	178,824	lb/hr
- Wood Was	760	68	517	138,182	lb/hr
No. 2 Fuel Oil	600	85	510	4,348	gal/hr
Coal	530	85	451	44,167	lb/hr
Tire-Derived Fuel	370	68	252	23,871	lb/hr
	Annual Average (per boiler)				
	(Btu/yr)		(Btu/yr)		
NORMAL OPERATIONS					
Biomass	6.658E+12	68	4.527E+12	783,247	TPY^a
No. 2 Fuel Oil	0	85	0	0	gal/yr
Coal	0	85	0	0	TPY
Tire-Derived Fuel	0	68	0	0	TPY
TOTAL	6.658E+12		4.527E+12		
24.9% OIL FIRING					
Biomass	4.707E+12	68	3.201E+12	553,765	TPY
No. 2 Fuel Oil	1.561E+12	85	1.327E+12	11,309,008	gal/yr
Coal	0	85	0	0	TPY
Tire-Derived Fuel	0	68	0	0	TPY
TOTAL	6.268E+12		4.527E+12		
6.68% COAL FIRING					
Biomass	6.110E+12	68	4.155E+12	718,824	TPY
No. 2 Fuel Oil	0	85	0	0	gal/yr
Coal	4.373E+11	85	3.717E+11	18,221	TPY
Tire-Derived Fuel	0	68	0	0	TPY
TOTAL	6.547E+12		4.527E+12		
20.34% TIRE-DERIVED FUEL					
Biomass	5.304E+12	68	3.607E+12	482,182	TPY^b
No. 2 Fuel Oil	0	85	0	0	gal/yr
Coal	0	85	0	0	TPY
Tire-Derived Fuel	1.354E+12	68	9.207E+11	43,677	TPY
TOTAL	6.658E+12		4.527E+12		

^a Based on bagasse firing.
^b Based on wood waste firing.

Notes: Total heat output required = 4.527E+12 Btu/yr total both boilers.
Fuels may be burned in combination, not to exceed total heat outputs.
Based on fuel heating values as follows:
Bagasse - 4,250 Btu/lb
Wood Waste - 5,500 Btu/lb
No. 2 Fuel Oil - 138,000 Btu/gal
Coal - 12,000 Btu/lb
Tire-derived fuel - 15,500 Btu/lb

Basis for annual heat input
Grinding season: 440,000 lb/hr steam; 658 MMBtu/hr/boiler; 140 crop days
Heat input= 4.4218E+12 Btu/yr

Non-grinding season: 273,150 lb/hr steam; 369 MMBtu/hr/boiler; 225 crop days; 95% capacity
Heat input= 3.7859E+12 Btu/yr

Totals: Heat input= 8.2077E+12 Btu/yr

FLORIDA DEPARTMENT OF HEALTH & REHABILITATIVE SERVICES
Working in partnership with local communities to help people be self-sufficient, experience good health and live in stable families and communities.

August 26, 1996

James Meriweather
Environmental Manager
Osceola Power Limited Partnership
P.O. Box 606
Pahokee, Florida 33476

Re: Osceola Power Limited Partnership AC50-269980, PSD-FL-197C
Emission Compliance Testing

Dear Mr. Meriweather:

We have received your response dated August 22, 1996 on the above referenced matter. This office has reviewed the operational information on both the units with the representative(s) of the United States Environmental Protection Agency (USEPA), Region IV Office. In consideration of extensive modification (relocation of both I.D. fans) the plant is undergoing and that both the units are shutdown at this time, the USEPA concurs to waive the 60 and 180 days test requirement. However, the plant is required to test both units as soon as possible but no later than thirty (30) days upon restart-up. If the facility is unable to operate at the maximum production rate for the initial performance test, a subsequent performance test will be required when the facility achieves the maximum production in order to assure compliance with that standard. This will be consistent with the determination the USEPA has made previously on such request.

Please call us at (561) 355-3070, or Mr. David McNeal with the USEPA at (404) 335-4158, if you have any questions.

Sincerely,

For the Division Director
Environmental Health & Engineering

Ajaya K. Satyal, Environmental Manager
Air Pollution Control Section

FJG/AKS/lh

cc: David McNeal, USEPA Region IV, Atlanta
David Knowles, P.E., DEP South Florida District, Ft. Myers
Jim Pennington, P.E., DARM, Tallahassee

Table 1. Calculation of Theoretical Metals Concentration in Ash, Osceola Power L.P. Facility, Pahokee, FL.

Parameter	Actual Woodwaste Fuel Analysis		Ash Element Concentration (ppm) (a)							
			Theoretical				Actual			
			Partitioning Factor (b)						Partitioning Factor	
	As Received 37 % Moisture (ppm)	Dry (ppm)	Fly Ash	Bottom Ash	Fly Ash	Bottom Ash	Fly Ash	Bottom Ash	Fly Ash	Bottom Ash
Arsenic	21.4	34.0	0.94	0.06	491	58	512	66	0.94	0.06
Barium	- -	- -	--	--	--	--	187	96	0.78	0.22
Cadmium	- -	- -	--	--	--	--	2.6	ND	1.00	0.00
Chromium	27.2	43.2	0.84	0.16	558	197	462	164	0.84	0.16
Copper	19.1	30.3	0.90	0.10	420	87	- -	- -	- -	- -
Lead	6.3	10.0	0.83	0.17	128	49	202	77	0.83	0.17
Mercury	0.078	0.12	0.30 (c)	N/A	0.6	- -	0.6	ND	N/A	N/A
Selenium	- -	- -	--	--	- -	- -	ND	ND	--	--
Silver	- -	- -	--	--	- -	- -	ND	ND	--	--

Note:
N/A = Not Applicable
ND = Non Detectable
(a) Assume woodwaste fuel consists of 10% ash, dry basis. Assume 65% of total ash becomes fly ash and 35% of total ash becomes bottom ash.
(b) Based on partitioning factors derived from actual ash concentrations. Partitioning factors for copper are assumed because no actual partitioning factors are available.
(c) Assume that 30% of the mercury condenses on to the fly ash and 70% volatilizes out the boiler stack.

Example Calculation - Theoretical Ash Element Concentration:

Basis = 1 lb of woodwaste fuel (dry)
Total arsenic present = 34.0 E-06 X 1 lb of wood (dry) = 34.0 E-06 lbs As
Arsenic partitioned to fly ash = 34.0 E-06 lbs X 0.94 = 31.96 E-06 lbs As
Arsenic partitioned to bottom ash = 34.0 E-06 lbs X 0.06 = 2.04 E-06 lbs As
Total ash generated = 10% of wood waste fuel (dry) = 0.10 lbs ash
Ash partitioned to fly ash = 0.10 lbs ash X 0.65 = 0.065 lbs fly ash
Ash partitioned to bottom ash = 0.10 lbs ash X 0.35 = 0.035 lbs bottom ash
Arsenic concentration in fly ash = 31.96 E-06 lbs As ÷ 0.065 lbs fly ash = 492 ppm
Arsenic concentration in bottom ash = 2.04 E-06 lbs As ÷ 0.035 lbs bottom ash = 58 ppm

General Equation:

Fly Ash

Ash Element Concentration (ppm) = [ppm of element X fly ash partitioning factor] ÷ [10% ash from wood waste X 65% ash is fly ash]

Bottom Ash

Ash Element Concentration (ppm) = [ppm of element X bottom ash partitioning factor] ÷ [10% ash from wood waste X 35% ash is fly ash]

General Equation - Actual Ash Concentration Partitioning Factor:

Fly Ash

Element Concentration (ppm) Fly Ash = [ppm (element) Fly Ash X 65%] ÷ {[ppm (element) Fly Ash X 65%] + [ppm (element) Bottom Ash X 35%]}

Bottom Ash

Element Concentration (ppm) Bottom Ash = [ppm (element) Bottom Ash X 35%] ÷ {[ppm (element) Fly Ash X 65%] + [ppm (element) Bottom Ash X 35%]}

Table 2. Calculation of Theoretical Metals Concentrations in Woodwaste Fuel, Osceola Power L.P. Facility, Pahokee, FL.

Parameter	Ash Chemical Analysis (ppm)		Woodwaste Fuel Analysis Dry Basis (ppm) (a)	
	Fly Ash	Bottom Ash	Theoretical	Actual
Arsenic	512	66	35.6	34.0
Barium	187	96	15.5	--
Cadmium	2.6	ND	0.17	--
Chromium	462	164	35.8	43.2
Copper	--	--	--	30.3
Lead	202	77	15.8	10.0
Mercury	0.6	ND	0.12 (b)	0.12
Selenium	ND	ND	ND	--
Silver	ND	ND	ND	--

Note:
ND = Non Detectable
(a) Assume woodwaste fuel consists of 10% ash, dry basis. Assume 65% of total ash becomes fly ash and 35% of total ash becomes botto
(b) Assume that 30% of the mercury condenses on to the fly ash and 70% volatilizes out the boiler stack.

Example Calculation - Theoretical Woodwaste Fuel Analysis Element Concentration:

Basis = 1 lb of ash
Total arsenic present in fly ash = 512 E-06 lb As per lb of fly ash X 0.65 lb fly ash per lb of ash = 332.8 E-06 lb As per lb of ash
Total arsenic present in bottom ash = 66 E-06 lb As per lb of bottom ash X 0.35 lb fly ash per lb of ash = 23.1 E-06 lb As per lb of ash
Total arsenic present in ash = 332.8 E-06 lb As + 23.1 E-06 lb As = 355.9 E-06 lb As
Total arsenic concentration in wood waste = 355.9 E-06 lbs As X 0.10 lb ash per lb wood waste (dry) = 35.6 ppm (dry)

General Equation for Theoretical Woodwaste Fuel Analysis Element Concentration:
Element Concentration (ppm) = {[ppm (element) in fly ash X 0.65 lb (fly ash)/ lb (ash)] +
[ppm (element) in bottom ash X 0.35 lb (bottom ash)/ lb (ash)]} X 0.10 lb (Ash) / lb (woodwaste)

Table 3. Calculation of Theoretical Metals Concentration in Ash from Combined Woodwaste and Tire-Derived Fuel, Osceola Power L.P. Facility, Pahokee, FL.

Parameter	Actual Woodwaste Fuel Analysis Dry (ppm)	Tire Derived Fuel Analysis Dry (b) (ppm)	Theoretical Combined Fuel Analysis Dry (c) (ppm)	Theoretical Ash Element Concentration (ppm) (a) Partitioning Factor (d) Fly Ash	Bottom Ash	Fly Ash	Bottom Ash
Arsenic	34.0	7	25	0.94	0.06	435	52
Barium	- -	12	4	0.90	0.10	70	14
Cadmium	- -	6	2	0.90	0.10	35	7
Chromium	43.2	98.5	62	0.84	0.16	983	348
Copper	30.3	950	349	0.90	0.10	5,889	1,215
Lead	10.0	65	29	0.83	0.17	452	172
Mercury	0.12	0.1	0.12	0.30 (e)	N/A	0.7	N/A
Selenium	- -	105	36	0.90	0.10	614	127
Silver	- -	- -	- -	--	--	- -	- -

Note:
N/A = Not Applicable
(a) Assume woodwaste fuel consists of 10% ash (dry basis) and tire derived fuel consists of 4.78% ash.
Assume 65% of total ash becomes fly ash and 35% of total ash becomes bottom ash.
(b) Analysis is based on an average obtained from two literature sources:
1) Waste Recovery, Inc. Bulletin 20.20.1C Dec.1986. and Burning Tires for Fuel and Tire Pyrolysis
2) Burning Tires for Fuel and Tire Pyrolysis: Air Implications. EPA-450/3-91-024.
(c) Fuel mix is 65.4% woodwaste fuel and 34.6% tire-derived fuel, dry basis (75% woodwaste / 25% TDF on an as-fired basis).
(see calculations on following page)
(d) Based on partitioning factors derived from actual ash concentrations. Partitioning factors for barium, cadmium, copper, and selenium are assumed because no actual partitioning factors are available.
(e) Assume that 30% of the mercury condenses on to the fly ash and 70% volatilizes out the boiler stack.

Fuel Mix Calculation:

TDF will only be burned with wood waste fuel. The following calculations are based on short term fuel usage for Okeelanta Power.
75% of the fuel consists of woodwaste on a wet basis at 37% moisture and 25% TDF on a dry basis.
Calculation basis is 1 lb of fuel.
Woodwaste (dry basis) = 0.75 lb fuel is woodwaste X (100%-37%) = 0.4725 lb woodwaste
TDF (dry basis) = 0.25 lb TDF
Total weight of fuel (dry basis) = 0.4725 lb woodwaste + 0.25 lb TDF = 0.7225 lb fuel
Woodwaste fuel mix = 0.4725 lb woodwaste ÷ 0.7225 lb fuel X 100% = 65.4% of fuel is woodwaste
TDF fuel mix = 0.25 lb woodwaste ÷ 0.7225 lb fuel X 100% = 34.6% of fuel is TDF

Example Calculation - Theoretical Ash Element Concentration:

Basis = 1 lb of mixed fuel (dry) = 0.645 lb woodwaste and 0.346 lb TDF
Arsenic present in wood = 34.0 E-06 X 1 lb of fuel X 65.4% of fuel is wood = 22.2 E-06 lbs As
Arsenic present in TDF = 7 E-06 X 1 lb of fuel X 34.6% of fuel is TDF = 2.42 E-06 lbs As
Total arsenic present = 22.2 E-06 lbs As + 2.42 E-06 lbs As = 24.6 2E-06 lbs As
Arsenic partitioned to fly ash = 24.62 E-06 lbs X 0.94 = 23.14 E-06 lbs As
Arsenic partitioned to bottom ash = 24.62 E-06 lbs X 0.06 = 1.48 E-06 lbs As
Total ash generated = (0.654 lb of woodwaste X 10% of wood waste fuel (dry)) +
(0.346 lb of woodwaste X 4.78% of wood waste fuel (dry) = 0.0819 lb ash
Ash partitioned to fly ash = 0.0819 lb ash X 65% of ash is fly ash = 0.05324 lbs fly ash
Ash partitioned to bottom ash = 0.0819 lb ash X 35% of total ash is bottom ash = 0.02866 lbs fly ash
Arsenic concentration in fly ash = 23.14 E-06 lbs As ÷ 0.05324 lbs fly ash = 435 ppm
Arsenic concentration in bottom ash = 1.48 E-06 lbs As ÷ 0.02866 lbs bottom ash = 52 ppm

General Equation:

Fly Ash

Ash Element Concentration (ppm) = {[(ppm of element in wood fuel X 65.4 % of total fuel is wood) +
(ppm of element in TDF X 34.6 % of total fuel is TDF)] X fly ash partitioning factor} ÷
[(10% ash from wood waste + 4.78% ash from TDF) X 65% ash is fly ash]

Bottom Ash

Ash Element Concentration (ppm) = {[(ppm of element in wood fuel X 65.4 % of total fuel is wood) +
(ppm of element in TDF X 34.6 % of total fuel is TDF)] X bottom ash partitioning factor} ÷
[(10% ash from wood waste + 4.78% ash from TDF) X 35% ash is bottom ash]

Table 2–9. Maximum Concentrations of Metals in Wood Waste Due To Treated Wood

WOOD WASTE PARAMETERS	
Total Biomass	965,647 tons
Total Wood waste	50%
Total Wood waste	482,824 tons
CLEAN WOOD WASTE PARAMETERS	
Total Clean Wood Waste	97.6%
	471,236 tons
Arsenic content (1 ppm)	0.47 tons
Chromium content (3 ppm)	1.41 tons
Copper content (15 ppm)	7.07 tons
TREATED WOOD PARAMETERS	
Percent of total wood amount	2.4%
Total treated wood amount	11,588 tons
Treated wood density	26.3 lb/ft^3
CCA in treated wood	0.47 lb/ft^3
	0.01787 lb CCA/lb treated wood
Total CCA in treated wood	207.1 tons
Total CCA components in treated wood	
Arsenic (13%)	26.9 tons
Chromium (15%)	31.1 tons
Copper (9%)	18.6 tons
WOOD WASTE CONCENTRATIONS	
Total CCA components in wood waste (clean wood plus treated wood):	
Arsenic	27.4 tons
Chromium	32.5 tons
Copper	25.7 tons
Arsenic	56.7 ppm
Chromium	67.3 ppm
Copper	53.2 ppm

SPECIFIC CONDITIONS:

9. Prior to operation of the source, the permittee shall submit to the Department an operation and maintenance plan that will allow the permittee to monitor emission control equipment efficiency and enable the permittee to return malfunctioning equipment to proper operation as expeditiously as possible.

10. During land clearing and site preparation, wetting operations or other soil treatment techniques appropriate for controlling unconfined particulates, including grass seeding and mulching of disturbed areas, shall be undertaken and implemented. Any open burning of land clearing debris on this site shall be performed in compliance with Department regulations.

Operational and Emission Restrictions

11. The proposed cogeneration facility steam generating units shall be constructed and operated in accordance with the capabilities and specifications described in the application or permit. The facility shall not exceed 74 (gross) megawatts generating capacity, 1 hour average. The maximum heat input rate for each steam generator shall not exceed 760 MMBtu/hr when burning 100 percent biomass, 600 MMBtu/hr when burning 100 percent No. 2 fuel oil, or 530 MMBtu/hr when burning low sulfur coal. Maximum heat input to the entire facility (total of two boilers) shall not exceed 8.208×10^{12} Btu per year. Steam production of each boiler shall not exceed an average of 506,000 lbs/hr at 1,540 psig, 955°F.

12. The primary fuel for the facility shall be biomass--bagasse and wood waste material. Authorized wood waste material is clean construction and demolition wood debris, yard trash, land clearing debris, and other clean cellulose and vegetative matter.

The fuel used at the cogeneration facility shall not contain special wastes, except wood, lumber, trees, tree remains, bagasse, cane tops and leaves, and other clean vegetative and cellulose matter. The biomass fuel used at the cogeneration facility shall not contain hazardous substances, hazardous wastes, biomedical wastes, or garbage. The permittee shall not use any delivered fuel that contains an amount of treated or painted wood which, if burned, would cause an exceedance of any of the Department's Acceptable Ambient Concentrations (AAC). The wood waste shall not contain more than 56.7 parts per million (ppm) arsenic or 67.3 ppm chromium or 53.2 ppm copper based on analysis of a composite sample of the fuel.

SPECIFIC CONDITIONS:

The permittee shall perform a daily visual inspection of any wood waste or similar vegetative matter that has been delivered to the facility for use as fuel. Any shipment observed to contain prohibited materials shall not be used as fuel unless such materials can be readily segregated and removed from the wood waste and vegetative matter.

The permittee shall design and implement a management and testing program for the wood waste and other materials delivered to the facility for fuel. The program shall be designed to keep painted and chemically treated wood, household garbage, toxic or hazardous non-biomass and non-combustible waste material, from being burned at this plant. This program shall be submitted to the Department's Bureau of Air Regulation for review and approval at least 60 days before the commencement of operations of the cogeneration facility. At a minimum, the program shall provide for the routine inspection and/or testing of the fuel at the originating wood yard sites as well as at the cogeneration site, to ensure that the quantities of painted or chemically treated wood in the fuel are minimized. Fuel scheduled for burning shall be inspected daily. Fuel tests shall be conducted weekly for the first year of operations at the facility and monthly thereafter, if the Department determines on the basis of the prior test results that less frequent testing is appropriate.

13. Any fuel oil burned in the facility shall be "new" No. 2 fuel oil with a maximum sulfur content of 0.05 percent sulfur as determined by the appropriate test method listed in 40 CFR 60.17. "New" oil means an oil which has been refined from crude oil and has not been used in any manner that may contaminate it.

14. Any coal burned in the facility shall be low sulfur coal with a maximum sulfur content of 0.70 percent and a maximum potential emission equivalent to 1.2 lbs SO_2/MMBtu.

15. The combined use of coal and oil shall be less than 25 percent of the total heat input to this cogeneration facility on a calendar quarter basis. The consumption of low sulfur coal shall not exceed 5.4 percent of the total heat input to each boiler unit in any calendar quarter. The plant shall not burn more than 18,221 tons of coal during any 12-month period (12-month rolling average).

16. The permittee shall maintain a daily log of the amounts and types of fuels used. The amount, heating value, beryllium content (coal only), sulfur content, and equivalent SO_2 emission rate (in lbs/MMBtu) of each fuel oil and coal delivery shall be kept in a

SPECIFIC CONDITIONS:

log for at least two years. For each month, the calculated SO_2 emissions and 12-month rolling average in tons shall be determined and kept in a log.

17. During the first three years of commercial cogeneration facility operation, the existing Boilers Nos. 2, 3, 4, 5, and 6 (Permit Nos. AC 50-203679, 165813, 203680, 165626, and 165814, respectively) may be retained for standby operation provided their operating permits are valid.

During the period from initial firing to commercial operation, both cogeneration boilers can be operated simultaneously with the existing boilers. Only biomass and No. 2 fuel oil may be used in the cogeneration boilers during this period. If more than 570,000 lb/hr steam, (24-hour average) is generated in the cogeneration boilers, steam in excess of 570,000 lb/hr (24-hour average) must be sent to the Osceola sugar mill, and the existing boiler's steam production reduced by an equivalent amount. This period shall not exceed a total duration of 12 months. During this 12-month period, simultaneous operation of the existing boilers and the cogeneration boilers shall not occur on more than a total of 120 calendar days. After the first year of cogeneration facility operation, the existing boilers may be operated only when both new cogeneration boilers are shutdown. During operation, the existing boilers must meet all requirements in the most recent construction and operation permits for the boilers. The existing boilers shall be shutdown and rendered incapable of operation within three (3) years of commercial startup of the cogeneration facility, but no later than January 1, 1999.

18. For the biomass, coal, fly ash, and mercury control system reactant handling facilities:

a. All conveyors and conveyor transfer points shall be enclosed to preclude PM emissions (except those directly associated with the stacker/reclaimers, for which enclosure is operationally infeasible).

b. Inactive coal storage piles shall be shaped, compacted, and oriented to minimize wind erosion. Sod, wetting agents, synthetic or other appropriate materials shall be used to cover those parts of the inactive coal pile that are prone to wind or water erosion.

c. Water sprays or chemical wetting agents and stabilizers shall be applied to storage piles, handling equipment, unenclosed transfer points, etc. during dry periods and as

SPECIFIC CONDITIONS:

necessary to all facilities to maintain an opacity of less than or equal to 5 percent, except when adding, moving or removing coal from the coal pile, which would be allowed no more than 20 percent opacity.

d. The mercury control system reactant storage silos shall be maintained at a negative pressure while operating with the exhaust vented to a filter control system. Particulate matter emissions from each of the three silos shall not exceed a visible emission limit of 5 percent opacity. A visible emission test is to be performed annually on each silo.

19. Visible emissions from any cogeneration boiler shall not exceed 20 percent opacity, 6 minutes average, except up to 27 percent opacity is allowed for 6 minutes in any 1-hour period. Based on a maximum heat input to each boiler of 760 MMBtu/hr for biomass fuels, 600 MMBtu/hr for No. 2 fuel oil, and 530 MMBtu/hr for coal, stack emissions shall not exceed any limit shown in the following table:

	Emission Limit (per boiler)[d]						Total[e]
	Biomass		No. 2 Oil		Bit. Coal		Both
Pollutant	(lb/MMBtu)	(lb/hr)	(lb/MMBtu)	(lb/hr)	(lb/MMBtu)	(lb/hr)	(TPY)
Particulate (TSP)	0.03	22.8	0.03	18.0	0.03	15.9	123.1
Particulate (PM_{10})	0.03	22.8	0.03	18.0	0.03	15.9	123.1
Sulfur Dioxide							
3-hour average	---	---	---	---	1.2	636.0	---
24-hour average	0.10	76.0	0.05	30.0	1.2	636.0	---
Annual average	0.02[a]	---	---	---	1.2[a]	---	339.0[f]
Nitrogen Oxides							
Annual average	0.12[a]	88.2[a]	0.12[a]	72.0[a]	0.15[a]	79.5[a]	477.1
Carbon Monoxide							
8-hour average	0.35	266.0[e]	0.2	120.0	0.2	106.0	1,436.4
Volatile Organic Compounds	0.06[b] 0.04[c]	45.6[b] 30.4[c]	0.03	18.0	0.03	15.9	219.2
Lead	2.7×10^{-6}	0.002	8.9×10^{-7}	0.0005	5.1×10^{-6}	0.0027	0.011
Mercury	5.7×10^{-6}[b] 0.29×10^{-6}[c]	0.0043[b] 0.00022[c]	2.4×10^{-6}	0.0014	8.4×10^{-6}	0.0045	0.0168