MEMORANDUM

DATE: April 17, 2008

TO: Bruce Mitchell, FDEP

FROM: Pwu-Sheng Liu, Ph.D., P.E
Diana M. Lee, P.E.
Sterlin Woodard, P.E.

SUBJECT: Tampa Electric Company (TECO) Application No. 0570039-027-AC

Below are our comments regarding TECO's PSD permit application relating to the Simple-Cycle Combustion Turbines Unit 3 through 6 for Bayside Power Station as part of our completeness review of this project.

Please be advised that the Environmental Protection Commission of Hillsborough County (EPC), as delegated by the Florida Department of Environmental Protection (DEP), has completed their initial review of TECO's permit application received on March 20, 2008, for the construction and operation of eight simple-cycle combustion turbines (SCCTs) at its existing H. L. Culbreath Bayside Power Station (BPS). In order to complete the review process the following additional information is being requested pursuant to Chapter 62-4.055, F.A.C.:

1. In accordance with Chapter 1-6.02.A.1.(a)(i), Rules of the Environmental Protection Commission of Hillsborough County, an application fee applies to permits that are to be reviewed pursuant to the authority of Chapter 84-446, Laws of Florida, and not pursuant to full permit delegation from the Florida Department of Environmental Protection (FDEP). The fee for a prevention of significant deterioration construction project for a non-delegated facility is $480. Please submit the specified fee to the EPC.

2. In the Air Construction Permit Application, under Section 3.3, TECO stated that the SCCT project qualifies as a major modification to an existing major facility and is subject to the PSD NSR requirements of Rule 62-212.400, F.A.C., for those pollutants that are

emitted at or above the specified PSD significant emission rate levels. However, the application did not include the seven combined cycle natural gas fired turbines located at the Bayside Station. Pursuant to Rule 62-210.200(204) "Modification", F.A.C., a modification is defined as a physical change in, change in the method of operation of, or addition to a facility, which would result in an increase in actual emissions of any air pollutant regulated under the Act. On Page 5-7, Section 5.2 of the Application, it is stated that the SCCTs would reduce deliverable cost to double-peak loads where the SCCTs can dispatch to meet short duration heating demand more cost effectively than TECO's large operational constraint CCCTs (Combined Cycle Combustion Turbines). It appears from this statement that TECO is planning a change in the method of operation of the facility, which means that TECO needs to determine if there will be a net increase in actual emissions from the facility due to increase dependence on the SCCTs, as opposed to the existing CCCTs. Therefore, in accordance with Rule 62-212.400(2)(a)3., F.A.C., the Hybrid Test for Multiple Types of Emissions Units applies to this project, since it involves a combination of new and existing emissions units. EPC staff performed a PSD applicability analysis, and determined that the existing CCCTs and the proposed SCCTs emissions increase will exceed the significant emissions rates for VOC, NOx, CO, PM, PM10, and SO2. Therefore, pursuant to Rule 62-212.400(10)(c), F.A.C., a BACT analysis is necessary for each PSD pollutant at each emissions unit, which would result in an significant net emissions increase as a result of the modification at the facility.

3. In the Air Construction Permit Application Section 5.2. Evaluation of Alternative Electrical Generation Technologies, TECO only listed SCCT as the only alternative for fuel combustion at the Bayside facility. As defined by Rule 62-210.200(40), F.A.C., BACT is defined as an emission limitation, including a visible emission standard, based on the maximum degree of reduction of each pollutant emitted which the Department, on a case by case basis, taking into account: (1) energy, environment, and economic impacts, and other costs, (2) all scientific, engineering, and technical material and other information available to the Department, and (3) the emission limiting standards or BACT determinations of Florida and any other state, determines is achievable through application of production processes and available methods, systems and techniques (including fuel cleaning or treatment or innovative fuel combustion techniques) for control of each such pollutant. Please explain why TECO did not consider installing CCCTs in lieu of the proposed SCCTs, since CCCTs is a production process and available method, system and technique, or innovative fuel combustion technology, which operates more efficiently and yields lower emission rates than SCCTs. We understand that, historically, EPA has not considered the BACT requirements as a means to redefine the design of the source when considering available control alternatives. However, as EPA stated in the NSR Workshop Manual, Page B.13, Draft 1990 Edition, 'this is an aspect of the PSD permitting process in which states have discretion to engage in a broader analysis if they so desire".

4. In the Air Construction Permit Application Section 5.3.2 Technical Feasibility and Ranking, TECO stated that the Dry low-NOx (DLN) combustor technology represents an inferior NOx control technology compared to wet injection, and is not considered further

in the BACT analysis. However, according to a study conducted by EPC staff by search the EPA RACT/BACT/LAER Clearinghouse (RBLC) information system database from 1998-2008, the DLN technology can achieve a better NOx limit to 9 ppmvd at 15% O2 which is better than the performance of water injection technology to 25 NOx ppmvd at 15% O2. Furthermore, in Section 5.3.4, Page 5-20, TECO stated that water injection technology was used as a baseline to compare SCR technology. Based upon this comparison, it was determined that SCR was not cost effective due to $14,564/ton of NOx reductions (Table 5-7). However, EPA's New Source Review procedures require that any major source or major modification subject to PSD must conduct an analysis to ensure the application of BACT. The analysis includes a "top-down" method for determining BACT. The top-down process provides that all available control technologies be ranked in descending order of control effectiveness. The BACT analysis consists of five steps that include; identifying all control technologies, eliminating technically infeasible options, ranking remaining control technologies by control effectiveness, evaluating the most effect controls and documenting results, and choosing a BACT. Determination of the technical infeasibility should be clearly documented and should show, based on physical, chemical, and engineering practices, that technical difficulties would preclude the successful use of the control options. Also, in determining the most effective controls, energy, environmental and economic impacts must also be evaluated and quantified for each option. The BACT analysis submitted by TECO did not provide an analysis for SCR alone, but instead evaluated the incremental cost effectiveness between SCR and water injection. According to AP-42 Section 3.1.4.3, SCR in conjunction with water injection is typically used to reduced NOx emission rates at combustion turbines to levels less than 10 ppmvd at 15% oxygen. We are therefore, requesting that, pursuant to Rules 62-212.400(4)(c) and 62-4.070(3), F.A.C., TECO should submit a BACT analysis, which properly evaluates SCR as the "top control technology" without a comparison to any other "baseline" technology. We also believe that TEC should also consider SCR in conjunction with water injection or DLN in the top down process. On Page B.14 of EPA's NSR Workshop Manual, Draft 1990 Edition, they state that combinations of inherently lower-polluting processes/practices and add-on controls are likely to yield more effective means of emissions control than either approach alone, and that these combinations should be identified in Step 1 of the top-down process for evaluation. This analysis will more than likely result in the selection of SCR, SCR and water injection, or DLN technology as BACT, which is consistent with the NOx limitation of 9 ppmvd at 15% oxygen cited in the EPA RACT/BACT/LAER Clearinghouse.

0570040 H. L. CULBREATH BAYSIDE POWER STATION

EU ID	EU DESCRIPTION	2005-2006 Avg. Hours	2005-2006 averaged tpy VOC	NOX	CO	PM10/PM	Total HAP	SO2
20	Bayside Unit 1A - 169 MW combined cycle gas turbine	4518	6.83	55.04	11.15	21.47	0.33	2
21	Bayside Unit 1B - 169 MW combined cycle gas turbine	5492	8.50	65.59	11.95	26.71	0.41	2.45
22	Bayside Unit 1C - 169 MW combined cycle gas turbine	5427	8.23	67.47	10.19	25.86	0.41	2.4
23	Bayside Unit 2A - 169 MW combined cycle gas turbine	5188	7.91	64.98	7.15	24.87	0.39	2.3
24	Bayside Unit 2B - 169 MW combined cycle gas turbine	5336	8.22	70.01	6.53	25.82	0.41	2.4
25	Bayside Unit 2C - 169 MW combined cycle gas turbine	5154	7.88	69.07	7.06	24.75	0.39	2.35
26	Bayside Unit 2D - 169 MW combined cycle gas turbine	5329	8.20	67.61	7.34	25.77	0.40	2.4
	Permit Limit lbs/hr		3.00	23.10	28.70	12.00		10.30

		PTE Hours/year	VOC	NOX	CO	PM10/PM	Total HAP	SO2
20	Bayside Unit 1A - 169 MW combined cycle gas turbine	8760	13.14	101.18	125.71	52.56	0.00	45.11
21	Bayside Unit 1B - 169 MW combined cycle gas turbine	8760	13.14	101.18	125.71	52.56	0.00	45.11
22	Bayside Unit 1C - 169 MW combined cycle gas turbine	8760	13.14	101.18	125.71	52.56	0.00	45.11
23	Bayside Unit 2A - 169 MW combined cycle gas turbine	8760	13.14	101.18	125.71	52.56	0.00	45.11
24	Bayside Unit 2B - 169 MW combined cycle gas turbine	8760	13.14	101.18	125.71	52.56	0.00	45.11
25	Bayside Unit 2C - 169 MW combined cycle gas turbine	8760	13.14	101.18	125.71	52.56	0.00	45.11
26	Bayside Unit 2D - 169 MW combined cycle gas turbine	8760	13.14	101.18	125.71	52.56	0.00	45.11

	Net Increase tpy	VOC	NOX	CO	PM10/PM	Total HAP	SO2
20	Bayside Unit 1A - 169 MW combined cycle gas turbine	6.31	**46.13**	**114.56**	**31.09**	-0.33	**43.11**
21	Bayside Unit 1B - 169 MW combined cycle gas turbine	4.64	35.59	**113.76**	**25.85**	-0.41	**42.66**
22	Bayside Unit 1C - 169 MW combined cycle gas turbine	4.91	33.71	**115.51**	**26.70**	-0.41	**42.71**
23	Bayside Unit 2A - 169 MW combined cycle gas turbine	5.23	36.20	**118.56**	**27.69**	-0.39	**42.81**
24	Bayside Unit 2B - 169 MW combined cycle gas turbine	4.92	31.17	**119.18**	**26.74**	-0.41	**42.71**
25	Bayside Unit 2C - 169 MW combined cycle gas turbine	5.26	32.11	**118.64**	**27.81**	-0.39	**42.76**
26	Bayside Unit 2D - 169 MW combined cycle gas turbine	4.94	33.57	**118.36**	**26.79**	-0.40	**42.71**
	SCCT Project	13.50	321.60	**46.80**	**25.00**	2.10	**18.60**
	TOTAL	49.71	670.97	865.51	317.56	-0.63	318.10
	Significant Emissions Rate tpy	40	40	100	15		40