

## DOCKETED

<b>Docket Number:</b>	93-AFC-02C
<b>Project Title:</b>	Compliance - Application for Certification SMUD's Proctor & Gamble Cogeneration Project
<b>TN #:</b>	203371
<b>Document Title:</b>	Response to data requested by CEC Staff re Nitrogen Deposition
<b>Description:</b>	N/A
<b>Filer:</b>	John Carrier
<b>Organization:</b>	CH2M HILL
<b>Submitter Role:</b>	Applicant Consultant
<b>Submission Date:</b>	11/24/2014 3:26:47 PM
<b>Docketed Date:</b>	11/24/2014



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November 24, 2014

Ms. Mary Dyas  
Compliance Project Manager  
California Energy Commission  
1516 Ninth Street, MS-15  
Sacramento, CA 95814

Subject: SCA's Petition to Amend, Procter and Gamble Cogeneration Project  
93-AFC-2C

Dear Mary:

At our meeting with your staff on October 30, 2014 to review Sacramento Cogeneration Authority's (SCA) Petition to Amend (PTA) the biologist requested some additional information about nitrogen deposition. In response to his request, we are providing some materials on that topic.

Let me know if there is anything else your staff needs, or if they have any additional questions, to make a timely review of SCA's PTA.

Sincerely,

CH2M HILL

A handwritten signature in blue ink that reads "John L. Carrier".

John L. Carrier, J.D.  
Program Manager

Encl.

## Nitrogen Deposition

Atmospheric nitrogen deposition alters the structure and function of terrestrial ecosystems, because nitrogen is often a primary limiting nutrient on overall productivity. These alterations can drive losses of biodiversity, as species that thrive in nitrogen-rich soils will increase and out-compete species adapted to more nutrient deficient conditions. Nitrogen sensitive areas support many of California's rare and endangered plant and animal species. Consequently, the California Energy Commission (CEC) requires that applicants analyze potential impacts from nitrogen deposition in power plant licensing cases located in areas with nitrogen-poor soils and nitrogen-sensitive plant communities.

The area surrounding the PGCP facility has not been identified as having nitrogen poor soil or nitrogen-sensitive plant communities. Nonetheless, the Boiler 1B project will result in a significant decrease in total nitrogen emissions from the PGCP facility, and therefore will result in less nitrogen deposition. Nitrogen emissions are associated with the elemental nitrogen portion of NOx and ammonia (NH3) emissions from plant combustion and selective catalytic reduction processes. The following tables present total hourly and annual nitrogen emissions from the PGCP facility and the proposed Boiler 1B project, and show the decrease in PGCP facility total nitrogen emissions as a result of the project.

### Maximum Total Nitrogen Emissions from the Existing PGCP Facility

Unit	Firing Rate MMBtu/hr	NOx ppm at 15% O2	NOx lb/hr	NOx Nitrogen lb/hr	NH3 ppm at 15% O2	NH3 lb/hr	NH3 Nitrogen lb/hr	Total Nitrogen lb/hr	Total Nitrogen ton/yr
Turbine 1A	500	2.5	4.6	1.4	10	6.8	5.6	7.0	26.8
Duct Burner 1A	83.2	2.5	0.8	0.2	10	1.1	0.9	1.2	4.5
Turbine 1B	500	2.5	4.6	1.4	10	6.8	5.6	7.0	26.8
Duct Burner 1B	83.2	2.5	0.8	0.2	10	1.1	0.9	1.2	4.5
Turbine 1C	500	2.5	4.6	1.4	10	6.8	5.6	7.0	26.8
Plant Total =								23.4	89.4

Maximum annual nitrogen emissions are restricted by SMAQMD permit conditions limiting facility NOx emissions to 117,534 lb/yr. For reference, the unit specific NOx mass emission limits are contained in Conditions 8 and 11 of SMAQMD Permits to Operate (PTOs) 20734 and 20735, Conditions 8 and 10 of SMAQMD PTO 20736, and Condition AQ-10 of CEC Commission Order 08-0312-3 (dated 03/12/2008). Also, NH3 mass emission limits have been calculated from the unit-specific NH3 concentration limits contained in Conditions 8 of SMAQMD PTOs 20734, 20735, and 20736.

### Maximum Total Nitrogen Emissions from the Operation of Auxiliary Boilers 1B and 1A

Unit	Firing Rate MMBtu/hr	NOx ppm at 3% O2	NOx lb/hr	NOx Nitrogen lb/hr	NH3 ppm at 3% O2	NH3 lb/hr	NH3 Nitrogen lb/hr	Total Nitrogen lb/hr	Total Nitrogen ton/yr
Boiler 1A	108.7	9.0	1.2	0.4	-	-	-	0.4	1.6
Boiler 1B	108.7	5.0	0.7	0.2	20	1.0	0.8	1.0	4.4
Plant Total =								1.4	6.0
Decrease in PGCP Facility Total Nitrogen Emissions =								22.0	83.4

Maximum annual nitrogen emissions based on 8,760 hr/yr operation. The NOx mass emission limit for Boiler 1A is contained in Condition 8 of SMAQMD PTO 12318(rev4).