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DOCKET
08-AFC-6
DATE June 30 2009
RECD. June 30 2009

June 30, 2009

Dockets Unit
California Energy Commission
1516 Ninth Street, MS 4
Sacramento, CA 95814

RE: Willow Pass Generating Station
Application for Certification 08-AFC-6

On behalf of Mirant Willow Pass, LLC, the applicant for the above-referenced Willow Pass Generating Station (WPGS) AFC, we hereby submit the enclosed documents:

- **Responses to CEC Data Requests (#58-61, 70, and 72).** One print copy of the responses. The electronic version of this document was emailed to dockets.

Please include this document in the AFC record.

URS Corporation

Kathy Rushmore

Kathy Rushmore
Project Manager

Enclosures

CC: Felicia Miller

URS Corporation
221 Main Street, Suite 600
San Francisco, CA 94105
Tel: 415.896.5858
Fax: 415.882.9261
www.urscorp.com

Responses to CEC Data Requests (#58-61, 70, and 72)

Application for Certification (08-AFC-6) for WILLOW PASS GENERATING STATION Pittsburg, California

June 2009

Prepared for:

MIRANT℠
WILLOW PASS, LLC

Prepared by:

URS

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LIST OF ACRONYMS AND ABBREVIATIONS USED IN RESPONSES

AAQS	ambient air quality standard
AERMOD	American Meteorological Society and Environmental Protection Agency preferred atmospheric dispersion model
BAAQMD	Bay Area Air Quality Management District
CCPP	Contra Costa Power Plant
CEC	California Energy Commission
CEMS	continuous emissions monitoring system
cm/sec	centimeters per second
CO	carbon monoxide
K	Kelvin
kg/ha/yr	kilograms per hectare per year
km	kilometers
m	meters
$\mu g/m^3$	micrograms per cubic meter
MLGS	Marsh Landing Generating Station
m/sec	meters per second
MW	megawatt
NADP	National Atmospheric Deposition Program
NH_3	ammonia
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NWR	National Wildlife Refuge
PM_{10}	particulate matter less than or equal to 10 microns in diameter
$PM_{2.5}$	particulate matter less than or equal to 2.5 microns in diameter
PPP	Pittsburg Power Plant
PSD	Prevention of Significant Deterioration
RCEC	Russell City Energy Center
RMNP	Rocky Mountain National Park
SO_2	sulfur dioxide
SO_X	sulfur oxides
USDA	U.S. Department of Agriculture
UTM	Universal Transverse Mercator
VOC	volatile organic compound
WPGS	Willow Pass Generating Station

Technical Area: Biological Resources
Author: Heather Blair

BACKGROUND

Emissions from the proposed Willow Pass Generating Station (WPGS), namely nitrogen oxides (NOx) and ammonia (NH_3), would result in nitrogen deposition from the atmosphere to the biosphere. Excessive nitrogen deposition can act as a fertilizer and promote the growth of non-native vegetation. The increased dominance and growth of invasive annual grasses is especially prevalent in low-biomass vegetation communities that are naturally nitrogen-limited, such as sand dunes. The Antioch Dunes National Wildlife Refuge (NWR), which is approximately five miles east of the WPGS site, comprises 67 acres of sand dunes that support the last known natural populations of the federally endangered Lange's metalmark butterfly, federally and state-endangered Antioch Dunes evening primrose, and federally and state-endangered Contra Costa wallflower. Major threats to these species include invasion of non-native vegetation and wildfire, which is exacerbated by the presence of non-native vegetation. Antioch Dunes evening primrose, Contra Costa wallflower, and naked buckwheat, the larval host plant of Lange's metalmark butterfly, require open sandy substrate for survival. Invasive non-native vegetation, which is enhanced by atmospheric nitrogen deposition, affects these species by outcompeting them for space, sunlight, moisture, and nutrients.

Nitrogen deposition and the resultant potential impacts to state and federally listed species at the Antioch Dunes NWR, is of concern to the Energy Commission staff, United States Fish and Wildlife Service (USFWS), and California Department of Fish and Game (CDFG). To assess impacts to nitrogen-sensitive biological resources, staff requires additional information on nitrogen deposition resulting from WPGS emissions.

DATA REQUESTS

58. Please quantify the existing baseline total nitrogen deposition rate in the vicinity of WPGS (encompassing the areas listed in DR #2) in kilograms per hectare per year (kg/ha/yr). Provide the complete citation for references used in determining this number.

RESPONSE

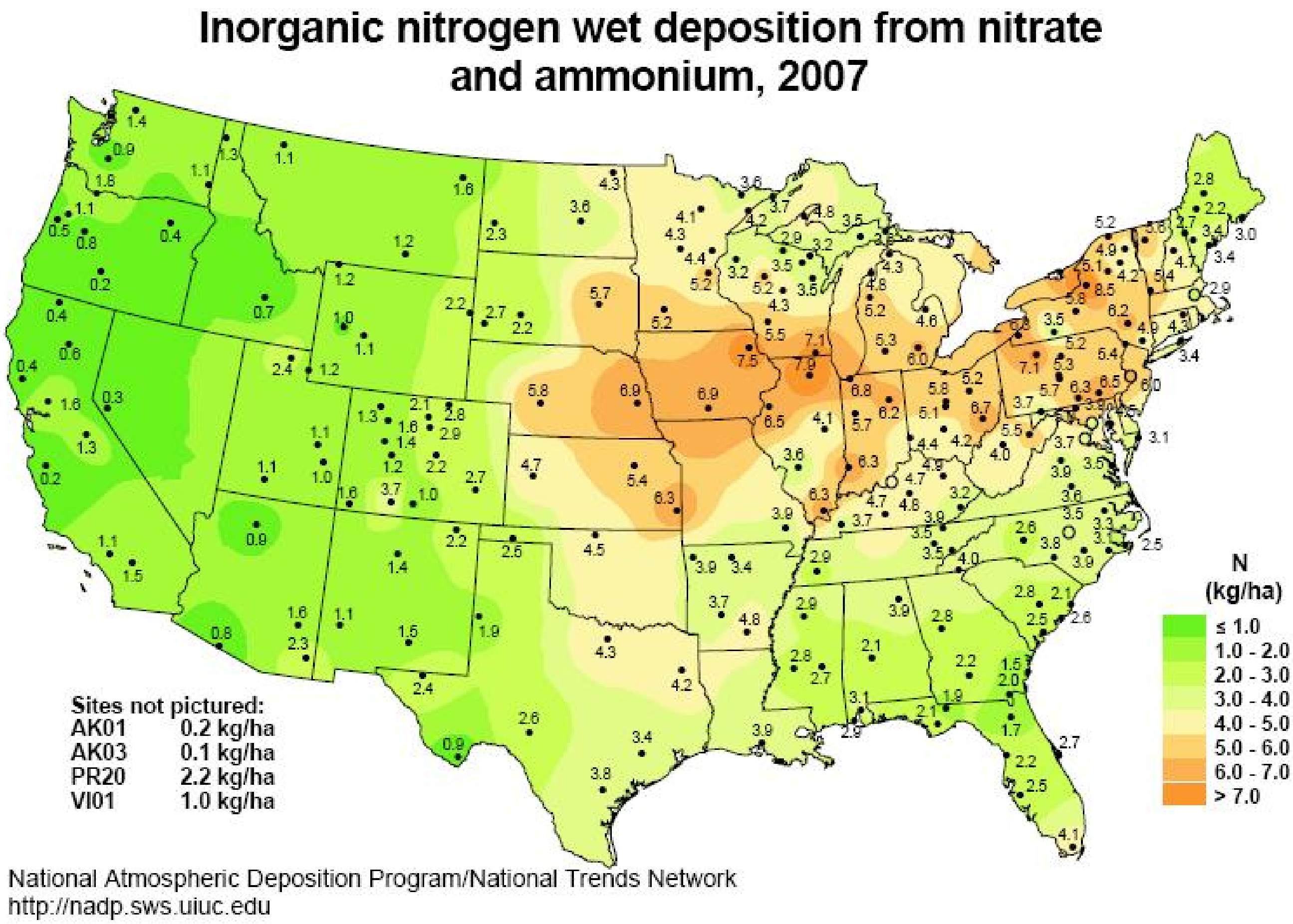
Based on data from the National Atmospheric Deposition Program, National Trends Network at The University of Illinois Urbana-Champaign (NADP, 2007), the wet nitrogen deposition rate in the vicinity of the Willow Pass Generating Station (WPGS), including the Antioch Dunes National Wildlife Refuge (NWR), was approximately 1.6 kilograms per hectare per year (kg/ha/yr) in 2007. Wet nitrogen deposition is used as a proxy for total nitrogen deposition because dry deposition rates are generally low and monitoring techniques for dry deposition are less reliable (RMNP, 2006). Figure 58-1 shows wet measured nitrogen deposition values across the country from the National Atmospheric Deposition Program. The background value of 1.6 kg/ha/yr is based on actual measured data from a deposition monitoring station in Davis, California, operated by the U.S. Geological Survey and the University of California-Davis.

References

NADP (National Atmospheric Deposition Program), 2007. Isopleth Maps. Accessed June 2009. Available at http//nadp.sws.uiuc.edu.

RMNP (Rocky Mountain National Park), 2006. Nitrogen Deposition Critical Load Goal and Target Load Approaches for Rocky Mountain National Park. August 18, 2006. Accessed June 2009. Available at: http://www.cdphe.state.co.us/ap/rmnp/critload.pdf.

Figure 58-1


Inorganic nitrogen wet deposition from nitrate and ammonium, 2007
N (kg/ha)
≤ 1.0
1.0 - 2.0
2.0 - 3.0
3.0 - 4.0
4.0 - 5.0
5.0 - 6.0
6.0 - 7.0
> 7.0
Sites not pictured:
AK01 0.2 kg/ha
AK03 0.1 kg/ha
PR20 2.2 kg/ha
VI01 1.0 kg/ha
National Atmospheric Deposition Program/National Trends Network
http://nadp.sws.uiuc.edu

DATA REQUEST

59. Please provide an analysis of impacts due to total nitrogen deposition from operation of the WPGS. The analysis should specify the amount of total nitrogen deposition in kg/ha/yr at the Sardis Unit and Stamms Unit of the Antioch Dunes National Wildlife Refuge, the freshwater/brackish marsh habitat immediately west of the project area, and all other "Areas of Concern" (A through O) as illustrated in AFC Figure 7.2-1.

RESPONSE

Maximum modeled nitrogen dioxide (NO_X) and ammonia (NH_3) concentrations were added together to estimate total nitrogen. A deposition rate of 2 centimeters per second (cm/sec), which represents an average gravitational settling speed for small particles, was used to convert concentrations of total nitrogen estimated from the WPGS air quality emissions modeling to nitrogen deposition values (Hanna et al, 1982). The analysis is based conservatively on total nitrogen deposition and did not segregate between wet and dry deposition. The maximum modeled nitrogen deposition rate from WPGS sources is 0.55 kg/ha/yr, located just south of the WPGS property line, and within the Pittsburg Power Plant site. When adding the background level of 1.6 kg/ha/yr from the response to Data Request 58, the maximum modeled nitrogen deposition rate for WPGS is 2.15 kg/ha/yr.

As illustrated in Figures 60-1a and 60-1b, nitrogen deposition rates from WPGS at the Sardis Unit and Stamms Unit of the Antioch Dunes NWR are approximately 0.06 kg/ha/yr. With background, the maximum nitrogen deposition rate for the Antioch Dunes Wildlife Refuge is 1.66 kg/ha/yr.

Nitrogen deposition can be problematic in areas where native plant species are adapted to grow on nutrient-poor soils (e.g., serpentine soils or dune sand). In these soils, lack of nitrogen prevents invasion of nonnative species. Nitrogen deposition results in an increased availability of nitrogen, and therefore favors the growth of plant species that have a high demand for nitrogen, specifically nonnative plants. As a result, nonnative plant species out-compete the native plant species (e.g., serpentine endemic plants) (Weiss, 1999). Both the Antioch Dunes evening primrose and Contra Costa wallflower occur at the Antioch Dunes NWR, where the dune sand can be considered nutrient limited. As such, these species could be impacted by large additions of nitrogen.

In the freshwater/brackish marsh habitat west of the project area, nitrogen deposition rates are between 0.06 and 0.12 kg/ha/yr. With added background, the maximum modeled nitrogen deposition rate for this area is estimated to be 1.72 kg/ha/yr. Tidal marshes have high biomass production and accumulation, in addition to tidal processes that affect nutrient fluxes. They also have nitrogen fluxes one order of magnitude higher than many other systems and are not particularly sensitive to nitrogen deposition (Rozema et al., 2000).

For all other "Areas of Concern," total nitrogen deposition with background is estimated to be between 1.63 kg/ha/yr to 1.78 kg/ha/yr. These areas either lack species sensitive to nitrogen deposition or lack nitrogen deficient soils. For example, Contra Costa goldfields is found in vernal pools and wet grasslands; these communities are not known to be nitrogen limited nor are they expected to be particularly sensitive to nitrogen deposition. In addition, most of the other Areas of Concern are located in areas mapped as clay and loam soils or marshes which are not considered nutrient deficient. These areas are not known to support nutrient limited communities or species sensitive to nitrogen deposition.

Based on a review of available scientific literature, the following nitrogen deposition rate standards or thresholds have been identified:

- Below a nitrogen deposition rate of 3 to 10 kg/ha/yr, no significant change to herbaceous plant communities (primarily within forested ecosystems of wilderness areas in the United States) is expected (Fox et al., 1989)
- In sand dune systems in the United Kingdom, 15 kg/ha/yr of nitrogen was identified as the threshold at which species composition and biomass changes were observed between high and low nitrogen inputs. Authors recommend a critical load threshold (i.e., the value at which communities are impacted) to be 10 to 20 kg/ha/yr of nitrogen (Jones et al., 2004).
- In the northeastern United States, watershed export of nitrogen increases with atmospheric deposition, particularly above 7 to 8 kg/ha/yr (Aber et al., 2003).
- In the Mojave Desert, a nitrogen application of 32 kg/ha/yr, comparable to estimated deposition rates in the nearby Los Angeles area, was found to increase the dominance of nonnative plants over native species. While this effect is of concern, the application associated with this study is one order of magnitude higher than the predicted deposition in the vicinity of the WPGS project area due to the proposed project.
- In forests in the western United States, field studies and simulation modeling indicate that nitrogen deposition of 20 to 35 kg/ha/yr elevate nitrate leaching, decrease base cation pools in the soil, and lead to soil acidification (Fenn et al., 1996).
- In the Pacific Northwest, sensitive organisms and communities respond to nitrogen inputs of 3 to 8 kg/ha/yr (Fenn et al., 2003)
- In California coniferous forests, the critical load for nitrogen impacts to lichen communities was estimated at 3.1 kg/ha/yr. The critical load for nitrogen leaching was estimated at 17 kg/ha/yr (Fenn et al., 2008).
- In Rocky Mountain National Park, 2.7 kg/ha/yr of wet nitrogen deposition was identified as the target goal to prevent long-term community composition impacts to native alpine flowering communities (RMNP, 2006).
- In California, 5 kg/ha/yr has been used as a benchmark for comparing nitrogen deposition on plant communities (Weiss, 2006 and CEC, 2007).

While the vegetation communities (and soil types) presented in these studies differ from those surrounding the WPGS, and may respond differently to nitrogen deposition, the data available represent the best available science. Based on recent evaluations of nitrogen deposition for other projects in the San Francisco Bay Area (CEC, 2007), ecosystems and plant communities are not expected to be significantly affected if the total nitrogen deposition rate is less than approximately 5 kg/ha/yr. Therefore, in this analysis, the significance threshold of 5 kg/ha/yr presented in Weiss 2006 (and previously accepted by the CEC) is used for nutrient limited communities, including sand dune and serpentine plant communities. Nitrogen levels on the order of those evaluated in this analysis are not expected to have a significant effect on non-nutrient limited plant communities, such as tidal marshes. These estimates are based largely on data collected throughout the United States, in wilderness areas that primarily consist of forested ecosystems. Studies on dune vegetation in the United Kingdom (Jones et al., 2004) indicate that dune ecosystems could be impacted at nitrogen deposition rates between 10 and 20 kg/ha/yr. However, for purposes of this analysis, a conservative value of 5 kg/ha/yr was selected as the threshold to assess potential impacts to nutrient limited communities.

Based on the results of the nitrogen deposition modeling, the predicted maximum nitrogen deposition rates due to the WPGS project in the areas of interest would not exceed the 5 kg/ha/yr benchmark. Therefore, project impacts from nitrogen deposition on nitrogen-sensitive biological resources would be less than significant.

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Fenn, M.E., M.A. Poth, D.W. Johnson, 1996. Evidence for nitrogen saturation in the San Bernardino Mountains in southern California. Forest Ecology and Management 82:211-230.

Fenn, M.E., J.S. Baron, E.B. Allen, H.M. Rueth, K.R. Nydick, and others, 2003. Ecological Effects of Nitrogen Deposition in the Western United States. BioScience, Vol. 53 No. 4, pp. 404-420.

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Fox, Douglas G., Ann M. Bartuska, James G. Byrne, and others, 1989. A screening procedure to evaluate air pollution effects on Class I wilderness areas. Gen. Tech. Rep. RM-168. Fort Collins, Colorado: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 36 pp.

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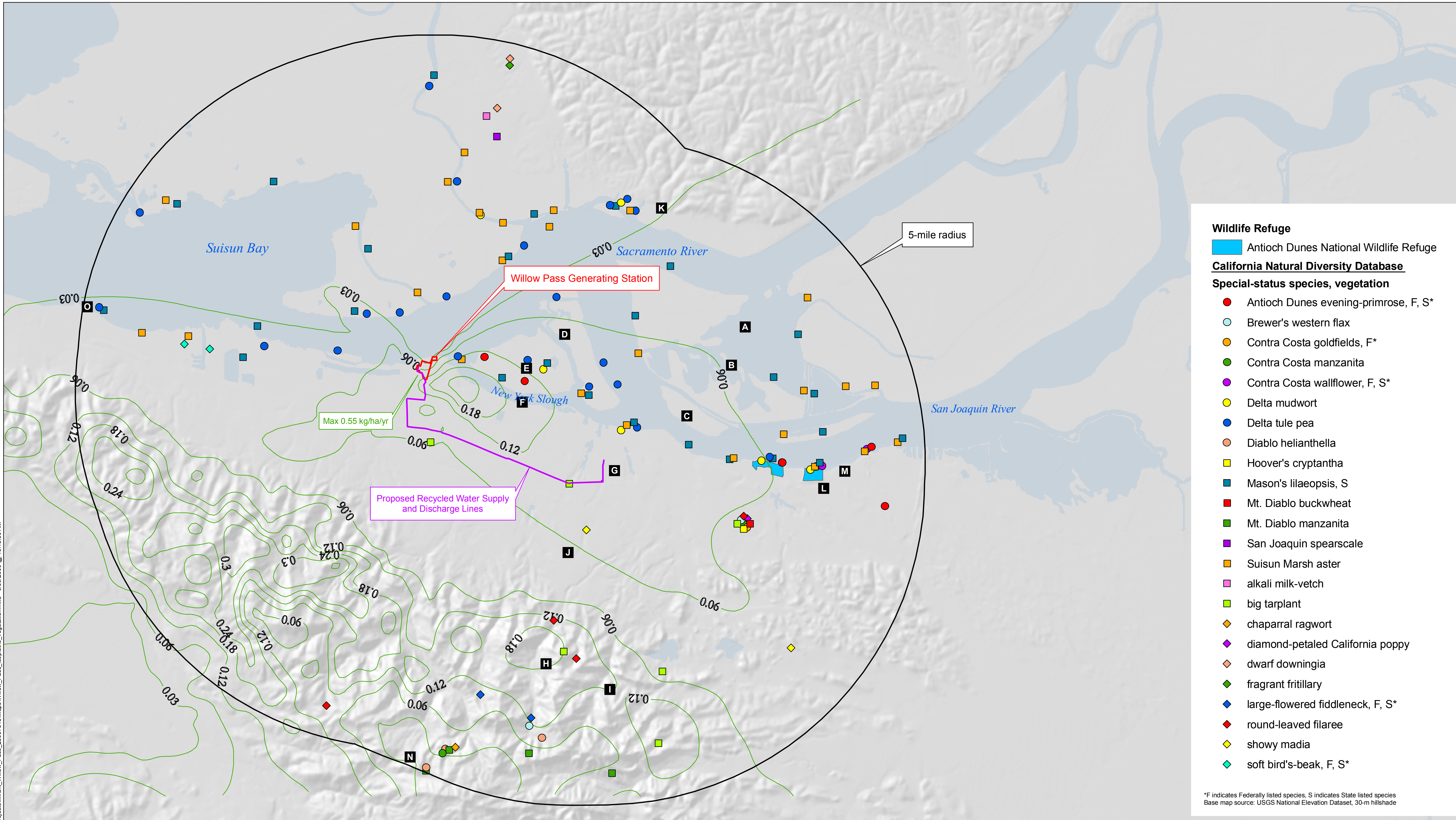
Weiss S.B., 2006. Impacts of Nitrogen Deposition on California Ecosystems and Biodiversity. California Energy Commission, PIER Energy-Related Environmental Research. CEC-500-2005-165.

DATA REQUEST

60. Please provide an isopleth graphic over USGS 7.5-minute maps (or equally detailed map) of the direct nitrogen deposition rates caused by the project that graphically depicts the results.

RESPONSE

Figures 60-1a and 60-1b provide the isopleths for nitrogen deposition rates due to the proposed project. Figure 60-1a shows the federal and state listed special-status vegetation species. Figure 60-1b shows the federal and state listed wildlife special-status species.



Areas of Concern

- A. Sherman Lake
- B. Sherman Island Water Flow Management Area
- C. Kimball Island
- D. Winter Island
- E. Browns Island
- F. New York Slough
- G. DOW Wetlands Preserve
- H. Black Diamond Mines Regional Preserve
- I. Contra Loma Regional Park & Reservoir
- J. Mouth of Contra Costa Channel
- K. Montezuma Habitat Enhancement Site
- L. Sardis Unit of the Antioch Dunes National Wildlife Refuge
- M. Antioch Sand Dunes
- N. Nortonville - Somersville
- O. Shoreline Between Martinez Waterfront & Concord Naval Weapons Station

Isopleth Contour (kg/ha/yr)

0 1 2 MILES

N

Nitrogen Deposition Isopleth Map (kg/ha/yr)-Vegetation

Willow Pass Generating Station
Mirant Willow Pass, LLC
Pittsburg, California

June 2009
28067343

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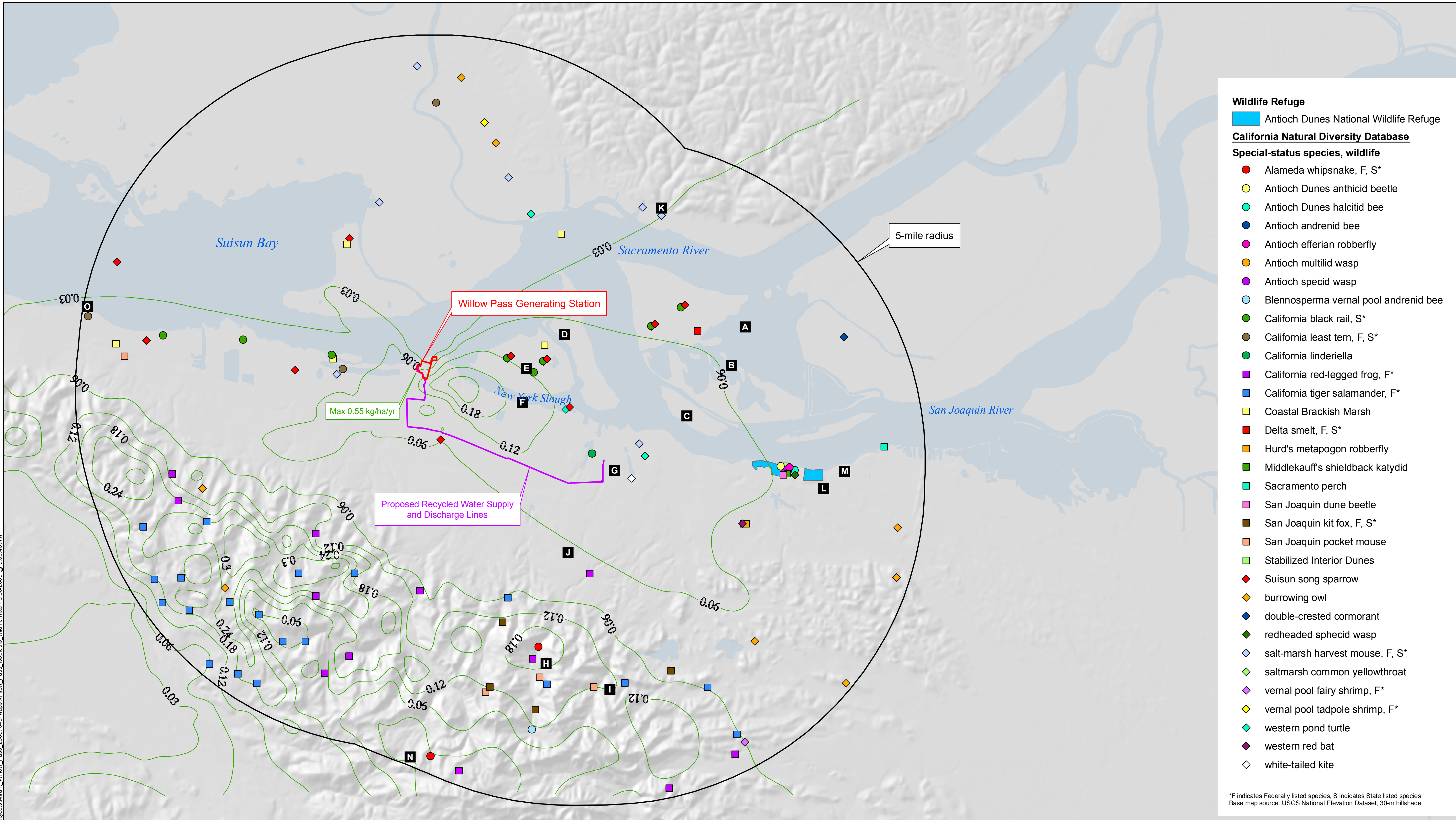
FIGURE 60-1a



Areas of Concern

A. Sherman Lake
B. Sherman Island Water Flow Management Area
C. Kimball Island
D. Winter Island
E. Browns Island
F. New York Slough
G. DOW Wetlands Preserve
H. Black Diamond Mines Regional Preserve
I. Contra Loma Regional Park & Reservoir
J. Mouth of Contra Costa Channel
K. Montezuma Habitat Enhancement Site
L. Sardis Unit of the Antioch Dunes National Wildlife Refuge
M. Antioch Sand Dunes
N. Nortonville - Somersville
O. Shoreline Between Martinez Waterfront & Concord Naval Weapons Station

Isopleth Contour (kg/ha/yr)

N

0 1 2 MILES

Nitrogen Deposition Isopleth Map (kg/ha/yr)-Wildlife

Willow Pass Generating Station
Mirant Willow Pass, LLC
Pittsburg, California

June 2009
28067343

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FIGURE 60-1b

DATA REQUEST

61. Please update the cumulative impact analysis (Tables 57-1 and 57-2) in Responses to Data Request Addendum Set #1A – Data Request #57 with nitrogen deposition values in kg/ha/yr. Provide an isopleth graphic over USGS 7.5-minute maps (or equally detailed map) of the direct nitrogen deposition values in the cumulative analysis.

RESPONSE

Tables 61-1 and 61-2 are updated versions of Response to Data Request 57, Tables 57-1 and 57-2, respectively. Table 61-1 is an update to Table 57-1 that now includes ammonia emissions. Table 61-2 includes the maximum annual modeled ammonia concentration from all cumulative sources listed in Table 61-1, as well as the maximum predicted nitrogen deposition rate in kg/ha/yr. Maximum modeled concentrations from nitrogen dioxide and ammonia were combined and converted into maximum modeled nitrogen deposition rates using a deposition rate of 2 cm/sec.

Figures 61-1a and 61-1b provide the isopleths for nitrogen deposition rates in kg/ha/yr due to all cumulative sources listed in Table 61-1. Figure 61-1a shows the federal and state listed special-status vegetation species. Figure 61-1b shows the federal and state listed special-status wildlife species.

As seen in Figures 61-1a and 61-1b, the maximum cumulative nitrogen deposition value occurs in the hills south of Pittsburg, which is located approximately 3 miles southwest of the WPGS project site. The maximum nitrogen deposition rate for all cumulative sources is estimated to be 5.4 kg/ha/yr (without background) near the Ameresco Keller Canyon facility. This is the only area that would exceed the benchmark of 5 kg/ha/yr with background; however this area is not considered sensitive to nitrogen deposition since sands or serpentine soils are not known to be present. Approximately 98 percent of the highest nitrogen deposition rates in these hills are caused by nitrous oxide emissions from sources at the Ameresco Keller Canyon LLC facility, which includes two landfill gas-fired internal combustion engines and a waste gas flare.

Other areas with elevated nitrogen deposition occur in the following three areas; however the cumulative nitrogen deposition in these areas are estimated to be below 5 kg/ha/yr with background as further detailed below:

- An area near the Black Diamond Mines Regional Preserve (Area H on the figures)
- An area around the Freedom High School Generator
- An area southeast of the Marsh Landing Generating Station (MLGS) site; west of Big Break Marsh and south of the Antioch Shoreline

Cumulative nitrogen deposition values in the hills near Black Diamond Mines Regional Preserve (Area H on the figures) are largely associated with ammonia emissions from the Gateway Generating Station. The maximum value in this area without background is 2.2 kg/ha/yr.

Other localized nitrogen deposition areas include the region around the Freedom High School generator set and the area to the southeast of the MLGS site. The maximum value near the Freedom High School generator set is 1.7 kg/ha/yr without background and the maximum value southeast of MLGS near Highway 160 is 2.4 kg/ha/yr without background. Nitrogen deposition values in these areas to the southeast of the MLGS property are mainly produced by nitrous oxide and ammonia emissions from Gateway Generating Station.

Based on regional soils information (Jones & Stokes, 2006 and USDA, 1977), the area in the vicinity of the Ameresco Keller Canyon facility, the Black Diamond Mines Regional Preserve, and the Freedom High School Generator areas are not mapped as sands and are not considered nutrient limited areas.

With respect to serpentine-derived soils, it is reasonable to assume that they would be restricted to areas where serpentinite (an ultramafic rock type) outcrops at the surface. Geologic maps (Wagner et al., 1991; Graymer et al., 1994) indicate that the nearest surface exposure of a serpentinite body is in the vicinity of Mt. Diablo, a distance of approximately 8.5 miles and 10 miles from the WPGS and the MLGS, respectively, in an area unaffected by nitrogen deposition from these and nearby sources. The occurrence of Brewer's western flax near the Black Diamond Mines Regional Preserve (Area H on the figures) suggests that there may be serpentine soils present at this location, as this species may sometimes be associated with serpentine soils (CDFG, 2009). However, a review of all 22 occurrence records for Brewer's western flax in the California Natural Diversity Database, as well as occurrence records for other species reportedly occurring nearby, revealed no mention of species occurrences on serpentine soils or in serpentine plant communities. Based on available geology and soil mapping information described above and the California Natural Diversity Database records, serpentine soil does not appear to be present in this area.

Big Break Regional Shoreline occurs in an area mapped as sands (Jones & Stokes, 2006 and USDA, 1977); however, this area is not expected to be nutrient limited. Big Break Regional Shoreline consists primarily of tidal sloughs and marshes. Tidal marshes have high biomass production and accumulation, in addition to tidal processes that affect nutrient fluxes. They also have nitrogen fluxes one order of magnitude higher than many other systems and are not particularly sensitive to nitrogen deposition (Rozema et al., 2000). The Antioch Regional Shoreline consists of a 4.5-acre meadow, picnic facilities, and a fishing pier. The area is landscaped and maintained, and does not contain sensitive plant resources. The area is also heavily used by the public for fishing, picnicking, and other recreational activities. Due to the lack of sensitive resources in this area and the current level of disturbance and maintenance, cumulative impacts to this area will not be significant.

As explained above, only an area near the Ameresco Keller Canyon with no known nitrogen-poor soils or known species sensitive to nitrogen deposition would have nitrogen deposition exceeding 5 kg/ha/yr (with background). Therefore, cumulative impacts from nitrogen deposition on nitrogen-sensitive biological resources would be less than significant.

References

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Jones & Stokes, 2006. East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan. October.

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Wagner, D.L., E.J. Bortugno, and R.D. McJunkin, 1991. Geologic Map of the San Francisco – San Jose Quadrangle, California, 1:250,000; California Department of Conservation, Division of Mines and Geology, Map No. 5A.

Table 61-1
Cumulative Sources for Marsh Landing Generating Station and Willow Pass Generating Station

Source Name	Address	Type of Source	Distance to Willow Pass Generating Station (miles)	Distance to Marsh Landing Generating Station (miles)	Emissions (tons/year)						Stack Parameters				UTM Coordinates NAD83 zone 10		Notes
					VOC	NO_X	NH_3[1]	SO_X	CO	PM_{10}	Diameter (m)	Height (m)	Exit velocity (m/s)	Temp (K)	Easting (km)	Northing (km)	
Calpine Natural Gas	South End of Nichols Road Bay Point, CA 94565	Calpine Natural Gas Ryer Island Station - 70 Barrel Water/ Condensate Storage Tank	5.13	12.2	1.39	0.162	**0**	0	0.041	0.004	0.05	3.66	1.94	295.9	588.848	4210.009	Emissions and stack parameters provided by BAAQMD
Silgan Containers Manufacturing Corporation	2200 Wilbur Avenue, Antioch, CA 94509	Silgan Containers Mfg Corp Thermal Oxidizer Modification	6.12	1.28	0	1.922	**0**	0.006	7.688	0.072	0.65	14.63	8.8	616.5	606.519	4207.724	Emissions and stack parameters provided by BAAQMD
Ameresco Keller Canyon LLC	901 Bailey Road, Pittsburg, CA 94565	Ameresco Keller Canyon LLC 2 LFG-Fired Internal Combustion Engines	3.19	9.67	9.64	31.02	**0**	8.637	95	5.17	0.51	10.67	40.68	740.4	592.879	4207.727	Emissions and stack parameters provided by BAAQMD
		Ameresco Keller Canyon LLC TSA Waste Gas Flare	3.19	9.67	0.603	2.168	**0**	1.805	20.796	1.212	1.52	9.14	4.57	1144.3	592.879	4207.727	Emissions and stack parameters provided by BAAQMD
United Spiral Pipe LLC Manufacturing Plant	900 E 3rd Street, Pittsburg, CA 94565	United Spiral Pipe LLC Manufacturing Plant welding, cleaning, misc.	1.44	5.8	4.584	0	**0**	0	0	4.781	0.26	12.19	73.89	294.3	599.2	4209.7	Emissions and stack parameters provided by BAAQMD
Freedom High School	1050 Neroly Road Oakley, CA 94561	Freedom High School Generator set	10.41	3.98	1.67	1.67	**0**	0	1.67	0.083	0.08	3.66	21.03	416.5	612.095	4203.127	Emissions and stack parameters provided by BAAQMD
Contra Costa Power Plant	3201 Wilbur Avenue, Antioch, CA 94509	CCPP Natural Gas Boiler 9 and 10 Stack Units 6 and 7	7.39	0.24	18.966	21.043	**21.7**	1.0863	144.83	13.104	5.7	137.16	28.7	411	608.825	4208.561	Emissions from 2005-2007 CEMS data
Gateway Generating Station	3223 Wilbur Avenue, Antioch, CA 94509	Gateway Natural Gas Boiler A	7.44	0.27	23.3	87.15	**122.06**	18.5	277.15	50.85	5.11	59.44	19.92	355.2	608.9	4208.454	From BAAQMD Engineering Evaluation For Proposed Amended Authority to Construct and Draft PSD Permit, June 2008.
Gateway Generating Station	3223 Wilbur Avenue, Antioch, CA 94509	Gateway Natural Gas Boiler B	7.45	0.27	23.3	87.15	**122.06**	18.5	277.15	50.85	5.11	59.44	19.92	355.2	608.9	4208.413	From BAAQMD Engineering Evaluation For Proposed Amended Authority to Construct and Draft PSD Permit, June 2008.
Pittsburg Power Plant	696 West 10th Street, Pittsburg, CA 94565	PPP Natural Gas Boiler 5	0.12	7.26	20.438	17.558	**27.4**	1.1705	156.07	14.121	4.18	137.16	32.64	403	597.003	4210.849	Emissions from 2005-2007 CEMS data
Pittsburg Power Plant	696 West 10th Street, Pittsburg, CA 94565	PPP Natural Gas Boiler 6	0.14	7.28	11.803	11.266	**14.2**	0.676	90.129	8.1546	4.18	137.16	32.64	403	596.974	4210.856	Emissions from 2005-2007 CEMS data
Pittsburg Power Plant	696 West 10th Street, Pittsburg, CA 94565	PPP Natural Gas Boiler 7	0.15	7.33	7.3935	11.292	**0**	0.4234	56.46	5.1083	6.1	137.16	25	398	596.862	4210.726	Emissions from 2005-2007 CEMS data

Notes:

BAAQMD = Bay Area Air Quality Management District
CCPP = Contra Costa Power Plant
CEMS = continuous emissions monitoring system
CO = carbon monoxide
K = Kelvin
km = kilometers
m = meters
m/sec = meters per second
NH_3 = ammonia
NO_X = nitrogen oxides
PM_{10} = particulate matter less than or equal to 10 microns in diameter
PPP = Pittsburg Power Plant
PSD = Prevention of Significant Deterioration
SO_X = sulfur oxides
UTM = Universal Transverse Mercator
VOC = volatile organic compound

[1] Table 61-1 is the same as Response to Data Request 57, Table 57-1 with column for NH_3 now added.

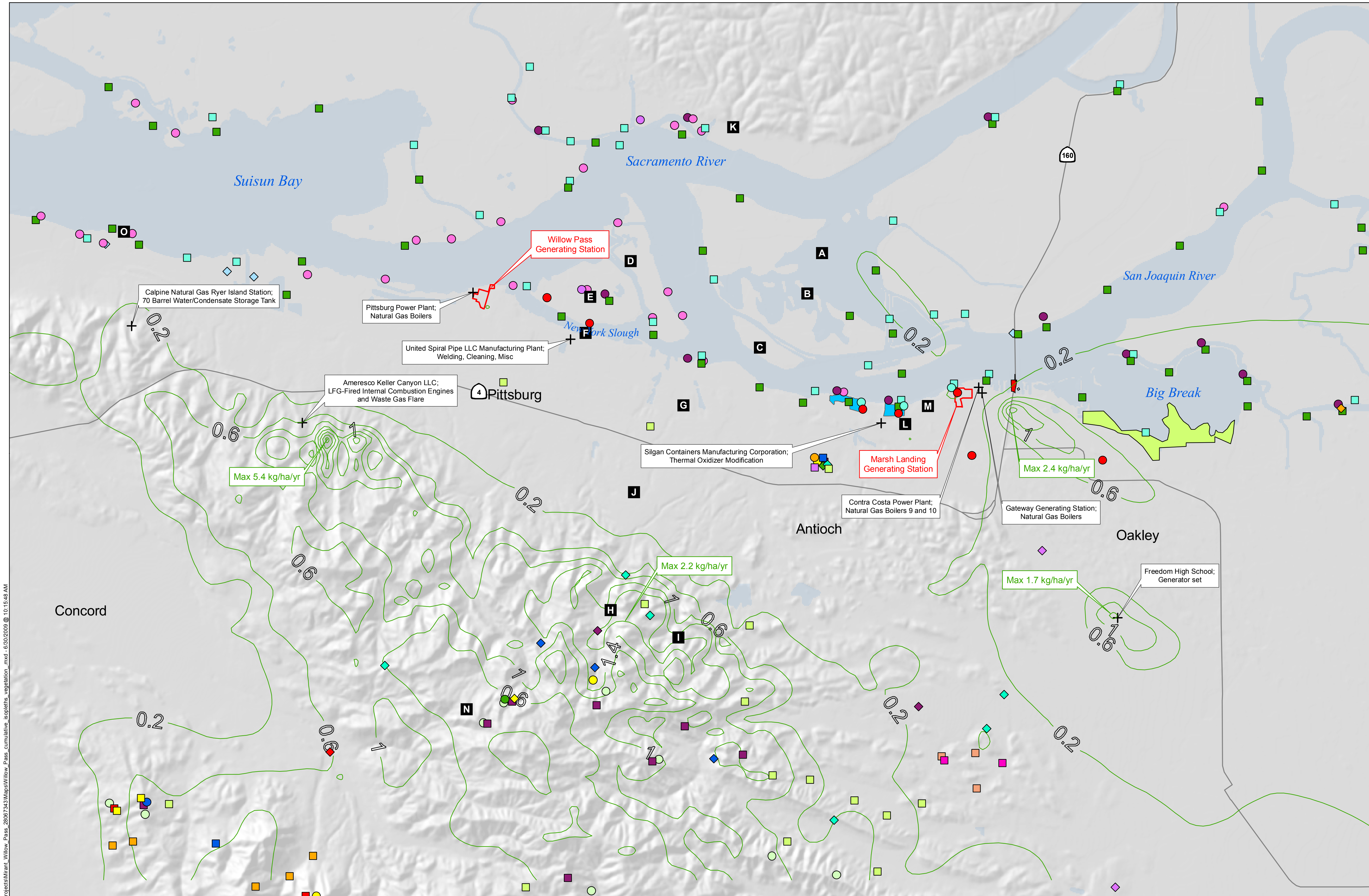
Table 61-2
AERMOD Cumulative Impact Modeling Result[1]

Pollutant	Averaging Period	Maximum Modeled Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)[2]	Maximum Total Predicted Concentration ($\mu g/m^3$)	Most Stringent AAQS ($\mu g/m^3$)	Maximum Predicted Nitrogen Deposition Rate (kg/ha/yr)	UTM Coordinates NAD27	
							East (m)	North (m)
CO	1 hour	403.34	4,715	5,118	23,000	**N/A**	593,500	4,207,000
	8 hour	259.31	2,222	2,481	10,000	**N/A**	593,500	4,206,800
NH_3	**Annual[3]**	**0.34**	**N/A[4]**	**0.34**	**N/A**	**1.77**	**609,800**	**4,207,800**
NO_2	1 hour[4]	104.59	122.1	227	339	**N/A**	592,250	4,207,000
	Annual[4]	2.73	22.4	25	57	**5.24**	593,525	4,207,000
PM_{10}	24 hour[5,6]	6.48	84	90	50	**N/A**	593,500	4,206,800
	Annual[5,6]	0.70	22	23	20	**N/A**	599,500	4,209,500
$PM_{2.5}$	24 hour[5,6]	6.48	74	80	35	**N/A**	593,500	4,206,800
	Annual[5,6]	0.70	12	13	12	**N/A**	599,500	4,209,500
SO_2	1 hour	36.40	235.8	272	655	**N/A**	593,500	4,207,000
	3 hour	26.75	114.4	141	1,300	**N/A**	593,500	4,206,800
	24 hour	10.57	26.3	37	105	**N/A**	593,500	4,206,800
	Annual	0.86	5.3	1	80	**N/A**	593,525	4,207,000

Notes:

AAQS = ambient air quality standard
AERMOD = American Meteorological Society and Environmental Protection Agency preferred atmospheric dispersion model
CO = carbon monoxide
m = meters
kg/ha/yr = kilograms per hectare per year
$\mu g/m^3$ = micrograms per cubic meter
N/A = not applicable
NH_3 = ammonia
NO_2 = nitrogen dioxide
PM_{10} = particulate matter less than or equal to 10 microns in diameter
$PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter. All PM emissions during operation were assumed to be $PM_{2.5}$
SO_2 = sulfur dioxide
UTM = Universal Transverse Mercator

1 Values highlighted in **bold** represent values not included in Table 57-2.
2 Background represents the maximum values measured at the monitoring stations in the Willow Pass AFC.
3 NH_3 modeled for nitrogen deposition calculation only. No background value used for NH_3.
4 Results for NO_2 used ozone limiting method (OLM) with ambient ozone data collected at Bethel Island monitoring station for the years 2000-2002 and 2004-2005.
5 PM_{10} and $PM_{2.5}$ background levels exceed ambient standards.
6 All PM_{10} emissions from project sources were also considered to be $PM_{2.5}$.



East Bay Regional Park
- Antioch Regional Shoreline
- Big Break Emergent Marsh (approximate)

Wildlife Refuge
- Antioch Dunes National Wildlife Refuge

California Natural Diversity Database

Special-status species, vegetation
- Antioch Dunes evening-primrose, F, S*
- Bolander's water-hemlock
- Brandegee's eriastrum
- Brewer's western flax
- Contra Costa goldfields, F*
- Contra Costa manzanita
- Contra Costa wallflower, F, S*
- Delta mudwort
- Delta tule pea
- Diablo helianthella
- Hall's bush-mallow
- Hoover's cryptantha
- Lime Ridge navarretia
- Mason's lilaeopsis, S*
- Mt. Diablo buckwheat
- Mt. Diablo fairy-lantern
- Mt. Diablo manzanita
- San Joaquin spearscale
- Suisun Marsh aster
- big tarplant
- brittlescale
- caper-fruited tropidocarpum
- chaparral ragwort
- diamond-petaled California poppy
- large-flowered fiddleneck, F, S*
- round-leaved filaree
- showy golden madia
- soft bird's-beak, F, S*
- stinkbells
- woolly rose-mallow

*F indicates Federally listed species, S indicates State listed species
Base map source: USGS National Elevation Dataset, 30-m hillshade

Areas of Concern
- A. Sherman Lake
- B. Sherman Island Water Flow Management Area
- C. Kimball Island
- D. Winter Island
- E. Browns Island
- F. New York Slough
- G. DOW Wetlands Preserve
- H. Black Diamond Mines Regional Preserve
- I. Contra Loma Regional Park & Reservoir
- J. Mouth of Contra Costa Channel
- K. Montezuma Habitat Enhancement Site
- L. Sardis Unit of the Antioch Dunes National Wildlife Refuge
- M. Antioch Sand Dunes
- N. Nortonville - Somersville
- O. Shoreline Between Martinez Waterfront & Concord Naval Weapons Station

Isopleth Contour (kg/ha/yr)

N

0 2 MILES

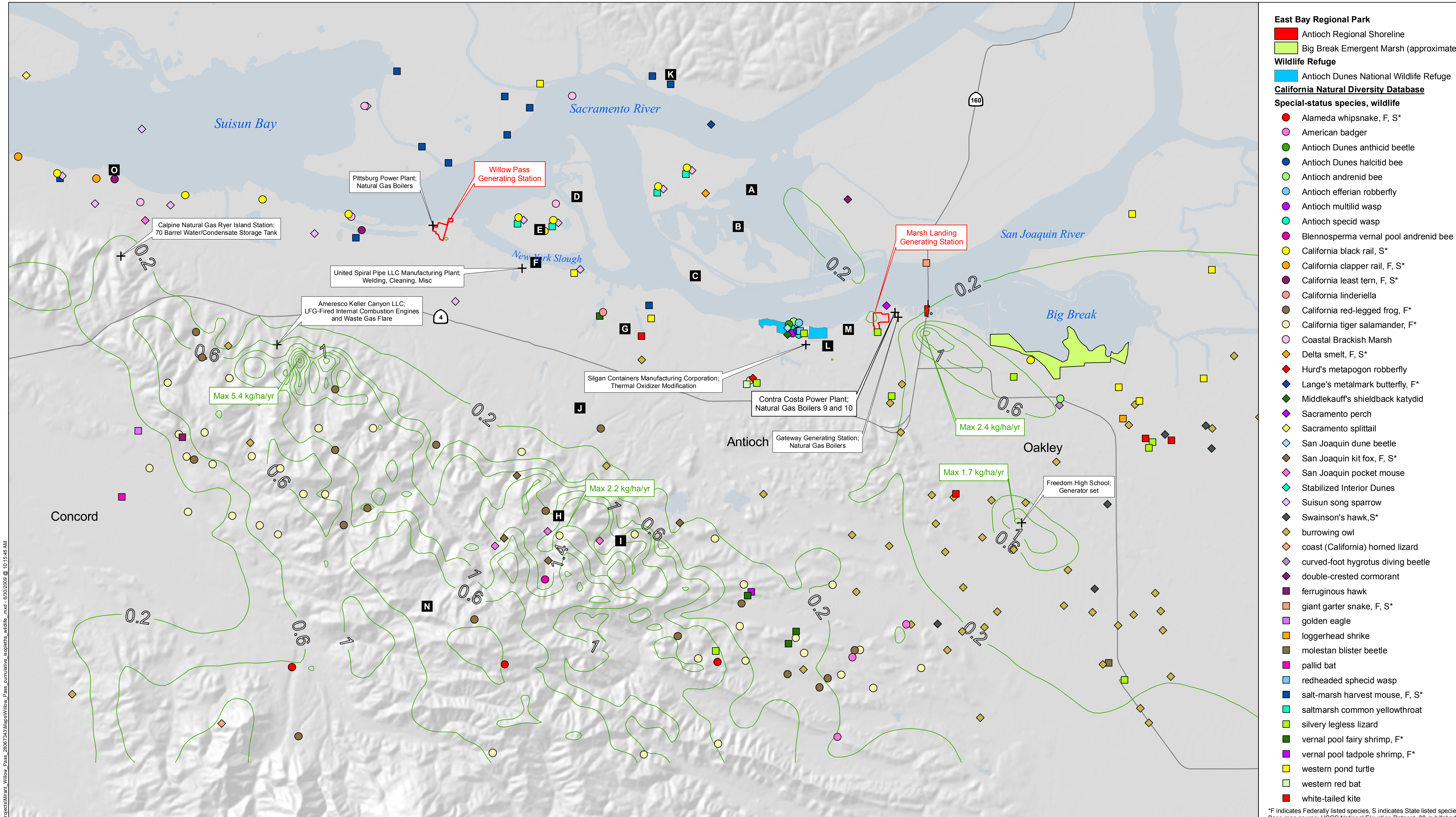
Cumulative Sources Nitrogen Deposition Isopleths(kg/ha/yr)-Vegetation

June 2009
28067344

Willow Pass Generating Station
Mirant Willow Pass, LLC - Pittsburg, California

URS

FIGURE 61-1a



Areas of Concern

A. Sherman Lake
B. Sherman Island Water Flow Management Area
C. Kimball Island
D. Winter Island
E. Browns Island
F. New York Slough
G. DOW Wetlands Preserve
H. Black Diamond Mines Regional Preserve
I. Contra Loma Regional Park & Reservoir
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K. Montezuma Habitat Enhancement Site
L. Sardis Unit of the Antioch Dunes National Wildlife Refuge
M. Antioch Sand Dunes
N. Nortonville - Somersville
O. Shoreline Between Martinez Waterfront & Concord Naval Weapons Station

Isopleth Contour (kg/ha/yr)

N

0 2 MILES

Cumulative Sources Nitrogen Deposition Isopleths(kg/ha/yr)-Wildlife

June 2009
28067344

Willow Pass Generating Station
Mirant Willow Pass, LLC - Pittsburg, California

URS

FIGURE 61-1b

URS Corp - Oakland, CA - B Jacobsen L:\Projects\Mirant_Willow_Pass_28067343\Maps\Willow_Pass_cumulative_isopleths_wildlife_mxd - 6/30/2009 @ 10:15:45 AM

DATA REQUEST

70 For the new overload identified on the Dumbarton-Newark 115-kV line for category B (L-1 and G-1) contingency, explain the conclusion, "This is an existing problem and is unrelated to the addition of the WPGS project". Provide any identified pre-project overload on this line exacerbated for the addition of the WPGS. Otherwise provide a mitigation plan for the overload.

RESPONSE

The Category B contingency modeled in the pre-project case shows the Dumbarton-Newark 115-kV line loading more than 90 percent of the line's emergency rating (91.1 percent). Therefore, this line is stressed prior to the addition of the WPGS. In the post WPGS power-flow case, the 100.3 percent overload on the Dumbarton-Newark 115-kV line for the Category B contingency due to the loss of G-1 Potrero 3 and N-1 East Shore – San Mateo 230-kV line is considered minor, and addressed below.

In both the pre- and post-project cases, the 600-megawatt (MW) Russell City Energy Center (RCEC) contributes significantly to the minor overload on the Dumbarton-Newark line. As explained below, if the RCEC is constructed, that project would provide transmission system upgrades that will mitigate the minor overload on the Dumbarton-Newark line. Conversely, if RCEC were not constructed, the overload on the Dumbarton-Newark line would not occur. Therefore, the WPGS is not the proximate cause of the minor Dumbarton-Newark line overload, and, in either case, no mitigation plan for the WPGS is necessary.

The RCEC final System Impact Study dated October 10, 2001, provided by CEC staff, was reviewed. Mitigation for the RCEC overloads listed in the document include looping both Pittsburg-San Mateo 230-kV lines into East Shore Substation with either a Remedial Action Scheme (RAS) or reconductoring on both East Shore-San Mateo 230-kV circuits 1 and 2. The result of these RCEC upgrades will force more power-flows on the 230-kV system into the San Francisco Peninsula. With another path from East Shore direct to San Mateo, more flows will stay on the East Shore – San Mateo 230-kV line, ultimately reducing power flows on the Dumbarton-Newark 115-kV system and mitigating the minor 0.3 percent overload identified on this line. This pending upgrade by RCEC was not included in the WPGS power-flow base case, but will resolve the identified overload and therefore obviate the need for any mitigation by WPGS.

In the event the RCEC project is not constructed, the elimination of 600 MW of generation at East Shore will significantly decrease power flows across the Newark-Dumbarton-East Shore 115-kV corridor, and the minor 0.3 percent overload on the Dumbarton-Newark 115-kV line would not occur in the WPGS post-project case.

DATA REQUEST

72. Since the submitted power flow diagrams are not legible, provide clear and legible power flow diagrams (units in MW, percentage loading and per unit voltage) for the following, these should be 11 × 17 and in color:

A. Diagrams for the pre and post-project 2013 summer peak study base cases.

B. Pre and post-project diagrams for all identified new overloads (not pre-project) or voltage criteria violations under normal system (N-0) or Category B and C contingency conditions.

C. Diagrams for a few identified pre and post-project worst overloads exacerbated by the addition of the WPGS (submit worst ones only as requested in Item 5 above).

D. The MW flows, percentage loadings and bus voltages along with the bus names must be clearly legible.

RESPONSE

Mirant Willow Pass previously responded to this data request in *Responses to CEC Data Requests (#58-75)*, submitted to the CEC on May 28, 2009. Subsequent to that filing, a typographical error was noted in the Filtered Category B, New Thermal Overload Plot List included in Appendix 8 of the Updated System Impact Study. The power-flow modeling results of the pre-project case show that the G-1 Potrero 3 and N-1 Sobrante-Moraga 115-kV Line outage does result in the East Shore-San Mateo 230-kV Line seeing overloads by 110 percent of its emergency rating. Table 72-1 provides a revised Filtered Category B New Thermal Overload Plot list, and replaces the version previously submitted in Appendix 8. This correction does not affect any of the findings or conclusions of the Updated System Impact Study.

Table 72-1
Revised Filtered Category B, New Thermal Overload Plot List

Outage Description	Overloaded Element	Pre E Pct	Post E Pct	E Delta	E Rate	Unit	Element Type
G-1 Potrero 3 and N-1 East Shore – San Mateo 240-kV Line	Dumbarton-Newark D 115-kV Line	91.1	100.3	9.3	1,541	Amps	Line
G-1 Potrero 3 and N-1 Sobrante – Moraga 115-kV Line	E. Shore San Mateo 230-kV Line	**110.0**	117.1	37.1	1,120	Amps	Line
G-1 Potrero 3 and N-1 Tesla – Metcalf 500-kV Line	San Jose BE-Trimble 115-kV Line	98.9	105.4	6.5	924	Amps	Line

Notes:
kV = kilovolt
pct = Percentage
Bold text Indicates corrected value from original table

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION
FOR THE WILLOW PASS
GENERATING STATION

Docket No. 08-AFC-6

PROOF OF SERVICE
(Revised 4/14/2009)

APPLICANT
Chuck Hicklin, Project Manager
Mirant Corporation
P.O. Box 192
Pittsburg, CA 94565
E-mail preferred
chuck.hicklin@mirant.com

Jonathan Sacks, Project Director
Steven Nickerson
Mirant Corporation
1155 Perimeter Center West
Atlanta, GA, 30338
E-mail preferred
jon.sacks@mirant.com
steve.nickerson@mirant.com

CONSULTANTS
Dale Shileikis
Kathy Rushmore
URS Corporation
221 Main Street, Suite 600
San Francisco, CA 94105-1917
E-mail preferred
Kathy_Rushmore@URSCorp.com
Dale_shileikis@URSCorp.com

COUNSEL FOR APPLICANT
Lisa Cottle
Karleen O'Connor
Winston & Strawn LLP
101 California Street
San Francisco, CA 94111-5802
E-mail preferred
lcottle@winston.com
koconnor@winston.com

INTERESTED AGENCIES
California ISO
e-recipient@caiso.com

Marc Grisham, City Manager
Garrett D. Evans
General Manager, Pittsburg Power Company
65 Civic Avenue
Pittsburg, CA 94565
MGrisham@ci.pittsburg.ca.us
gevans@ci.pittsburg.ca.us

Greggory L. Wheatland
Ellison, Schneider & Harris
2015 H Street
Sacramento, CA 95811-3109
glw@eslawfirm.com

INTERVENORS
California Unions for Reliable Energy ("CURE")
Gloria D. Smith & Marc D. Joseph
Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, California 94080
gsmith@adamsbroadwell.com
mdjoseph@adamsbroadwell.com

ENERGY COMMISSION
KAREN DOUGLAS
Chair and Presiding Member
kldougla@energy.state.ca.us

JAMES D. BOYD
Vice Chair and Associate Member
jboyd@energy.state.ca.us

Paul Kramer
Hearing Officer
pkramer@energy.state.ca.us

*Felicia Miller
Project Manager
fmiller@energy.state.ca.us

Dick Ratliff
Staff Counsel
dratliff@energy.state.ca.us

Elena Miller
Public Adviser
publicadviser@energy.state.ca.us

DECLARATION OF SERVICE

I, Kathy Rushmore, declare that on June 30, 2009, I served and filed copies of the attached *Responses to CEC Data Requests (#58*-61, 70, and 72). The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at: **[http://www.energy.ca.gov/sitingcases/willowpass/index.html]**. The document has been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

(C*heck all that Apply*)

For service to all other parties:

_X_ sent electronically to all email addresses on the Proof of Service list;

___ by personal delivery or by depositing in the United States mail at San Francisco, California with first-class postage thereon fully prepaid and addressed as provided on the Proof of Service list above to those addresses **NOT** marked "email preferred."

AND

For filing with the Energy Commission:

_X_ sending an original paper copies and one electronic copy, mailed and emailed, respectively, to the address below (preferred method):

OR

___ depositing in the mail an original and 12 paper copies, as follows:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 08-AFC-6
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct.

Kathy Rushmore