

1050294

**Holtom, Jonathan**

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**From:** Kosky, Ken [KKosky@GOLDER.com]  
**Sent:** Friday, September 26, 2003 9:04 AM  
**To:** Svec, Ed; Holtom, Jonathan  
**Cc:** Farzie Shelton (Farzie.Shelton@lakelandelectric.com)  
**Subject:** City of Lakeland McIntosh Title V - Compliance and CAM Information

Ed/Jonathan: As we discussed yesterday concerning the Department's September 5, 2003 letter, I am forwarding some charts of actual Acid Rain opacity data for McIntosh Unit 3. The data evaluated was a typical 3 month period of one hour average data. There are two charts. The frequency chart is the number of 3-hour averages in a particular opacity range. As shown in the chart, most of the values would be below the excursion value of 13 percent. However, there are opacity levels above the excursion where actions would have to be implemented or otherwise flagged (e.g., startup and shut down). It should be noted these data are block 3-hour average values. A rolling 3-hour value consistent with the averaging time for the particulate standard would likely be similar. However, since this would be tracked on a 1-hour basis, the City would have plenty of opportunity to take appropriate action as the average approaches the excursion value.

The second chart also shows 1-hour opacity versus load. Again, most of the values are below the excursion value.

Also, as discussed yesterday, adding following language in the Title V Permit (Specific Condition E9) would exempt the City from the requirements of CAM: "Compliance with the percent reduction requirement and lb/MMBtu emission rate determined on a 30-rolling average". The City currently uses the lb/MMBtu since it is more stringent requirement than the percent reduction.

Please e-mail or call if there are any further questions.

Regards, Ken

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9/26/2003



copy June 16

**Farzie Shelton, chE; REM**

Manager of Environmental Affairs

**RECEIVED**

AUG 29 2003

BUREAU OF AIR REGULATION

August 26, 2003

Mr. Scott M. Sheplak, P.E.; Administrator  
Department of Environmental Protection  
Division of Air Resources Management  
Title V Section  
Twin Towers Office Building  
2600 Blair Stone Road, Mail Station #5505  
Tallahassee, Florida 32399-2400

**Re: C. D. McIntosh Power Plant - Facility Identification Number 1050004  
Title V Permit Renewal Permit Application**

Dear Mr. Sheplak:

We are in receipt of your letter dated June 11, 2003 addressed to Mr. Bates (Lakeland Electric's RO) in reference to the CAM for SO<sub>2</sub> and PM for Unit 3 located at the above facility. We are sorry to have taken some time to response to your letter as we were waiting for the result of annual stack testing on this unit so that we could utilize additional test data. Accordingly, we requested Mr. Ken Kosky P.E of Golder Associates to address your questions. Therefore, enclosed please find our response to your comments and questions sealed by Mr. Kosky. Additionally, we are enclosing our Responsible Official's certification with this letter.

If you should have any questions, please do not hesitate to contact me.

Sincerely,

Farzie Shelton

Enc.

Cc: Ken Kosky P.E. - Golder Associates

**City of Lakeland • Department of Electric Utilities**

501 East Lemon Street • Lakeland, FL 33801-5050 • (863) 834-6603 • Fax (863) 834-8187 • Message System 834-6592

farzie.shelton@lakelandgov.net

**Owner/Designated Representative or Alternate Designated Representative**

1. Name and Title of Owner/Designated Representative or Alternate Designated Representative: <b>Timothy Bates, Director of Energy Supply</b>
2. Owner/ Designated Representative or Alternate Designated Representative Mailing Address:  Organization/Firm: Lakeland Electric Street Address: 501 East Lemon Street City: Lakeland State: FL Zip Code: 33801-5079
3. Owner/ Designated Representative or Alternate Designated Representative Telephone Numbers:  Telephone: (863) 834-6559 Fax: (863) 834-6362
4. Owner/Designated Representative or Alternate Designated Representative:  <i>I, the undersigned, am the designated representative (check here [X], if so) or the alternate designated representative (check here [ ], if so) of the Title V, Acid Rain source(s) addressed in this application, whichever is applicable.</i>  <i>I am authorized to make this submission on behalf of the owner and operator of the affected source(s) or affected units for which the submission is made. I certify that I have personally examined, and am familiar with, the statement and information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete.</i>  <u>Timothy C Bates</u> <u>8/26/03</u> Signature Date

**Golder Associates Inc.**

6241 NW 23rd Street, Suite 500  
Gainesville, FL 32653-1500  
Telephone (352) 336-5600  
Fax (352) 336-6603



August 25, 2003

0237637

Lakeland Electric  
City of Lakeland  
501 East Lemon Street  
Lakeland, Florida 33801

Attention: Ms. Farzie Shelton, Manager of Environmental Affairs

RE: FDEP REQUEST FOR ADDITIONAL INFORMATION  
TITLE V AIR OPERATION PERMIT RENEWAL APPLICATION  
C.D. MCINTOSH, JR. POWER PLANT, FACILITY ID: 1050004

Dear Farzie:

Attached you will find response to FDEP's request for additional information for the C.D. McIntosh, Jr. Power Plant, Title V Air Operations Permit renewal application, dated June 11, 2003.

The attached material includes clarification of the exempt status of Unit 3 for SO<sub>2</sub> CAM requirements, as well as updated PM CAM indicator ranges based on additional test data. In addition, a discussion of the ESP TR set secondary voltage relationship to ESP performance and PM emissions is provided as requested by FDEP.

Please call if you have any questions.

Sincerely,

GOLDER ASSOCIATES INC.

A handwritten signature in black ink, appearing to read 'Kennard F. Kosky', is written over the typed name.

Kennard F. Kosky, P.E.  
Principal

Professional Engineer Registration Number 14996

Golder Associates Board of Professional Engineers Certificate of Authorization #00001670

Handwritten initials 'JK' are written above the word 'SEAL'.

KFK/jkw

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**RESPONSES TO COMMENTS FROM FDEP  
REGARDING THE TITLE V AIR OPERATION PERMIT RENEW APPLICATION  
FOR THE C.D. MCINTOSH, JR. POWER PLANT**

**Comment:** Because the SO<sub>2</sub> emissions standard for Unit 3 is not an Acid Rain Emission limit, Unit 3 is not automatically exempt from CAM pursuant to 40 CFR 64.2(b)(iii) just because the unit is using an Acid Rain SO<sub>2</sub> CEM. However, the use of the Acid Rain SO<sub>2</sub> CEM could qualify the unit for an exemption from the CAM requirements. Pursuant to 40 CFR 64.2(b)(vi), if Lakeland Electric chooses to use this CEM as a continuous compliance determination method, rather than just a monitoring method as required by 40 CFR 60.47a, Unit 3 could be exempt from the CAM requirements for emission of SO<sub>2</sub>.

Please provide either, a statement that Lakeland Electric wishes to have a SO<sub>2</sub> CEM listed in the permit as the continuous compliance determination method, or and acceptable CAM plan for the FGD. The use of the Acid Rain CEM is a presumptively acceptable method of satisfying the CAM requirements, but must be written into the permit in a CAM plan.

**Response:** McIntosh Unit 3 is exempt from the requirements of 40 CFR Part 64 by Section 64.2(b)(1)(vi) for sulfur dioxide (SO<sub>2</sub>) since a continuous emission monitoring system is used to determine compliance on a continuous basis consistent with the averaging time for that standard. This section, which provides exemptions, states:

E.32. Monitoring Requirement.

“Emission limitations or standards for which a part 70 or 71 permit specifies a continuous compliance determination method, as defined in § 64.1. The exemption provided in this paragraph (b)(1)(vi) shall not apply if the applicable compliance method includes an assumed control device emission reduction factor that could be affected by the actual operation and maintenance of the control device (such as a surface coating line controlled by an incinerator for which continuous compliance is determined by calculating emissions on the basis of coating records and an assumed control device efficiency factor based on an initial performance test; in this example, this part would apply to the control device and capture system, but not to the remaining elements of the coating line, such as raw material usage).”

The SO<sub>2</sub> emissions from Unit 3 are based on both a percent reduction and emission limit expressed in lb/MMBtu (see Condition E.9. of current Title V permit). The percent reduction is based on a 30-day rolling average. A percent reduction is also an appropriate “emission limitation or standard” based on the definition in Section 64.1, which states:

“*Emission limitation or standard* means any applicable requirement that constitutes an emission limitation, emission standard, standard of performance or means of emission limitation as defined under the Act. An emission limitation or standard may be expressed in terms of the pollutant, expressed either as a specific quantity, rate or concentration of emissions (e.g., pounds of SO<sub>2</sub> per hour, pounds of SO<sub>2</sub> per million British thermal units of fuel input, kilograms of VOC per liter of applied coating solids, or parts per million by volume of SO<sub>2</sub>) or as the relationship of uncontrolled to controlled emissions (e.g., percentage capture and destruction efficiency of VOC or percentage reduction of SO<sub>2</sub>). An emission limitation or standard may also be expressed either as a work practice, process or control device parameter, or other

E.21.14) Specifies  
method 6 as  
asth compliance  
det. method.

form of specific design, equipment, operational, or operation and maintenance requirement. For purposes of this part, an emission limitation or standard shall not include general operation requirements that an owner or operator may be required to meet, such as requirements to obtain a permit, to operate and maintain sources in accordance with good air pollution control practices, to develop and maintain a malfunction abatement plan, to keep records, submit reports, or conduct monitoring.”

This unit is required to have CEMS pursuant to 40 CFR Part 60 Subpart D and the air construction/PSD permit. Information is obtained on a continuous basis consistent with the averaging time of the standard. This meets the requirement for a continuous compliance determination method as defined in Section 64.1:

*This permit only requires a continuous monitoring method.*  
“Continuous compliance determination method means a method, specified by the applicable standard or an applicable permit condition, which:

- (1) Is used to determine compliance with an emission limitation or standard on a continuous basis, consistent with the averaging period established for the emission limitation or standard; and (2) Provides data either in units of the standard or correlated directly with the compliance limit.”

As a result, a CAM Plan is not required for SO<sub>2</sub> emissions based on the underlying applicable standards.

**Comment:** Unit 3 is subject to CAM for PM emissions controlled by an ESP. Lakeland Electric proposed the use of the COMs for monitoring opacity as an indicator that the ESP is functioning properly. Various levels of opacity were also presented in the application as indicator ranges for the different types of fuel being fired. The selected opacity indicator ranges appear to be high based on the one test submitted with the application. Since there is not a consistent or well-defined correlation between PM emissions and opacity, please provide additional test data to support your choice of indicator ranges. Also, to avoid recordkeeping problems while switching between types of fuels, explore the feasibility of choosing a single maximum opacity reading for all types of fuels. Also, please provide data showing the correlation between tested PM emissions levels and ESP voltage for the different fuel types that are allowed to be fired. Consider identifying a minimum ESP voltage as an indicator of performance instead of, or in addition to, opacity.

**Response:** Unit 3 is subject to CAM for PM emissions controlled by an ESP. Lakeland Electric proposed as CAM, the use of COMS for monitoring opacity as an indicator that Unit No. 3 ESP is functioning properly. The proposed indicator ranges were based on COM readings taken simultaneously to the 2002 annual compliance test. PM emissions were plotted versus the average of the COM opacity readings for three 1-hour stack test runs. A linear regression analysis was then performed to develop a relationship between opacity and PM (lb/MMBtu) emissions. The resulting correlation was applied to estimate opacity readings equivalent to each fuel specific PM emission limitation. To account for error in the correlation, 10 percent was added to each indicator range.

At the request of the Department, the correlation has been updated with additional data. Test data from the last three years (2003, 2002, and 2001) compliance tests has been correlated with the associated average COM data. The three 1-hour PM test

runs of each compliance test were averaged and plotted versus the average opacity readings during the same time period. In addition, zero opacity was assumed to occur with zero PM emissions. The resulting graph and correlation equation are presented in Figure 1. The compliance test and COM data used to develop the correlation as well as the details of the linear regression analysis are presented in Table 1 and 2, respectively.

Based on the new correlation and the permit limits for PM for each mode of firing, the corresponding estimated opacity for each limit is as follows:

Mode of Firing	PM Permit Limit (lb/MMBtu)	New Correlation Corresponding Opacity (%)
Coal	0.044	12.4
Coal/Petroleum Coke	0.044	12.4
Coal/Refuse	0.050	14.4
Coal/Petroleum Coke/Refuse	0.050	14.4
Oil	0.070	*
Oil/Refuse	0.075	*

\* Oil and oil/refuse modes of firing only occur during Unit No. 3 start-up. Therefore these periods are excluded pursuant to Rule 62-210.700.

To reduce the recordkeeping burden and increase the ease of CAM plan implementation, Lakeland Electric proposes to set two CAM plan indicator ranges, which are as follows:

Mode of Firing	CAM Indicator Range Opacity (%)
Coal	13.5
Coal/Petroleum Coke	13.5
Coal/Refuse	15.5
Coal/Petroleum Coke/Refuse	15.5

*No. Needs to be less than 12.4 + 14.4 that correspond to emission limit maybe 10% for excursion*

Therefore an excursion will be defined as a VE (3-hour block averaging time) greater than 13-percent opacity for coal and coal/petroleum coke firing. For coal/refuse and coal/petroleum coke/refuse firing an excursion will be defined as a VE (3-hour block averaging time) greater than 15-percent opacity. To account for error in the correlation, 10 percent was added to each indicator range. The indicator range was then rounded to the nearest 0.5-percent opacity. An excursion will trigger an evaluation of operation of the power boiler and ESP. Corrective action will be taken as necessary. Any excursion will trigger recordkeeping and reporting requirements. It should be noted that this indicator range is less than the permitted allowable opacity of 20 percent (6-minute average).

Prior to developing a correlation between opacity and PM emissions, data was analyzed to determine if a relationship exists between ESP TR set secondary voltage and PM emissions. Secondary voltage has not historically been logged and therefore limited data exists. However, data exists from the year 2002 compliance test and was utilized to explore a correlation with PM emissions. The results of this investigation indicates that a linear relationship exists, see Figure 2. However, the relationship

suggests that as TR set secondary voltage increases, the PM emissions (lb/MMBtu) also increase. This relationship does not agree with the theory of ESP performance. The ESP electric field plays an important role in the precipitation process in that it provides the basis for generation of corona required for charging and the necessary conditions for establishing a force to separate particulate from the gas stream. An electric field is formed from application of high voltage to the ESP discharge electrodes; the strength of this electric field is a critical factor in ESP performance.

Although the strength of the electric field is typically an indication of the effectiveness of an ESP, the examined data suggest otherwise and therefore is not considered appropriate as a monitoring parameter for CAM for Unit No. 3.



Table 1. Lakeland Electric McIntosh Unit 3 CAM Data

Run Number	Test Date	Start Time	Average Opacity (%)	Test Mass Emissions (lb/mmbtu)	Average of Three Runs	
					Opacity (%)	Mass Emissions (lb/mmbtu)
					0	0
1	6/9/03	13:26	6.7	0.042		
2	6/9/03	15:09	6	0.043	6.0333	0.0380
3	6/9/03	16:50	5.4	0.029		
1	6/11/02	7:00	11.6	0.017		
2	6/11/02	10:06	13.1	0.046 <i>&gt;.044</i>	13.4333	0.0410
3	6/11/02	11:30	15.6	0.06 <i>&gt;.044</i>		
1	6/7/01	7:54	5.14	0.036		
2	6/7/01	10:00	5.48	0.01	5.6858	0.0227
3	6/7/01	11:48	6.44	0.022		

Table 2. Linear Regression Output

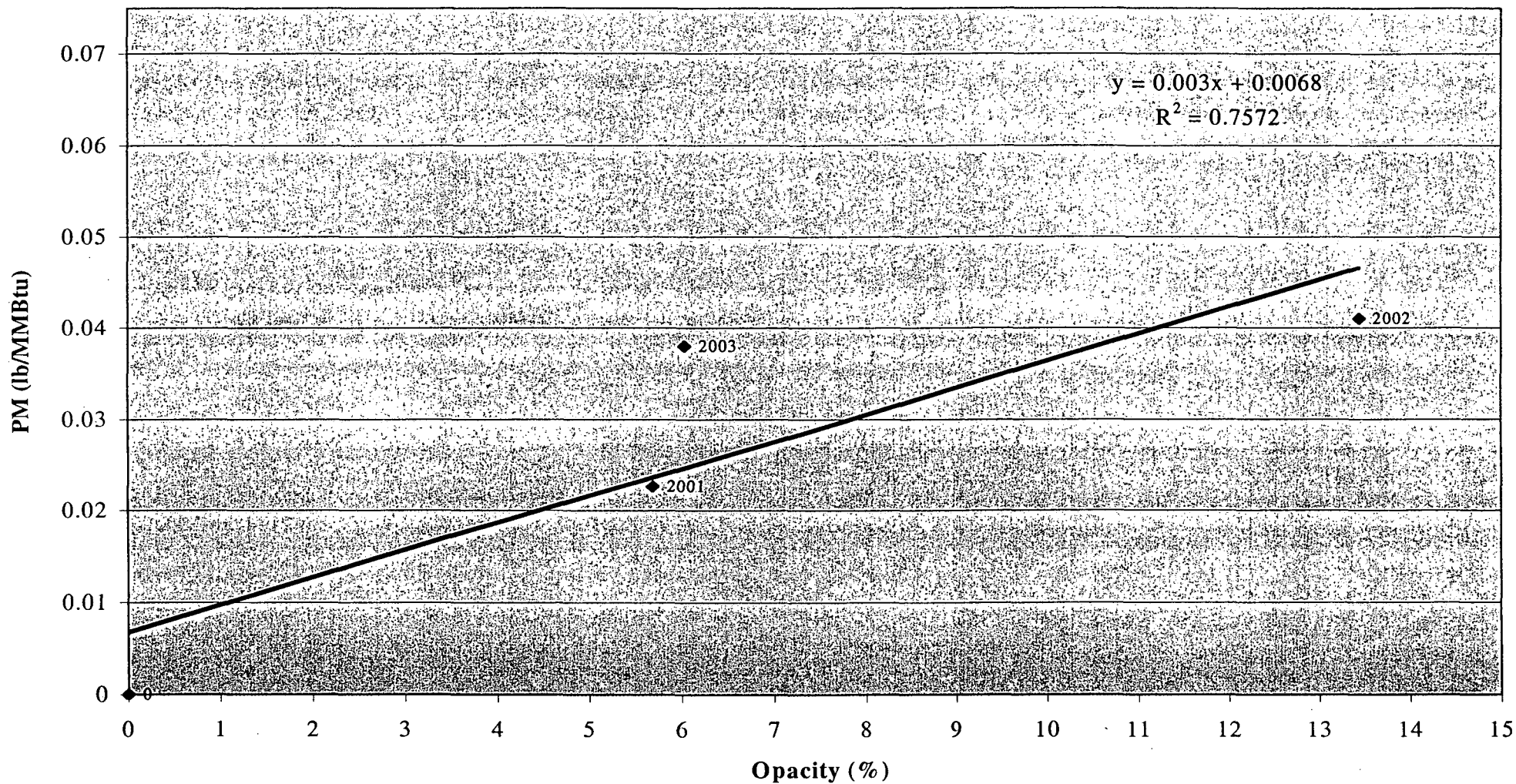
<i>Regression Statistics</i>	
Multiple R	0.870167724
R Square	0.757191868
Adjusted R Square	0.635787802
Standard Error	0.011315959
Observations	4

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	0.000798648	0.0007986	6.236956419	0.129832276
Residual	2	0.000256102	0.0001281		
Total	3	0.00105475			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	0.006790458	0.009361545	0.7253566	0.543624151	-0.033489047	0.047069964	-0.033489047	0.047069964
X Variable 1	0.002962129	0.00118609	2.4973899	0.129832276	-0.002141208	0.008065466	-0.002141208	0.008065466

**Figure 1. ESP Opacity/PM Correlation Based on 2003, 2002, and 2001 Compliance Test Results**



**Figure 2. ESP Average Secondary Voltage/PM Correlation Based on 2002 Compliance Test Results**

