TAMPA ELECTRIC
A TECO ENERGY COMPANY

D. E. R.

JUN 20 1984

SOUTH WEST DISTRICT
TAMPA

June 20, 1984

Richard B. Garrity, Ph.D.
Florida Department of
Environmental Regulation
7601 Highway 301 North
Tampa, FL 33610-9544

Re: Air Operation Permit Applications
Gannon Station Flyash Silos
Tampa Electric Company

Dear Dr. Garrity:

On reviewing the particulate emissions estimate for the Gannon Station Units 1-4 flyash silo baghouse, an incorrect assumption regarding the expected gas exit pressure was identified. The gas exit pressure at the baghouse vent is expected to be approximately atmospheric pressure (29.92 inches of mercury), not maximum silo pressure as previously assumed. Revised calculations and a revised permit application page reflecting the above correction are attached. (See Enclosures 1 & 2)

Please also find attached revised calculations and a revised permit application page for the Gannon Units 5 and 6 flyash silo permit application. Since the emissions estimate for Units 5 and 6 flyash silo were based on emissions from the Units 1-4 flyash silo , revisions were necessary to maintain accuracy and consistency. (See Enclosures 3 & 4)

As can be seen in the enclosures, emissions from both baghouse systems are still expected to be minimal:

(1) The maximum expected emission from the Units 1-4 flyash silo baghouse is 0.78 lbs/hr and the potential emission, 390 lbs/hr.

(2) The maximum expected emission from the Units 5 & 6 flyash silo baghouse is 1.22 lbs/hr and the potential emissions, 1216 lbs/hr.

TAMPA ELECTRIC COMPANY
P.O. Box 111 Tampa, Florida 33601 (813) 228-4111

If you should have any questions, please feel free to call.

Sincerely,

A. Spence Autry
Manager
Environmental Planning

ASA/tb

cc: Jim Estler (w/attachments)
Dan Williams (w/attachments)
Jerry Campbell (w/attachments)

Attachment D

Enclosure I

GANNON STATION UNITS 1-4 FLYASH SILO

EMISSION CALCULATIONS

(A) Maximum Expected Emissions:

Maximum expected emissions = maximum baghouse emissions = 0.03 gr/dscf (Design)
Capacity of baghouses (2) = 4696 Acfm (Total)

$$dscfm = (Acfm)(FDA)\left(\frac{528}{T_A}\right)\left(\frac{PA}{29.92}\right)$$

where:
- Acfm = Actual cubic feet per minute
- dscfm = dry standard cubic feet per minute
- FDA = Fraction dry air (max = 1.0)
- T_A = Absolute gas temp. (^{o}R)
- P_A = Absolute pressure (in. Hg.)

$$dscfm = (Acfm)(1.0)\left(\frac{528}{810^{o}R}\right)\left(\frac{29.92\ in.\ Hg.}{29.92}\right) = (0.65)(Acfm)$$

$$\therefore\ 4696\ Acfm = (4696)\left(0.65\ \frac{dscfm}{Acfm}\right) = 3052\ dscfm$$

Thus, maximum expected emissions:

$$= \left[3052\ \frac{dscf}{min.}\right]\left[0.03\ \frac{gr}{dscf}\right]\left[0.002285\ \frac{oz}{gr}\right]\left[\frac{1}{16}\ \frac{lb}{oz}\right]\left[60\ \frac{min}{hr.}\right]$$

$$= 0.78\ \frac{lbs}{hr}$$

(B) Potential Emissions

= maximum emissions ÷ (1-baghouse efficiency)
= 0.78 ÷ (1-.998)
= 390 $\frac{lbs}{hr}$

Revised: 6/19/84

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Not Applicable

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		

B. Process Rate, if applicable: (See Section V, Item 1) Not Applicable

1. Total Process Input Rate (lbs/hr): _____

2. Product Weight (lbs/hr): _____

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/~~xx~~ hr.	T/yr	
Particulate	0.78 *	Not	See	Not	390 *	Not	Fig. 1
		Applic	Attach. C	Applicable		Applic.	

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3]Calculated from operating rate and applicable standard.

[4]Emission, if source operated without control (See Section V, Item 3).

* See Attachment D.

ATTACHMENT C
Gannon Units 5 & 6 Flyash Silo

Section V 3. & 5.

(A) Maximum Potential Emissions

Maximum potential emissions = maximum expected emissions generated within the silo.

Assume: Maximum conditions occur at combined maximum production rate, that is, both precipitator hoppers emptying simultaneously.

: Flyash dusting characteristics within Units 5 & 6 silo, similar to flyash dusting characteristics within Units 1-4 flyash silo.

: Settling characteristics within silo dependent on plan area of silo.

Known Data

Unit 5 flyash production rate (full load) = 5.08 tons/hr
Unit 6 flyash production rate (full load) = 7.97 tons/hr

maximum throughput rate = 5.08 + 7.97 = 13.05 tons/hr

	Units 1-4 flyash silo	Units 5 & 6 flyash silo
Silo diameter (ft)	30	25
Silo plan area (ft^2)	707	491
Throughput to silo (tons/hr)	14.4	13.05
Baghouse efficiency	99.8	99.9
Expected emissions (lbs/hr)	0.78	To be calculated
Potential emissions (lbs/hr)	390	To be calculated
Baghouse capacity (Acfm)	4696	11300

$$\frac{\text{1-4 silo throughput}}{\text{silo plan area}} = \frac{14.4 \text{ tons/hr}}{707 \text{ ft}^2} = \frac{0.02037 \text{ tons}}{\text{hr. ft}^2}$$

$$\frac{\text{5 \& 6 silo throughput}}{\text{silo plan area}} = \frac{13.05 \text{ tons/hr}}{491 \text{ ft}^2} = \frac{0.02658 \text{ tons}}{\text{hr. ft}^2}$$

∴ Ratio of dust loading expected =

0.02037 : 0.02658 = 1:1.3

1-4 silo, calculated potential emissions (within silo)

= 390 lbs/hr per 4696 Acfm

$$= \frac{[390\ \text{lbs}]}{[\ \text{hr}\ ]} \frac{[1\ \text{hr}\ ]}{[60\ \text{min}]} \frac{[\ 1\ \text{min}]}{[4696\ \text{Acf}]} = 0.00138\ \frac{\text{lbs}}{\text{Acf}}$$

∴ 5 & 6 silo, estimated potential emissions (within silo)

$$= [0.00138\ \frac{\text{lbs}}{\text{Acf}}]\ [11300\ \frac{\text{Acf}}{\text{min}}]\ [60\ \frac{\text{min}}{\text{hr.}}]\ [1.3] = 1216\ \frac{\text{lbs}}{\text{hr.}}$$

(B) Maximum Emissions

Potential emissions = Maximum emissions ÷ (1 - baghouse efficiency)

Maximum emissions = Potential emissions (1 - baghouse efficiency)

= (1216) x (1-0.999)

= 1.22 lbs/hr.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable: Not Applicable

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		

B. Process Rate, if applicable: (See Section V, Item 1) Not Applicable

1. Total Process Input Rate (lbs/hr): _____

2. Product Weight (lbs/hr): _____

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
Particulate	1,22	Not	See	Not	1216	Not	Fig. 1
		Applic.	Attach B	Applicable		Applic.	

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3]Calculated from operating rate and applicable standard.

[4]Emission, if source operated without control (See Section V, Item 3).