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DOCKET
08-AFC-3
DATE June 25 2009
RECD. June 25 2009

June 25, 2009

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

RE: Marsh Landing Generating Station
Application for Certification 08-AFC-03

On behalf of Mirant Marsh Landing, LLC, the applicant for the Marsh Landing Generating Station (MLGS), we are pleased to submit the Responses to Data Request Set 2 (#60-63).

Please include this document in the AFC record.

URS Corporation

Anne Connell
Project Manager

Attachment

CC: Mike Monasmith

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Responses to Data Request Set 2: (#60–63)

Application for Certification (08-AFC-03)

for

MARSH LANDING GENERATING STATION

Contra Costa County, California

June 2009

Prepared for:

MIRANT℠
MARSH LANDING, LLC

Prepared by:

URS

TABLE OF CONTENTS

RESPONSES TO DATA REQUESTS 60 THROUGH 63

TABLES

FIGURES

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
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
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 Marsh Landing Generating Station (MLGS), namely nitrogen oxides (NO_X) 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 0.75 mile west of the MLGS 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, 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 MLGS emissions.

DATA REQUEST

60. Please quantify the existing baseline total nitrogen deposition rate in the vicinity of MLGS (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

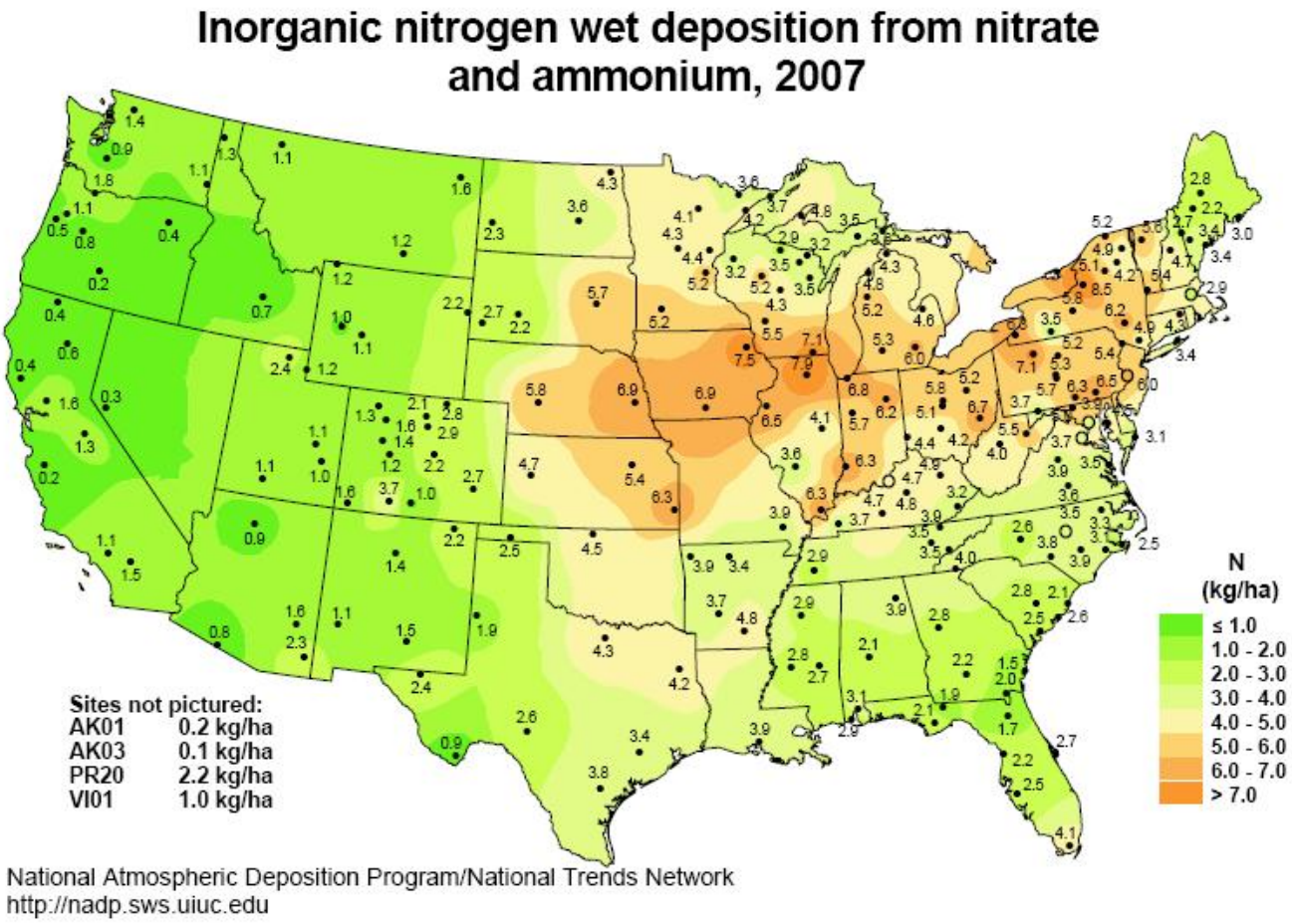
Based on data from the National Atmospheric Deposition Program, National Trends Network at The University of Illinois Urbana-Champaign (NADP, 2007), the wet nitrogen deposition rate in the vicinity of the Marsh Landing Generating Station (MLGS), including the Antioch Dunes National Wildlife Refuge (NWR), 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 60-1 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 60-1


Inorganic nitrogen wet deposition from nitrate and ammonium, 2007
Sites not pictured:
AK01 0.2 kg/ha
AK03 0.1 kg/ha
PR20 2.2 kg/ha
VI01 1.0 kg/ha
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
National Atmospheric Deposition Program/National Trends Network
http://nadp.sws.uiuc.edu

DATA REQUEST

61. Please provide an analysis of impacts due to total nitrogen deposition from operation of the MLGS. 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 north of the project area along the San Joaquin River shoreline, and all other "Areas of Concern" (B through R) 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 MLGS 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 MLGS sources is 0.3 kg/ha/yr, located in the hills to the southwest of the project site, near Black Diamond Mines Regional Preserve (Area L on Figures 62-1a and 62-1b). When adding the background level of 1.6 kg/ha/yr from the response to Data Request 60, the maximum modeled nitrogen deposition rate for MLGS is 1.9 kg/ha/yr.

As illustrated in Figures 62-1a and 62-1b, nitrogen deposition rates from MLGS at the Sardis Unit and Stamms Unit of the Antioch Dunes NWR are between 0.005 and 0.03 kg/ha/yr. With background, the maximum nitrogen deposition rate for the Antioch Dunes Wildlife Refuge is 1.63 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 (i.e., 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 north of the project area along the San Joaquin River shoreline, nitrogen deposition rates are between 0.06 and 0.09 kg/ha/yr. With added background, the maximum modeled nitrogen deposition rate for this area is estimated to be 1.69 kg/ha/yr. Tidal marshes have high biomass production and accumulation, in addition to tidal processes that help control nutrient fluxes. They also have nitrogen fluxes an 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 1.6 kg/ha/yr and 1.9 kg/ha/yr. These areas either lack species sensitive to nitrogen deposition or lack nitrogen deficient soils. For example, the Contra Costa goldfields, which are found in vernal pools and wet grasslands, are not 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 nitrogen deficient.

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 3.2 grams per square meter per year (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 an order of magnitude higher than the predicted deposition in the MLGS 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 MLGS, 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 affect 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 (Jones et al., 2004) indicate that dune ecosystems could be impacted at nitrogen deposition values between 10 and 20 kg/ha/yr. However, for purposes of this analysis, 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 values due to the MLGS 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.

References

Aber, J.D., C.L. Goodale, S.V. Ollinger, M.L. Smith, A.H. Magill, M.E. Martin, R.A. Hallett, and J.L. Stoddard, 2003. Is nitrogen deposition altering the nitrogen status of northeastern forests? BioScience 53:375–389.

CEC (California Energy Commission), 2007. Final Staff Assessment, City of Hayward Eastshore Energy Center Application for Certification (06-AFC-6). November.

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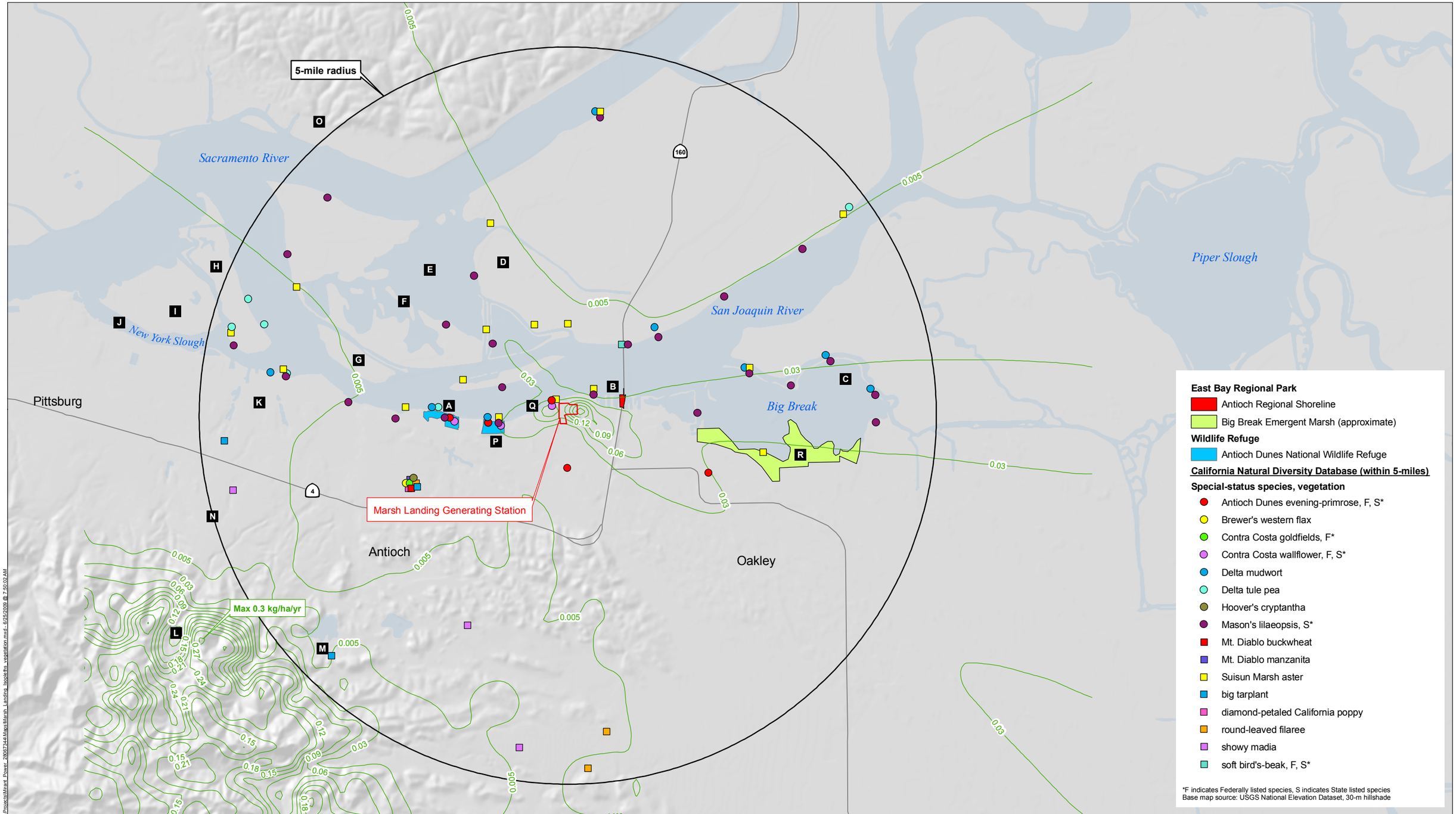
Weiss S.B., 2006. Impacts of Nitrogen Deposition on California Ecosystems and Biodiversity. California Energy Commission, PIER Energy-Related Environmental Research. CEC-500-2005-165.

DATA REQUEST

62. 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 62-1a and 62-1b provide the isopleths for nitrogen deposition rates due to the proposed project. Figure 62-1a shows the federal and state listed special-status vegetation species. Figure 62-1b shows the federal and state listed wildlife special-status species.



Areas of Concern

A Antioch Dunes NWR	G Kimball Island	M Contra Loma Regional Park & Reservoir
B Antioch Shoreline	H Winter Island	N Mouth of Contra Costa Channel
C Big Break	I Browns Island	O Montezuma Habitat Enhancement Site
D Sherman Island	J New York Slough	P Sardis Unit of the Antioch Dunes National Wildlife Refuge
E Sherman Lake	K DOW Wetlands Preserve	Q Antioch Sand Dunes
F Sherman Island Water Flow Management Area	L Black Diamond Mines Regional Preserve	R Big Break Emergent Marsh Supporting CA Black Rail

Isopleth Contour (kg/ha/yr)

N

0 1 2 MILES

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

Marsh Landing Generating Station
Mirant Marsh Landing, LLC
Contra Costa County, California

June 2009
28067344

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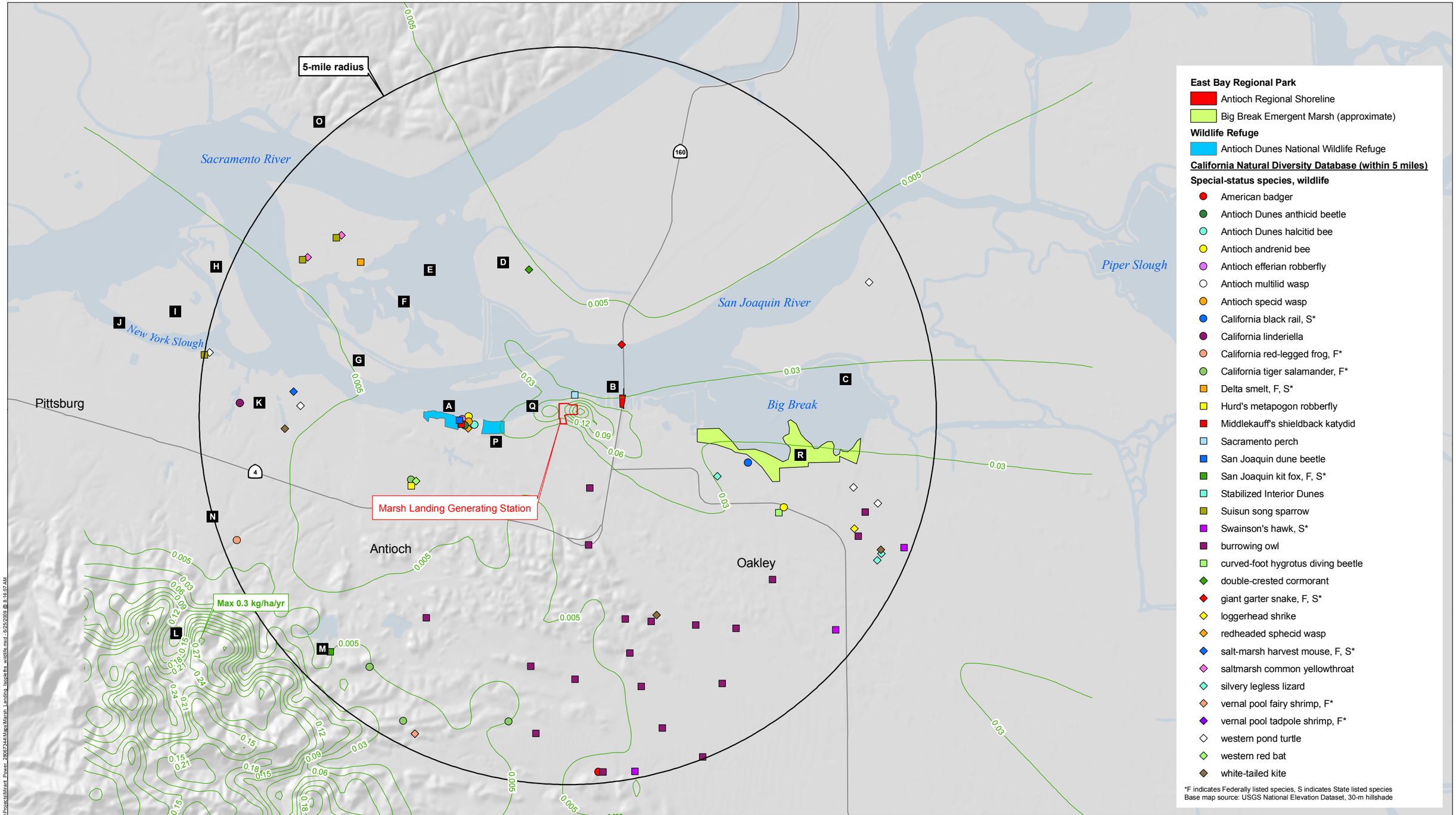
FIGURE 62-1a



East Bay Regional Park

- Antioch Regional Shoreline
- Big Break Emergent Marsh (approximate)

Wildlife Refuge

- Antioch Dunes National Wildlife Refuge

California Natural Diversity Database (within 5 miles)

Special-status species, wildlife

- American badger
- Antioch Dunes anthicid beetle
- Antioch Dunes halcitid bee
- Antioch andrenid bee
- Antioch efferian robberfly
- Antioch multilid wasp
- Antioch specid wasp
- California black rail, S*
- California linderiella
- California red-legged frog, F*
- California tiger salamander, F*
- Delta smelt, F, S*
- Hurd's metapogon robberfly
- Middlekauff's shieldback katydid
- Sacramento perch
- San Joaquin dune beetle
- San Joaquin kit fox, F, S*
- Stabilized Interior Dunes
- Suisun song sparrow
- Swainson's hawk, S*
- burrowing owl
- curved-foot hygrotus diving beetle
- double-crested cormorant
- giant garter snake, F, S*
- loggerhead shrike
- redheaded sphecid wasp
- salt-marsh harvest mouse, F, S*
- saltmarsh common yellowthroat
- silvery legless lizard
- vernal pool fairy shrimp, F*
- vernal pool tadpole shrimp, F*
- western pond turtle
- western red bat
- white-tailed kite

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

Areas of Concern

A Antioch Dunes NWR	G Kimball Island	M Contra Loma Regional Park & Reservoir
B Antioch Shoreline	H Winter Island	N Mouth of Contra Costa Channel
C Big Break	I Browns Island	O Montezuma Habitat Enhancement Site
D Sherman Island	J New York Slough	P Sardis Unit of the Antioch Dunes National Wildlife Refuge
E Sherman Lake	K DOW Wetlands Preserve	Q Antioch Sand Dunes
F Sherman Island Water Flow Management Area	L Black Diamond Mines Regional Preserve	R Big Break Emergent Marsh Supporting CA Black Rail

Isopleth Contour (kg/ha/yr)

N

0 1 2 MILES

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

Marsh Landing Generating Station
Mirant Marsh Landing, LLC
Contra Costa County, California

June 2009
28067344

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FIGURE 62-1b

URS corp - Oakland, CA, B. Jacobsen, L:\Projects\Mirant Power - 28067344\Maps\Marsh Landing Isopleths wildlife.mxd - 6/25/2009 @ 8:16:07 AM

DATA REQUEST

63. Please update the cumulative impact analysis (Tables 9-1 and 9-2) in Responses to Data Request Set #1 (Data Request #9) 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 63-1 and 63-2 are updated versions of Response to Data Request 9, Tables 9-1 and 9-2, respectively. Table 63-1 is an update to Table 9-1 that now includes ammonia emissions. Table 63-2 includes the maximum annual modeled ammonia concentration from all cumulative sources listed in Table 63-1, 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 63-1a and 63-1b provide the isopleths for nitrogen deposition rates in kg/ha/yr due to all cumulative sources listed in Table 63-1. Figure 63-1a shows the federal and state listed special-status vegetation species. Figure 63-1b shows the federal and state listed special-status wildlife species.

As seen in Figures 63-1a and 63-1b, the maximum cumulative nitrogen deposition value occurs in the hills south of Pittsburg, which is located more than 9 miles southwest of the MLGS 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 L on the figures)
- An area around the Freedom High School Generator
- An area southeast of MLGS west of Big Break Marsh (Area R on the figures) and south of the Antioch Shoreline (Area B on the figures)

Cumulative nitrogen deposition values in the hills near Black Diamond Mines Regional Preserve (Area L 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 (near Areas R and B on the figures). 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 10 miles and 8.5 miles from the MLGS and the Willow Pass Generating Station, 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 L on the figures) suggests that there may be serpentine soils present at this location. However, based on available geology and soil mapping information described above and the California Natural Diversity Database records for Brewer's western flax, serpentine soil does not appear to be present in this area.

Big Break Regional Shoreline (Area R on the figures) 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 help control nutrient fluxes. They also have nitrogen fluxes an order of magnitude higher than many other systems and are not particularly sensitive to nitrogen deposition (Rozema et al., 2000). The Antioch Regional Shoreline (Area B on the figures) consists of a 4.5-acre meadow, picnic facilities, and fishing pier. The area is landscaped and maintained, and does not contain any 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 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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Table 63-1
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 63-1 is the same as Response to Data Request 9, Table 9-1 with column for NH_3 now added.

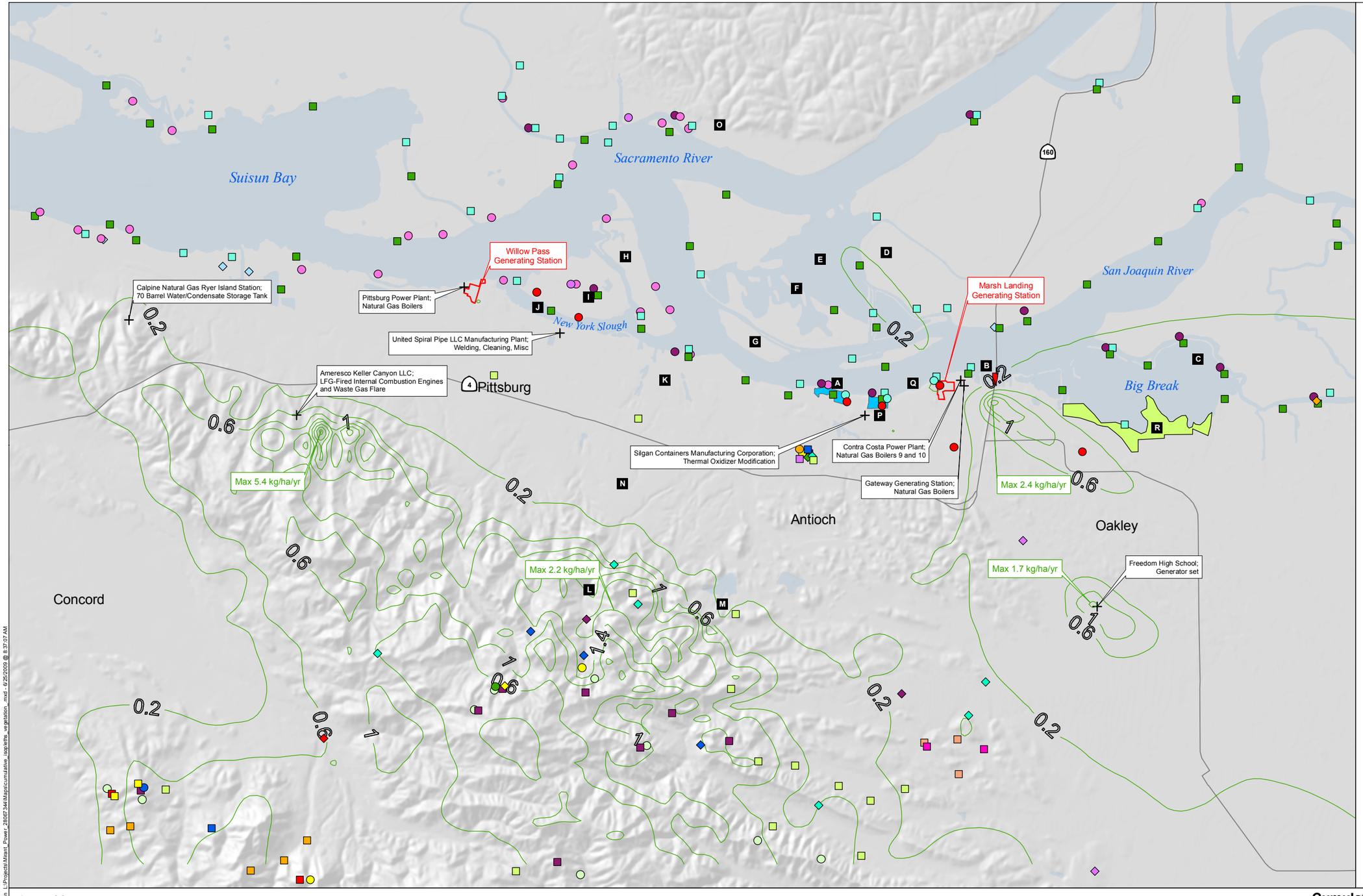
Table 63-2
AERMOD Cumulative Impact Modeling Result[1]

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 9-2.
2 Background represents the maximum values measured at the monitoring stations in Marsh Landing 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 Antioch Dunes NWR
B Antioch Shoreline
C Big Break
D Sherman Island
E Sherman Lake
F Sherman Island Water Flow Management Area
G Kimball Island
H Winter Island
I Browns Island
J New York Slough
K DOW Wetlands Preserve
L Black Diamond Mines Regional Preserve
M Contra Loma Regional Park & Reservoir
N Mouth of Contra Costa Channel
O Montezuma Habitat Enhancement Site
P Sardis Unit of the Antioch Dunes National Wildlife Refuge
Q Antioch Sand Dunes
R Big Break Emergent Marsh Supporting CA Black Rail

Isopleth Contour (kg/ha/yr)

N

0 2 MILES

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

June 2009
28067344

Marsh Landing Generating Station
Mirant Marsh Landing, LLC Contra Costa County, California

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FIGURE 63-1a

Suisun Bay
Sacramento River
Sherman Lake
New York Slough
San Joaquin River
Big Break
Pittsburg
Antioch
Oakley
Concord
160
Pittsburg Power Plant; Natural Gas Boilers
Willow Pass Generating Station
Calpine Natural Gas Ryer Island Station; 70 Barrel Water/Condensate Storage Tank
United Spiral Pipe LLC Manufacturing Plant; Welding, Cleaning, Misc
Ameresco Keller Canyon LLC; LFG-Fired Internal Combustion Engines and Waste Gas Flare
Marsh Landing Generating Station
Silgan Containers Manufacturing Corporation; Thermal Oxidizer Modification
Contra Costa Power Plant; Natural Gas Boilers 9 and 10
Gateway Generating Station; Natural Gas Boilers
Freedom High School; Generator set
Max 5.4 kg/ha/yr
Max 2.2 kg/ha/yr
Max 2.4 kg/ha/yr
Max 1.7 kg/ha/yr
0.2
0.6
1
1.4
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R

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, wildlife
- Alameda whipsnake, F, S*
- American badger
- Antioch Dunes anthicid beetle
- Antioch Dunes halcitid bee
- Antioch andrenid bee
- Antioch efferian robberfly
- Antioch multilid wasp
- Antioch specid wasp
- Blennosperma vernal pool andrenid bee
- California black rail, S*
- California clapper rail, F, S*
- California least tern, F, S*
- California linderiella
- California red-legged frog, F*
- California tiger salamander, F*
- Coastal Brackish Marsh
- Delta smelt, F, S*
- Hurd's metapogon robberfly
- Lange's metalmark butterfly, F*
- Middlekauff's shieldback katydid
- Sacramento perch
- Sacramento splittail
- San Joaquin dune beetle
- San Joaquin kit fox, F, S*
- San Joaquin pocket mouse
- Stabilized Interior Dunes
- Suisun song sparrow
- Swainson's hawk,S*
- burrowing owl
- coast (California) horned lizard
- curved-foot hygrotus diving beetle
- double-crested cormorant
- ferruginous hawk
- giant garter snake, F, S*
- golden eagle
- loggerhead shrike
- molestan blister beetle
- pallid bat
- redheaded sphecid wasp
- salt-marsh harvest mouse, F, S*
- saltmarsh common yellowthroat
- silvery legless lizard
- vernal pool fairy shrimp, F*
- vernal pool tadpole shrimp, F*
- western pond turtle
- western red bat
- white-tailed kite

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

Areas of Concern

A Antioch Dunes NWR	G Kimball Island	M Contra Loma Regional Park & Reservoir
B Antioch Shoreline	H Winter Island	N Mouth of Contra Costa Channel
C Big Break	I Browns Island	O Montezuma Habitat Enhancement Site
D Sherman Island	J New York Slough	P Sardis Unit of the Antioch Dunes National Wildlife Refuge
E Sherman Lake	K DOW Wetlands Preserve	Q Antioch Sand Dunes
F Sherman Island Water Flow Management Area	L Black Diamond Mines Regional Preserve	R Big Break Emergent Marsh Supporting CA Black Rail

Isopleth Contour (kg/ha/yr)

0 2 MILES

N

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

June 2009
28067344

Marsh Landing Generating Station
Mirant Marsh Landing, LLC Contra Costa County, California

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FIGURE 63-1b

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 MARSH LANDING GENERATING STATION

DOCKET NO. 08-AFC-3

PROOF OF SERVICE
(REVISED 2/26/2009)

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DECLARATION OF SERVICE

I, _Catherine Short, declare that on _June 25, 2009, I served and filed copies of the attached _Responses to Data Requests Set 2 (#60-63). 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/marshlanding/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:

(*Check all that Apply*)

For service to all other parties:

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

__X__ 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 copy 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-3
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.

C Short