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AUG 24 2009

KA 308-09-04
August 21, 2009

BUREAU OF AIR REGULATION

Mr. Jeff Koerner
Administrator, NSR Section
Bureau of Air Regulation
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

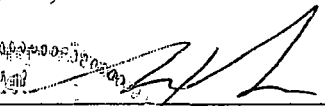
RE: Response to Request for Additional Information dated July 29, 2009
Project No. 0530021-023-AC
Central Power and Lime, Inc. (CPL)
Power Plant; Brooksville, Florida
Request to Co-fire Wood Pellets with Coal in the Power Plant Boiler

Dear Mr. Koerner,

Enclosed please find four (4) copies of a response to the request for additional information (RAI) dated July 29, 2009 of the subject project. Please note that we have significantly reduced the proposed quantity of wood pellets to test which addresses many of the concerns of the RAI. The proposed quantity is reduced from 20,000 tons to 2,000 tons. This reduced material usage effectively reduces all pollutant emission increases to less than one-tenth of the PSD thresholds. CPL is confident the material can still effectively be evaluated at this proposed quantity. The responses below are in sequence of the RAI questions. If you should have any questions regarding this application, please do not hesitate to contact me at (352) 377-5822 or mlee@kooglerassociates.com.

In accordance with Rule 62-4.050(3), I have sealed this letter with enclosure as certification by a professional engineer.

Regards,


Max Lee, Ph.D., P.E.
PE Seal 58091


Date

Cc: Terry Woodard, Central Power and Lime
Robert Noble, Delta Power Services
Cleve Holladay, FDEP (email with requested electronic data files)

Enclosure: Revised Application Attachment 02 and 03
Attachment B - alternative PM test method

PROJECT UPDATE: CPL proposes to reduce the amount of wood pellets to be co-fired from 20,000 tons to 2,000 tons. CPL feels this amount of co-firing can still provide adequate information of the system performance while reducing the emissions to far below PSD emission thresholds. As such, the responses and related revisions below are based on the reduced amount. Related pages of the initial application, Attachments 02 and 03 have been revised and are attached.

- 1. In your application, you stated that a study to determine system performance when co-firing pelletized wood material would be finished at the end of July, 2009. If this study is complete, please provide the results of this study. The application is based on general information on wood combustion and is not specific to pelletized wood.*

CPL contracted with Babcock Power to conduct a bench-scale study to evaluate the co-firing of these materials. The study should be completed at the end of this month. The study has produced some preliminary data that indicate that at 30% (based on heat input) of fuel substitution, NO_x is projected to be 0.212 lb/mmBtu. Please note that because this data is preliminary, more conservative emission factors for wood and coal were applied for NO_x emissions to determine PSD threshold in the revised calculations in Attachment 03. The study team indicated that carbon monoxide emissions cannot be predicted in the study and will need to be determined in the testing phase. Thus, the study is not expected to predict CO emissions. At this time no other pollutant information is available. The study team expects to provide predictions of SO₂ emissions. It should be noted that SO₂ emissions are generally known to be lower when co-firing with wood. The results of the study will be submitted as soon as available.

While the study results will help guide CPL in the test design, CPL plans to evaluate the wood pellets impact on pollutant emissions during testing by either CEMs or stack testing (see Item 4 and 5 below). CPL believes that the study results are valuable but should not hold up this permitting process and thus is eager to move forward and obtain an air construction permit.

- 2. According to the information provided, if particulate matter emissions less than 10 microns (PM₁₀) are identical to particulate matter (PM) emissions, the project will be subject to PSD review and all of its requirements for PM₁₀, since the PM emissions are projected to be greater than the PSD applicability rate of 15 tons per year. Please provide PM₁₀ information to show whether the facility is subject to PSD. In addition, the carbon monoxide (CO) emissions are very near the 100 ton per year PSD significance threshold. Please provide the active Excel spreadsheets showing all calculations in the proposed trial burn tables in Attachment 2. The values in the trial burn table appear to be based on four periods of trial burns instead of five mentioned in the Air Construction Description in Attachment 03. Please clarify the discrepancy.*

Pollutant emission calculations in Attachment 02 are revised based on the reduced amount of wood pellets, from 20,000 tons to 2,000 tons. The revised active Excel spreadsheet of Attachment 02 is attached on CD and will be emailed to Cleve Holladay, FDEP. Note, the number of trial burn loads is reduced to three based on co-firing loads at 10, 20, and 30 percent heat input replacement with wood pellets. Relevant pages of the permit Application Air Construction Description in Attachment 03 are revised and attached.

The table of potential pollutant emissions is revised and provided in Attachment 02. Each pollutant is calculated in a separate table. The calculations are conservatively based on permit limits (NO_x, SO₂, and PM) for coal burning and AP-42 emission factors for wood burning and

VOC and CO having no limits. The increase of pollutant emissions based on the reduced amount of pellets, results in emissions of near one-tenth the PSD threshold or less (see revised Attachment 02 of application for details).

The summary table is provided below:

	Maximum Increase HOURLY lb/hr	Maximum Increase TRIAL PERIOD tons	PSD Threshold tons
Carbon Monoxide	366	9.9	100
Sulfur Dioxide	-650	-5.8	40
Nitrogen Oxides	54	1.5	40
Volatile Organic Compounds	9	0.3	40
Particulate matter (PM/PM10)	55	1.5	25/15

3. Provide justification for the proposed trial burn of six months. Identify operational data that will be collected to determine the feasibility of co-firing wood pellets with coal.

Per your email on August 21, 2009, we are requesting a one-year permit. While analysis of the system is planned to be five hours at each co-firing load, adjusting the system to a stable operation mode will likely take more time. CPL estimates a full day to obtain stable operation and complete testing per load. To allow flexibility of time to stabilize operations and evaluate the system, CPL requests that the Department not limit the time of firing at each load but only the amount of material (2000 tons).

The requested length of the permit of one year to complete the testing for the permit is requested for several reasons. In discussions with FDEP the time frame of one year was recommended by FDEP to allow for uncertainties that typically arise in such a planned trial test. Such uncertainties include unexpected power plant downtime and contingencies of coordinating engineering staff availability during the testing. The plant supplies power to the commercial electric grid. Time allowance will also be needed for planning with power recipient companies such that unexpected outages due to this testing do not interrupt electric power service. Such planning with the recipient companies would be planned on short-term (e.g., week to week basis) and thus cannot be determined at the time the permit is issued.

A limitation of time to less than one year could cause unnecessary burdens without environmental benefit. The time frame may prevent unnecessary administrative work to request for permit extensions if unexpected delays occur and permit extension must be requested.

Testing will be completed within 90 days of beginning the first test. Following completion of the testing, stack test reports will be filed within 45 days. Provided the testing is successful, CPL is requesting to submit an air construction permit application within 120 days of completing the tests.

The operational data to be collected during testing includes the following:

Data Requirements from Riley Power

Data will be collected from the control room and locally. Data sheets will be provided prior to testing, to outline the necessary data. The data sheets should be reviewed prior to testing to verify the availability of each test point. All test instrumentation should be checked to ensure that it is in good working order and recently calibrated. If computer data is available a list of point identifications, engineering units, and measurement locations should be provided in Microsoft Excel format.

Flows:

- Feedwater Flow
- Superheater Spray Flow
- Reheater Spray Flow
- Total Combustion Airflow
- Total Primary Airflow A,B,C,&D
- Main Steam Flow
- Total Flue Gas Flow

Temperatures:

- BFP Inlet
- Crossover heat Outlet
- Saturation
- Primary SH Out Bef. Spray A&B
- SH Spray Water Temp
- Primary SH Out Aft. Spray A&B
- Secondary SH Outlet A&B
- Cold RH In Bef. Spray A&B
- RH Spray Water Temp
- Cold RH In Aft. Spray A&B
- Hot RH Out Aft. Spray A&B
- Ambient Air
- FD Fan Discharge A &B
- Air Heater Air Inlet A &B
- Air Heater Air Outlet A &B
- Air Heater Gas Inlet A &B
- Air Heater Gas Outlet A &B
- ID Fan Discharge A &B
- Baghouse Inlet
- Main ID Fan Inlet
- Main ID Fan Outlet
- Stack

Pressures:

- BFP Discharge
- Economizer Inlet
- Drum
- Boiler Fee pump Discharge
- Main Steam A &B
- Throttle
- Cold RH In Bef. Spray A &B
- Cold RH In Aft. Spray A &B
- Hot RH Out Aft. Spray A &B

Pressures:

- Barometric
- FD Fan Discharge A & B
- Air Heater Air Inlet
- Air Heater Air Outlet
- Windbox A
- Windbox B
- Windbox C
- Windbox D
- Furnace
- Secondary SH In/Outlet
- Primary SH In/Outlet
- Reheater In/Outlet
- Economizer In/Outlet
- Air Heater Gas In/Outlet
- ID Fan Suction A &B
- ID Fan Discharge A &B
- Baghouse In/Outlet

Boiler Process Outlet:

- O₂ % Volume Probe A
- O₂ % Volume Probe B

Boiler Process Outlet:

- O₂
- Combustibles (CO and CO₂)
- Temperature
- Static Pressure

Air Heater Outlet:

- Temperature
- Static Pressure

Stack: (CEMS)

- NO_x(CEMS-Powerduct and Mainstack)
- SO₂(CEMS-Powerduct and Mainstack)
- Opacity (Mainstack only)

Fan Data: (for FD, ID, primary air, and baghouse fans)

- Fan Current
- Fan Voltage
- Fan Speed
- Frequency (for VFD)
- Fan Inlet Damper Position

Burner Settings:

- Windbox Pressure
- Furnace Pressure
- Shroud Position
- OFA Damper Position
- SA Control Damper Position
- TA Swirl Vane Angle
- Coal Spreader Retracted
- OFA Duct Pressure

Pulverizer Data:

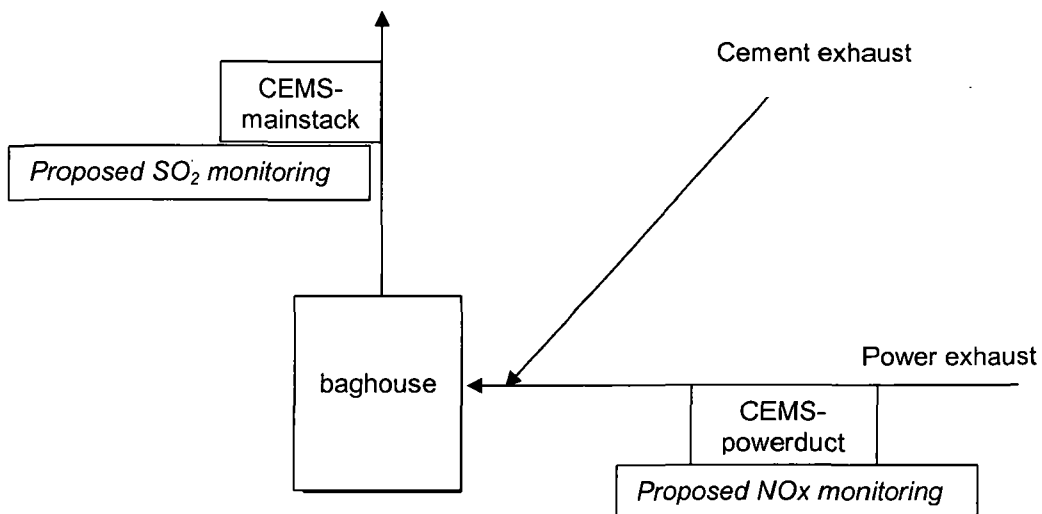
- Motor Current
- Fuel Flow
- Hot Primary Air Temperature
- Tempering Air Temperature
- Mill Discharge Temperature
- Total Primary Airflow to Mill
- Hot Air Damper Position
- Mill Differential Pressure
- PA Fan Motor Current
- Primary Air Damper Position
- Cold Air Damper Position
- Hot Air Damper Position
- Tempering Air Damper Position

4. Provide nitrogen oxide (NOx) and sulfur dioxide (SO2) continuous emissions monitoring (CEMS) data for the past five years to establish baseline data for emissions due to coal firing. In addition, provide any available test information for volatile organic compounds (VOC), PM10, and CO emissions from the power plant boiler to establish baseline emissions for these pollutants.

Test information is not available for volatile organic compounds (VOC), PM10, or CO emissions from the power plant.

For background information, cement plant emissions combine with power plant emissions prior to entering the baghouse and then enter as a single exhaust to the main stack. There are two sets of NOx and SO2 CEMS. One set is located on the main stack (CEMS-mainstack) and one set is located in the power plant ductwork (CEMS-powerduct). A diagram of the setup is shown below.

Table 1. Proposed CEMS monitoring



The CEMS-powerduct is located prior to where cement and power plant emissions combine and enter the baghouse. The baghouse does not control NOx emissions but does remove SO2 due to the alkalinity of cement kiln dust.

CPL proposes to monitor NOx emissions by the NOx, CEMS-powerduct and monitor SO2 emissions with the SO2, CEMS-mainstack for this study.

There are several reasons for choosing the NOx, CEM-powerduct. At the location of the NOx, CEMS-powerduct the power plant NOx emissions are not combined with cement plant NOx emissions. NOx, CEMS-mainstack measures the combined power and cement NOx emissions. Furthermore, the NOx, CEMS-mainstack does not meet the rigor of Part 75 CEMS monitoring as is met by the NOx, CEMS-powerduct. The NOx, CEMS-powerduct was installed for CAIR monitoring. Prior NOx emissions were measured by EPA Method 7E testing in the power plant duct work. Given the reduced projected emissions increase (based on 2000 tons of wood), the switch in monitoring methods and that CPL is currently working to reduce NOx to address CAIR, CPL proposes to determine baseline data from 90 days of operation prior to the date that trial testing begins as allowed by 62-210.200(36)a., F.A.C.

There are several reasons for choosing the SO2, CEMS-mainstack. SO2 is removed in the baghouse. Nearly all SO2 measured at the mainstack originates from the power plant. For relative reference, the Title V permit (05320021-011-AV) limits establish power plant emissions at the main stack at 770 lb/hr of SO2 and cement plant emissions at 11 lb/hr of SO2 (i.e., 98.5% of SO2 attributed to power plant). It should also be noted that SO2 is actively controlled by a feed loop to a limestone injection system in the power plant boiler. It is noted, as stated in item 2 above, that SO2 emission are expected to be reduced by wood co-firing. While this monitoring data is available for the past five years, similar to NOx, CPL requests to determine baseline data from 90 days of operation prior to the data that trial testing begins.

- 5. NOx and SO2 emissions are continuously monitored for the coal-fired boiler. The Department will likely require stack tests for PM (highest expected pellet firing rate) and CO (at low, medium and high pellet firing rates). The Department will also require CO and PM tests for coal firing to determine baseline levels. Please comment.***

CPL agrees to testing CO as suggested by the Department. Regarding PM emissions, the baghouse controls PM emissions from the combined exhaust of the power plant and cement plant. Given this unique design, FDEP has approved alternate test methods for PM emissions testing from the power plant at the main stack. In summary the alternative methods state, 1) if the cement plant is not running, the power plant PM emissions are determined by Method 5 at the main stack with no adjustments, or 2) if the cement plant and power plant are operating, the power plant PM emissions are determined by proportioning PM emissions at the main stack based on air flow from the power and cement plant. A copy of this testing allowance is attached (Attachment B). CPL agrees to perform PM testing as suggested by the alternate test methods at baseline and the highest expected pellet firing rate. CPL will work to conduct all PM tests when the cement plant is down. However, CPL does not control the Cemex cement plant operations and thus cannot guarantee how the cement plant will operate during the trial periods.

ATTACHMENT 02
Emission Calculations and Material Comparisons

REVISED AUGUST 14, 2009
PER RAI (JULY 29, 2009) RESPONSE

Central Power and Lime (facility ID: 0530021)

Proposed Trial Burn: Biomass, wood pellets from Green Circle BioEnergy, Inc.

Emissions Comparison - Summary

		maximum hourly	
		coal ton/hr	wood ton/hr
Scenario A)	no co-fire	74	0
Scenario B)	co-fire (30% heat from wood)	51.8	37

	Maximum Increase HOURLY lb/hr	Maximum Increase TRIAL PERIOD tons	PSD Threshold tons
Carbon Monoxide	366	9.9	100
Sulfur Dioxide	-650	-5.8	40
Nitrogen Oxides	54	1.5	40
Volatile Organic Compounds	9	0.3	40
Particulate matter (PM/PM10)	55	1.5	25/15

Central Power and Lime (facility ID: 0530021)

Proposed Trial Burn Schedule: Biomass, wood pellets from Green Circle BioEnergy, Inc.

heat values

coal 12500 btu/lb=
wood 7500 btu/lb=

25 mmbtu/ton
15 mmbtu/ton

reference

AP-42, App. A
Green Circle BioEnergy

No co-firing	estimated dates	estimated # of days	heat input replaced %	rate of firing			mass of material firing				
				total mmbtu/hr	coal mmbtu/hr	wood mmbtu/hr	coal ton/hr	coal ton/period	wood ton/hr	wood ton/period	
	1-Oct	1	10	1850	1850	0	74.0				
	(6 months)	1	20	1850	1480	370	66.6	1,598	12.3	296	
	↓	1	30	1850	1295	555	59.2	1,421	24.7	592	
	30-Mar						51.8	1,243	37.0	888	

Total mass	tons	tons
	2,664	1,480

2000

Request a total of 2,000 tons of wood

equivalent coal tonnage	2664	1,200
equivalent coal tonnage total		3,864

Central Power and Lime (facility ID: 0530021)

Proposed Trial Burn: Biomass, wood pellets from Green Circle BioEnergy, Inc.

Emissions Comparison

		maximum hourly		Total Trial period		heat content	
		coal ton/hr	wood ton/hr	coal ton/period	wood ton/period	coal mmbtu/ton	wood* mmbtu/ton
Scenario A)	no co-fire	74	0	3,864	0	25	16.97
Scenario B)	co-fire (30% heat from wood)	51.8	37	2,664	2,000		

* heat content of wood based on material analyses average (see Material comparison sheet)

Carbon Monoxide

HOURLY EMISSIONS		coal ton/hr	factor lb/ton	=	lb/hr	factor reference	
Scenario A)		74	0.5	=	37	AP42, Table 1.1-3	
B)		51.8	0.5	=	25.9	AP42, Table 1.1-3	
B)		37	16.97	0.6	=	377	AP42, Table 1.6-2
Scenario B) total					<u>403</u>		
Maximum hourly increase (scenario A versus B)					366		
TRIAL PERIOD EMISSIONS		coal tons	factor lb/ton	=	tons		
A)		3,864	0.5	=	1.0	AP42, Table 1.1-3	
B)		2,664	0.5	=	0.7	AP42, Table 1.1-3	
B)		2,000	16.97	0.6	=	<u>10.18</u>	AP42, Table 1.6-2
Scenario B) total					<u>11</u>		
Maximum period increase (scenario A versus B)					9.9		

Central Power and Lime (facility ID: 0530021)
Proposed Trial Burn: Biomass, wood pellets from Green Circle BioEnergy, Inc.

Emissions Comparison

		maximum hourly		Total Trial period	
		coal ton/hr	wood ton/hr	coal ton/period	wood ton/period
Scenario A)	no co-fire	74	0	3,864	0
Scenario B)	co-fire (30% heat from wood)	51.8	37	2,664	2,000

heat content	
mmbtu/ton	mmbtu/ton
coal	wood*
25	16.97

* heat content of wood based on material analyses average (see Material comparison sheet)

Sulfur Dioxide

HOURLY EMISSIONS					factor reference
	coal ton/hr	mmbtu/ton	factor lb/mmbtu	=	lb/hr
Scenario A)	74	25.00	1.2	=	2220
there are two permit limits (1.2 lb/mmbtu and 770 lb/hr) use limit for averaging of 2 hours or less					
B)	51.8	25.00	1.2	=	1554
permit limit					
	wood ton/hr	mmbtu/ton	factor lb/mmbtu	=	lb/hr
B)	37	16.97	0.025	=	16
AP42, Table 1.6-2					
Scenario B) total					<u>1570</u>
Maximum hourly increase (scenario A versus B)					lb/hr -650
TRIAL PERIOD EMISSIONS					factor
	coal tons		factor lb/ton	=	tons
A)	3,864		10.4	=	20.1
there are two permit limits use limit for avg of 3-hours (1)					
B)	2,664		10.4	=	13.9
permit limit (1)					
	wood tons	mmbtu/ton	factor lb/mmbtu	=	tons
B)	2,000	16.97	0.025	=	0.42
AP42, Table 1.6-2					
Scenario B) total					<u>14</u>
Maximum period increase (scenario A versus B)					tons -5.8

1) permit limit, 3-hr avg or greater, measured at main stack = 770 lb/hr @ 74 ton/hr coal = 10.4 lb/ton coal

Central Power and Lime (facility ID: 0530021)

Proposed Trial Burn: Biomass, wood pellets from Green Circle BioEnergy, Inc.

Emissions Comparison

		maximum hourly		Total Trial period		heat content	
		coal ton/hr	wood ton/hr	coal ton/period	wood ton/period	coal mmbtu/ton	wood* mmbtu/ton
Scenario A)	no co-fire	74	0	3,864	0	25	16.97
Scenario B)	co-fire (30% heat from wood)	51.8	37	2,664	2,000		

heat content	
coal	wood*
25	16.97

* heat content of wood based on material analyses average (see Material comparison sheet)

Nitrogen oxides

HOURLY EMISSIONS	coal ton/hr	factor lb/ton	=	lb/hr	factor reference permit limit (1)
Scenario A)	74	11.43	=	846	
B)	51.8	11.43	=	592	permit limit (1)
B)	37	16.97	0.49	308	AP42, Table 1.6-2
Scenario B) total				900	

Maximum hourly increase (scenario A versus B) lb/hr
54

TRIAL PERIOD EMISSIONS

	coal tons	factor lb/ton	=	tons	factor reference permit limit (1)
A)	3,864	11.43	=	22.1	permit limit (1)
B)	2,664	11.43	=	15.2	permit limit (1)
B)	2,000	16.97	0.49	8.31	AP42, Table 1.6-2
Scenario B) total				24	

Maximum period increase (scenario A versus B) tons
1.5

1) permit limit, 1-hr avg or greater, measured at main stack = 846 lb/hr @ 74 ton/hr coal = 11.4 lb/ton coal

Central Power and Lime (facility ID: 0530021)

Proposed Trial Burn: Biomass, wood pellets from Green Circle BioEnergy, Inc.

Emissions Comparison

		maximum hourly		Total Trial period		heat content	
		coal ton/hr	wood ton/hr	coal ton/period	wood ton/period	coal mmbtu/ton	wood* mmbtu/ton
Scenario A)	no co-fire	74	0	3,864	0	25	16.97
Scenario B)	co-fire (30% heat from wood)	51.8	37	2,664	2,000		

* heat content of wood based on material analyses average (see Material comparison sheet)

Volatile Organic Compounds

HOURLY EMISSIONS		coal ton/hr	factor lb/ton	=	lb/hr	factor reference	
Scenario A)		74	0.06	=	4	AP42, Table 1.1-19	
B)		51.8	0.06	=	3	AP42, Table 1.1-19	
B)		wood ton/hr	mmbtu/ton	factor lb/mmbtu	=	lb/hr	AP42, Table 1.6-3
B)		37	16.97	0.017	=	11	AP42, Table 1.6-3
Scenario B) total					14		
Maximum hourly increase (scenario A versus B)					9		
TRIAL PERIOD EMISSIONS		coal tons	mmbtu/ton	factor lb/ton	=	tons	factor reference
A)		3,864	25.00	0.06	=	0.12	AP42, Table 1.1-19
B)		2,664	25.00	0.06	=	0.1	AP42, Table 1.1-19
B)		wood tons	mmbtu/ton	factor lb/mmbtu	=	tons	AP42, Table 1.6-3
B)		2,000	16.97	0.017	=	0.29	AP42, Table 1.6-3
Scenario B) total					0.37		
Maximum period increase (scenario A versus B)					0.25		

Central Power and Lime (facility ID: 0530021)
Proposed Trial Burn: Biomass, wood pellets from Green Circle BioEnergy, Inc.

Emissions Comparison

		maximum hourly		Total Trial period		heat content	
		coal ton/hr	wood ton/hr	coal ton/period	wood ton/period	coal mmbtu/ton	wood* mmbtu/ton
Scenario A)	no co-fire	74	0	3,864	0	25	16.97
Scenario B)	co-fire (30% heat from wood)	51.8	37	2,664	2,000		

* heat content of wood based on material analyses average (see Material comparison sheet)

Particulate matter

HOURLY EMISSIONS		coal ton/hr	factor lb/ton	=	lb/hr	factor reference permit limit (1)	
Scenario A)		74	0.3378	=	25		
B)		51.8	0.3378	=	17	permit limit (1)	
B)		wood ton/hr	mmbtu/ton	factor lb/mmbtu	=	lb/hr	AP42, Table 1.6-1
		37	16.97	0.1	=	63	
Scenario B) total					<u>80</u>		
Maximum hourly increase (scenario A versus B)					lb/hr	55	
TRIAL PERIOD EMISSIONS		coal tons	factor lb/ton	=	tons	factor reference permit limit (1)	
A)		3,864	0.3378	=	0.65		
B)		2,664	0.3378	=	0.4	permit limit (1)	
B)		wood tons	mmbtu/ton	factor lb/mmbtu	=	tons	AP42, Table 1.6-1
		2,000	16.97	0.1	=	1.70	
Scenario B) total					<u>2.15</u>		
Maximum period increase (scenario A versus B)					tons	1.5	

1) permit limit, 1-hr avg or greater, measured at main stack = 25 lb/hr @ 74 ton/hr coal = 0.3378 lb/ton coal

ATTACHMENT 03
Air Construction Description

REVISED AUGUST 14, 2009
AS RESPONSE TO
RAI DATED JULY 29, 2009

REVISED 8/14/2009

CP&L Renewable Energy Study - Co Firing with Pulverized Coal

Description of Air Construction permitting request:

This application follows up on the conference call on June 8, 2009 between, FDEP, Central Power and Lime and Koogler & Associates, Inc.

This application as revised in response to the Request for Additional Information letter dated July 29, 2009. CPL requests a trial burn of 2,000 tons of wood biomass to be co-fired with coal in the power plant, unit (EU018). The power plant unit is currently allowed to burn coal. Even though the pellet material, at this time is nearly six times the cost of coal, CPL believes the reduced carbon foot print of these pellets and that biomass fuel is considered a carbon neutral fuel, that this material should be tested at this time. CPL believes this fuel may soon become economically viable if certain regulations and limitations arise to address greenhouse gas emissions.

The biomass consists of yellow pine wood pellets produced by a facility (facility AIRS ID: 0630058) owned by Green Circle BioEnergy Inc. in Jackson county, Florida. General information from the pellet producer is provided in Attachment 01.

An academic study of the feasibility of burning this material is currently underway to evaluate the boundaries or limits of co-firing biomass with coal. Results of this study will be provided when the study is complete (expected to be complete in August). The information will be provided as a supplement to the application but is not believed to be essential to the application determination by FDEP.

The time frame requested to complete this trial burn study is 180 days. This amount of time will allow for any unexpected delays in the trial burn. The proposed schedule for trial burn is at increments of 10% of heat substitute, wood + coal firing will be tested, at 10, 20 and 30 percent wood substitution.

The pellets will be transported on-site by truck or rail, stored in the coal storage area and injected to burner system using the existing material handling system. Thus, no significant change in material handling will occur. In fact, the fugitive emissions are likely to be reduced due to material higher moisture content than coal.

Estimates of Emission increases are compared to ensure the potential emissions increase are below PSD thresholds. To ensure increases are less than PSD threshold limits the total amount of biomass is requested to be limited to 2,000 tons. Calculations are provided of in Attachment 02.

ATTACHMENT B
FDEP-approved Alternate PM Test Method



KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
352/377-5822 • FAX/377-7158

308-01-02
August 3, 2001

Mr. Bill Proses
FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION
Southwest District Office
3804 Coconut Palm Drive
Tampa, Florida 33619-8318

Subject: *Florida Crushed Stone/Central Power & Lime
Hernando County
DEP File No. 0530021-002-AV
Power Plant Compliance Demonstration*

Dear Bill:

The purpose of this letter is to establish a protocol to be used to demonstrate compliance with the emission limiting standards for the CPL Power Plant as set forth in the above-captioned Title V Permit. As I discussed with you, the objective at this point in time is to develop a technical protocol which is acceptable to all concerned parties. Once this is accomplished, we can discuss how the protocol can be incorporated into the regulatory framework.

As a very brief background, both the power and cement plants were permitted in the mid-1980s under PSD-FL-091 and Power Plant Site Certification PA82-17. Both plants were subject to PSD permitting including a review of Best Available Control Technology (BACT). Further, the cement plant is subject to New Source Performance Standards for Portland Cement Plants (40 CFR 60, Subpart F) and National Emission Standards for Hazardous Air Pollutants from the Portland Cement Manufacturing Industry (40 CFR 63, Subpart LLL). The power plant is not subject to New Source Performance Standards as the age of the plant predates New Source Performance Standards for such plants.

Regarding the emissions from the two plants, the emissions from the power plant, the cement kiln and the clinker cooler are exhausted through a common fabric filter collector (baghouse) for particulate matter control, and are discharged through a common stack. Operationally and for compliance demonstration, there are scheduled outages of the power plant during each Federal fiscal year, such that emissions measurements can be conducted in the common stack to demonstrate compliance with the permitted emission limiting standards of the cement plant (particulate matter, sulfur dioxide, nitrogen oxides and visible emissions). With the cement plant operation, however, there are no scheduled outages during many Federal fiscal years and unscheduled outages of the cement plant are very infrequent and typically of short duration. As a result, there have been, and in all likelihood will be in the future, Federal fiscal years when compliance testing cannot be conducted with the power plant operating alone. The protocol proposed herein is for compliance testing to demonstrate compliance with the emission limiting standards of the power plant with or without the cement plant operating.

As stated previously, there is adequate opportunity during each Federal fiscal year to conduct emission measurements in the common stack to demonstrate compliance with emission limiting standards of the cement plant when only the cement plant is operating. Regarding the protocol for demonstrating compliance with emission limiting standards of the power plant, there are two alternatives under which emission measurements can be conducted. The two alternatives are:

ALTERNATIVE ONE

If there is a scheduled or unscheduled outage of the cement plant of sufficient duration, emission measurements (sulfur dioxide, nitrogen oxides, particulate matter and visible emissions) for power plant compliance demonstration will be conducted in the common stack with no interference from the cement plant. This alternative will be used as the primary alternative whenever circumstances permit.

ALTERNATIVE TWO


This involves emission measurements to demonstrate compliance with the emission limiting standards for the power plant when both the cement and power plants are operating and with emissions from both plants being discharged through the common stack. There are two issues to address under this scenario; the compliance test for the gaseous pollutants (sulfur dioxide and nitrogen oxides) and the compliance test for particulate matter. These issues are separate as the control of SO₂ and NO_x emissions occurs within the power plant, whereas the control of particulate matter emissions occurs in the baghouse after the gas streams from the power and cement plants have been combined. As such, separate approaches are proposed for conducting compliance tests for SO₂ and NO_x and for particulate matter.

SO₂ and NO_x Compliance - To demonstrate compliance with the sulfur dioxide and nitrogen oxides emission limiting standards for the power plant, it is proposed that sampling be conducted in the duct work, discharging combustion gases from the power plant prior to this gas stream mixing with the gas stream discharged from the cement plant. Referring to the attached drawing of the power plant exhaust system, the proposed sampling location of SO₂ and NO_x will be noted. The proposed location is in a 13 feet by 13 feet (cross section) duct through which all of the exhaust gas from the power plant flows. The proposed sampling location is downstream of primary dust collectors (which will reduce the dust loading in the gas stream being sampled) and upstream of the point where the power plant gases mix with gases discharged from the cement plant clinker cooler.

To demonstrate compliance with the SO₂ and NO_x emission limiting standards for the power plant, it is proposed that concentration measurements for these two gases and for oxygen be made at the proposed location. The measurements for SO₂, NO_x and oxygen will be made in accordance with EPA Methods 6C, 7E and 3 (40 CFR 60, Appendix A), respectively. The concentration measurements for SO₂ and NO_x (ppm converted to pounds per dry standard cubic foot) will be combined with the oxygen corrected "F" factor (cubic feet per mmbTU, oxygen corrected) to yield an SO₂ and NO_x emission rate with the units pounds per mmbTU. These emission rates will then be combined with the heat input rate to the power plant (mmbTU per hour) determined from the recorded coal feed rate (pounds of coal per hour) and the heating

value of the coal (mmBTU per pound of coal, as fired). The resulting SO₂ and NO_x emission rates (pounds per hour and/or pounds per mmBTU) will then be compared with the permitted SO₂ and NO_x emission limits for the power plant (the pounds per hour emission caps or the pounds per mmBTU emission limits at less than maximum permitted heat input rates).

If you will recall, this concept was approved for the compliance testing conducted on the power plant on September 26, 2000. During those tests, the SO₂ and NO_x sampling was conducted in a split duct upstream of Primary Dust Collector 1A (see attached figure). Subsequent investigation determined that the sampling location proposed herein is more suitable as far as access, it represents the total gas stream discharged from the power plant and it is downstream of the primary dust collectors. Being downstream of the primary dust collectors will not affect the SO₂ and NO_x concentration measurements but it will reduce the dust loading in the gas stream which will facilitate the SO₂ and NO_x emission measurements.



Particulate Matter Compliance - To demonstrate compliance with the particulate matter emission limiting standard for the power plant when both the power and cement plants are operating, there are two alternatives; both involving emission measurements conducted in the common stack exhausting the cement plant and power plant. The choice of alternatives will depend upon the efficiency of the fabric filter collector used for controlling particulate matter emissions from both the cement and power plants at the time of testing.

The particulate matter concentration in the stack gas discharged from the common stack (a measure of baghouse efficiency) varies over quite a range. Particulate matter emission measurement data collected during the period March 1998 through May 2001, with both the cement plant operating alone and with the cement and power plants operating together, were reviewed. These data, summarized in the attached table, show the particulate matter concentration ranging from 0.0007-0.0068 grains per dry standard cubic foot. The data further demonstrate that the particulate matter concentration in the stack gas is essentially independent of which plants are operating; i.e. the particulate matter concentration is about the same with the cement plant operating as it is with both the cement and power plants operating.

From the summary of particulate matter emission measurement data, a couple of things are apparent. First and most important, it can be observed that the measured particulate matter emission rates are all well below the permitted allowable particulate matter emission rates regardless of which plants are operating. The measured emission rates have ranged from about five to 52 percent of the allowable, demonstrating that overall compliance with particulate matter emission limiting standards is not an issue.

The second thing to be noted is that there are times with the cement plant and power plant operating together where the total measured particulate matter emissions (from both plants) are less than what is allowed for the power plant alone. Examples of this are the May 1999 and May 2001 tests. This was almost the case for the June 1998 tests also.

From the data summarized in the attached table, it appears that if the stack gas particulate matter concentration is less than about 0.003 grains per dry standard cubic foot, the total

particulate matter emission rate (pounds per hour, from both the cement and power plants) will be less than the particulate matter emission rate (pounds per hour) allowed for the power plant if operating alone. If particulate matter emission measurements happen to be conducted under these circumstances for purposes of demonstrating compliance with the power plant emission limiting standards, it will be stated that the measured particulate matter emission rate with both plants operating (pounds per hour) is less than the permitted particulate matter emission rate for the power plant if operating alone and therefore it follows that compliance with the particulate matter emission limiting standard for the power plant is demonstrated.

The second situation which can be encountered is when the stack gas particulate matter concentration exceeds 0.003 grains per dry standard cubic foot; or more specifically when the measured particulate matter emission rate from the two plants combined exceeds the allowable particulate matter emission rate for the power plant if operating alone. Referring to the attached table, this circumstance was observed with the particulate matter emission measurements made in June 1998, April 2000 and September 2000. Under this circumstance, the following protocol is proposed for demonstrating compliance with the particulate matter emission limiting standard for the power plant.

If the measured particulate matter emission rate (pounds per hour) from the cement and power plants combined exceeds the particulate matter emission rate (pounds per hour) allowed for the power plant if operating alone, the combined cement/power plant particulate matter emission rate will be adjusted by deducting the particulate matter emissions (pounds per hour) attributable to the cement plant. This will be done using the particulate matter emission data from the cement plant compliance test immediately preceding the power plant compliance test. To demonstrate how this will be accomplished, the particulate matter emission data for the periods May 22, 2000 (the cement plant only) and September 26, 2000 (cement plant plus power plant) will be used.

During the September 26, 2000 compliance test, the cement and power plants were operating and the particulate matter emission rate of 34.21 pounds per hour exceeded the particulate matter emission rate allowed for the power plant if operating alone (17.06 pounds per hour). The particulate matter emission rate measured on May 22, 2000 with the cement plant only operating was 20.12 pounds per hour, the particulate matter concentration in the stack gas was 0.0056 grains per dry standard cubic foot and the cement plant preheater feed rate was 133.8 tons per hour. It is proposed that this cement plant particulate matter emission rate be adjusted to the stack gas particulate matter concentration measured with the cement and power plants operating and that the emission rate also be adjusted to the cement plant preheater feed rate reported with the cement and power plants operating.

The particulate matter emission rate from the cement plant measured on May 22, 2000, adjusted to September 26, 2000 conditions, would be as follows:

$$\begin{aligned} & 20.12 \text{ lb PM/hr @ } 0.0056 \text{ gr/dscf and a P.H. feed rate of } 133.8 \text{ tph} \\ & \quad \times 0.0066/0.0056 \times 133.0/133.8 \\ & = 23.57 \text{ lb PM/hr @ } 0.0066 \text{ gr/dscf and a P.H. feed rate of } 133.0 \text{ tph} \end{aligned}$$

Thus, the particulate matter emissions during the September 26, 2000 test period attributable to the cement plant would be 23.57 pounds per hour. If this is deducted from the total measured particulate matter emission rate of 34.21 pounds per hour, the particulate matter emissions attributable to the power plant alone would be 10.64 pounds per hour. This compares with an allowable particulate matter emission rate for the power plant if operating alone (on September 26, 2000) of 17.06 pounds per hour.

Using the particulate matter emission data for the test periods August 13, 1999 and April 25, 2000, and applying the same adjustments results in a particulate matter emission rate attributable to the power plant of 11.77 pounds per hour. This demonstrates that even with a relatively large difference in stack gas particulate matter concentrations, the proposed adjustment protocol still yields reasonable estimates of power plant particulate matter emissions.

SUMMARY

To summarize compliance demonstration for the FCS/CPL plants, the following is proposed:

- **Cement Plant** - There is adequate opportunity during each Federal fiscal year to conduct emission measurements for compliance demonstration purposes in the common stack with the cement plant operating alone. No special consideration is required for cement plant compliance demonstration.
- **Power Plant with Cement Plant Offline** - If there is a scheduled or unscheduled outage of the cement plant of sufficient duration during a Federal fiscal year, emission measurements will be conducted to demonstrate compliance with the power plant emission limiting standards in the common stack with the power plant operating alone. Under these conditions, no special consideration is required for the power plant compliance tests.
- **Power Plant Compliance Testing with Cement Plant Operating** - Under this operating scenario, emission measurements for sulfur dioxide and nitrogen oxides will be conducted in the duct work exhausting the power plant upstream of the point where the power plant exhaust gases are combined with the cement plant exhaust gases. The sulfur dioxide and nitrogen oxides concentration measurements made at this point will be combined with an oxygen corrected "F" factor and the power plant heat input to determine the sulfur dioxide and nitrogen oxides mass emission rates (pounds per hour).

Compliance with the particulate matter emission limiting standard for the power plant will be determined in one of two ways. In either case, the particulate matter emission measurements will be conducted in the common stack exhausting the cement and power plants:

- **Cement Plant/Power Plant Particulate Matter Emissions less than Allowable Power Plant Particulate Matter Emissions** - If the measured particulate matter



Mr. Bill Proses
Power Plant Compliance Demonstration
August 3, 2001

emission rate in the common stack with both the cement and power plants operating is less than the allowable particulate matter emission rate for the power plant if operating alone, compliance with the power plant particulate matter emission limiting standard is demonstrated and no further action is required.

Cement Plant/Power Plant Particulate Matter Emissions greater than Allowable Power Plant Particulate Matter Emissions - In this case, the particulate matter emission rate from the cement and power plants will be adjusted by deducting particulate matter emissions attributable to the cement plant. The resulting adjusted power plant emission rate will then be compared with the allowable particulate matter emission rate for the power plant if operating alone.

- *Visible Emissions* - Under all plant operating scenarios, the opacity of emissions will be determined at the discharge of the common stack. The opacity limits which will apply are those applicable to the plant or plants for which compliance is being demonstrated. No special consideration is required under any circumstance for determining the opacity of emissions.

A copy of this letter is being sent to Joe Kahn and to Buck Oven for review and comment. If the protocol I've proposed is acceptable, I suggest a conference call or meeting to discuss how this protocol might best be incorporated in the regulatory framework. If the protocol is not acceptable or if there are questions regarding the protocol, I would appreciate the opportunity to discuss and resolve these matters. I can be contacted at 352-377-5822 or by email at jkoogler@kooglerassociates.com. Thank you for your consideration in this matter.

Very truly yours,

KOOGLER & ASSOCIATES

John B. Koogler, Ph.D., P.E.

JBK/jhm
attachment

cc: Hamilton "Buck" Oven, FDEP, Tallahassee
Joe Kahn, FDEP, Tallahassee
Pat Venable, CPL



ATTACHMENT

Table 1

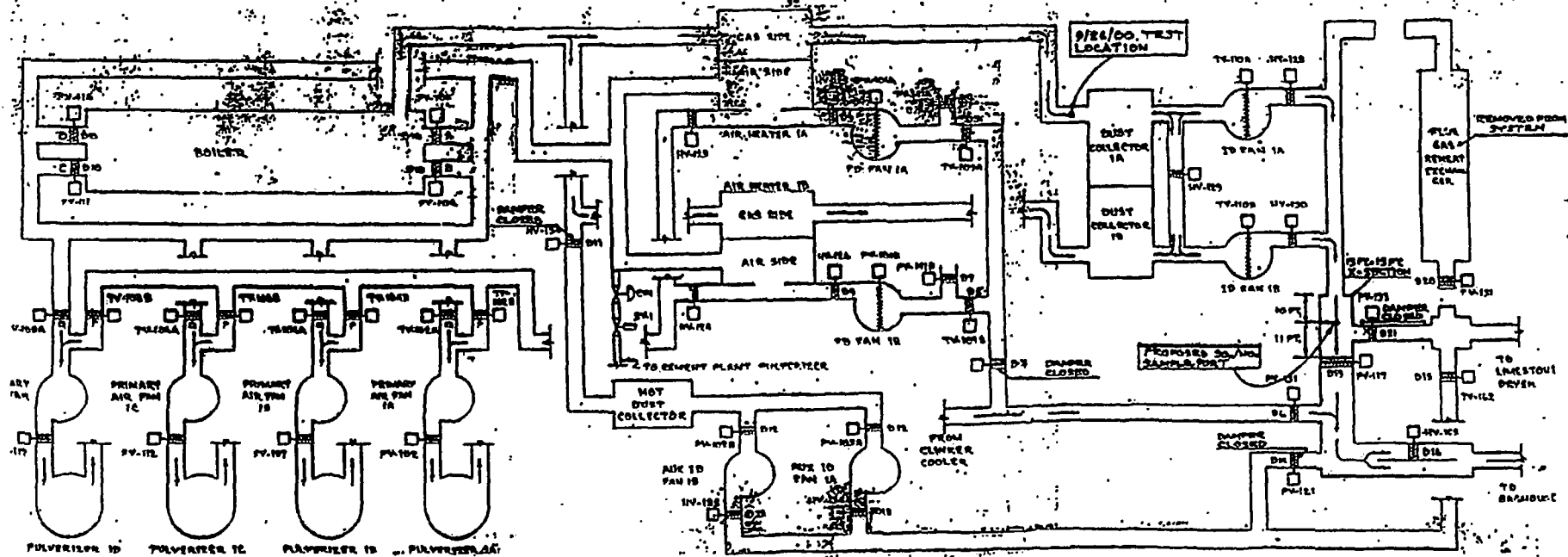
FCS/CPL Particulate Matter Emission Summary

Date	Plants Operating (1)	Cement Plant Preheater Feed Rate (tph)	Stack Gas PM Concentration (gr/dscf)	PM Emission Rate (lb/hr)		
				Measured	Allowable	Power Plant Allowable
3/31/98	C	134.9	0.0007	2.37	49.5	—
6/16/98	C+P	124.2	0.0032	17.18	63.6	16.67
5/22/99	C+P	131.8	0.0022	10.54	65.6	16.12
8/13/99	C	128.6	0.0035	11.52	48.0	—
4/25/00	C+P	126.3	0.0060	31.16	65.0	15.53
5/22/00	C	133.8	0.0056	20.12	49.5	—
9/26/00	C+P (2)	133.0	0.0066	34.21	65.0	17.06
3/8/01	C	132.2	0.0068	21.54	49.5	—
5/22-25/01	C+P	132.0	0.0020	9.67	64.9	16.27

(1) C = Cement Plant
P = Power Plant

(2) To demonstrate compliance for power plant





CPL POWER PLANT
EXHAUST SYSTEM



KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
352/377-5822 • FAX/377-7158

308-01-02
August 20, 2001

FAXED

Via Fax: 813-744-6458

Mr. Bill Proses
FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
Southwest District Office
3804 Coconut Palm Drive
Tampa, Florida 33619-8318

Subject: *Florida Crushed Stone/Central Power & Lime
Hernando County, Florida
DEP File No. 0530021-002-AV
Power Plant Compliance Demonstration for fiscal year 2001*

Dear Bill:

This is a follow-up to our telephone conversation of August 15, 2001 regarding the demonstration of compliance with the emission limiting standards of the above-captioned air operating permit for the Central Power & Lime (CPL) power plant. During our telephone conversation, it was my understanding that you stated there was Department concurrence with the emission measurement protocol outlined in my letter of August 3, 2001 to you. The purpose of that letter was to propose an emission measurement protocol for compliance demonstration for the CPL power plant that, if acceptable to the Department, could be incorporated in one form or another into the above-captioned permit. As the protocol proposed in my letter of August 3, 2001 appears to be acceptable to the Department, we need to determine the most expeditious way to accomplish this objective.

In the meantime, however, compliance testing for the CPL power plant for fiscal year 2001 must be completed on or before September 30, 2001. By this letter, I am requesting approval to conduct the CPL power plant compliance testing for fiscal year 2001 in accordance with the protocol set forth in my letter to you dated August 3, 2001. This request, hopefully, will be a one-time request. For fiscal years 2002 and beyond, I would expect that the requested protocol will be incorporated permanently into the above-captioned air operating permit.

If there are any questions regarding this request, please feel free to contact me at 352-377-5822 or by email at jkoogler@kooglerassociates.com. Thank you for your consideration in this matter.

Very truly yours,

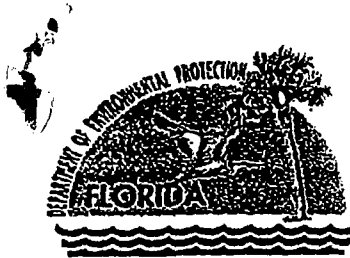
KOOGLER & ASSOCIATES


John B. Koogler, Ph.D., P.E.

JBK/jhm
attachment

cc: Hamilton Oven, FDEP, Tallahassee
Joe Kahn, FDEP, Tallahassee
Pat Venable, CPL

FAXED



Department of Environmental Protection

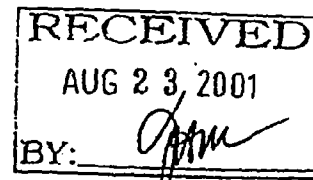
Job Bush
Governor

Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619

David B. Struhs
Secretary

August 20, 2001

Dr. John B. Koogler, Ph.D., P.E.
Koogler & Associates
4014 NW Thirteenth Street
Gainesville, Florida 32609



Re: Florida Crushed Stone/Central Power & Lime
DEP File No. 0530021-002-AV
Power Plant Compliance Demonstration for Federal Fiscal Year 2001

Dear Dr. Koogler:

In response to your letter dated August 20, 2001, your request to conduct the Central Power & Lime (CPL) power plant compliance testing for federal fiscal year 2001 in accordance with the protocol set forth in your letter dated August 3, 2001, is approved.

Florida Crushed Stone/Central Power & Lime (FCS/CPL) should apply to the Division of Air Resources Management, Title V Permitting, to have that protocol incorporated into FCS/CPL's Title V permit for federal fiscal years 2002 and beyond.

Please notify the department 15 days prior to commencing testing.

If you have should have any questions, please call me at (813) 744-6100 extension 119.

Sincerely,

W. A. Proses, P.E.
Air Compliance Supervisor

cc: Mr. Hamilton Oven, FDEP, Tallahassee
Mr. Joe Kahn, FDEP, Tallahassee
Mr. Pat Venable, FCS/CPL

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