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 DIVISION OF AIR
 RESOURCE MANAGEMENT

August 10, 2011

Jeffery F. Koerner, Program Administrator
 Florida Department of Environmental Protection
 Division of Air Resource Management
 Office of Air Permitting and Compliance
 2600 Blair Stone Road, M.S. 5505
 Tallahassee, Florida 32399-2400

Via FedEx
Airbill No. 7973 9598 6423

Re: Tampa Electric Company - Big Bend Station
Title V Permit Number 0570039-045-AV
Cooling Tower Permit Correction and Notification

Dear Mr. Koerner:

This correspondence requests an administrative correction to permit no. 0570039-045-AV pursuant to Rule 62-210.360 F.A.C. A recent review of the existing permit shows there are no references to five (5) existing cooling towers currently in operation at Big Bend Power Station. A historical review of previous air permits did not reveal any references to these cooling towers. It is believed these cooling towers were considered insignificant emission sources at the time of construction and were inadvertently omitted from the air operating permit and subsequent Title V permit revisions. Table 1 shows a description and purpose of each cooling tower.

Table 1 – Description and Purpose of the Existing Cooling Towers.

Location	Installation Date	Description	Purpose
Unit 1	1970	Induced Draft Cooling Tower	Cool mechanical equipment
Unit 2	1973	Induced Draft Cooling Tower	Cool mechanical equipment
Unit 3	1976	Induced Draft Cooling Tower	Cool mechanical equipment
Unit 4	1985	Induced Draft Cooling Tower	Cool mechanical equipment
FGD area	1985	Induced Draft Cooling Tower	Cool HVAC equipment

TEC conducted calculations to estimate PM/PM₁₀ emissions from each cooling tower. The AP-42 procedure (Chapter 13.4 Wet Cooling Towers, latest Ed.) was used to calculate the particulate matter (PM) emissions for each cooling tower. The revised procedure by Reisman and Frisbie (2001)¹ was used to calculate PM₁₀ emissions for each cooling tower.

¹ Reisman, J. and Frisbie, G. , *Calculating Realistic PM₁₀ Emissions from Cooling Towers*, Technical Proceedings, Air Waste Management Association, June 2001.

TAMPA ELECTRIC COMPANY
 P. O. BOX 111 TAMPA, FL 33601-0111

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Mr. Jeffery F. Koerner
August 10, 2011
Page 2 of 2

Table 1 shows the PM emissions for each cooling tower was less than the 5.0 tons per year threshold. The PM and PM₁₀ emissions from the unit cooling towers were calculated to be 1.5 and 0.93 tons per year, respectively. PM and PM₁₀ emissions from the FGD cooling tower were estimated at 0.047 and 0.029 tons per year, respectively. Consequently, each cooling tower is considered an insignificant source of emissions and exempt from air permitting requirements pursuant to Rule 62-210.300(3)(b)1., F.A.C., *Generic Emission Unit or Activity Exemption*.

Table 2 – PM/PM₁₀ Emission Summary of Existing Cooling Towers.

Location	PM Emission Rate		PM ₁₀ Emission Rate	
	(lb/hr)	(tons/year)	(lb/hr)	(tons/year)
Unit 1 Cooling Tower	0.32	1.4	0.20	0.86
Unit 2 Cooling Tower	0.32	1.4	0.20	0.86
Unit 3 Cooling Tower	0.35	1.5	0.21	0.93
Unit 4 Cooling Tower	0.35	1.5	0.21	0.93
FGD HVAC Cooling Tower	0.011	0.047	0.0066	0.029

This correspondence also serves as a courtesy notification for the replacement all unit cooling towers at Big Bend Power Station. Unit 2 cooling tower will be replaced in-kind in October 2011 with fiber-glass construction. The unit will be designed to withstand the latest wind loading requirements of the Florida Building Code. This replacement is not expected to change the aforementioned emissions. In fact, the replacement is expected to decrease the emission rate with the new mist eliminators. Units 3, 4 and 1 cooling towers are tentatively scheduled for replacement in 2013, 2014, and 2015, respectively. Similarly, these future replacements are expected to decrease emissions.

TEC requests the Title V permit be revised to include the aforementioned cooling towers as insignificant emission units pursuant to Rule 62-210.360 F.A.C. Please contact me at (813) 228-4232 or Byron Burrows at (813) 228-1282, if you have any questions or comments.

Sincerely,



Robert A. Velasco, P.E., BCEE, QEP
Air Programs
Environmental, Health & Safety

EHS/hk/RAV106

Enclosure

c/enc: Cindy Zhang-Torres, DEP SW District
Diana Lee, EPCHC

**Tampa Electric Company
Big Bend Station**

Cooling Tower Permit Correction and Notification

Professional Engineer Certification

1. Professional Engineer Name: Robert A. Velasco, P.E.

Registration Number: 57190

2. Professional Engineer Address...

Organization/Firm: Tampa Electric Company

Street Address: P.O. Box 111

City: Tampa

State: FL

Zip Code: 33601

3. Professional Engineer Telephone Numbers...

Telephone: (813) 228 - 4232

Fax: (813) 228 - 1308

4. Professional Engineer E-mail Address: ravelasco@tecoenergy.com

5. Professional Engineer Statement:

(1) Engineering opinion and information included herein provides reasonable assurance of meeting the requirements of the Title V permit and Chapter 62-210.300(3)(b)1., F.A.C., Generic Emission Unit or Activity Exemption;

(2) Title V permit correction is based on information best available information at the time and is believed to be correct to the best of the Engineer's knowledge;

(3) Emission information is based on acceptable techniques available for calculating emissions or estimating emissions of insignificant emission units from materials, information and calculations contained in this certification; and

(4) Seal does not certify or attest to the accuracy of work or information prepared by others who are qualified to perform such services. This includes, but not limited to drawings, specifications, correspondences, personnel communication etc.



Signature/Date

(seal)



Emission Inventory Work Sheet

PM EMISSIONS - WET COOLING TOWERS

Big Bend Power Station

Tampa Electric Company

Facility ID No. 0570039

INPUT DATA AND EMISSION CALCULATIONS

Emission Source Description:
Emission Control Methods:
Emission Points:

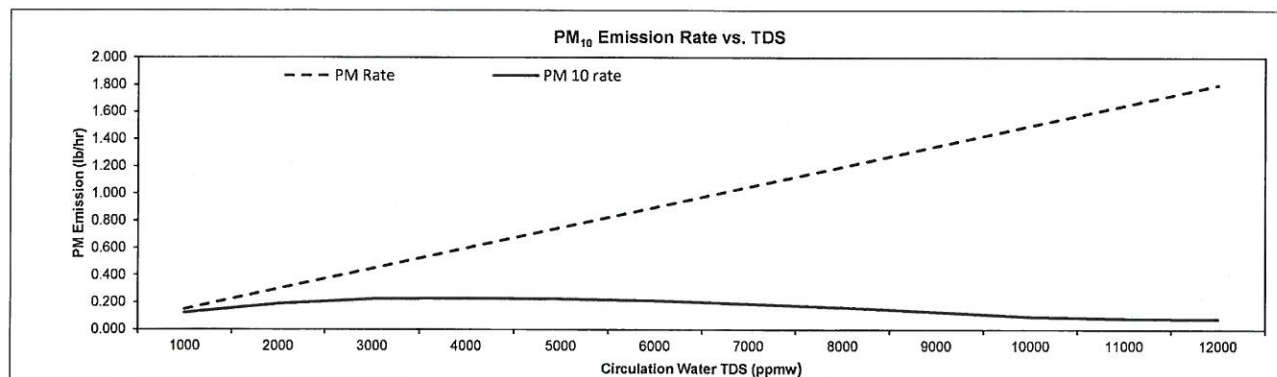
Unit 1 wet cooling tower
Drift eliminators
Cooling drift

INPUT DATA AND EMISSION CALCULATIONS

Water droplet density	1	g/cm ³
Solid particle density	2.2	g/cm ³
TDS	2,150	ppmw
Drift rate	0.005	%
Water circulation rate	6,000	gpm
PM emission rate	0.32	lb/hr
	1.414	ton/yr
PM ₁₀ emission rate	0.1967	lb/hr
	0.862	ton/yr

Solids Particle Size Distribution

EPRI Droplet Diameter (μm)	Droplet Volume (μm ³) [2]	Droplet Mass (μg) [3]	Particle Mass Solids (μg) [4]	Solid Particle Volume (μm ³)	Solid Particle Diameter (μm) [7]	EPRI % Mass Smaller
10	524	5.24E-04	1.13E-06	0.51	0.992	0.000
20	4189	4.19E-03	9.01E-06	4.09	1.985	0.196
30	14137	1.41E-02	3.04E-05	13.82	2.977	0.226
40	33510	3.35E-02	7.20E-05	32.75	3.969	0.514
50	65450	6.54E-02	1.41E-04	63.96	4.962	1.816
60	113097	1.13E-01	2.43E-04	110.53	5.954	5.702
70	179594	1.80E-01	3.86E-04	175.51	6.947	21.348
90	381704	3.82E-01	8.21E-04	373.03	8.931	49.812
110	696910	6.97E-01	1.50E-03	681.07	10.916	70.509
130	1150347	1.15E+00	2.47E-03	1124.20	12.901	82.023
150	1767146	1.77E+00	3.80E-03	1726.98	14.885	88.012
180	3053628	3.05E+00	6.57E-03	2984.23	17.863	91.032
210	4849048	4.85E+00	1.04E-02	4738.84	20.840	92.468
240	7238229	7.24E+00	1.56E-02	7073.72	23.817	94.091
270	10305995	1.03E+01	2.22E-02	10071.77	26.794	94.689
300	14137167	1.41E+01	3.04E-02	13815.87	29.771	96.288
350	22449298	2.24E+01	4.83E-02	21939.09	34.733	97.011
400	33510322	3.35E+01	7.20E-02	32748.72	39.695	98.340
450	47712938	4.77E+01	1.03E-01	46628.55	44.656	99.071
500	65449847	6.54E+01	1.41E-01	63962.35	49.618	99.071
600	113097336	1.13E+02	2.43E-01	110526.94	59.542	100.000



EMISSION EQUATIONS

- [2] Volume of drift droplet $V = \frac{4}{3} \pi (D_p/2)^3$
- [3] Mass of solids in drift droplet $TDS \times \rho_w \times V$
- [4] Mass of solids $\rho_{TDS} \times V$
- [7] Diameter of drift droplet $D_d [(TDS)(\rho_w/\rho_{TDS})]^{1/3}$

SOURCES OF INPUT DATA

- Circulation Rate Design Specifications
- Drift Rate % Marley Rep - RME Associates, Inc.
- PM Calculation EPA AP 42 Chapter 13.4 Wet Cooling Towers (latest Ed.)
- PM₁₀ Calculation Reisman, J. and Frisbie, G., Calculating Realistic PM₁₀ Emissions from Cooling Towers, Technical Proceedings Air Waste Management Association, June 2001.

NOTES AND OBSERVATIONS

PM₁₀/PM ratio based on a conservative 0.0006% drift rate



Emission Inventory Work Sheet

PM EMISSIONS - WET COOLING TOWERS
Big Bend Power Station
Tampa Electric Company
Facility ID No. 0570039

INPUT DATA AND EMISSION CALCULATIONS

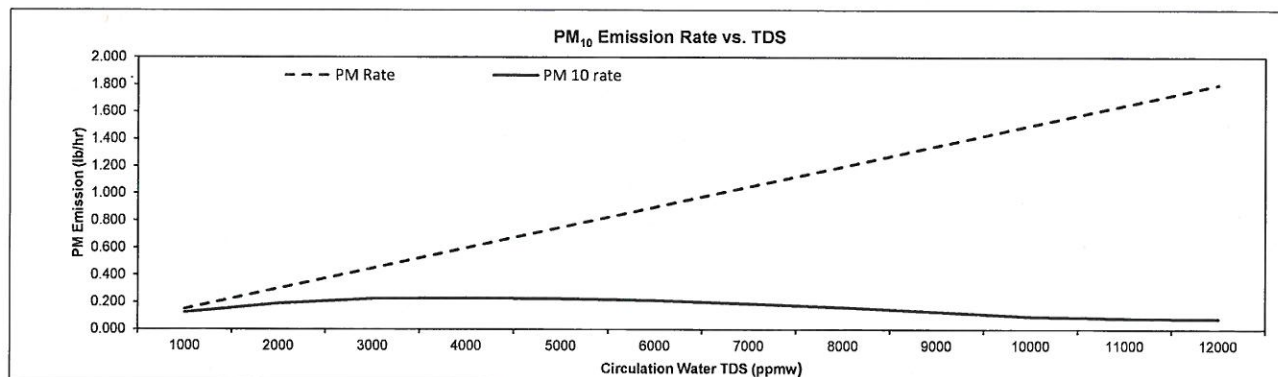
Emission Source Description: Unit 2 wet cooling tower project
Emission Control Methods: Drift eliminators
Emission Points: Cooling drift

INPUT DATA AND EMISSION CALCULATIONS

Water droplet density	1	g/cm ³
Solid particle density	2.2	g/cm ³
TDS	2,150	ppmw
Drift rate	0.005	%
Water circulation rate	6,000	gpm
PM emission rate	0.32	lb/hr
	1.414	ton/yr
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EMISSION EQUATIONS

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SOURCES OF INPUT DATA

Circulation Rate Design Specifications
 Drift Rate Marley Rep - RME Associates, Inc.
 PM Calculation EPA AP 42 Chapter 13.4 Wet Cooling Towers (latest Ed.)
 PM₁₀ Calculation Reisman, J. and Frisbie, G., Calculating Realistic PM₁₀ Emissions from Cooling Towers, Technical Proceedings Air Waste Management Association, June 2001.

NOTES AND OBSERVATIONS

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Emission Inventory Work Sheet

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Big Bend Power Station
Tampa Electric Company
Facility ID No. 0570039

INPUT DATA AND EMISSION CALCULATIONS

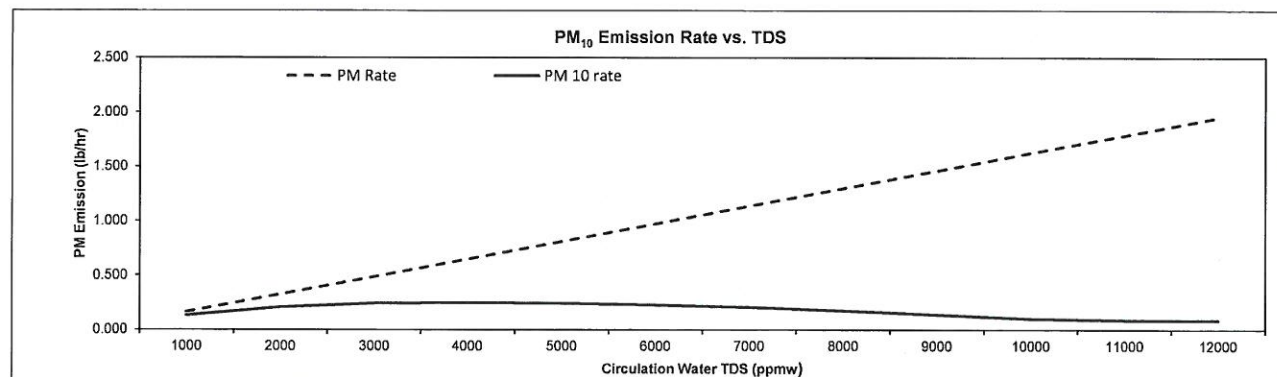
Emission Source Description: Unit 3 wet cooling tower
Emission Control Methods: Drift eliminators
Emission Points: Cooling drift

INPUT DATA AND EMISSION CALCULATIONS

Water droplet density 1 g/cm³
Solid particle density 2.2 g/cm³
TDS 2,150 ppmw
Drift rate 0.005 %
Water circulation rate 6,500 gpm
PM emission rate 0.35 lb/hr
1.531 ton/yr
PM₁₀ emission rate 0.2131 lb/hr
0.934 ton/yr

Solids Particle Size Distribution

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- [7] Diameter of drift droplet $D_d [(TDS)(\rho_w/\rho_{TDS})]^{1/3}$

SOURCES OF INPUT DATA

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Emission Inventory Work Sheet

PM EMISSIONS - WET COOLING TOWERS

Big Bend Power Station

Tampa Electric Company

Facility ID No. 0570039

INPUT DATA AND EMISSION CALCULATIONS

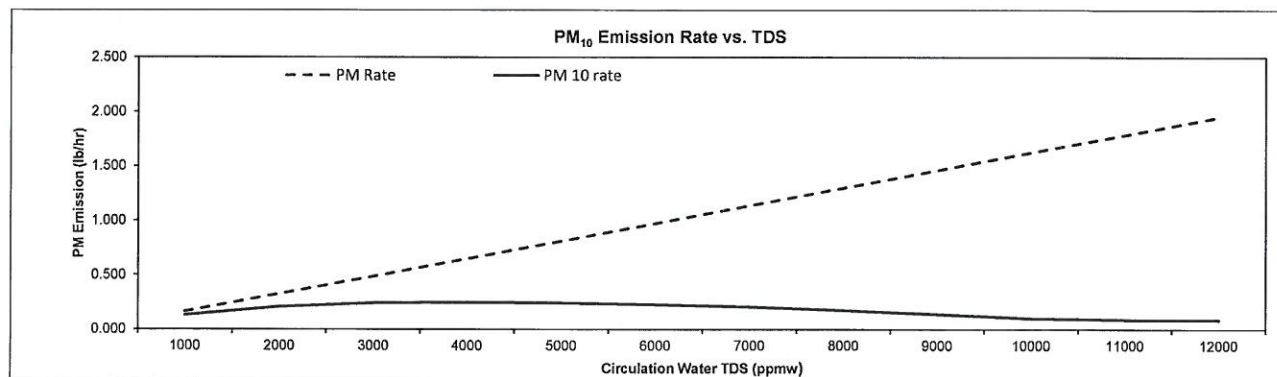
Emission Source Description: Unit 4 wet cooling tower
 Emission Control Methods: Drift eliminators
 Emission Points: Cooling drift

INPUT DATA AND EMISSION CALCULATIONS

Water droplet density 1 g/cm³
 Solid particle density 2.2 g/cm³
 TDS 2,150 ppmw
 Drift rate 0.005 %
 Water circulation rate 6,500 gpm
 PM emission rate 0.35 lb/hr
 1.531 ton/yr
 PM₁₀ emission rate 0.2131 lb/hr
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Solids Particle Size Distribution

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Big Bend Power Station

Tampa Electric Company

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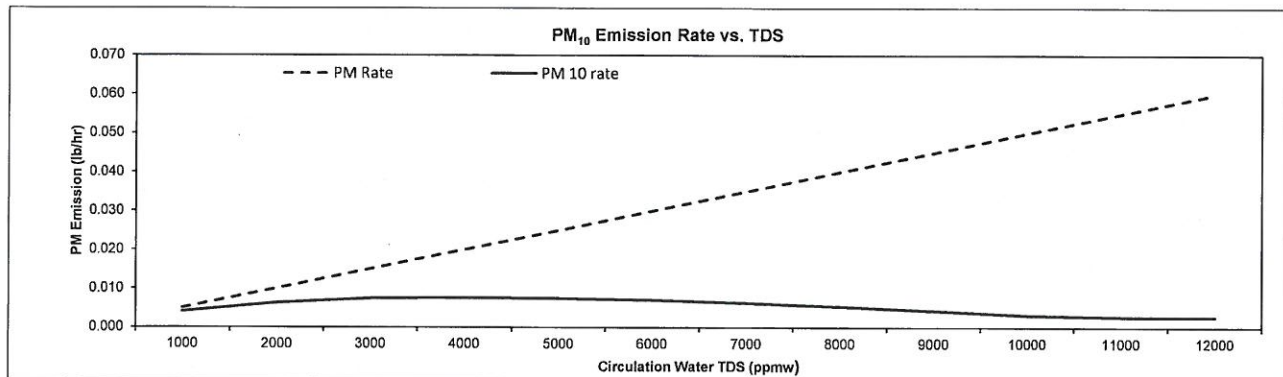
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 Emission Control Methods: Drift eliminators
 Emission Points: Cooling drift

INPUT DATA AND EMISSION CALCULATIONS

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 Drift rate 0.005 %
 Water circulation rate 200 gpm
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EMISSION EQUATIONS

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SOURCES OF INPUT DATA

- Circulation Rate Baltimore Aircoil Company
- Drift Rate Baltimore Aircoil Company
- PM Calculation EPA AP 42 Chapter 13.4 Wet Cooling Towers (latest Ed.)
- PM₁₀ Calculation Reisman, J. and Frisbie, G., Calculating Realistic PM₁₀ Emissions from Cooling Towers, Technical Proceedings Air Waste Management Association, June 2001.

NOTES AND OBSERVATIONS

PM₁₀/PM ratio based on a conservative 0.0006% drift rate