URS

DOCKET
08-AFC-3
DATE DEC 12 2008
RECD. DEC 16 2008

December 12, 2008

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

RE: Marsh Landing Generating Station
AFC CEC Docket No. 08-AFC-3

On behalf of Mirant Marsh Landing, LLC, the applicant for the Marsh Landing Generating Station (MLGS), we are pleased to submit the enclosed documents:

- One signed original and one CD of the Responses to CEC Data Requests Set 1(1-54) of November 13, 2008 (1-50) and November 14, 2008 (51-54);
- Twelve (12) print copies and 12 CDs of the Responses to CEC Data Requests Set 1 (1-54) of November 2008. The CDs are attached to the back cover of the Responses;
- One set of documents provided in response to Data Request 47; and
- Five (5) CDs of the Air Quality Modeling files in response to Data Requests 7, 8 and 9.

Please include these documents in the AFC record.

URS Corporation

Anne Connell
Project Manager

Enclosure

cc: Jonathan Sacks, Mirant
Mike Monasmith
Lisa Cottle

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

Responses to Data Request Set 1 (#1–54)

Application for Certification (08-AFC-03) for MARSH LANDING GENERATING STATION Contra Costa County, California

December 2008

Prepared for:

MIRANT℠
MARSH LANDING, LLC

Prepared by:

URS

Printed on 100% Recycled Paper

TABLE OF CONTENTS

RESPONSES TO DATA REQUESTS SET 1

AIR QUALITY
1 THROUGH 9

CULTURAL RESOURCES
10 THROUGH 13

HAZARDOUS MATERIALS MANAGEMENT
14 AND 15

LAND USE
16 THROUGH 22

SOCIOECONOMICS
23 THROUGH 26

SOIL AND WATER RESOURCES
27 THROUGH 36

TRANSMISSION SAFETY ENGINEERING
37 THROUGH 45

WASTE MANAGEMENT
46 THROUGH 49

WORKER SAFETY AND FIRE PROTECTION
50

BIOLOGICAL RESOURCES
51 THROUGH 54

REFERENCES

APPENDICES

Appendix A Air Quality
Appendix A-1 Construction Emissions
Appendix A-2 Operational Emissions
Appendix A-3 Estimated Emissions Data From Siemens

Appendix B Land Use
Appendix B-1 Subdivision Application Information

Appendix C Soil & Water
Appendix C-1 Storm Water Control Plan

Appendix D Transmission
Appendix D-1 Reconductoring Project Preliminary Environmental Analysis

TABLES

Table 1-1 Greenhouse Gas Emissions from Construction Equipment
Table 1-2 Vehicle Emission Factors for Greenhouse Gases
Table 1-3 Rail Emission Factors for Greenhouse Gases
Table 1-4 Greenhouse Gas Emissions from Worker Commutes and Material Deliveries during Construction Phase
Table 2-1 Vehicle Emission Factors for Greenhouse Gases and Criteria Pollutants for Contra Costa County
Table 2-2 Greenhouse Gas and Criteria Pollutant Emissions from Worker Commutes and Deliveries during the Operations Phase
Table 3-1 Emission Factors and Fuel Gas Heater Emission Rates
Table 6-1 Hourly Emissions for All Sources
Table 6-2 Daily Emissions for All Sources
Table 6-3 Annual Average Emissions for All Sources
Table 7-1 Total Estimated Startup and Shutdown Emissions: SGT6-5000F in Flex Plant 10 Combined Cycle Operation on Natural Gas at 62 °F and 41 °F
Table 7-2 Total Estimated Startup and Shutdown Emissions and Fuel Use: SGT6-5000F 9 ppm Ultra Low Nitrogen in Simple Cycle Operation at 59 °F on Natural Gas
Table 7-3 Criteria Pollutant Emission Rates during Startup and Shutdown
Table 7-4 AERMOD Modeling Results for Pollutants with Revised Maximum Hourly Emission Rates (All Project Sources Combined)
Table 8-1 Peak Concentrations Due to Nocturnal Inversion Breakup Fumigation
Table 8-2 Shoreline Inversion *X*/Q Values for Different Thermal Inversion Boundary Layer Factors
Table 8-3 Peak Concentrations Due to Shoreline Inversion Fumigation
Table 9-1 Cumulative Sources for Mirant Marsh Landing Generating Station and Mirant Willow Pass Generating Station
Table 9-2 AERMOD Cumulative Impact Modeling Result
Table 10-1 Approximate Depth of Excavation
Table 14-1 Hazardous Materials to be Added at MLGS during the Operational Phase
Table 29-1 Estimated Construction Water Uses

FIGURES

Figure 11-1 MLGS Site Plan with Foundation Excavation Depths Greater than 3 Feet
Figure 12-1 Dames & Moore 1949 Geotechnical Investigation
Figure 12-2 Rancho Los Meganos Map Circa 1853
Figure 12-3 Rancho Los Meganos Map Circa 1853 (Alternate Version)
Figure 12-4 1862 GLO Plat T2N R2E
Figure 12-5 1908 Marsh Landing
Figure 12-6 1918 USGS Collinsville Topographic Quadrangle
Figure 12-7 1906 USGS Map of Marsh Landing
Figure 12-8 1908 USGS Map of Marsh Landing
Figure 12-9 1918 USGS Collinsville Topographic Quadrangle Showing Current CCPP Layout
Figure 12-10 1939 Aerial Photograph
Figure 12-11 Current CCPP Layout and MLGS APE Overlaid on 1939 Aerial Photograph
Figure 14-1 Locations of Hazardous Materials
Figure 22-1 Department of Conservation Important Farmland Map
Figure 50-1 Site Access Plan

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
AFC	Application for Certification
APE	Area of Potential Effect
BAAQMD	Bay Area Air Quality Management District
BLS	Bridgehead Lift Station
CAAQS	California ambient air quality standard
CAISO	California Independent System Operator
Calpine	Calpine Corporation
CCPP	Contra Costa Power Plant
CEC	California Energy Commission
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CVRWQCB	Central Valley Regional Water Quality Control Board
DDSD	Delta Diablo Sanitation District
DEC	Delta Energy Center
DOC	Department of Conservation
ESA	Environmental Site Assessment
°F	Fahrenheit
FP10	Flex Plant 10
FSNL	full speed no load
g/gal	grams per gallon
g/hr	grams per hour
GHG	greenhouse gas
GLO	Government Land Office
HRSG	heat recovery steam generator
hrs/yr	hours per year
LAFCO	Local Agency Formation Commission
lb/hr	pounds per hour
lbs/mile	pounds per mile
lbs	pounds
LDA	light-duty automobiles
LDT	light-duty trucks
LGIA	Large Generator Interconnection Agreement
LMEC	Los Medanos Energy Center
LORS	laws, regulations, ordinances, and standards
m	meters
mgd	million gallons per day
$\mu g/m^3$	micrograms per cubic meter
$\mu g/m^3/g/s$	micrograms per cubic meter pet gram per second
MLGS	Marsh Landing Generating Station
MLLW	mean low low water
MMBtu/hr	million British thermal units per hour
MSL	mean sea level
NAAQS	national ambient air quality standard
N_2O	nitrous oxide
NO_2	nitrogen dioxide
NO_X	nitrogen oxides

OLM	ozone limiting method
PDOC	Preliminary Determination of Compliance
PG&E	Pacific Gas & Electric Company
PM	particulate matter
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
ppm	parts per million
REC	Recognized Environmental Condition
RO	reverse osmosis
RQ	reportable quantities
RWF	Recycled Water Facility
SO_2	sulfur dioxide
SPS	Special Protection Scheme
TIBL	thermal internal boundary layer
tpd	metric tons per day
tpm	metric tons per month
TPQ	Threshold Planning Quantity
tpy	metric tons per year
TQ	Threshold Quantity
USGS	U.S. Geological Survey
UTM	Universal Transverse Mercator
VOC	volatile organic compounds
WPGS	Willow Pass Generating Station

Technical Area: Air Quality
Author: Brewster Birdsall

BACKGROUND

Greenhouse Gas Emissions

Energy Commission staff plans to use AFC Appendix J3, p. 7, to quantify the emissions of greenhouse gases (GHG) caused during construction of the project. These include carbon dioxide, nitrous oxide, and methane (unburned natural gas). However, it is not clear whether activity for construction of linear facilities, worker commutes, and material deliveries using diesel trucks during construction are included in the GHG totals. AFC Section 2.7.5 shows the proposed general construction emission control measures that may also reduce GHG emissions from construction. Staff also seeks to quantify emissions from worker commutes and material deliveries during operation of the proposed project.

DATA REQUEST

1. ***Please show the total and annual GHG emissions for the construction phase of the proposed project including all activities at the construction site and any construction activities for linear facilities (gas and water pipelines and transmission lines), worker commutes, and material deliveries.***

RESPONSE

The Application for Certification (AFC) included a table of estimated emissions from the construction equipment used on site and for the linear facilities. This table is on page 7 of AFC Appendix J. This information is repeated and summarized in Table 1-1. Estimated GHG emissions from construction worker commutes and from deliveries of construction materials not included in the AFC are provided in the response to Data Request 2.

Table 1-1
Greenhouse Gas Emissions from Construction Equipment

	CO_2 Emissions	CH_4 Emissions	N_2O Emissions
Max. Monthly (tpm)	396	0.02	0.01
Max. Rolling 12 month (tpy)	3,086	0.18	0.07
Project Total (metric tons)	**6,475**	**0.37**	**0.14**

Source: AFC Appendix J, page 7.

CO_2 = carbon dioxide
CH_4 = methane
N_2O = nitrous oxide
lbs/mile = pounds per mile
tpm = metric tons per month
tpy = metric tons per year

The average number of workers for construction staff is provided in AFC Table 2.7-1a and Table 2.7-1b. The average miles commuted during a one-way trip in Contra Costa County is estimated using default values in the 2007 release of the Urban Emissions Model (URBEMIS2007). The workers are assumed to commute 22 days per month. To account for trips made by construction workers during their lunch hour, an average trip rate of 3.02 is assumed per worker per day. This trip rate value is obtained from URBEMIS2007 for General Light Industry.

The maximum number of vehicle trips for construction material delivery (not including heavy equipment) is 16 one-way trips; this is provided in AFC Figure 2.7-4. The construction material is transported from the Port of Stockton to the project site and the distance traveled is 24 miles per one-way trip.

Most of the heavy equipment and its components will be transported by rail to the existing spur at the project site. A total of six rail deliveries will occur over the course of the construction period (which averages two locomotive deliveries per year). It is assumed that only two rail cars per locomotive delivery will be used for Marsh Landing Generating Station (MLGS) equipment. GHG emissions are based on the distance traveled from the California state line to the project site along the Burlington Northern & Santa Fe railway tracks.

Vehicle emission factors based on the vehicle fleet mix for Contra Costa County are required to estimate emissions. Construction vehicle emission factors are summarized in Table 1-2. Emission factors for rail delivery are summarized in Table 1-3. The worker fleet is assumed to be 50 percent light-duty automobiles (LDA) and 50 percent light-duty trucks (LDT). The material delivery truck fleet is assumed to be only heavy-heavy duty trucks.

Average annual and total GHG emission estimates for the construction worker commute and delivery of construction materials are provided in Table 1-4. Appendix A-1 provides backup for these calculations.

Table 1-2
Vehicle Emission Factors for Greenhouse Gases

Vehicle Description	CO_2		CH_4		N_2O	
	tpd	lbs/mile	tpd	lbs/mile	tpd	lbs/mile
Light-Duty Automobile	5,880	0.89	0.56	8.44E-06	--	1.08E-04
Light-Duty Truck	4,930	1.09	0.45	9.95E-05	--	1.68E-04
Heavy-Heavy Duty Diesel Truck	870	4.04	0.04	1.86E-04	0.02	1.10E-04

CH_4 = methane
CO_2 = carbon dioxide
lbs/mile = pounds per mile
N_2O = nitrous oxide
tpd = metric tons per day

Notes:

Emission factors for CO_2 and CH_4 are based on results from EMFAC Emissions Model 2007 Version 2.3 (BURDEN output). The values are the projected values for the LDA and LDT (both Class I and II) vehicles within Costa Contra County in 2009. Emission factors in lbs/mile are calculated by dividing emission factor (tpy) by vehicle miles traveled from EMFAC2007.

N_2O factors are derived from California Climate Action Registry General Reporting Protocol Version 2.3 (March 2007), Table C.5 using the mileage accrual rates by age table from EMFAC2007 Version 2.3, November 1, 2006, California Air Resources Board, normalized accrual rates (annual odometer mileage weighted by population) for gasoline-fueled light duty automobiles and trucks.

Table 1-3
Rail Emission Factors for Greenhouse Gases

Vehicle Description	CO_2 Emissions	CH_4 Emissions	N_2O Emissions
Locomotive in Motion (g/gal)	10,084	0.3	0.1
Locomotive Idling (g/hr)	40,336	1.2	0.4

CH_4 = methane
CO_2 = carbon dioxide
g/gal = grams per gallon
g/hr = grams per hour
N_2O = nitrous oxide

Notes:

Per EPA's Emission Facts <http://www.epa.gov/otaq/climate/420f05001.pdf>, CO_2 emissions from a gallon of diesel fuel are 10,084 g/gal diesel.

CH_4 and N_2O factors are derived from California Climate Action Registry General Reporting Protocol Version 2.2 (March 2007), Table C.6 (Methane and Nitrous Oxide Emission Factors for Stationary Combustion by Sector and Fuel Type).

Fuel consumed during idling period is assumed to be 4 gallons per hour and is based on switcher idling information on the U.S. EPA web page: http://www.epa.gov/smartway/idlingimpacts.htm

Table 1-4
Greenhouse Gas Emissions from Worker Commutes and Material Deliveries during the Construction Phase

Activity	Distance Traveled per year (miles)	CO_2 Emissions (tpy)	CH_4 Emissions (tpy)	N_2O Emissions (tpy)
Worker Commute	2,896,417	1,431	0.08	0.20
Material Delivery	6,048	17	8.55 E-04	5.58 E-04
Rail Delivery	847	2	6.96 E-05	2.32 E-06
Total Annual Average (tpy)		1,452	0.08	0.20
Total (metric tons)		**3,993**	**0.22**	**0.55**

CH_4 = methane
CO_2 = carbon dioxide
N_2O = nitrous oxide
tpy = metric tons per year

Note:

Total construction period is 33 months. Total emissions conservatively used annual rate for entire period.

DATA REQUEST

2. Please quantify emissions of criteria pollutants and GHG from worker commutes and material deliveries during operation of the proposed project.

RESPONSE

Natural gas, which is used for fuel at the site, will be delivered through a pressurized pipeline. Aqueous ammonia, which will be used in the selective catalytic reduction system, will be transported to the site by 8,000-gallon-capacity California Department of Transportation-certified trucks. The chemical that will be transported to the site in the largest quantities is aqueous ammonia. Other miscellaneous materials are assumed to be transported to the site at the same frequency used for aqueous ammonia delivery.

The average number of workers is provided in AFC Table 2.8-1. The average miles commuted during a one-way trip in Contra Costa County is estimated using default values in URBEMIS2007. The plant operators are assumed to commute 30 days per month and other plant personnel are assumed to commute 22 days per month. To account for trips made by plant personnel during their lunch hours, an average trip rate of 3.02 is assumed per worker per day. This trip rate value is obtained from URBEMIS2007 for General Light Industry.

The maximum number of vehicle trips for aqueous ammonia delivery is 120 one-way trips (or 10 one-way trips per month) and is provided in AFC Section 7.12.2.2. The aqueous ammonia currently used at the site is transported to the project site from the supplier in either Dixon, California or La Mirada, California. For the purpose of the MLGS calculations, it is assumed that half of the ammonia is transported to the project site from Dixon and the other half is transported to the project site from La Mirada. The maximum number of vehicle trips for miscellaneous materials (for example lubrication oil, or hydraulic fluid deliveries) is assumed to be 10 one-way trips per month, with each one-way trip covering a distance of 50 miles.

Vehicle emission factors based on the vehicle fleet mix for Contra Costa County are required to estimate emissions. Vehicle emission factors are summarized in Table 2-1. The worker fleet is assumed to be 50 percent LDA and 50 percent LDT. The material delivery truck fleet is assumed to be only heavy-heavy duty trucks.

Vehicle emission factors from Table 1-2 were used along with the mileage estimates to estimate emissions. GHG emission estimates for the plant personnel commute and delivery of materials for operations are provided in Table 2-2. Appendix A-2 provides backup for these calculations.

Table 2-1
Vehicle Emission Factors for Greenhouse Gases and Criteria Pollutants for Contra Costa County

Vehicle Description	CO tpd	CO_2 tpd	CH_4 tpd	N_2O tpd	NO_X tpd	PM_{10} tpd	$PM_{2.5}$ tpd	SO_2 tpd	VOC tpd
Light-Duty Automobile	50.32	6,030	0.47	0.74	5.32	0.48	0.29	0.06	6.59
Light-Duty Truck	48.18	5,020	0.41	0.77	6.01	0.44	0.30	0.05	5.20
Heavy-Heavy Duty Diesel Truck	4.04	880	0.03	0.02	7.02	0.27	0.23	0.01	0.64

CH_4 = methane
CO = carbon monoxide
CO_2 = carbon dioxide
N_2O = nitrous oxide
NO_X = nitrogen oxides
PM_{10} = particulate matter less than 10 microns
$PM_{2.5}$ = particulate matter less than 2.5 microns
SO_2 = sulfur dioxide
tpd = metric tons per day
VOC = volatile organic compounds

Notes:

[1] Emission factors are based on results from EMFAC Emissions Model 2007 Version 2.3 (BURDEN output). The values are the projected values for the LDA and LDT (Both Class I and II) vehicles within Costa Contra County in 2009. Emission factors in lbs/mile are calculated by dividing emission factor (tpy) by vehicle miles traveled from EMFAC2007.

[2] N_2O factors are derived from California Climate Action Registry General Reporting Protocol Version 2.3 (March 2007), Table C.5 using the mileage accrual rates by age table from EMFAC2007 Version 2.3, November 1, 2006, California Air Resources Board, normalized accrual rates (annual odometer mileage weighted by population) for gasoline fueled light duty automobiles and trucks.

Table 2-2
Greenhouse Gas and Criteria Pollutant Emissions from Worker Commutes and Deliveries during the Operations Phase

Activity	Distance Traveled per year (miles)	CO (tpy)	CO_2 (tpy)	CH_4 (tpy)	N_2O (tpy)	NO_X (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	VOC (tpy)
Plant Personnel Commute	306,851	1.37	151	0.01	0.02	0.14	0.01	0.01	1.51E-03	0.14
Aqueous Ammonia and Misc. Material Delivery	57,982	0.54	118	4.01E-03	3.20E-03	0.94	0.04	0.03	1.34E-03	0.09
Total Average Annual (tpy)		**1.91**	**269**	**0.02**	**0.02**	**1.07**	**0.05**	**0.04**	**2.84E-03**	**0.22**

CH_4 = methane
CO = carbon monoxide
CO_2 = carbon dioxide
N_2O = nitrous oxide
NO_X = nitrogen oxides
PM_{10} = particulate matter less than 10 microns
$PM_{2.5}$ = particulate matter less than 2.5 microns
SO_2 = sulfur dioxide
tpd = metric tons per day
VOC = volatile organic compounds

BACKGROUND

Fuel Gas Preheaters

The July 2008 addendum to the AFC shows that two fuel gas preheaters would need to be installed, and the addendum shows annual emissions and stack parameters in AFC Tables 7.1-17a and 7.1-17c. Emission factors for the heaters and operational assumptions (including hours of operation) are not shown in the addendum.

DATA REQUEST

3. Please quantify the short-term hourly emissions of the proposed fuel gas heaters, and show emission calculations with emission factors and any operational assumptions, such as anticipated annual hours of operation.

RESPONSE

The applicant proposes to have two fuel gas heaters: one heater for the two Flex Plant 10 (FP10) Units and one heater for the two Simple Cycle Units. The fuel gas heater for the FP10 Units is assumed to operate for the same number of hours as the FP10 Units (4,383 hours per year [hrs/yr]) and the fuel gas heater for the Simple Cycle Units is assumed to operate for the same number of hours as the Simple Cycle Units (877 hrs/yr).

Short term and annual emission rates are estimated using the equations shown below.

Short-Term Emission Calculations:

ER (lb/hr) = EF (lb/MMBtu/unit) × Capacity (MMBtu/hr)

Annual Emission Calculations:

ER (tpy) = ER (lb/hr) × Annual Operating Hours (hrs/yr) × 1 ton/2,000 lbs

Short-term emission rates are quantified in Table 3-1, and annual emission rates are shown in AFC Table 7.1-17b.

Table 3-1
Emission Factors and Fuel Gas Heater Emission Rates

Pollutant	Emission Factor		Sources	Emission Rate (same for both units lb/hr/unit
	lbs/Mscf/Unit	lbs/MMBtu/unit		
NO_X	30.6	0.03	FIRE Version 6.25 using SCC-3-10-004-04	0.15
CO	35	0.034		0.17
VOC	2.8	0.0027		0.014
PM_{10}	3	0.0029		0.015
SO_2	1.14	0.0011	Calculated. See equation below	0.006

Notes:

Net heating value for fuel is assumed to 1,020 Btu/scf. Capacity for fuel gas heaters is 5 MMBtu/hr.
The SCC number was obtained from http://www.epa.gov/ttnchie1/eiip/techreport/volume02/ii10.pdf (Table 10.7-1)
The emission factor for SO_X was calculated using the following formula:

$$SO_X\ (lbs/Mscf) = \frac{\#\,grains}{100\ scf} \times \frac{1\,lb}{7{,}000\ grains} \times \frac{MWSO_2}{MWS} \times \frac{10^6\ scf}{1\,Mscf}$$

BACKGROUND

Fire Pump or Emergency Generator

The AFC does not mention whether a fire pump or an emergency generator is proposed for the project.

DATA REQUEST

4. Please confirm whether a fire pump or an emergency generator would be needed for the project.

RESPONSE

The applicant confirms that MLGS will not include a fire pump or an emergency diesel generator.

As explained on pages 2-18 and 2-19 of the AFC, the existing Contra Costa Power Plant (CCPP) fire pumps will be used to discharge to the new MLGS dedicated extension of the existing underground firewater loop system. AFC Figure 2.5-9 shows the proposed MLGS firewater loop that connects to the existing CCPP system. The MLGS is not anticipated to result in nonemergency increase in the use of the CCPP fire pumps. [Note: AFC Table 2.7-2 incorrectly lists a fire pump skid. This was an oversight. There is no new fire pump or fire pump skid.]

DATA REQUEST

5. If either a fire pump or the emergency generator is needed, please provide their manufacturer's specifications and their respective operating schedule and estimated emissions.

RESPONSE

Not applicable; see the response to Data Request 4. No manufacturer's specifications or other data are included because no new diesel fire pumps or diesel emergency generators are proposed for this project.

BACKGROUND

Estimated Facility Emissions

In AFC Section 7.1.2.2, operational emissions are described with assumptions and explanations of calculations. Emissions for worst-case scenarios are summarized in AFC Table 7.1-16 without total emissions per period for all pollutants. This section does not reference Appendix J3 that shows assumptions for calculations for each source. However, without calculations and assumptions that lead to facility-wide emission rates, staff does not have complete information supporting the facility's emissions in AFC Table 7.1-16. Similarly, there is no vendor information supporting the proposed startup and shutdown emission rates shown in AFC Table 7.1-15.

DATA REQUEST

6. Please provide calculations, assumptions, and methods used to estimate the total facility hourly, daily, and annual emissions provided in AFC Table 7.1-16, showing all sources and pollutants.

RESPONSE

The applicant provided assumptions for the hourly, daily, and annual emission rates for pollutants and sources in the "Worst-Case Emission Scenario by Operating Equipment" column in AFC Table 7.1-16 only for the combinations of pollutants and averaging times required for modeling purposes. Further information on all emissions is provided in Tables 6-1 through 6-3 and includes emission estimates by source and the MLGS plant-wide total for the hourly, daily, and annual time periods, respectively. The operating assumptions used are shown on the tables and are consistent with those in AFC Table 7.1-16 and AFC Appendix J3 except for revised estimates of the maximum hourly emissions operating scenario. The maximum hourly emission estimates for both gas turbine types were revised to include more starts during the worst-case hour and are discussed in more detail in the response to Data Request 7 below.

Table 6-1
Hourly Emissions for All Sources

Pollutant[1,2]	FP10 Units (lb/hr/CT)	Simple Cycle Units (lb/hr/CT)	Fuel Gas Preheaters[3] (lb/hr/unit)	MLGS Total[4] (lb/hr)
NO_X	68.6	45.1	0.15	227.6
CO	677.3	544.0	0.18	2,443.0
VOC	33.6	30.1	0.01	127.5
SO_2 (1 gr/100 scf)	6.7	6.2	0.01	25.8
PM_{10}	12.1	9.0	0.01	42.3

CO = carbon monoxide
NO_X = nitrogen oxide
PM_{10} = particulate matter less than 10 micrometers in diameter
SO_2 = sulfur dioxide
VOC = volatile organic compounds

Notes:
1 Maximum hourly emissions for all pollutants for FP10 Units and for CO and NO_X for Simple Cycle Units are based on two startups, one shutdown, and the remaining time in the hour at normal operating rate. See the response to Data Request 7 for more details on startups.
2 Maximum hourly emissions for VOC, SO_2 and PM_{10} for Simple Cycle Units are based on normal operating conditions.
3 There are two Fuel Gas Preheaters – one for the FP10 Units and one for the Simple Cycle Units. Each preheater has a maximum heat input capacity of 5 MMBtu/hr
4 MLGS total emissions are based on two FP10 Units, two Simple Cycle Units, and two Fuel Gas Preheaters emissions.

Table 6-2
Daily Emissions for All Sources

Pollutant	FP10 Units[1,2] (lb/day/CT)	Simple Cycle Units [3,4] (lb/day/CT)	Fuel Gas Preheaters[5] (lb/day/unit)	MLGS Total[6] (lb/day)
NO_X	507.0	540.4	3.6	2,102.0
CO	1,574.1	1,207.8	4.1	5,571.9
VOC	196.6	177.9	0.3	749.6
SO_2 (1 gr/100 scf)	154.3	149.0	0.3	607.2
PM_{10}	243.0	214.3	0.3	915.3

CO = carbon monoxide
NO_X = nitrogen oxide
PM_{10} = particulate matter less than 10 micrometers in diameter
SO_2 = sulfur dioxide
VOC = volatile organic compounds

Notes:

1 Maximum daily emissions for all pollutants except SO_2 for FP10 Units are based on three startups, three shutdowns, and the remaining time in 24 hours at normal operating rate.

2 Maximum daily emissions for SO_2 for FP10 Units are based on normal operating conditions over 24 hours.

3 Maximum daily emissions for all pollutants except SO_2 for Simple Cycle Units are based on three startups, two shutdowns, and the remaining time in 24 hours at normal operating rate.

4 Maximum daily emissions for SO_2 for Simple Cycle Units are based on normal operating conditions over 24 hours.

5 There are two Fuel Gas Preheaters – one for the FP10 Units and one for the Simple Cycle Units. Each preheater has a maximum heat input capacity of 5 MMBtu/hr. Daily worst case scenario assumes both preheaters are operating over 24 hours.

6 MLGS total emissions are based on two FP10 Units, two Simple Cycle Units, and two Fuel Gas Preheaters emissions.

Table 6-3
Annual Average Emissions for All Sources

Pollutant	FP10 Units[1] (lb/yr/CT)	Simple Cycle Units[2] (lb/yr/CT)	FP10 Fuel Gas Preheater[3] (lb/yr)	Simple Cycle Fuel Gas Preheater[3] (lb/yr)	MLGS Total[4] (lb/yr)
NO_X	77,103	18,230	657	132	191,456
CO	142,371	46,757	752	150	373,159
VOC	28,459	6,013	60	12	69,016
SO_2 (0.4 gr/100 scf)	10,521	1,943	25	5	24,957
PM_{10}	39,400	6,989	64	13	92,857

CO = carbon monoxide
NO_X = nitrogen oxide
PM_{10} = particulate matter less than 10 micrometers in diameter
SO_2 = sulfur dioxide
VOC = volatile organic compounds

Notes:

[1] Annual average emissions for all pollutants for FP10 Units are based on 193 startups, emissions from 193 shutdowns, emissions from operations with power for 4,000 operating hours, and emissions from operations without power augmentation for 322 hours.

[2] Annual average emissions for all pollutants for Simple Cycle Units are based on 100 startups, 100 shutdowns, and emissions from normal operating conditions for 849 hours.

[3] There are two Fuel Gas Preheaters – one for the FP10 Units and one for the Simple Cycle Units. Each preheater has a maximum heat input capacity of 5 MMBtu/hr. The FP10 preheater operates for 4,383 hrs/yr and the Simple Cycle preheater operates for 877 hrs/yr.

[4] MLGS total emissions are based on two FP10 Units, two Simple Cycle Units, and two Fuel Gas Preheaters emissions.

DATA REQUEST

7. Please provide vendor guarantees to support the proposed startup and shutdown emissions values listed in AFC Table 7.1-15 and cited in Appendix J3.

RESPONSE

Estimated startup and shutdown times and the emissions during startup and shutdown were provided by Siemens, the gas turbine manufacturer. They are approximate values and are not guaranteed by Siemens. Copies of the information provided by Siemens for the FP10 units and the Simple Cycle Units are included in Appendix A-3 and were the source of the information provided in AFC Table 7.1-15. Originally this information was labeled as proprietary; however, Siemens has been contacted and has now authorized the release of this information. The information provided by Siemens is summarized in Tables 7-1 and 7-2. The ATC application is consistent with the information provided by Siemens (the only difference is the number of significant digits shown). The application used the 41 degree Fahrenheit (°F) case because emissions are higher in that case.

The applicant requests that the permit not include permit conditions limiting startup and shutdown times. The values summarized in the AFC and in Tables 7-1 and 7-2 were provided by Siemens in different submittals. Please use the longer times for the evaluation of the application if necessary (i.e., 12 minutes for start up and 7 minutes for shutdown).

This response provides a revision of the maximum hourly emissions for both the FP10 units and the Simple Cycle units. The revised information is provided in Table 7-3. The maximum hourly emissions are now based on one startup, one shutdown, a second startup, and the remainder of the hour at full load emissions all occurring within the same clock hour. This is considered as a more conservative but potentially realistic operating scenario, taking into account a unit trip during start and subsequent re-start.

Please note that the startup time reflects the time from ignition to 100 percent load. The shutdown time reflects the time from 100 percent load to full speed no load (FSNL) without any cool down at FSNL. Siemens has provided mass emission estimates that include all emissions during the expected 12-minute startup plus the next 10 minutes of operation. The maximum one-hour emissions for a turbine startup were represented very conservatively in the AFC and in the ATC application to the Bay Area Air Quality Management District (BAAQMD). Even though startup duration is conservatively estimated to take no longer than 22 minutes in the AFC, URS included all of those emissions as if they occur within a 12-minute period as expected by Siemens.

Therefore, because of this conservatism it is acceptable to the applicant to include the maximum mass emission rates in the permit.

New AERMOD modeling was conducted to assess maximum potential impacts from incorporating additional startups and shutdowns in a given hour. The results of this modeling are included in this response. Consistent with the MLGS AFC, stack parameters were set to a reduced stack exhaust velocity and temperature for the startup/shutdown modeling analyses. Table 6-1 presented the maximum hourly emissions for NO_X and CO, including two startups and one shutdown per turbine. The maximum 8-hour emission rate for CO, including four startups and three shutdowns, is 293.2 pounds per hour (lb/hr) per FP10 turbine, and 252.3 lb/hr per Simple Cycle turbine. The above emission rates were used in modeling maximum impacts due to turbine startup and shutdown conditions. Modeling results are provided in Table 7-4. Modeling input and output files are included on a CD provided with this response to Data Requests.

Table 7-1
Total Estimated Startup and Shutdown Emissions:
SGT6-5000F in Flex Plant 10 Combined Cycle
Operation on Natural Gas at 62 °F and 41 °F

Mode	Approximate Time (minutes)	Total Emissions per Event (lbs)				Fuel Usage (lbs)
		NO_X	CO	VOC	PM	
Startup on Natural Gas at 62 °F	12	24	259	12	3	23,029
Shutdown on Natural Gas at 62 °F	7	10	131	5	1	6,239
Startup on Natural Gas at 41 °F	12	25	267	13	3	24,173
Shutdown on Natural Gas at 41 °F	7	10	135	5	1	6,525

CO = carbon monoxide
°F = degrees Fahrenheit
lbs = pounds
NO_X = nitrogen oxides
PM = particulate matter
VOC = volatile organic compounds

General Notes

1 All data is ESTIMATED, NOT guaranteed, and is for ONE unit.
2 Gas fuel must be in compliance with Siemens fuel specifications.
3 Emissions are at the heat recovery steam generator exhaust stack outlet and exclude ambient air contributions.
4 Emissions are based on new and clean conditions.
5 Please be advised that the information contained in this transmittal has been prepared and is being transmitted per customer request specifically for information purposes only. Such information is not intended to be used for evaluation of plant design and/or performance relative to contractual commitments. Data included in any permit application or Environmental Impact Statement is strictly the customer's responsibility. Siemens is available to review permit application data upon request.

Startup Emissions Notes

1 Estimated startup (SU) data are from gas turbine (GT) ignition through 100% GT load plus 10 minutes
2 Estimated SU and shutdown (SD) data are based on the assumed times noted above and will be higher for longer times.
3 Estimated SU and SD data are based on the ambient temperatures noted above and will be higher at lower ambient temperatures.
4 NO_X emissions assume selective catalytic reduction is not in operation (no removal).
5 CO emissions assume 20% removal from ignition to 100% GT load and 90% removal from 100% GT load on.
6 SU assumes 5 minutes from turning gear to synchronization.
7 SD assumes 100% load to FSNL with no cooldown at FSNL.
8 Operator actions do not extend startup or shutdown.
9 It is assumed that there is no restriction from the interconnected utility for loading the GT from synchronization to 100% load within the SU times considered.

Table 7-2
Total Estimated Startup and Shutdown Emissions and Fuel Use:
SGT6-5000F 9 ppm Ultra Low Nitrogen in Simple Cycle Operation at 59 °F on Natural Gas

Mode	Approximate Time (minutes)	Total Emissions per Event (lbs)				Fuel Usage (lbs)
		NO_X	CO	VOC	PM	
Startup	11	12	213	11	1	6,638
Shutdown	3	10	110	5	1	5,905

CO = carbon monoxide
°F = degrees Fahrenheit
lbs = pounds
NO_X = nitrogen oxides
PM = particulate matter
ppm = parts per million
VOC = volatile organic compounds

General Notes

1 All data is ESTIMATED, NOT guaranteed, and is for ONE unit.
2 Gas fuel must be in compliance with Siemens fuel specifications.
3 Emissions are at the exhaust stack outlet and exclude ambient air contributions.
4 Emissions are based on new and clean conditions.
5 NO_X as NO_2.
6 VOC consists of total hydrocarbons excluding methane and ethane and are expressed un terms of methane (CH_4).
7 Particulates are per U.S. EPA Method 5/202 (front and back half).
8 Estimated fuel use data is based on a heating value of 22,356 Btu/lb_m (HHV) and will be different for different heating values.
9 Please be advised that the information contained in this transmittal has been prepared and is being transmitted per customer request specifically for information purposes only. Such information is not intended to be used for evaluation of plant design and/or performance relative to contractual commitments. Data included in any permit application or Environmental Impact Statement is strictly the customer's responsibility. Siemens is available to review permit application data upon request.

Startup Emissions Notes

1 Estimated startup (SU) data are from gas turbine (GT) ignition through 100% load.
2 Estimated SU and shutdown (SD) data are based on the assumed times noted above and will be higher for longer times.
3 Estimated SU and SD data are based on the ambient temperatures noted above and will be higher at lower ambient temperatures.
4 Total SU time includes 5 minutes from turning gear to synchronization.
5 SD assumed 100 percent load to FSNL with no cooldown at FSNL.
6 Continuous Emissions Monitoring System (CEMS) may calculate emission differently.
7 Operator actions do not extend startup or shutdown.
8 It is assumed that there is no restriction from the interconnected utility for loading the GT from synchronization to 100% load within the SU times considered.

Table 7-3
Criteria Pollutant Emission Rates during Startup and Shutdown

Pollutant	FP10 Units			Simple Cycle Units		
	Maximum hourly (lb/hr)	Startup (12 min) Total Emissions (lb/event)	Shutdown (7 min) Total Emissions (lb/event)	Maximum Hourly (lb/hr)	Startup (11 min) Total Emissions (lb/event)	Shutdown (6 min) Total Emissions (lb/event)
NO_X (2.0 or 2.5 ppm)	68.6	24.8	10.5	45.1	12	10
CO (3 ppm)	677.3	267.1	135.4	544.0	213	110
VOC (2 ppm)	33.6	12.7	5.2	30.1	11	5
SO_2 (0.4 gr/100 scf)	2.7	0.6	0.2	1.8	0.17	0.15
SO_2 (1 gr/100 scf)	6.7	1.6	0.4	6.2	0.42	0.37
PM_{10}	12.1	3.1	1.1	9.0	1	1

CO = carbon monoxide
NO_X = nitrogen oxide
PM_{10} = particulate matter 10 microns in diameter
ppm = parts per million
SD = shutdown
SO_2 = sulfur dioxide
SU = startup
VOC = volatile organic compounds

Notes:

Startup/shutdown duration defined as operation of CTG below 60 percent load for the FP10s or 60 percent load for the Simple Cycle units when gaseous emission rates (lb/hr basis) exceed the controlled rates defined as normal operation.

Startup and shutdown SO_2 emissions are calculated based on the total amount of fuel used for each and the emission rate of SO_2 at a winter extreme of 20°F; 100% load.

Maximum hourly emissions assume two startups, one shutdown, and the remainder of the hour at maximum normal operating rate.

Table 7-4
AERMOD Modeling Results for Pollutants with Revised Maximum Hourly Emission Rates[1]
(All Project Sources Combined)

Pollutant	Averaging Period	Maximum Predicted Impact (µg/m^3)	Background Concentration (µg/m^3)[2]	Total Concentration (µg/m^3)	NAAQS (µg/m^3)	CAAQS (µg/m^3)	Maximum UTMX NAD27 (m)	Maximum UTMY NAD27 (m)
NO_2	1 hour[3]	75.3	122.1	197	NA	339	600,925	4,202,775
CO	1 hour	773	4,715	5,488	40,000	23,000	600,925	4,202,775
	8 hour	115	2,222	2,337	10,000	10,000	601,625	4,200,550

AERMOD = American Meteorological Society and Environmental Protection Agency preferred atmospheric dispersion model
CAAQS = California ambient air quality standard
CO = carbon monoxide
m = meters
µg/m^3 = micrograms per cubic meter
NAAQS = national ambient air quality standard
NO_2 = nitrogen dioxide

Notes:

1 Pollutants having AAQS less than 24-hour only and whose maximum hourly emissions rate increased.
2 Background represents the maximum values measured at the monitoring stations
3 Results for NO_2 during operations used ozone limiting method (OLM) with ambient ozone data collected at the Bethel Island monitoring station for the years 2000 through 2002 and 2004 through 2005.

BACKGROUND

Dispersion Modeling

The applicant submitted updated dispersion modeling files to the Energy Commission in October 2008. Staff has not yet reviewed these files. Of particular concern would be adherence to Bay Area Air Quality Management District (BAAQMD) recommendations for meteorological data. Staff may develop additional data requests upon review of the new modeling files.

DATA REQUEST

8. Please provide documentation (such as a Report of Conversation or correspondence with BAAQMD staff) that confirms that the October 2008 dispersion modeling has been completed to the satisfaction of the BAAQMD.

RESPONSE

The BAAQMD staff has informed the applicant that the Preliminary Determination of Compliance (PDOC) will include this information. The BAAQMD is expected to issue the PDOC in late January 2009. On December 3, 2008, the BAAQMD sent URS an email containing comments in advance of the new modeling to be performed by the applicant relative to the increase in the maximum hourly emissions (see the response to Data Request 7). BAAQMD requested expanded modeling of fumigation impacts and those results are included in this response.

Fumigation may occur when a plume that was originally emitted into a stable layer of air is mixed rapidly to ground level and unstable air below the plume reaches plume height. Fumigation can cause relatively high ground-level concentrations for some elevated point sources during either the breakup of the nocturnal radiation inversion by solar warming of the ground surface (inversion breakup fumigation), or by the transport of pollutants from a stable marine environment to an unstable onshore environment (shoreline fumigation). The transition from stable to unstable surroundings can rapidly draw a plume down to ground level and create relatively high pollutant concentrations for a short period. In general, this phenomenon will be transient, seldom persisting for as long as an hour. Typically, a fumigation analysis is conducted using SCREEN3 when the project site is rural and the stack height is greater than 10 meters (U.S. EPA, 1995). Therefore, no fumigation calculation was made for the process heater sources.

The SCREEN3 model was used to calculate concentrations from both inversion breakup fumigation and shoreline fumigation. A unit emission rate was used (1 gram per second) in the fumigation modeling to represent the project emissions, and the model results were scaled to reflect expected plant emissions for each pollutant. Higher maximum hourly emissions were used in this fumigation remodeling analysis than in the fumigation analysis included in the AFC. For NO_X 1-hour, CO 1-hour, and CO 8-hour emissions, longer startup and shutdown times were incorporated into each emission rate. Details on longer startup and shutdown times are discussed in the responses to Data Requests 6 and 7. Because SCREEN3 only models the impacts from one source, the model was run twice, once for the FP10 combined cycle stack parameters and once for Simple Cycle stack parameters. For shoreline fumigation, thermal internal boundary layer (TIBL) factors 2, 3, 4, 5, and 6 were used to determine the highest impact. BAAQMD provided a modified version of SCREEN3 that allows the input of various TIBL factors.

For both the nocturnal inversion and shoreline inversion analyses, impacts were determined for each source, then summed over all sources using peak predicted fumigation concentrations regardless of location. Fumigation impacts can affect concentrations longer than 1 hour; therefore, the procedures described in Section 4.5.3 of "Screening Procedures for Estimating the Air Quality Impact of Stationary Sources" were used to determine the 3-, 8-, and 24-hour average concentrations (U.S. EPA, 1992).

Peak concentrations due to nocturnal inversion fumigation are presented in Table 8-1. Maximum predicted concentrations include impacts from all four turbines. For both the FP10 combined cycle turbines and the 5000F Simple Cycle turbines, the peak shoreline fumigation impacts occurred when the TIBL factor was set to 6. This is confirmed by Table 8-2, which shows the different *Chi* over *Q* (χ/Q) ($\mu g/m^3/g/s$) values corresponding to different TIBL factors used in the SCREEN3 modeling analysis. Finally, peak concentrations due to shoreline inversion fumigation are presented in Table 8-3. Maximum predicted concentrations include impacts from all four turbines using a TIBL factor of 6.

Modeling input and output files are included on a CD provided with this response to Data Requests

Table 8-1
Peak Concentrations Due to Nocturnal Inversion Breakup Fumigation

Pollutant	Averaging Time	Maximum Predicted Impact ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)[1]	Total Concentration ($\mu g/m^3$)	Most Stringent AAQS ($\mu g/m^3$)
NO_X	1-hour	17.2	122.1	139	339
SO_2	1-hour	1.9	235.8	238	655
	3-hour	1.5	114.4	116	1300
	24-hour	0.6	26.3	27	105
CO	1-hour	180.8	4,715	4,896	23,000
	8-hour	48.2	2,222	2,270	10,000
PM_{10}[2,3]	24-hour	0.9	84	85	50
$PM_{2.5}$[2,3]	24-hour	0.9	74	75	35

AAQS = ambient air quality standard
CO = carbon monoxide
$\mu g/m^3$ = micrograms per cubic meter
NO_X = nitrogen oxides
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
SO_2 = sulfur dioxide

Notes:

1 Background represents the maximum values measured at the monitoring stations in Marsh Landing AFC
2 PM_{10} and $PM_{2.5}$ background levels exceed ambient standards.
3 All PM_{10} emissions from project sources were also considered to be $PM_{2.5}$.

Table 8-2
Shoreline Inversion *X*/Q Values for Different Thermal Inversion Boundary Layer Factors

TIBL factor	FP-10 Combined Cycle turbine *X*/Q ($\mu g/m^3/g/s$)	5000F Simple Cycle turbine *X*/Q ($\mu g/m^3/g/s$)
2	0.512	0.310
3	1.292	0.736
4	2.353	1.308
5	3.493	1.943
6	4.553	2.561

$\mu g/m^3/g/s$ = micrograms per cubic meter pet gram per second
TIBL = thermal internal boundary layer

Table 8-3
Peak Concentrations Due to Shoreline Inversion Fumigation

Pollutant	Averaging Time	Maximum Predicted Impact ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)[1]	Total Concentration ($\mu g/m^3$)	Most Stringent AAQS ($\mu g/m^3$)
NO_X	1-hour	107.9	122.1	230	339
SO_2	1-hour	11.7	235.8	247	655
	3-hour	6.0	114.4	120	1300
	24-hour	0.9	26.3	27	105
CO	1-hour	1129.2	4,715	5,844	23,000
	8-hour	103.2	2,222	2,325	10,000
PM_{10}[2,3]	24-hour	1.3	84	85	50
$PM_{2.5}$[2,3]	24-hour	1.3	74	75	35

AAQS = ambient air quality standard
CO = carbon monoxide
$\mu g/m^3$ = micrograms per cubic meter
NO_X = nitrogen oxides
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
SO_2 = sulfur dioxide

Notes:

1 Background represents the maximum values measured at the monitoring stations in Marsh Landing AFC
2 PM_{10} and $PM_{2.5}$ background levels exceed ambient standards.
3 All PM_{10} emissions from project sources were also considered to be $PM_{2.5}$.

BACKGROUND

Cumulative Modeling Analysis

AFC Section 7.1.3 describes a cumulative modeling impact assessment that has not yet been filed with the Energy Commission.

DATA REQUEST

9. Please provide the analysis of cumulative air quality impacts and ensure that the existing Contra Costa Power Plant Units 6 and 7, the approved Gateway Generating Station, and the proposed Willow Pass Generating Station are included.

RESPONSE

As required by California Energy Commission (CEC) policy, a dispersion modeling analysis has been conducted to evaluate the maximum cumulative air quality effects of MLGS, the Willow Pass Generating Station (WPGS), and other sources within 6 miles of either site. This data response is meant to fulfill the cumulative analysis for either the Marsh Landing or the Willow Pass Generating Station, or both plants combined. The additional sources included in the cumulative analysis have not yet begun operation and are either under construction, or currently in the permitting process.

In order to facilitate the cumulative analysis, staff at the BAAQMD were contacted to obtain a list of permitted emission sources within 6 miles of the two Mirant plant sites. The listed sources with emissions and stack parameters are presented in Table 9-1. The same emissions and screening stack parameters that were used for MLGS and WPGS in each respective revised AFC section were also used in cumulative modeling. Because ABA Energy Corporation's exempt heater has criteria pollutant emissions of less than 1 ton/year, this source was not included in the cumulative analysis. Sources that only emit volatile organic compounds were not included in cumulative modeling analysis.

Cumulative modeling with AERMOD used the same 5-year record of hourly meteorological input data from the onsite Contra Costa Power Plant meteorological station that was used in the modeling for the ATC/PTO application revision (October 3, 2008). The ozone limiting method was applied to nitrogen dioxide modeling using Bethel Island Road monitoring station data for the same years as the meteorological data. The meteorological data and the ozone data closer to MLGS are more appropriate for this dual analysis than the corresponding set of data closer to WPGS because the combined emissions of the MLGS and sources in the vicinity of MLGS, including the Contra Costa Power Plant and the Gateway Generating Station, are much larger than the emissions from WPGS and sources in the vicinity of WPGS. Receptors spaced 25 meters apart were placed along the CCPP and Pittsburg Power Plant fencelines out to 100 meters. Beyond 100 meters from either fenceline, 100-meter, 500-meter, and 1,000-meter spaced receptors were generated out to 10 kilometers. Similar to the analysis presented in the AFC, tighter grids of receptors were used for the hills to the south of WPGS and southeast of MLGS.

Maximum concentrations due to the combined emissions of the eight additional facilities and proposed MLGS and WPGS power generation facilities were calculated and the results were added to conservative background pollutant concentrations reported in the Marsh Landing Generating Station AFC. The results are presented in Table 9-2.

Maximum concentrations for all pollutants except PM-annual are caused almost entirely by emissions from internal combustion engines at the Ameresco Keller Canyon facility, which is located south of the Pittsburg Power Plant. Maximum concentrations occur several hundred meters south of the Ameresco Keller Canyon sources, in the hills south of West Leland Drive in Pittsburg, CA. The maximum concentration for PM-annual is caused almost entirely by emissions from the United Spiral Pipe LLC Manufacturing Plant, the maximum impact occurring a few hundred meters south of the United Spiral Pipe sources. A CD with modeling files is provided with this response.

As demonstrated by these results, maximum predicted concentrations for all pollutants are below applicable ambient standards, except for particulate matter less than 10 microns and particulate matter less than 2.5 microns, whose maximum background concentrations alone exceed the state and federal standards. However, the maximum contributions from the modeled facilities are small. Based on these results it is concluded that the combined effects of the Mirant MLGS, Mirant WPGS, and other cumulative sources close to the Mirant sites will be below a level of significance.

Table 9-1
Cumulative Sources for Mirant Marsh Landing Generating Station and Mirant 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/yr)					Stack Parameters				UTM Coordinates NAD83 zone 10		Notes
					VOC	NO_X	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	12.20	1.39	0.162	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	0.006	7.688	0.072	0.65	14.63	8.80	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	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	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	5.80	4.584	0	0	0	4.781	0.26	12.19	73.89	294.3	599.200	4209.700	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	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	1.0863	144.83	13.104	5.70	137.16	28.70	411.0	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	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	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	1.1705	156.07	14.121	4.18	137.16	32.64	403.0	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	0.676	90.129	8.1546	4.18	137.16	32.64	403.0	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	0.4234	56.46	5.1083	6.10	137.16	25.00	398.0	596.862	4210.726	Emissions from 2005-2007 CEMS data

Table 9-2
AERMOD Cumulative Impact Modeling Result

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

AAQS = ambient air quality standard
AERMOD = American Meteorological Society and Environmental Protection Agency preferred atmospheric dispersion model
CO = carbon monoxide
m = meters
$\mu g/m^3$ = micrograms per cubic meter
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 Background represents the maximum values measured at the monitoring stations in Marsh Landing AFC
2 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
3 PM_{10} and $PM_{2.5}$ background levels exceed ambient standards.
4 All PM_{10} emissions from project sources were also considered to be $PM_{2.5}$.

Technical Area: Cultural Resources
Author: Amanda Blosser

BACKGROUND

Section 2.0 of the AFC provides a project description and limited set of construction specifications for the Marsh Landing Generating Station (MLGS). More specifically, section 2.6.8 (Earthwork) states that 80,060 cubic yards of cut is required for the project, but provides no information on the depth of the ground disturbance for construction of the facility nor does the section specify where the disturbance will occur in the project area.

In addition to trenches for linear facilities, the project description (pp. 2-22–2-23) lists several equipment installations that appear to require excavation and construction of foundations capable of considerable weight-bearing. Thus, it is possible that excavations associated with the new installation could reach previously undisturbed soil layers where intact archaeological deposits could exist.

To assess potential project impacts to possible buried archaeological resources, staff needs information on the locations and the greatest depths to which the proposed new equipment foundations would extend.

DATA REQUEST

10. Please provide the depths of the excavations required for the following features and foundations for proposed equipment:

a. Combustion Turbine Generators

b. Heat Recovery System Generators

c. Single Turbine Generators

d. Balance of Plant Equipment

e. modified water (reclaimed and potable) piping systems, fire protection system, natural gas piping system, and stormwater drainage collection system

f. stormwater retention basin expansion

RESPONSE

After the five tanks have been demolished, the site will be graded as shown on AFC Figure 2.6-2. Grading of the site primarily involves removing soil and asphalt from the tank berms and the area under Tanks 1 and 2 and using that material as fill to level the rest of the site. The maximum cut to grade the site is estimated to be approximately 13 feet and the maximum depth of fill is approximately 6 feet. Once grading is complete, project features will be constructed. The estimated depths of excavation for foundations are summarized in Table 10-1.

Table 10-1
Approximate Depth of Excavation

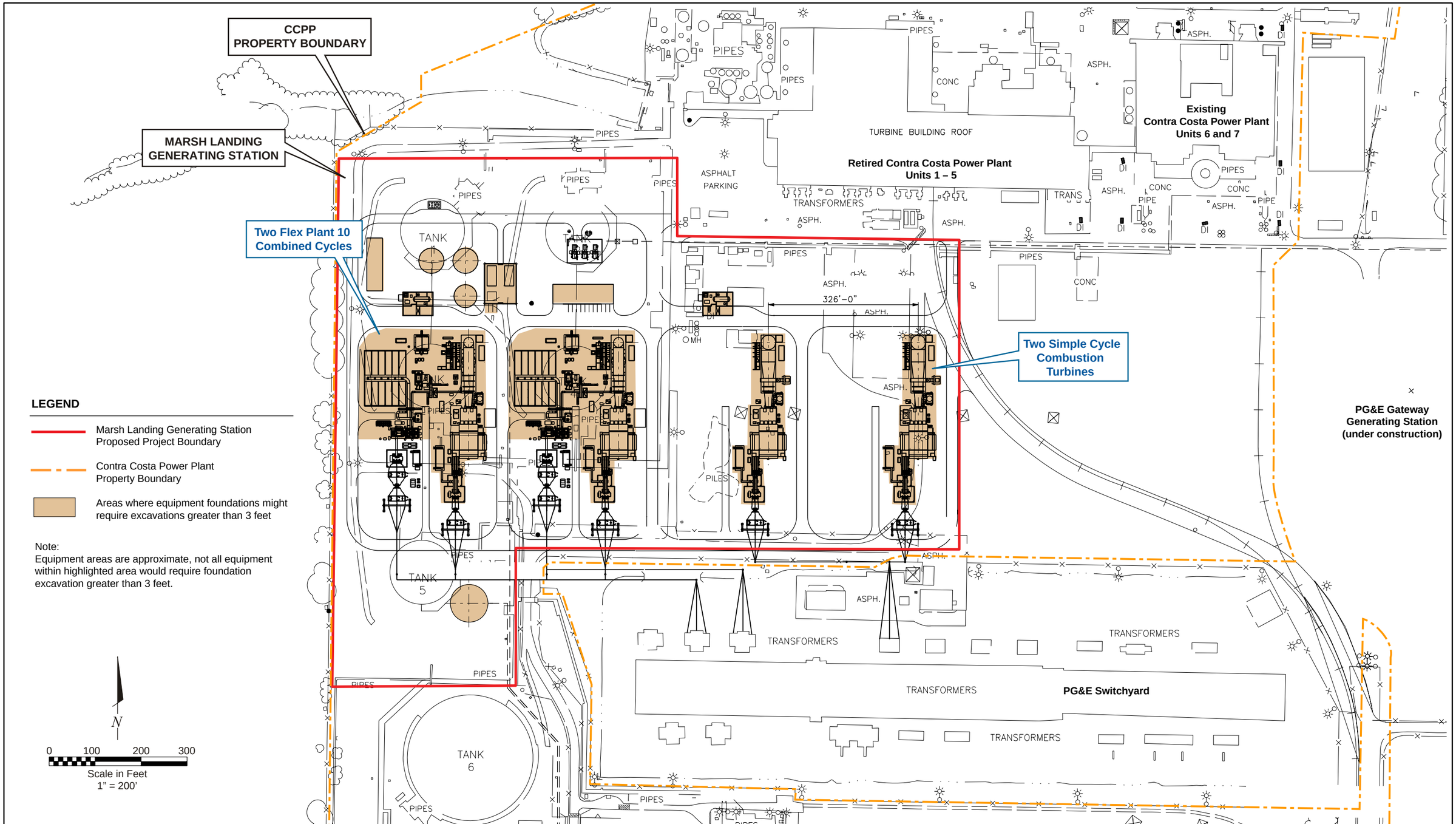
Feature	Depth of Excavation
Combustion Turbine Generators	As stated on AFC p. 7.14-10, pile driving will be used for foundation construction in lieu of deep excavations. Foundation depth will be approximately 5 feet.
Heat Recovery Steam Generators	As stated on AFC p. 7.14-10, pile driving will be used for foundation construction in lieu of deep excavations. Foundation depth will be approximately 4 feet.
Steam Turbine Generators	As stated on AFC p. 7.14-10, pile driving will be used for foundation construction in lieu of deep excavations. Foundation depth will be approximately 6 feet.
Balance of Plant Equipment	Balance of Plant equipment foundation depths are expected to range from approximately 2 to 9 feet, but could be up to 13 feet depending on final design.
Modified water (reclaimed and potable) piping systems, fire protection system, natural gas piping system, and storm water drainage collection system	As stated on AFC p. 7.9-5, piping and pipeline trenches are expected to be no greater than 4 feet deep.
Stormwater Retention Basin Expansion	There is no new or expanded stormwater retention basin associated with this project

DATA REQUEST

11. Please provide a project site plan showing the locations of equipment for whose foundations excavation would exceed three feet below the surface.

RESPONSE

The project site would be graded as shown on AFC Figure 2.6-2. Areas of the site where excavation (i.e., cut) for grading would exceed 3 feet are limited to the berms surrounding the five fuel oil tanks and the area underneath Tanks 1 and 2. Figure 11-1 shows areas where foundation excavation for new equipment would exceed 3 feet.



Source:
CH2MHill Lockwood Greene; General Arrangement Marsh Landing Generating Station,
Combined Cycle Siemens Flex 10s & Simple Cycle Layout;
Drawing No: MR-GA-ML-01-12 (Rev. D, 06/04/08)

EQUIPMENT AREAS WHERE FOUNDATION DEPTHS EXCEED THREE FEET

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

December 2008
28067344

URS

FIGURE 11-1

12/08/08 vsa ..\T:\Mirant Contra Costa-Marsh Landing\Graphics\DATA REQUESTS\DR_11-1_fndn depths.ai

BACKGROUND

Based on the information obtained from the record search, the applicant identified that there are no archaeological resources within the project area. The archival research revealed that Mirant's Contra Costa Power Plant (CCPP) property had been previously surveyed for cultural resources with negative results. The survey was conducted in support of the Environmental Impact Report (EIR) for PG&E's sale of this and other power plants. It is noted in the EIR, that because of previous disturbances within the CCPP, there is moderate to low potential for buried prehistoric resources. The applicant also identified that there is no evidence supporting the presence of historical archaeological materials in the CCPP.

However, the Office of Historic Preservation Directory of Historic Properties identified the Marsh Landing Site (Primary #07-000878) within the CCPP property. Marsh Landing is the site of John Marsh's former wharf, or ship landing, established in 1838 and shown on the 1868 General Land Office plat, the 1908 USGS "Collinsville" topographic map, and the 1918 USGS "Antioch" topographic map in what is now the northeastern portion of the power plant site. Archival research also confirmed that a smokehouse, blacksmith shop, and a warehouse were located at the Marsh Landing site.

Staff needs more substantive information on the possible presence of buried historic-period archaeological deposits on the project site, especially in light of the former presence of the nearby Marsh Landing historic site.

DATA REQUEST

12. To facilitate a more substantive factual assessment of whether the proposed project may impact potentially significant buried historic-period archaeological deposits, staff requests that the applicant provide a report of the results from a more thorough identification effort for the Marsh Landing historic site, including the following:

a. The applicant should conduct additional archival research, if available, to determine the location and extent of the Marsh Landing historic site and to provide a land use history that addresses the likelihood that remains of the historic site still exist in the project impact areas, taking into consideration nineteenth- and twentieth-century shoreline filling, and land modifications associated with the twentieth-century industrial use of the area. The land use history should describe the changes in the topography of the locality of the historic site and the changes in the landform on which the historic site was located.

b. If the archival research does not support a conclusion about the likelihood of buried extant remains of the historic site, the applicant should have a qualified historical archaeologist conduct a subsurface inventory of the probable historic site location to determine the presence or absence of buried archaeological deposits. Methods could include backhoe trenching or other sampling strategies to provide data which either confirms the presence or absence of deposits associated with the Marsh Landing historic site.

RESPONSE

Additional archival research was conducted and supports the findings presented in the MLGS AFC that the proposed project would not impact the site of Marsh Landing or associated cultural resources. Additional archival research confirms that the site of John Marsh's former landing was situated in the vicinity of current CCPP facilities, to the northeast but outside the Area of Potential Effect (APE) for the MLGS. Furthermore, the likelihood that any intact cultural deposits associated with Marsh Landing exist within the MLGS APE is remote given the history of industrial development on the CCPP site, including the area proposed for MLGS development. The evidence to support these findings is detailed below.

Establish Shoreline

Marsh Landing was the site of John Marsh's wharf facility, from which he shipped cattle, produce, and other goods to San Francisco beginning in the mid-nineteenth century. Marsh's holdings included the wharf, a warehouse, a smokehouse, and a blacksmith shop. In order to determine the location of the Marsh Landing site, which was a shore-focused establishment, archival research was performed to locate the historic shoreline. If extensive shoreline filling had occurred, the argument could be made that intact remains associated with the facility could now be situated inland of the current shoreline and potentially within the boundaries of the MLGS APE.

In 1949, Dames & Moore conducted a geotechnical investigation for the then-proposed Pacific Gas & Electric Company (PG&E) Contra Costa Steam Generating Plant (today's CCPP) (Dames & Moore, 1949). The geotechnical report includes a topographic map that depicts the pre-construction topographic conditions, the locations of the geotechnical borings, and the proposed footprint of the power plant including the tank farm area within which the proposed MLGS is to be constructed (see Figure 12-1). Figure 12-1 shows geotechnical boring numbers 29, 35, 36, and 37, which are located on the northern portion of the area to be developed for the MLGS project. No evidence of fill was observed at any of these borings locations, indicating that land reclamation activities (i.e., filling) did not occur within the portion of the CCPP property where the MLGS would be constructed. The topographic map further demonstrates that the tank farm was not placed on reclaimed land. As can be seen on Figure 12-1, the footprint of the then-proposed tank farm is located along on top of an east-west trending ridgeline. This same ridgeline is seen within the series of historic U.S. Geological Survey (USGS) maps that are presented below (see Figures 12-6, 12-7, 12-8, and 12-9).

This evidence supports the conclusion that the shoreline location during the period of John Marsh's Landing is very similar to its current location. Substantial filling in of the shoreline has not occurred and therefore it is expected that remains associated with the site, to the extent that any still exist, are located along the current shoreline and outside of the MLGS APE.

Confirm Marsh Landing Location in Relation to MLGS APE

The location of the Marsh Landing site has been further confirmed with additional archival research. The earliest identified mapping of Marsh Landing is the circa 1853 *Map of the Rancho Los Meganos* provided here as Figure 12-2 (Whitcher, n.d.). Although the map is fairly crude, a wharf and one (or two) structures is depicted along the shoreline within the current CCPP property. Another contemporaneous map from the same Land Case file housed at the University of California's Bancroft Library similarly depicts the wharf, an adjacent structure with chimney, and possibly a second structure at the foot of the wharf. The facilities are labeled as "Marsh's Landing" on this map (see Figure 12-3 for an alternate view). These early maps place the original facilities near the shoreline.

The next identified map is the 1862 Government Land Office (GLO) Plat map for Township 2 North, Range 2 East (see Figure 12-4) (GLO, 1862). Along the shoreline within Section 16 is a structure identified as "Ware House at Marsh Landing." No additional structures or features are depicted or labeled in the vicinity. As this map includes section lines, it allows for the direct comparison with current maps of the site. This nineteenth century map shows that Marsh Landing falls within the CCPP property boundary, but to the northeast of where the MLGS facilities are proposed.

The 1908 official map of Contra Costa County (McMahon, 1908) depicts a wharf labeled as "MARSH LDG" paralleling the shoreline (as opposed to extending perpendicular out into the river). Similar to the 1862 GLO Plat, no other structures are identified or labeled within the CCPP vicinity (see Figure 12-5).

Figure 12-6 shows a lone structure labeled as "Marsh Landing" plotted on the 1918 USGS Collinsville topographic quadrangle (USGS, 1918). A similar configuration is also depicted on the 1906 USGS Sacramento Valley, Sheet Q topographic quadrangle (USGS, 1906), and on the 1908 USGS Antioch topographic quadrangle (USGS, 1908) (see Figures 12-7 and 12-8, respectively). For comparison purposes, the CCPP project boundary and facilities and the proposed MLGS project boundary have been drawn on the 1918 quadrangle map. Figure 12-9 shows that the location of the Marsh Landing structure is occupied by CCPP facilities. The structure depicted on the 1906 and 1918 quadrangles is situated slightly inland from the shoreline but still outside of the proposed MLGS boundary.

The final depiction of the Marsh Landing vicinity prior to the construction of the CCPP is shown on an aerial photograph taken in 1939 (Aerial Photo, 1939). This photograph is presented in two forms, one with only the CCPP property boundary plotted (Figure 12-10) and a second with current CCPP facilities as well as the APE for the MLGS included for reference. These photographs confirm that the structure labeled as "Marsh Landing" on the earlier topographic quadrangles is situated outside of the APE for the MLGS. Furthermore, the photograph does not reveal the presence of other structures within the currently proposed MLGS construction footprint. It is also worth noting how closely the topographic map presented in the 1949 geotechnical report (Figure 12-1) matches the shoreline depicted in the 1939 aerial photograph (Figure 12-10).

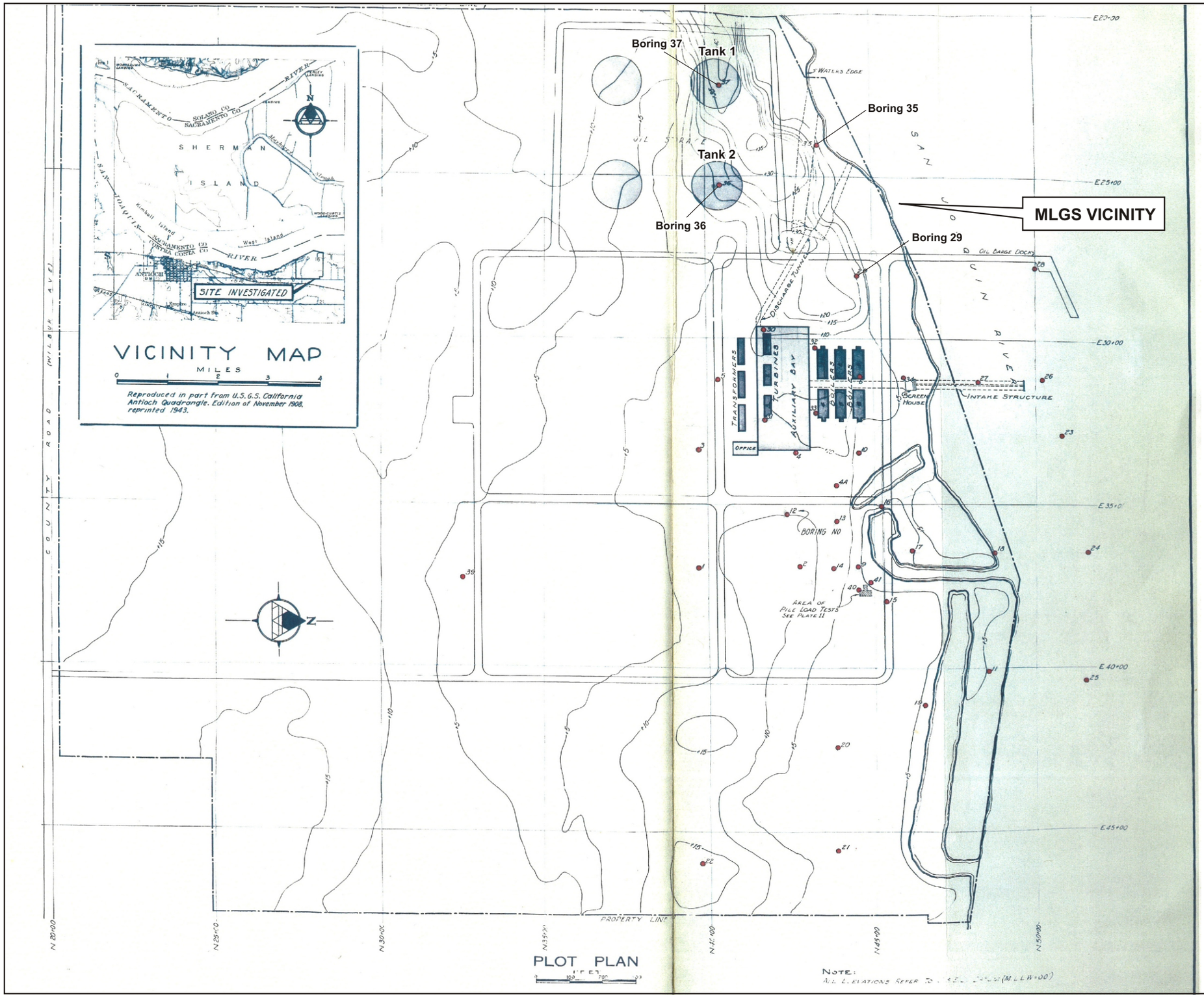
From the above identified sources it is evident that the primary Marsh Landing facilities (that have been mapped) were situated outside of the current APE for the MLGS.

Previous Earth-Moving Activities

It should also be noted that substantial land modifications were made in the early 1950s to develop the tank farm. As discussed previously, the topographic map provided in the 1949 Dames & Moore geotechnical report reveals that the tank farm was to be constructed within an area that at the time exhibited a topography dominated by an east-west trending ridgeline (Figure 12-1). Perhaps more importantly, however, the topographic map makes it possible to determine approximately how much grading occurred to construct the tank farm. The top of the historic ridge reached a height of approximately 40 feet above mean low low water (MLLW) in the vicinity of the northwesternmost tank (i.e., Tank No. 1). Today, the elevation within the containment berm surrounding Tank No. 1 exhibits a minimum height of 10 feet above mean sea level (MSL). This represents a cut of approximately 28 feet at this location[1]. The cut was slightly less around Tank No. 2 (the tank closest to the mapped location of the Marsh Landing

[1] MLLW is 2 to 3 feet below MSL, as it represents the annual mean of only the lower of the daily low tides as opposed to all annual tides.

site), where the pre-tank elevation reached 20 feet above MLLW and currently exhibits a minimum height of 9 feet above MSL, a cut of approximately 9 feet. Given the extent of grading in this location to construct the tanks and tank berms that currently exist on the CCPP site, it is unlikely that intact remains associated with Marsh Landing, if ever present, currently occur within the MLGS construction footprint. This grading for the construction of the tank farm would have altered cultural deposits associated with other prehistoric and/or historic period activities that may have been present within the MLGS APE, and therefore no deposits would be expected to be encountered by construction activities associated with MLGS.



Source:
Dames & Moore, *Report of Foundation Investigation, Proposed Contra Costa Steam Plant, Antioch, California for the Pacific Gas and Electric Company* (1949).

0 100 200 300
Scale in Feet

DAMES & MOORE
1949 GEOTECHNICAL INVESTIGATION

December 2008
28067344

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

URS

FIGURE 12-1

12/05/08 vsa ..T:\Mirant Contra Costa-Marsh Landing\Graphics\DATA REQUESTS\Cultural\DR_12-1_1949 D&M 1949 geotech.cdr

Source:
Detail from Map of the Rancho Los Meganos, n.d., Land Case No. 107, by J. E. Whitcher, ca. 1853, U.S. District Court, Northern District California, Bancroft Library, University of California, Berkeley.

Approximate North;
No Scale

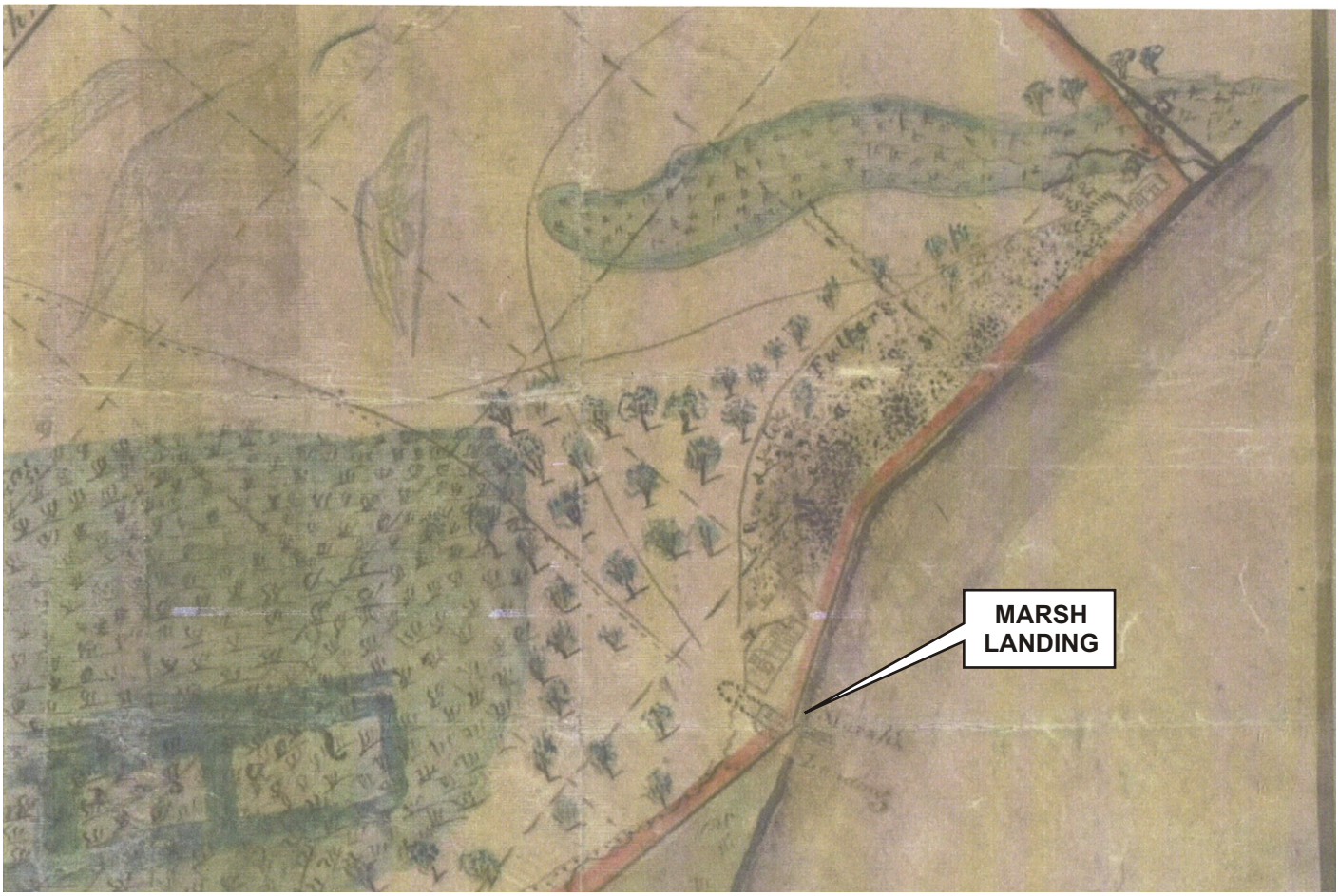
RANCHO LOS MEGANOS MAP CIRCA 1853

December 2008
28067344

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

URS

FIGURE 12-2



Source:
Detail from Map of the Rancho Los Meganos, n.d., Land Case No. 107, by J. E. Whitcher, ca. 1853, U.S. District Court, Northern District California, Bancroft Library, University of California, Berkeley.

Approximate North;
No Scale

RANCHO LOS MEGANOS MAP CIRCA 1853 (ALTERNATE VERSION)

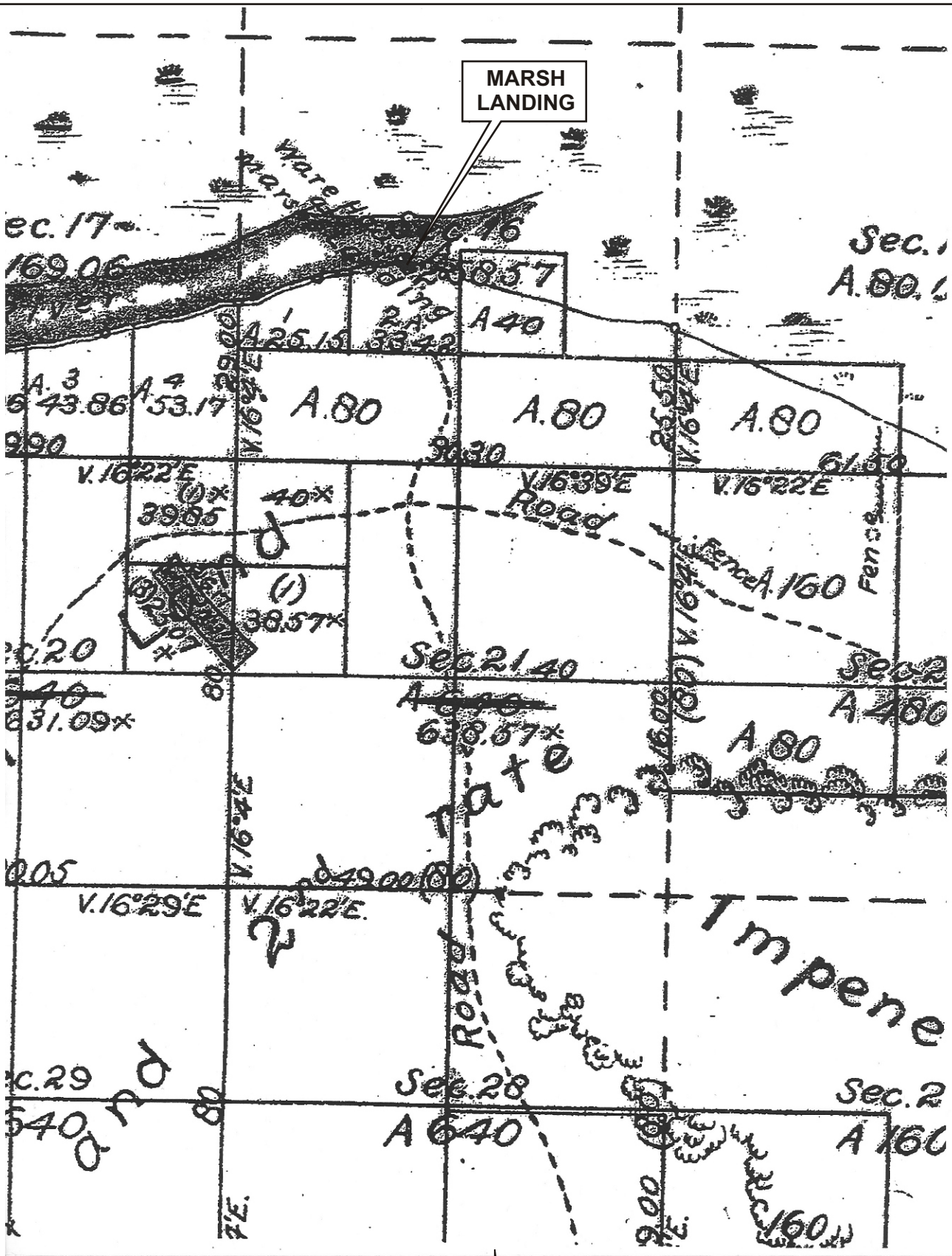
Marsh Landing Generating Station
Mirant Marsh Landing, LLC
Contra Costa County, California

December 2008
28067344

URS

FIGURE 12-3

12/05/08 vsa ..T:\Mirant Contra Costa-Marsh Landing\Graphics\DATA REQUESTS\Cultural\DR_12-3_1853 marsh landing_Alt vers.cdr



Source:
Government Land Office (GLO), 1862

N

No Scale

1862 GLO PLAT T2N R2E

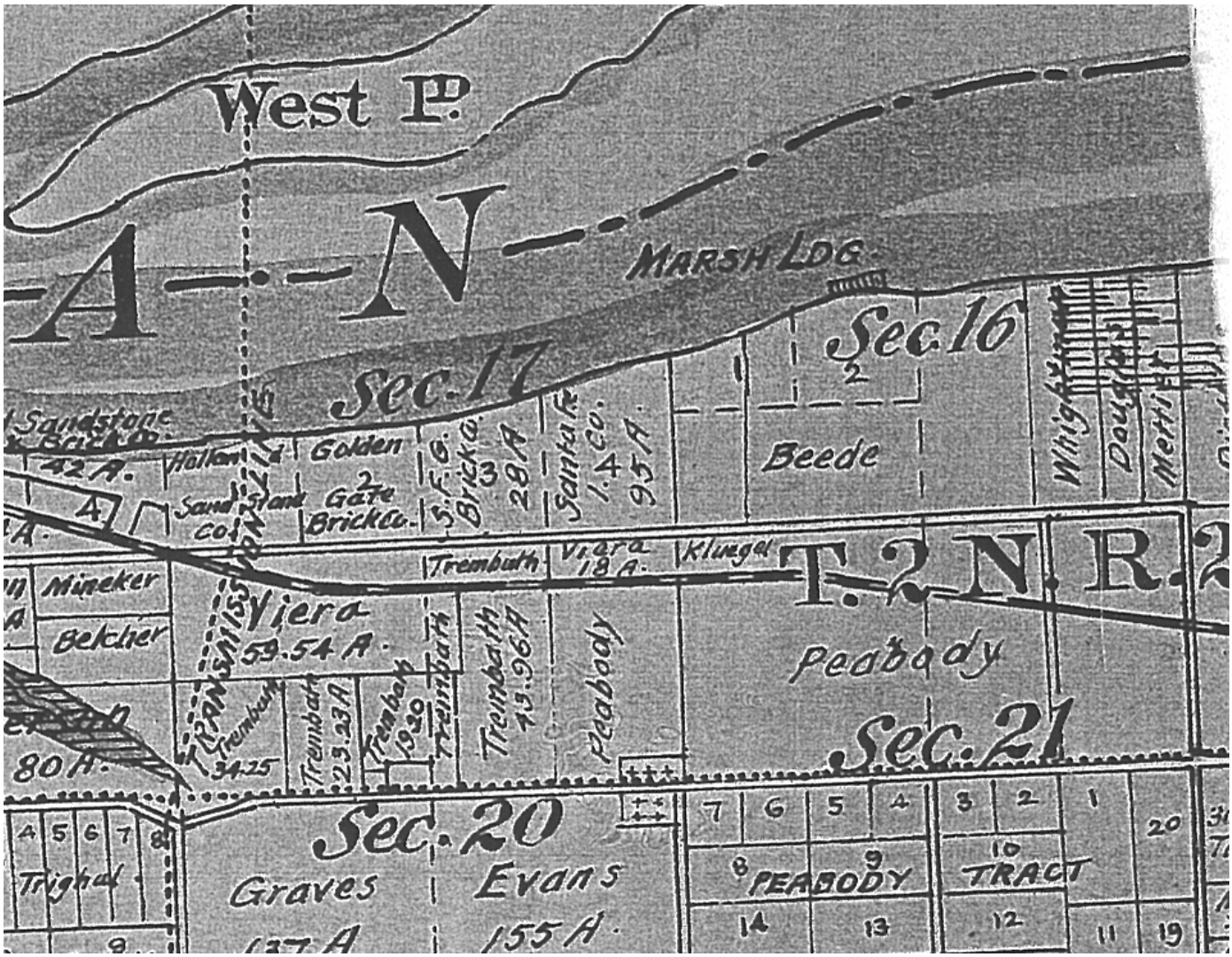
Marsh Landing Generating Station
Mirant Marsh Landing, LLC
Contra Costa County, California

December 2008
28067344

URS

FIGURE 12-4

11/20/08 vsa ..T:\Mirant Contra Costa-Marsh Landing\Graphics\DATA REQUEASTS\Cultural\DR_12-4_GLO Plat.cdr



Source:
Detail from T. A. McMahon, 1908,
Official Map of Contra Costa County.

N

No Scale

1908 MARSH LANDING

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

December 2008
28067344

URS

FIGURE 12-5

12/05/08 vsa ..T:\Mirant Contra Costa-Marsh Landing\Graphics\DATA REQUESTS\Cultural\DR_12-5_1908 marsh landing.cdr

Source:
USGS, 1918, Collinsville, California Quadrangle (Antioch, CA).

N

0 0.5 1

Approximate Scale in Miles

1918 USGS COLLINSVILLE TOPOGRAPHIC QUADRANGLE

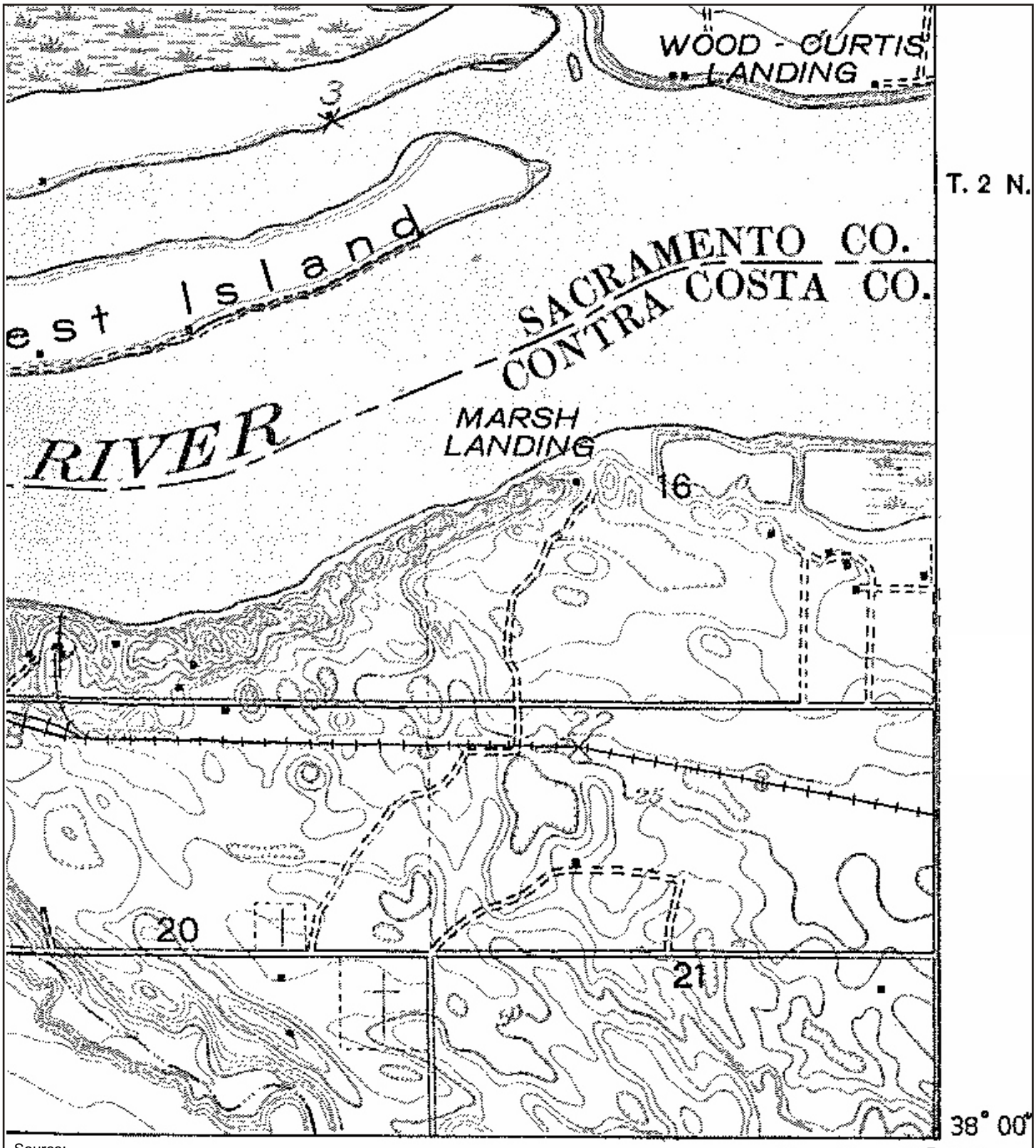
December 2008
28067344

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

URS

FIGURE 12-6

12/05/08 vsa ..T:\Mirant Contra Costa-Marsh Landing\Graphics\DATA REQUESTS\Cultural\DR_12-6_1918-USGS collinsville quad.cdr



Source:
Detail from U.S. Geological Survey, 1906,
California Sacramento Valley. Sheet Q.

0 0.5 1
Approximate Scale in Miles

N

1906 USGS MAP OF MARSH LANDING

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

December 2008
28067344

URS

FIGURE 12-7

12/05/08 vsa ..T:\Mirant Contra Costa-Marsh Landing\Graphics\DATA REQUESTS\CulturalI\DR_12-7_1906 marsh landing.cdr

Source:
USGS, 1908, Antioch, California Quadrangle.

N

No Scale

1908 MARSH LANDING

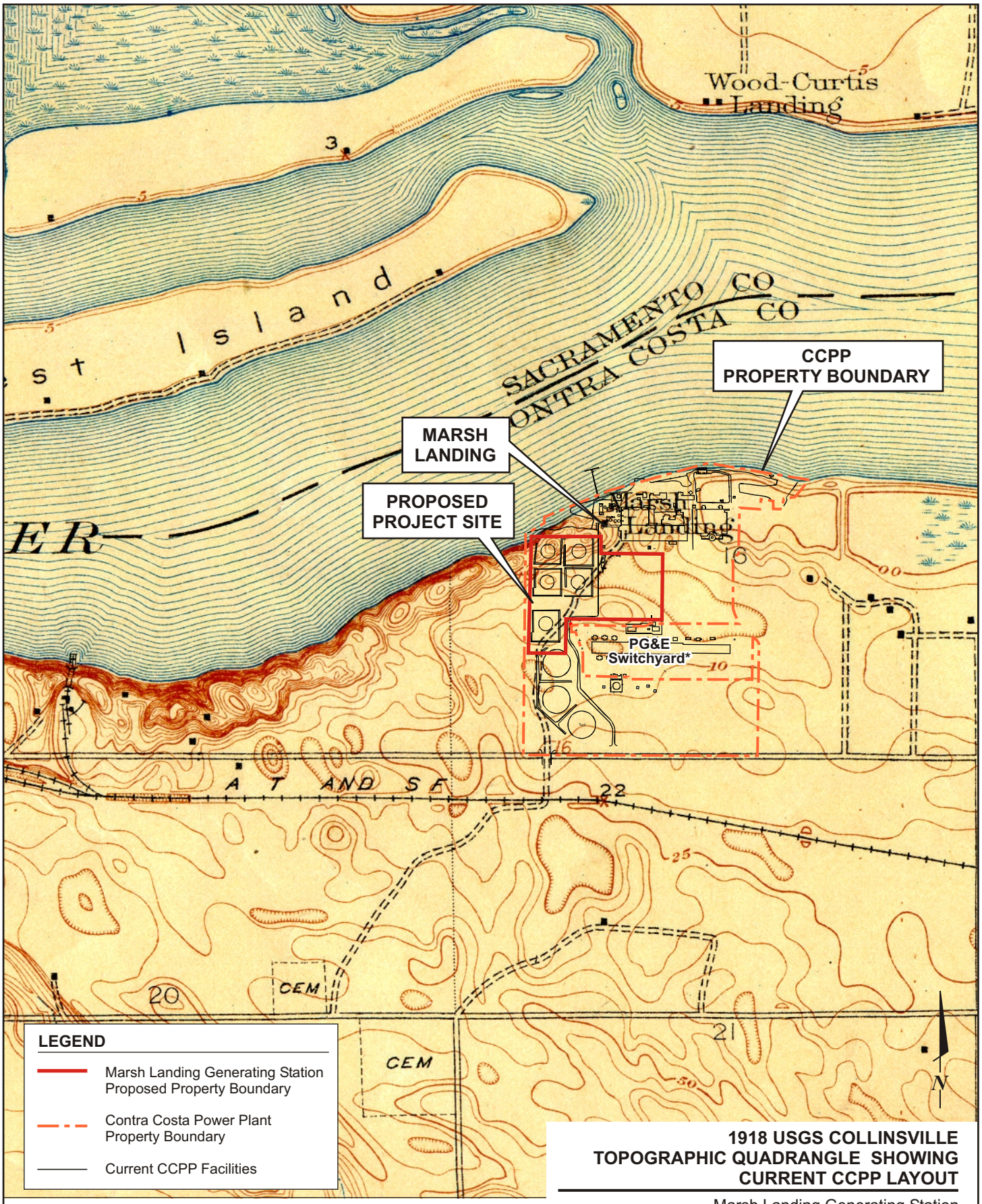
Marsh Landing Generating Station
Mirant Marsh Landing, LLC
Contra Costa County, California

December 2008
28067344

URS

FIGURE 12-8

12/05/08 vsa ..T:\Mirant Contra Costa-Marsh Landing\Graphics\DATA REQUEASTS\Cultural\DR_12-8_1908 marsh landing.cdr



Source:
USGS, 1918, Collinsville, California Quadrangle (Antioch, CA).

0 1400 2800
Approximate Scale in Feet

1918 USGS COLLINSVILLE TOPOGRAPHIC QUADRANGLE SHOWING CURRENT CCPP LAYOUT

December 2008
28067344

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

URS

FIGURE 12-9

12/08/08 vsa ..T:\Mirant Contra Costa-Marsh Landing\Graphics\DATA REQUESTS\Cultural\DR_12-9_1918-USGS collinsville_site.cdr

Source: Aerial Photo BUU 268-23 (1939)

1939 AERIAL PHOTOGRAPH

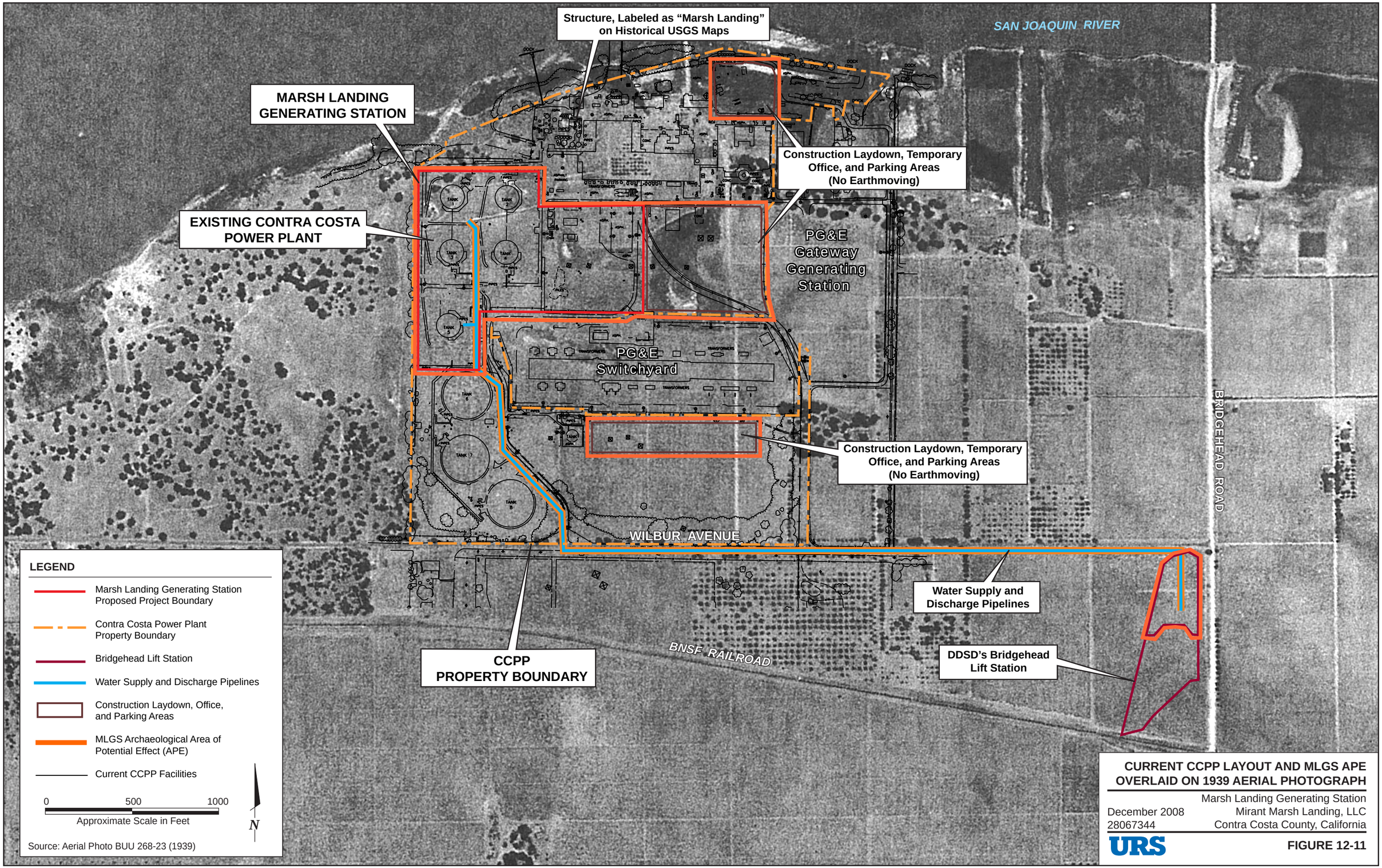
Marsh Landing Generating Station
Mirant Marsh Landing, LLC
Contra Costa County, California

December 2008
28067344

URS

FIGURE 12-10

11/20/08 vsa ..T:\Mirant Contra Costa-Marsh Landing\Graphics\DATA REQUESTS\Cultural\DR_12-10_1939 Aerial photo.ai



CURRENT CCPP LAYOUT AND MLGS APE OVERLAID ON 1939 AERIAL PHOTOGRAPH

December 2008
28067344

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

URS

FIGURE 12-11

11/20/08 vsa ..T:\Mirant Contra Costa-Marsh Landing\Graphics\DATA REQUESTS\Cultural\DR_12-11_1939 Aerial_site+APE.ai

BACKGROUND

The MLGS AFC indicates that approximately 8,000 cubic yards of soil will be re-used on site or recycled to the extent possible. In case the project must dispose of soils off-site, staff seeks assurance that a disposal site is available to the applicant that is either a commercial disposal site or a site that has been previously surveyed and found to contain no significant cultural resources.

DATA REQUEST

13. Please identify a soil disposal site, available to the project if needed, which is either a commercial disposal site or a site that has been previously surveyed and found to contain no significant cultural resources.

RESPONSE

Keller Canyon Landfill of Pittsburg, California, is expected to be the commercial disposal site for soil (see page 7.9-4 of the AFC). As shown on AFC Table 7.13-1, Keller Canyon has adequate capacity (63 million cubic yards).

Technical Area: Hazardous Materials Management
Author: Alvin Greenberg

BACKGROUND

Section 7.12.2.2 states that Table 7.12-4, hazardous materials to be added to the site and used or stored on-site during operations of MLGS, includes the CAS number, nature of associated hazard, state/federal threshold quantities, and storage location of hazardous materials. However, much of this information is not included in the referenced table. In addition, the Estimated Storage Quantity column apparently has an absent footnote. Staff needs complete information on what will be added to the site for operations of the MLGS so that potential impacts of hazardous materials use and storage can be assessed. Also, the project owner will be limited to using and storing those hazardous materials identified in this table and in the amounts and concentrations identified.

Also, Chapter 5 of the AFC does not indicate the class of service the gas pipeline would be designed for, who will construct it, who will own it, and who will maintain it. It appears that the pipeline would be approximately 2,100 feet long and would be installed in areas covered by three different entities. Therefore, staff would like confirmation that the MLGS owner will build and own the gas pipeline and be responsible for its maintenance.

DATA REQUEST

14. Please update Table 7.12-4 to include all of the above-indicated information and the appropriate footnote.

RESPONSE

Table 14-1 replaces AFC Table 7.12-4 and provides the CAS number, nature of associated hazard, state/federal threshold quantities, and storage location of hazardous materials expected to be used during the operation of MLGS. Figure 14-1 shows the storage locations of the hazardous materials provided in Table 14-1.

Table 14-1
Hazardous Materials to be Added at MLGS during the Operational Phase

Hazardous Material	CAS Number	Hazardous Characteristics	Regulatory Thresholds (lbs)				Primary Application	Estimated 30-Day Usage	Estimated Storage Quantity[1]	Storage Type	Storage Location (refer to Figure 7.12-1)
			Cal-ARP	Federal RQ	Federal TPQ	Federal TQ					
Aqueous ammonia (19%)	7664-41-7	Corrosive	500	100	500	20,000 (if >20%) 10,000 anhydrous	NO_X reduction in SCR	40,000 gallons	40,000 gallons	Two above-ground tanks	See Figure 7.12-1, Ammonia Unloading Storage Area
Power Cycle Water Treatment Chemicals for Two Siemens Flex Plant 10 Units											
26° Be Aqueous ammonia (NH_4OH – 29.4% weight)	1336-21-6	Corrosive	500	1,000	–	20,000	CO_2 neutralization within steam power cycle.	34 gallons	400 gallons	Stackable tote bins inside containment	See Figure 7.12-1, Hazardous Chemical Storage Area
Microfiltration and Reverse Osmosis Treatment Chemicals											
Dibromo-nitrolo-propionamide	10222-01-2	Corrosive	–	–	–	–	Primary non-oxidizing biocide for RO system	30 gallons	100 gallons	Manufacturer standard bucket/drum/ tote inside secondary containment	See Figure 7.12-1, Hazardous Chemical Storage Area
Isothiazolone			–	–	–	–	Secondary non-oxidizing biocide	30 gallons	100 gallons	Manufacturer standard bucket/drum/ tote inside secondary containment	See Figure 7.12-1, Hazardous Chemical Storage Area
Acrylic acid-based polymer	9003-04-7	Corrosive Irritant	–	–	–	–	Tricalcium phosphate and calcite dispersant	60 gallons	180 gallons	Manufacturer standard bucket/drum/ tote inside secondary containment	See Figure 7.12-1, Hazardous Chemical Storage Area
Sodium hydroxide (50% wt)	1310-73-2	Corrosive	–	1,000	–	–	Conversion of CO_2 in second-pass of RO to HCO_3	16 gallons	500 gallons	Bulk tank inside containment	See Figure 7.12-1, Hazardous Chemical Storage Area

Table 14-1
Hazardous Materials to be Added at MLGS During Operational Phase (Continued)

Hazardous Material	CAS Number	Hazardous Characteristics	Regulatory Thresholds (lbs)				Primary Application	Estimated 30-Day Usage	Estimated Storage Quantity[1]	Storage Type	Storage Location (refer to Figure 7.12-1)
			Cal-ARP	Federal RQ	Federal TPQ	Federal TQ					
Microfiltration and RO Clean-In-Place Chemicals											
Citric acid (2% wt)	77-92-9 5949-29-1	Irritant	–	–	–	–	Cleaning of RO membranes	10 gallons	30 gallons	Drum inside containment	See Figure 7.12-1, Hazardous Chemical Storage Area
Sodium hypochlorite (12.5% weight, Trade)	7681-52-7	Corrosive	–	100	–	–	Cleaning of RO membranes	0.3 gallon	Included in source water chemical storage	Included in source water chemical storage	See Figure 7.12-1, Hazardous Chemical Storage Area
Sodium Hydroxide (50% wt)	1310-73-2	Corrosive	–	1,000	–	–	Cleaning of RO membranes	2 gallons	500 gallons	Aboveground tank	See Figure 7.12-1, Hazardous Chemical Storage Area
Sodium hypochlorite (12.5% weight, Trade)	7681-52-7	Corrosive	–	100	–	–	Biocide/biofilm control for service water system and raw water tank	240 gallons	240 gallons	Aboveground tank inside secondary containment	See Figure 7.12-1, Hazardous Chemical Storage Area
Service Water Treatment											
Polysilicate			–	–	–	–	Corrosion inhibitor for service water system	60 gallons	400 gallons	Manufacturer standard bucket/drum/ tole inside secondary containment	See Figure 7.12-1, Hazardous Chemical Storage Area
Other Materials											
Acetylene	74-86-2	Toxic Flammable	–	–	–	10,000	Welding	400 cu. ft.	1,000 cu. ft.	Cylinder	See Figure 7.12-1, Hazardous Chemical Storage Area

Table 14-1
Hazardous Materials to be Added at MLGS During Operational Phase (Continued)

Hazardous Material	CAS Number	Hazardous Characteristics	Regulatory Thresholds (lbs)				Primary Application	Estimated 30-Day Usage	Estimated Storage Quantity[1]	Storage Type	Storage Location (refer to Figure 7.12-1)
			Cal-ARP	Federal RQ	Federal TPQ	Federal TQ					
Paint (Ethylene glycol)	107-21-1 (13463-67-7)	Toxic Flammable	–	5,000	–	–	Painting	5 gallons	300 gallons	Can	See Figure 7.12-1, Hazardous Chemical Storage Area
Natural gas		Flammable	–	–	–	–	Fuel for power plant	As needed	As needed	Pipeline	Not stored onsite
Mineral oil	8020-83-5	Irritant	–	–	–	–	Transformers	80,000 gallons, initial fill	80,000 gallons	Steel drum	See Figure 7.12-1, Hazardous Chemical Storage Area
Nitrogen	7727-37-9	Toxic	–	–	–	–	Turbine blanket	5,400 gallons	6,000 gallons	Aboveground tank	Figure 7.12-1, Liquid Nitrogen Storage Area
Sulfur hexafluoride	2551-62.4	Asphyxiant	–	–	–	–	Switchyard breakers	600 pounds	600 pounds	Within equipment	See Figure 7.12-1, Equipment Areas
Turbine and Generator Lube Oil (HB-1170 Turbine Oil)	8002-05-9	Toxic Flammable Irritant	–	–	–	–	Rotating equipment	50,000 gallons	50,000 gallons	Steel drum	See Figure 7.12-1, Equipment Areas
Hydraulic Oil (HB-1150 HYGuard)	8002-05-9	Toxic Flammable Irritant	–	–	–	–	Rotating equipment	1,000 gallons	1,000 gallons	Steel drum	See Figure 7.12-1, Equipment Areas
Hydraulic Fluid	Mixture	Toxic Flammable Irritant	–	–	–	–	Construction vehicles and equipment	10 gallons per week	250 gallons	Drums inside secondary containment	See Figure 7.12-1, Equipment Areas
Transmission Fluid	Mixture	Toxic Flammable Irritant	–	–	–	–	Construction vehicles and equipment	5 gallons per week	250 gallons	Drums within secondary containment	See Figure 7.12-1, Equipment Areas

Table 14-1
Hazardous Materials to be Added at MLGS During Operational Phase (Continued)

Hazardous Material	CAS Number	Hazardous Characteristics	Regulatory Thresholds (lbs)				Primary Application	Estimated 30-Day Usage	Estimated Storage Quantity[1]	Storage Type	Storage Location (refer to Figure 7.12-1)
			Cal-ARP	Federal RQ	Federal TPQ	Federal TQ					
Unleaded Gasoline	8006-61-9	Flammable Toxic Irritant Target Organ (CNS)	–	–	–	–	Construction vehicles	300 gallons per week	500 gallons	Tank with secondary containments	See Figure 7.12-1, Equipment Areas
Motor Oil (CITGO SuperGard® SAE 30)	Proprietary Mixture	Flammable	–	–	–	–	Construction vehicles and equipment	5 gallons per week	250 gallons	Drums inside secondary containment	See Figure 7.12-1, Equipment Areas
Propane	74-98-6	Flammable	–	–	–	10,000		300 pounds per month	500 pounds	Cylinder	See Figure 7.12-1, Equipment Areas
Dryer Desiccant (Silica Gel, SiO_2 99% wt)	112926-00-8		–	–	–	–	Instrument air	1,000 pounds over 3 to 5 years	1,000 pounds	Instrument air dryer	See Figure 7.12-1, Hazardous Chemical Storage Area
Various Detergents	various		–	–	–	–	Combustion turbine cleaning	1,000 pounds, before startup; Periodic short-term storage 500 pounds	1,000 pounds	Manufacturer container	See Figure 7.12-1, Hazardous Chemical Storage Area
Hydrochloric acid (38%)	7647-01-0	Toxic Corrosive	–	5,000	500 (anhydrous)	15,000	Microfiltration membrane cleaning	300 gallons	400 gallons	Tank	See Figure 7.12-1, Hazardous Chemical Storage Area
Antiscalant (Nalco Permatreat® PC-191)	Proprietary Mixture	Corrosive Irritant	–	–	–	–	RO system	60 gallons	180 gallons	Manufacturer standard bucket/drum/ tote inside secondary containment	See Figure 7.12-1, Hazardous Chemical Storage Area

Table 14-1
Hazardous Materials to be Added at MLGS During Operational Phase (Continued)

Hazardous Material	CAS Number	Hazardous Characteristics	Regulatory Thresholds (lbs)				Primary Application	Estimated 30-Day Usage	Estimated Storage Quantity[1]	Storage Type	Storage Location (refer to Figure 7.12-1)
			Cal-ARP	Federal RQ	Federal TPQ	Federal TQ					
Sodium bisulfite (38%)	7631-90-5	Toxic	–	5,000	–	–	Dechlorination (RO system)	760 gallons	4,000 gallons	4,000-gallon tank inside secondary containment	See Figure 7.12-1, Hazardous Chemical Storage Area
RO membrane cleaners (Alkali detergent; Acid detergent)	Proprietary Mixture	Toxic Corrosive Irritant	–	–	–	–	Detergent for RO system	2 gallons	5 gallons	Manufacturer standard bucket/drum/ tote inside secondary containment	See Figure 7.12-1, Hazardous Chemical Storage Area
Boiler Water Internal Treatment Chemicals											
Tri-sodium phosphate	10101-89-0	Corrosive	–	5,000	–	–	HRSG	30 gallons	200 gallons	Two 200-gallon totes inside secondary containment	See Figure 7.12-1, Hazardous Chemical Storage Area
Neutralizing Amine (Nalco® 356: Cyclohexylamine 30% wt; Morpholine 10% wt)	108-91-8 110-91-8	Toxic Flammable Corrosive	15,000	–	10,000	15,000	HRSG	150 gallons	800 gallons	Two 400-gallon totes inside secondary containment	See Figure 7.12-1, Hazardous Chemical Storage Area
Oxygen Scavenger (Nalco ELIMIN-OX®)	497-18-7	Irritant	–	–	–	–	HRSG	120 gallons	800 gallons	Two 400-gallon totes inside secondary containment	See Figure 7.12-1, Hazardous Chemical Storage Area

Table 14-1
Hazardous Materials to be Added at MLGS During Operational Phase (Continued)

Hazardous Material	CAS Number	Hazardous Characteristics	Regulatory Thresholds (lbs)				Primary Application	Estimated 30-Day Usage	Estimated Storage Quantity[1]	Storage Type	Storage Location (refer to Figure 7.12-1)
			Cal-ARP	Federal RQ	Federal TPQ	Federal TQ					
Closed Cooling System Treatment Chemicals											
Sodium Nitrate-Borax formulation	Borax 1330-43-4 (Anhydrous)	Irritant	–	–	–	–	Closed cooling water corrosion inhibitor	<5 gallons	30 gallons	Manufacturer standard bucket/drum/ tote inside secondary containment	See Figure 7.12-1, Hazardous Chemical Storage Area
Propylene-glycol	57-55-6	Irritant	–	–	–	–	Auxiliary cooling closed cooling water system	As needed	60,000 gallons, initial fill	Closed cooling water system	See Figure 7.12-1, Hazardous Chemical Storage Area
Industrial Gases											
Carbon dioxide	124-38-9	Toxic Asphyxiant	–	–	–	–	Instrument air	500 lbs	2,000 lbs	Aboveground CO_2 Tank	See Figure 7.12-1, Hazardous Chemical Storage Area
Nitrogen	7727-37-9	Toxic Asphyxiant	–	–	–	–	Instrument air	5,000 cu. ft.	17,130 cu. ft.	Cylinder	See Figure 7.12-1, Nitrogen System
Oxygen	7782-44-7	Toxic	–	–	–	–	Instrument air, welding	500 cu. ft.	2,000 cu. ft.	Cylinder	See Figure 7.12-1, Hazardous Chemical Storage Area
Nitric oxide	10102-43-9	Toxic	100	10	100	10,000	Instrument air	50 cu. ft.	120 cu. ft.	Cylinder	See Figure 7.12-1, Hazardous Chemical Storage Area
Helium and nitrogen mix	7440-59-7 7727-37-9	Toxic	–	–	–	–	Instrument air	0	0	Cylinder	See Figure 7.12-1, Hazardous Chemical Storage Area

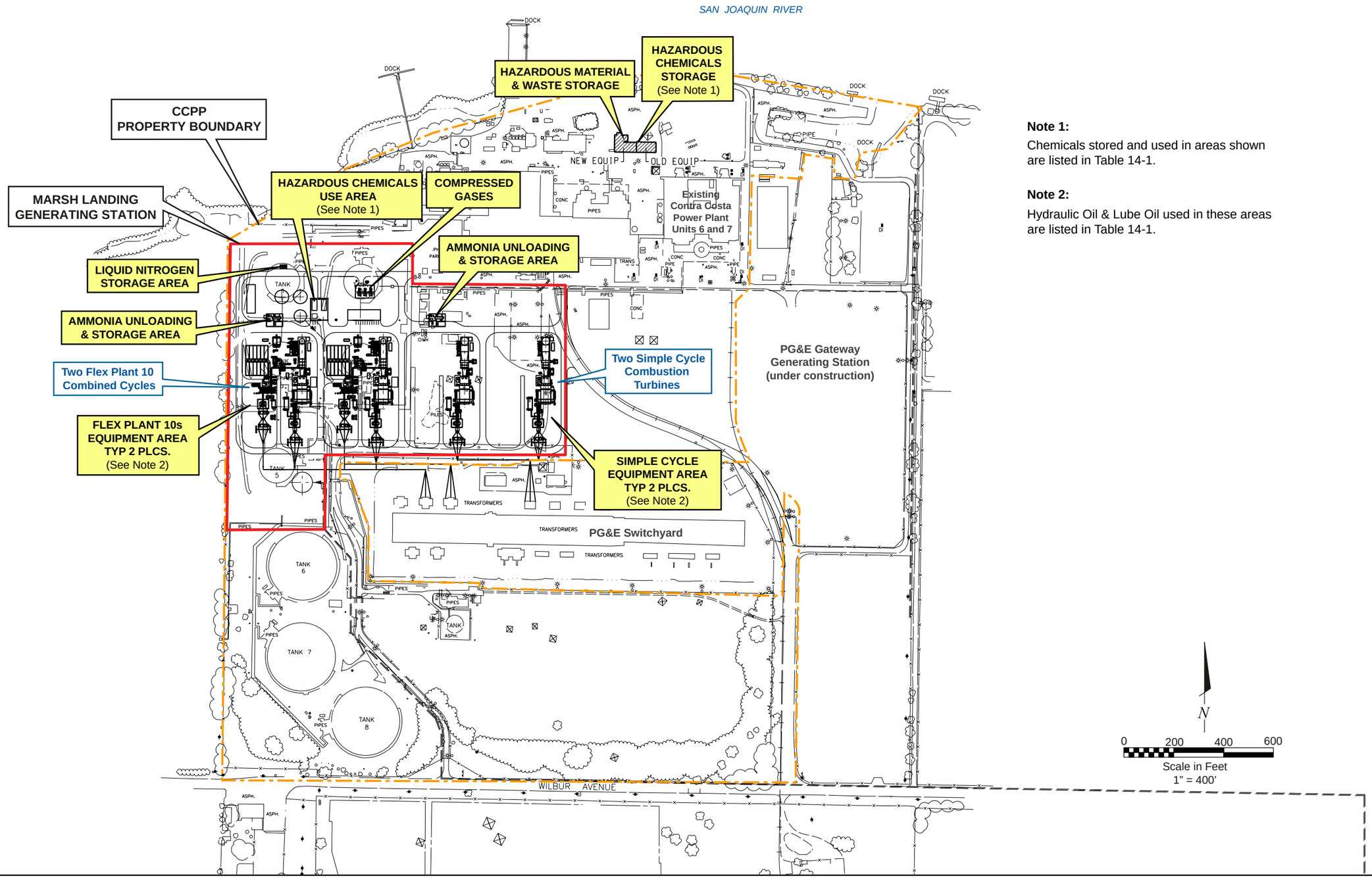
Table 14-1
Hazardous Materials to be Added at MLGS During Operational Phase (Continued)

Hazardous Material	CAS Number	Hazardous Characteristics	Regulatory Thresholds (lbs)				Primary Application	Estimated 30-Day Usage	Estimated Storage Quantity[1]	Storage Type	Storage Location (refer to Figure 7.12-1)
			Cal-ARP	Federal RQ	Federal TPQ	Federal TQ					
Carbon monoxide	630-08-0	Toxic	–	–	–	–	Instrument air	10 cu. ft.	255 cu. ft.	Cylinder	See Figure 7.12-1, Hazardous Chemical Storage Area
Argon	7440-37-1	Toxic	–	–	–	–	Instrument air	150 cu. ft.	500 cu. ft.	Cylinder	See Figure 7.12-1, Hazardous Chemical Storage Area

CAS = Chemical Abstracts Service
CNS = central nervous system
CO_2 = carbon dioxide
cu. ft. = cubic feet
HCO_3 = bicarbonate
HRSG = heat recovery steam generator
lbs = pounds
RO = reverse osmosis
RQ = reportable quantities
SiO_2 = silicon dioxide
TBD = To be determined
TPQ = Threshold Planning Quantity
TQ = Threshold Quantity

Note:

[1] Expected based on 107°F operation condition. Usage and storage will be optimized during final design



Note 1:

Chemicals stored and used in areas shown are listed in Table 14-1.

Note 2:

Hydraulic Oil & Lube Oil used in these areas are listed in Table 14-1.

Source:
CH2MHill Lockwood Greene; General Arrangement Marsh Landing Generating Station, Location of Stored & Used Areas of Hazardous Materials; Drawing No: MR-GA-ML-01-22 (Rev. A, 05/09/08)

LOCATIONS OF HAZARDOUS MATERIALS

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

December 2008
28067344

URS

FIGURE 14-1

12/03/08 vsa ..\T:\Mirant Contra Costa-Marsh Landing\Graphics\DATA REQUESTS\DR_14-1_locs hazmat.ai

DATA REQUEST

15. Please confirm that the MLGS project owner will build and own the approximately 2100-foot long gas pipeline that will provide fuel to the power plant.

RESPONSE

The applicant confirms that Mirant Marsh Landing, LLC will build (by contracting with a third party contractor) the gas transmission line between the connection to interstate TL-400 and the project. Mirant Marsh Landing, LLC will own this gas transmission line.

Technical Area: Land Use
Author: Negar Vahidi

BACKGROUND

According to AFC Section 7.4.1.3, the Contra Costa County Local Agency Formation Commission has considered the annexation proposal, the City of Antioch and Contra Costa County are actively negotiating the terms of annexation, and the City of Antioch expects to complete annexation of the area in early 2009.

DATA REQUEST

16. Given that the information provided in the AFC is from the May 2008 filing date, and that early 2009 is approaching, please provide information regarding the current status of the City of Antioch's annexation of the MLGS project site and the negotiation process taking place between the City of Antioch and Contra Costa County.

RESPONSE

Based on discussions with the City of Antioch's Planning Department on November 13, 2008, it is the applicant's understanding that the City of Antioch's annexation of the MLGS project site (and surrounding area) is pending the completion of a fiscal study and tax transfer agreement. The City of Antioch and Contra Costa County expect to complete their reviews of the fiscal study and to finalize an agreement in February 2009 (City Council approval) and March 2009 (Board of Supervisors approval). The Local Agency Formation Commission (LAFCO) approval of annexation would follow and is expected no later than July 2009.

DATA REQUEST

17. Please provide the date by which the annexation process for the unincorporated county area including the MLGS project site is expected to be completed.

RESPONSE

As stated in the response to Data Request 16 and based on discussions with the City of Antioch, it is the applicant's understanding that annexation of the unincorporated portion of the county that contains the MLGS project parcel is expected to be complete by July 2009.

BACKGROUND

The MLGS site is currently zoned as Heavy Industrial by Contra Costa County. The county's General Plan designates the majority of the site as Heavy Industrial and a narrow strip of land along the river as Open Space (OS). The City of Antioch has not pre-zoned the MLGS project site but has indicated that zoning will be compatible with the MLGS project. The City of Antioch's General Plan designates the MLGS site as General Industrial within the Eastern Waterfront Employment Focus Area.

DATA REQUEST

18. Although the City of Antioch has not pre-zoned the MLGS project site, given the upcoming expected annexation of the site to the City, please provide the specific zoning designation the City expects to attach to the MLGS site. This information is needed for staff to determine the applicable zoning standards and conduct LORS consistency analysis of the project site.

RESPONSE

The City of Antioch has indicated in discussions with the applicant that the zoning of the site will be consistent with the MLGS development plans. As indicated by the City of Antioch and documented in LAFCO's Delta Diablo Sanitation District (DDSD) Sphere of Influence Expansion Staff Report dated August 13, 2008, the zoning of the site would be M-2, Heavy Industrial. The standards for Heavy Industrial include:

> *M-2 Heavy Industrial District.* This district allows heavy industrial uses which may generate adverse impacts on health or safety. This zone applies primarily to existing heavy industrial uses. The district is consistent with the General and Rail-Served Industrial General Plan Designations. Uses include production of and extraction of metals or chemical products from raw materials, steel works and finishing mills, chemical or fertilizer plants, petroleum and gas refiners, paper mills, lumber mills, asphalt, concrete and hot mix batch plants, power generation plants, glassworks, textile mills, concrete products manufacturing and similar uses. (Article 3 § 9-5.301, Antioch Zoning Code)

BACKGROUND

AFC Table 7.4-7 (Permits Required) provides information on Lot Subdivision procedures for Contra Costa County. However, AFC Section 7.4.1.4 (Project Parcel Legal Status), on page 7.4-6, states, *"The subdivision of the parcel will be initiated with Contra Costa County or the City of Antioch, depending on the status of annexation. The process could take approximately 6 months to complete. Either agency would require approval of a tentative subdivision map through the minor subdivision process."* The Lot Subdivision procedures required by the City of Antioch are not provided in the AFC. In addition, as stated in Section 7.4.7 (Permits Required and Permit Schedule) on AFC page 7.4-15, *"[l]ocal approval will be necessary to create the new 27-acre parcel that will be the MLGS site. Mirant Delta will seek local approval to subdivide the existing CCPP site in order to sell the portion constituting the MLGS site to Mirant Marsh Landing. A lot subdivision is a discretionary approval that is subject to CEQA, but in this case, the CEQA review of the subdivision will be subsumed by the CEC's process."* In order for staff to conduct CEQA analysis of the lot subdivision, the following information is needed:

DATA REQUEST

19. Please provide detailed information regarding the City of Antioch's Lot Subdivision procedures as they would apply to the MLGS project site given that City annexation of the site is expected.

RESPONSE

The City of Antioch requires applicants seeking a subdivision that affects four or fewer parcels to file a tentative minor subdivision map and, upon approval of the tentative minor subdivision map by the City's Planning Commission, a parcel map. Within 30 days following receipt of an application, the City of Antioch must determine whether the application is complete. The Planning Commission must then hold a Public Hearing within 50 days after an application is deemed complete, and render its decision within 30 days after the Public Hearing. The minor subdivision application contains a tentative minor subdivision map, a completed environmental assessment form, a current title report, a list of property owners and addresses within 300 feet of the property (along with stamped enveloped to each), a storm water control plan and a financial deposit. These requirements are specified in detail in the following documents, which are included in Appendix B-1: (1) excerpts from the Municipal Code of the City of Antioch; (2) the City's Development Application form; (3) Procedures for Tentative Minor Subdivision Map, published by the City's Community Development Department; (4) the City's Tentative Map Submittal Checklist; (5) the City's Environmental Assessment form; and (6) the City's Storm Water Control Plan Checklist.

DATA REQUEST

20. Given the potential 6-month duration of lot subdivision, please provide detailed information on when the applicant expects to initiate the parcel subdivision process for the MLGS project site.

RESPONSE

The MLGS project site, excluding linear facilities but including construction laydown areas, is already located on the single legal parcel that is identified in the AFC. The project thus meets the requirements in Appendix B(g)(3)(iv)(C) of the CEC's siting regulations. The applicant is contemplating subdivision to facilitate its purchase of the site, but has not ruled out a lease arrangement, which could make subdivision unnecessary. If the applicant elects to proceed with a subdivision, the process will be initiated with the City according to a schedule that is linked to the commencement of construction and will be completed prior to commercial operation.

As discussed in responses to Data Requests 16 and 17, the City now predicts that annexation of the project site will be complete by July 2009. This schedule indicates that the earliest that an application for a subdivision could be filed with the City (assuming that the applicant elects to pursue subdivision) would be after July 2009. However, all of the information that the City would review as part of its environmental assessment in the subdivision process will have been reviewed and analyzed by the CEC in this proceeding. The City therefore should be in a position to rely on the CEC's assessment of the project's environmental impacts and compliance with all applicable laws, regulations, ordinances, and standards (LORS), as part of its review of the subdivision application. Also, as explained in the response to Data Request 19, the City's subdivision process should take approximately 110 days. This is less than the 6-month time frame that was included as a conservative estimate in the AFC.

In this respect, the subdivision should be able to proceed efficiently and relatively quickly once the City completes the annexation process. At the same time, given that subdivision is not necessary to comply with the CEC's regulations or other applicable LORS, the timing of filing the subdivision application should not delay the CEC's review or approval of the project. To this end, the applicant is willing to work with CEC staff and the City to ensure that all applicable requirements in the City's subdivision process are included in the scope of the CEC's review.

DATA REQUEST

21. In addition, please indicate the local agency (i.e., City of Antioch or Contra Costa County) with which the applicant expects to initiate the lot subdivision.

RESPONSE

As discussed in the response to Data Request 20, the City is proceeding with annexation of the project site and expects to complete the process by July 2009. Because the project site will be under the City's jurisdiction in the near future, the applicant expects to initiate subdivision (assuming that is the chosen path) with the City.

BACKGROUND

AFC Figure 7.4.6 (Important Farmlands) shows the MLGS project site to be within an area designated as Urban and Built-up Land by the California Department of Conservation (DOC). However, there is no discussion of the MLGS project site's specific DOC land designation in the applicable text narrative of the AFC Land Use section within the Important Farmland discussion on page 7.4-5 and Section 7.4.2.4, Impacts to Agricultural Lands.

DATA REQUEST

22. Please confirm that the specific DOC land designation for the MLGS project site is "Urban and Built-up Land."

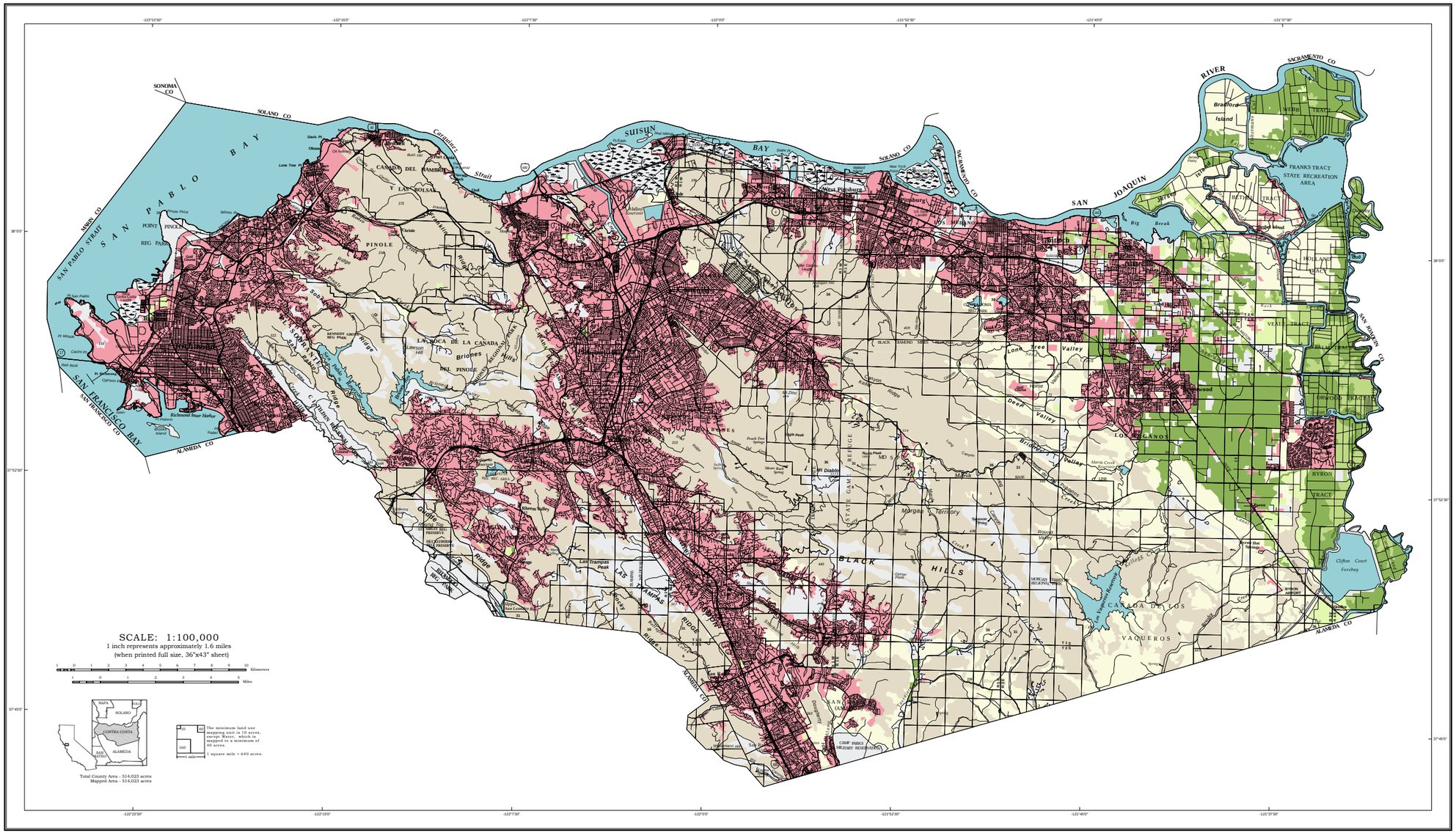
RESPONSE

The designation is correct. As shown on AFC Figure 7.4-6, the Department of Conservation (DOC) designates the site as "Urban and Built-up Land" with respect to Important Farmland (i.e., the site is not farmland of prime, unique, statewide, or local importance). Therefore, the project would not have any impacts on important farmlands. Figure 22-1 is the 2006 DOC map that was used to create AFC Figure 7.4-6 (DOC, 2006).

STATE OF CALIFORNIA
Arnold Schwarzenegger, *Governor*
THE RESOURCES AGENCY
Mike Chrisman, *Secretary*
DEPARTMENT OF CONSERVATION
Bridgett Luther, *Director*

CONTRA COSTA COUNTY IMPORTANT FARMLAND 2006

CALIFORNIA DEPARTMENT OF CONSERVATION
DIVISION OF LAND RESOURCE PROTECTION
FARMLAND MAPPING AND MONITORING PROGRAM



PRIME FARMLAND - 29,938 acres

PRIME FARMLAND HAS THE BEST COMBINATION OF PHYSICAL AND CHEMICAL FEATURES ABLE TO SUSTAIN LONG-TERM AGRICULTURAL PRODUCTION. THIS LAND HAS THE SOIL QUALITY, GROWING SEASON, AND MOISTURE SUPPLY NEEDED TO PRODUCE SUSTAINED HIGH YIELDS. LAND MUST HAVE BEEN USED FOR IRRIGATED AGRICULTURAL PRODUCTION AT SOME TIME DURING THE FOUR YEARS PRIOR TO THE MAPPING DATE.

FARMLAND OF STATEWIDE IMPORTANCE - 8,092 acres

FARMLAND OF STATEWIDE IMPORTANCE IS SIMILAR TO PRIME FARMLAND BUT WITH MINOR SHORTCOMINGS, SUCH AS GREATER SLOPES OR LESS ABILITY TO STORE SOIL MOISTURE. LAND MUST HAVE BEEN USED FOR IRRIGATED AGRICULTURAL PRODUCTION AT SOME TIME DURING THE FOUR YEARS PRIOR TO THE MAPPING DATE.

UNIQUE FARMLAND - 3,589 acres

UNIQUE FARMLAND CONSISTS OF LESSER QUALITY SOILS USED FOR THE PRODUCTION OF THE STATE'S LEADING AGRICULTURAL CROPS. THIS LAND IS USUALLY IRRIGATED, BUT MAY INCLUDE NONIRRIGATED ORCHARDS OR VINEYARDS AS FOUND IN SOME CLIMATIC ZONES IN CALIFORNIA. LAND MUST HAVE BEEN CROPPED AT SOME TIME DURING THE FOUR YEARS PRIOR TO THE MAPPING DATE.

FARMLAND OF LOCAL IMPORTANCE - 52,071 acres

THE LANDS WITHIN THE TASSAJARA AREA, EXTENDING EASTWARD TO THE COUNTY BOUNDARY AND BORDERED ON THE NORTH BY THE BLACK HILLS, THE DEER, LONE TREE AND BRIONES VALLEYS, THE ANTIOCH AREA, AND THE DELTA. THESE LANDS ARE TYPICALLY USED FOR LIVESTOCK GRAZING. THEY ARE CAPABLE OF PRODUCING DRYLAND GRAIN ON A TWO YEAR SUMMER FALLOW OR LONGER ROTATION WITH VOLUNTEER HAY AND PASTURE. THE FARMLANDS IN THIS CATEGORY ARE INCLUDED IN THE U.S. NATURAL RESOURCES CONSERVATION SERVICE'S LAND CAPABILITY CLASSES I, II, III, AND IV, AND LACK SOME IRRIGATION WATER.

GRAZING LAND - 168,662 acres

GRAZING LAND IS LAND ON WHICH THE EXISTING VEGETATION IS SUITED TO THE GRAZING OF LIVESTOCK.

URBAN AND BUILT-UP LAND - 148,966 acres

URBAN AND BUILT-UP LAND IS OCCUPIED BY STRUCTURES WITH A BUILDING DENSITY OF AT LEAST 1 UNIT TO 1.5 ACRES, OR APPROXIMATELY 6 STRUCTURES TO A 10-ACRE PARCEL. COMMON EXAMPLES INCLUDE RESIDENTIAL, INDUSTRIAL, COMMERCIAL, INSTITUTIONAL FACILITIES, CEMETERIES, AIRPORTS, GOLF COURSES, SANITARY LANDFILLS, SEWAGE TREATMENT, AND WATER CONTROL STRUCTURES.

OTHER LAND - 49,465 acres

OTHER LAND IS LAND NOT INCLUDED IN ANY OTHER MAPPING CATEGORY. COMMON EXAMPLES INCLUDE LOW DENSITY RURAL DEVELOPMENTS, BRUSH, TIMBER, WETLAND, AND RIPARIAN AREAS NOT SUITABLE FOR LIVESTOCK GRAZING, CONFINED LIVESTOCK, POULTRY, OR AQUACULTURE FACILITIES, STRIP MINES, BORROW PITS, AND WATER BODIES SMALLER THAN 40 ACRES. VACANT AND NONAGRICULTURAL LAND SURROUNDED ON ALL SIDES BY URBAN DEVELOPMENT AND GREATER THAN 40 ACRES IS MAPPED AS OTHER LAND.

WATER - 53,240 acres

PERENNIAL WATER BODIES WITH AN EXTENT OF AT LEAST 40 ACRES.

Important Farmland Maps are compiled by the Farmland Mapping and Monitoring Program (FMMP) pursuant to Section 65570 of the California Government Code. To create the maps, FMMP combines current land use information with U.S. Department of Agriculture-Natural Resources Conservation Service (NRCS) soil survey data. Soil units qualifying for Prime Farmland and Farmland of Statewide Importance are determined by the NRCS. Changes to soil profiles subsequent to publication of NRCS soil surveys are not reflected on this map. This map was developed using NRCS digital soil data (SSURGO) and may contain individual soil units as small as one acre.

Land use status is determined using current and historic aerial imagery and field verification. Principal imagery sources include the U.S. Department of Agriculture National Agricultural Imagery Program, AirPhotoUSA, the High Altitude Missions Branch of NASA, EROS Data Center and SIOT Data Corporation. Additional data on land management and land use conversion activity was made available from the U.S. Fish and Wildlife Service, U.S. Forest Service, California Department of Fish and Game, California Integrated Waste Management Board, and various local government agencies. Map reviewers at the local level contribute valuable information with their comments and suggestions.

Cultural base information for the Important Farmland Maps was compiled from the U.S. Geological Survey, the California Spatial Information Library (http://gis.ca.gov/), Geographical Data Technology, Inc., and current imagery.

This map should be used within the limits of its purpose - as a current inventory of agricultural land resources. This map does not necessarily reflect general plan or zoning designations, city limit lines, changing economic or market conditions, or other factors which may be taken into consideration when land use policies are determined. This map is not designed for parcel-specific planning purposes due to its scale and the ten-acre minimum land use mapping unit. Classification of important farmland and urban areas on this map is based on best available data. The information has been delineated as accurately as possible at 1:24,000-scale, but no claim to meet 1:24,000 National Map Accuracy Standards is made due to variations in the quality of source data.

The Department of Conservation makes no warranties as to the suitability of this product for any particular purpose.

Additional data is available at www.conservation.ca.gov/dlrp/fmmp, including detail on the program, map categories, statistics, field summaries, and GIS data for download. Contact the:

Farmland Mapping and Monitoring Program
801 K Street, MS 18-01
Sacramento, CA 95814
Phone: (916) 324-0859
e-mail: fmmp@conservation.ca.gov

© California Department of Conservation, Division of Land Resource Protection, 2007.

Map published June 2007.

Reference:
State of California, Department of Conservation, Division of Land Resource Protection, 2006. Farmland Mapping and Monitoring Program. Contra Costa County Important Farmland 2006.
http://www.conservation.ca.gov/dlrp/fmmp/Pages/Index.aspx

CONTRA COSTA COUNTY IMPORTANT FARMLAND 2006

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

December 2008
28067344

URS

FIGURE 22-1

11/24/08 vsa ..\T:\Mirant Contra Costa-Marsh Landing\Graphics\DATA REQUESTS\DR_22-1_ccc imp farmland.ai

Technical Area: Socioeconomics

Author: Joseph Diamond, Ph.D.

BACKGROUND

Staff needs to know the year that corresponds to all dollar estimates. The time value of money should be reflected for all economic estimates.

DATA REQUEST

23. Please verify the year for all economic estimates (e.g., construction costs, construction and operation payroll, property taxes, school impact fees, etc.) and IMPLAN construction and operation economic impacts which include secondary impacts. Some dollar estimates in AFC Section 1.1, Project Overview, page 1-2, and Section 7.8.2, Environmental Consequences, pages 7.8-9 to 11, are in 2008 dollars (i.e., project construction costs and construction employment expenditures, operations and maintenance materials for the Five-County Study Area [Contra Costa, Sacramento, San Joaquin, Alameda, and Solano Counties], and IMPLAN operation estimates).

RESPONSE

All of the economic analyses completed for the MLGS AFC are in 2008 dollars.

BACKGROUND

Gross economic benefits including secondary impacts (indirect and induced) are an important part of the MLGS project.

DATA REQUEST

24. Please show your calculations for the construction and operation employment, income, and output Type II multipliers.

RESPONSE

The calculations are described in footnote 3 on page 7.8-10 of the Supplemented AFC.

Output includes spending for materials and supplies (nonlabor costs), plus value added, which is comprised of employee compensation, proprietary income, other property income, and indirect business taxes. The IMPLAN Social Accounting Matrix multipliers were used for this analysis. These multipliers are the direct, indirect, and induced effects, where the induced effect is based on information in the social account matrix. This relationship accounts for social security and income tax leakage, institution savings, and commuting. It also accounts for inter-institutional transfers. IMPLAN does not directly calculate multipliers; however, multipliers have been calculated based upon the IMPLAN model results. The approximate output multiplier for project construction is 2.66 and the approximate output multiplier for project operation is 1.79.

DATA REQUEST

25. Socioeconomic Table 7.8-12, Construction Staff By Trade, page 7.8-33 of the AFC appears to reflect generation, demolition of five fuel oil tanks, and linear facilities such as the natural gas pipeline. Staff is unclear if the electric transmission line between the PG&E switchyard and the MLGS is included in Table 7.8-12. If complete workforce estimates were not used, please revise the tables including the construction and operation economic benefits associated with this, such as payroll, local materials and supplies, sales tax, and secondary impacts, etc. Then, if necessary please recalculate the construction and operation secondary impacts and related multipliers.

RESPONSE

The construction staffing tables (AFC Table 2.7-1a, Table 2.7-1b, Table 7.8-12a, and Table 7.8-12b) include staff for the demolition of the tanks, linear facilities, and electrical transmission line connection construction. As such, no recalculations are necessary.

DATA REQUEST

26. If you find that Data Request 25 requesting more complete linear facilities in your construction and operation estimates is not needed because the secondary impacts are likely to be small and may not coincide with peak construction, please elaborate using numeric information and other rationale, if appropriate, to bound the economic impacts.

RESPONSE

As explained in the response to Data Request 25, the AFC included the workforce staff for all components of the project. No additional analyses are needed.

Technical Area: Soil and Water Resources

Author: Richard Latteri

BACKGROUND

In Delta Diablo Sanitation District's (DDSD) "Will Serve Letter" dated June 25, 2008, DDSD states:

> *… staff has analyzed DDSD's current and expected plant flows for the years 2011 and beyond. Based on this analysis, DDSD has sufficient uncommitted quantities of recycled water to support Mirant's anticipated peak usage of 1.5 million gallons per day at peak flow of 1,400 gallons per minute of recycled water.*

DATA REQUEST

27. Please provide a list of recycled water customers that would receive tertiary treated recycled water from DDSD's proposed Bridgehead Lift Station (BLS) recycled water facility, their contractual delivery amounts, and a discussion of the long-term (30-35 years) recycled water supply reliability based on current and future supply and demand projections for tertiary treated recycled water from this facility.

RESPONSE

The DDSD's Bridgehead Lift Station (BLS) is a lift station for raw sewage. Currently no recycled water is produced at this location and all raw sewage collected at BLS is conveyed to DDSD's water treatment facility.

The proposed satellite treatment plant at the BLS would produce recycled water from raw sewage. The plant would be funded by Mirant Marsh Landing, LLC, and constructed by DDSD on a schedule compatible with the MLGS project. The plant would be dedicated to MLGS. There would be no other customers that would receive recycled water from this facility.

The reliability of the long-term recycled water supply is dependent on system wastewater influent flows. While DDSD system wastewater flows are expected to increase an average of 2 percent per year over the long term, influent flows at BLS are expected to remain level in the short term due to current economic conditions in the area. According to DDSD, the current and expected influent flows to the BLS are sufficient to meet the anticipated MLGS demand.

While construction of the BLS could affect recycled water operations at DDSD's Recycled Water Facility (RWF), the wastewater influent flows available to the RWF exceed the recycled water demands of DDSD's current customers at this facility. DDSD currently provides tertiary recycled water produced from its RWF to Calpine Corporation (Calpine) for the Los Medanos Energy Center (LMEC) and the Delta Energy Center (DEC), as well as to the City of Pittsburg for landscape irrigation. The current capacity of the RWF is 12.8 million gallons per day (mgd). DDSD has a contractual obligation to Calpine to fulfill the recycled water demands of both LMEC and DEC, which average 7.0 mgd. The peak day demand for the City's landscape irrigation sites is 1.2 mgd. During the summer 2006, the demand for recycled water (LMEC and DEC, but not City of Pittsburg irrigation use) was only approximately 56 percent of the DDSD system wastewater influent flow. In addition, industrial recycled water demands are considered higher priority over other demands to ensure an acceptable level of delivery reliability over the long term. Based on anticipated wastewater influent flows, there would be sufficient recycled water supplies for DDSD's current customers and the proposed project.

DATA REQUEST

28. Please provide the source (potable, recycled, or groundwater) and quality of the water that would be used during construction of the Marsh Landing Generating Station (MLGS).

RESPONSE

Similar to the Gateway Generating Station, the source of construction water would be City of Antioch potable water. AFC Table 7.14-1 summarizes the water quality of the City of Antioch water supply.

DATA REQUEST

29. Please provide in tabular format the specific uses and volume of construction water in gallons per day and total annual consumption in acre-feet for construction of the MLGS.

RESPONSE

AFC Table 2.7-4 tabulates the construction water requirements per month for the duration of project construction. Table 29-1 provides additional detail with respect to specific construction water uses and shows water consumption in average gallons per day and total annual consumption in acre-feet.

Table 29-1
Estimated Construction Water Uses

Construction Water Use	Average Daily Water Usage (gallons per day)	Total Annual Water Usage (acre-feet)
Consumption[1]	2,300	3
Dust Control[1]	4,400	3
Concrete Washout[2]	250	0.1
Hydrostatic Testing[3]	4,500	2
Steam Blow[4]	50,000	6

Notes:

[1] Use would occur over a 33-month period. Total annual amount reflects maximum 12-month usage.
[2] Use would occur over a 7-month period. Total annual amount assumes that all usage would occur in same year.
[3] Use would occur over 5 months. Total annual amount assumes that all usage would occur in same year.
[4] Use would occur over two 1-month periods. Total annual amount assumes that all usage would occur in same year.

BACKGROUND

In their 'Will Serve Letter" dated June 25, 2008, DDSD also states:

> *Annexation to the District's service area would also be required if the pending application at the Local Agency Formation Commission (LAFCO) is not approved, and a formal notification process with the Contra Costa Water District is required. Subject to DDSD Board approval of a definitive agreement between DDSD and Mirant, DDSD is willing to make such water available to Mirant for its proposed generation facility.*

DATA REQUEST

30. Please provide a discussion of the approval process and timeframe for the LAFCO decision for annexation of the MLGS into the DDSD's service area.

RESPONSE

The DDSD service area amendment will occur with the City of Antioch annexation, because the proposed LAFCO action addresses both. For timeframe, see the response to Data Request 17.

DATA REQUEST

31. Please provide a DDSD Board approved agreement for the long-term delivery (30-35 years) of tertiary treated recycled water at a peak delivery rate of 1,400 gallons per minute and up to 1.5 million gallons per day.

RESPONSE

As stated in the applicant's December 2, 2008 letter to the CEC Staff and Committee, Mirant Marsh Landing is not able to provide the requested agreement as this time. Mirant Marsh Landing and DDSD are in discussions regarding the terms of a long-term recycled water supply agreement for the MLGS, but an agreement has not yet been negotiated. Mirant Marsh Landing expects to have an executed DDSD Board-approved agreement in place before construction of the MLGS begins. Note that DDSD has provided a "will serve" letter for the MLGS, which was submitted with the AFC.

BACKGROUND

Mirant Marsh Landing, LLC (applicant) proposes to use recycled water provided by DDSD from a new satellite treatment facility that would be designed, constructed, and operated by DDSD at the existing BLS, which would be within the jurisdictional area of the Central Valley Regional Water Quality Control Board (CVRWQCB).

DATA REQUEST

32. Please define the level of Title 22 treatment (disinfected tertiary, disinfected secondary-2.2, or disinfected secondary-23) of all recycled water sources proposed for use at the MLGS.

RESPONSE

All recycled water produced by DDSD for use at the MLGS will meet or exceed the Title 22 requirements for disinfected tertiary recycled water for unrestricted use. However, as it relates to the MLGS, this water is not required to comply with California's Code of Regulations Title 22, given that the water will not be used for cooling tower makeup water.

DATA REQUEST

33. Please provide a discussion of the permits and over-sight requirements of the CVRWQCB, Department of Public Health (DPH), and the City of Antioch for the supply and use of recycled water at the MLGS and whether water recycling requirements would be prescribed by CVRWQCB prior to the delivery of recycled water to the MLGS.

RESPONSE

DDSD is currently permitted to produce and distribute recycled water by the San Francisco Bay Regional Water Quality Control Board. DDSD has initiated discussions with the Central Valley Regional Water Quality Control Board (CVRWQCB) regarding a satellite treatment facility at BLS to determine what, if any, oversight requirements would be imposed by the CVRWQCB. If the CVRWQCB determines they have jurisdiction over this facility, DDSD will comply with all prescribed requirements prior to the delivery of recycled water to the MLGS.

DATA REQUEST

34. Please provide the schedule for completion of the BLS recycled water treatment facility and a description of the process and on-site equipment required to produce recycled water that includes the redundant and standby equipment necessary for the reliable supply of recycled water to the MLGS.

RESPONSE

The construction schedule for the satellite treatment facility at BLS will correspond with construction of the MLGS to ensure that recycled water is available to meet the MLGS demand. The agreement between Mirant Marsh Landing and DDSD, which is referred to in the response to Data Request 31, will spell out the deadlines and commitments for the construction and operation of the satellite treatment facility. According to DDSD, it typically takes approximately 15 to 18 months for the design and construction of a satellite treatment facility of the size proposed for MLGS, which would be well within the MLGS 33-month construction period.

AFC Figure 6-1 provides a preliminary layout of the equipment required to provide tertiary treatment to raw wastewater at the satellite treatment facility. The facility would be a membrane bioreactor/ultraviolet disinfection system that would include screening and grit removal, aeration tanks, membrane tanks, and ultraviolet disinfection. The specific types and sizes of these features will be determined by DDSD during design.

To ensure a high level of reliability, the following redundancy features have been incorporated into the recycled water supply system design:

- The BLS already has redundant and standby equipment to handle the sewage influent. These features include a 24-inch force main along Wilbur Avenue, an emergency storage tank and a 900-kilovolt diesel generator to provide backup power supply to the pumps. As such, any power outages and interruptions to flows would be very brief (i.e., on the order of minutes).

- A 1.8-million-gallon raw water storage tank will be provided on the MLGS site. This tank has been sized to provide one day of water usage under peak operating conditions in the event of a water supply interruption.

- The MLGS generating units use technology which allows a high level of operation flexibility. The units can be started up or shut down within a few minutes (less than 12 minutes). In the event of a water supply system interruption, MLGS has the flexibility to curtail operations of the FP10 Units or turn off the power augmentation to reduce water consumption.

DATA REQUEST

35. Please provide the names and telephone numbers of the regional board and DPH personnel who are responsible for recycled water permitting and use.

RESPONSE

The regional board and Department of Public Health personnel who will be responsible for permitting of the satellite recycled water facility have not yet been determined. This determination will be made as part of DDSD's ongoing discussions with the CVRWQCB (see the response to Data Request 34).

General contact information is as follows:

- California Department of Health
  Jeff Stone, Recycled Water Specialist
  (805) 566-9797

- Central Valley Regional Water Quality Control Board
  Lonnie Wass, Non-Chapter 15 Permits
  (559) 445-6051

BACKGROUND

The San Francisco Bay Regional Water Quality Control Board reissued waste discharge requirements under the National Pollutant Discharge Elimination System permit (No. CAS0029912) for the Contra Costa Clean Water Program (Program). The City of Antioch, under Provision C.3 of the Program, requires significant redevelopment projects to design and implement storm water treatment measures to reduce the discharge of storm water pollutants to the maximum extent practicable.

DATA REQUEST

36. Please provide a draft Storm Water Control Plan per the Provision C.3 requirements of the Contra Costa Clean Water Program NPDES permit No. CAS0029912 that meets the City of Antioch's municipal standards for the discharge of storm water pollutants.

RESPONSE

A draft Storm Water Control Plan is provided in Appendix C.

Technical Area: Transmission System Engineering

Authors: Laiping Ng and Mark Hesters

BACKGROUND

The California Environmental Quality Act (CEQA) requires the identification and description of the "Direct and indirect significant effects of the project on the environment." The Application for Certification requires discussion of the "energy resource impacts which may result from the construction or operation of the power plant." For the identification of impacts on the transmission system resources and the indirect or downstream transmission impacts, staff relies on the System Impact and Facilities Studies for insuring the interconnecting grid meets the California Independent System Operator (California ISO) reliability standards. The studies analyze the effect of the proposed project on the ability of the transmission network to meet reliability standards. When the studies determine that the project will cause a violation of reliability standards, the potential mitigation or upgrades required to bring the system into compliance are identified. The mitigation measures often include the construction of downstream transmission facilities. CEQA requires the analysis of any downstream facilities for potential indirect impacts of the proposed project. Without a complete System Impact Study (SIS) or Facilities Study Report (FSR), staff is not able to fulfill the CEQA requirement to identify the indirect effects of the proposed project.

The SIS indicated several options to mitigate the normal and contingency overloads caused by the addition of the Marsh Landing Generation Station project (MLGS). Staff needs additional documentation and information to support the proposed mitigation measures in order to prepare the Staff Assessment for the MLGS Project.

DATA REQUEST

The SIS, using the 2013 Summer Peak Full-loop base case, indicates that under normal and contingency conditions, some 230 kV transmission lines in the study area will be loaded above their line ratings. The proposed mitigations for the overloads will be: transmission line re-rates, reconductoring, and reducing the proposed MLGS generation. The overloaded lines are:

- Contra Costa – Brentwood 230 kV lines,
- Contra Costa – Wind Master 230 kV lines,
- Delta Pump – Wind Master 230 kV lines,
- Las Positas – Newark D 230 kV lines,
- Cayetano – USWP – JRW – Lonetree 230 kV lines.

37. Please select the mitigation alternative and provide evidence showing the selected mitigation measure is feasible and effective.

RESPONSE

With regard to the above-mentioned transmission lines and any other N-1 transmission line overloads, the applicant's overload mitigation preference is to:

1. Request a transmission line re-rate from PG&E.

2. In the event that a transmission line re-rate is not feasible, then the applicant will formally request a Special Protection Scheme (SPS) in accordance with the

current California Independent System Operator (CAISO) Grid Planning Standards.

3. If the SPS is not granted, then transmission line reconductoring would be selected.

As stated in the applicant's December 2, 2008 letter to the CEC Staff and Committee, Mirant Marsh Landing is not able to select a mitigation alternative or confirm its feasibility at this time. As noted above, the CAISO had suspended the processing of applications for Large Generator Interconnection Agreements (LGIAs) while it devised a new system for reviewing and approving LGIA applications. Mirant Marsh Landing filed its LGIA application and submitted its deposit in time for the MLGS to be included in the CAISO's transition cluster group. Prior to November 25, 2008 (the deadline set by the CAISO), Mirant Marsh Landing submitted the required forms and additional payments to the CAISO for inclusion as part of the transition cluster study, which resumes the CAISO's LGIA process. Commencing this month, Mirant Marsh Landing expects to be able to re-initiate discussions with the CAISO and PG&E regarding appropriate and feasible mitigation measures, although some of these analyses will be part of the CAISO's LGIA process. Mirant Marsh Landing will follow up with Staff in the response to Data Requests 37 through 40 as soon as it receives the requisite feedback from the CAISO and PG&E.

BACKGROUND

As required by the California ISO planning standards, the SIS performed with the 2013 summer peak case does not include power flow analysis for Category B contingencies of possible simultaneous combinations of a transmission line /transformer and a generator (L-1 & G-1), and for Category C contingencies of multiple transmission elements (more than N-2) in the SIS. The SIS also does not include analyses for transient stability, short circuit, post-transient voltage and reactive power deficiency.

DATA REQUEST

38. If re-rate is selected, please provide the following:

a. Provide the current line ratings and the current wind speeds that are used for all the proposed re-rate lines listed above.

b. Provide the future line ratings and wind speeds that would be used for all the proposed re-rate lines listed above.

c. Provide evidence showing re-rate of these transmission lines is feasible and effective (letter from the California ISO).

RESPONSE

Re-rating of the lines is the preferred mitigation option. Given that PG&E is the current owner of the transmission lines that would require re-rates, they would be responsible for obtaining the information regarding re-rates and the overall feasibility of the request. The applicant is unable to provide the requested information at this time, as stated in the applicant's December 2, 2008 letter to CEC Staff and Committee.

DATA REQUEST

39. If reconductoring is selected, please provide the following:

a. Detailed information on each of the reconductored transmission lines. Information should include the number of poles required (new or existing), pole configurations, conductor types, sizes, and lengths.

b. Provide a general environmental analysis and any recommended mitigation measures sufficient to meet CEQA requirements for indirect project impacts.

RESPONSE

As stated in the response to Data Request 38, re-rating is the preferred option. The applicant is unable to provide PG&E's or CAISO's approval for re-rating at this time. Therefore, reconductoring of the identified lines is assumed to be a worst-case scenario with regard to potential indirect environmental impacts.

PG&E is the owner of the transmission studies. Until PG&E completes its own studies and engineering design, detailed information for each of the reconductored transmission lines, such as the number of poles required (new or modified), pole configurations, conductor types, sizes, and lengths cannot be provided.

To comply with the CEC's need to evaluate indirect project impacts, the applicant has prepared a general environmental analysis based on typical reconductoring construction activities. This analysis is provided in Appendix D.

DATA REQUEST

40. If de-generation is selected, please provide the following:

a. Provide the amount of MLGS generation reduction required to mitigate the transmission line overloads under normal and contingency conditions.

b. Provide evidence showing the de-generation is feasible and effective (letter from California ISO).

RESPONSE

The applicant does not consider this option to be feasible.

BACKGROUND

The CAISO Controlled Grid Planning Criteria require that multiple element contingencies (Category "C") be studied in the SIS report. Staff needs a complete study on Category "C" contingencies, a short circuit study and dynamic stability analysis using the 2013 Summer Peak Full-loop base case.

DATA REQUEST

41. Please provide Category "C" study on:

a. Selected bus outages within the study area,

b. Selected outages caused by selected breaker failures (excluding bus tie and sectionalizing breakers) at bus section,

c. Selected combination of any two-generator/transmission line/transformer outages (except ones included in the Category "B") within the study area.

RESPONSE

As stated in the applicant's December 2, 2008 letter to the CEC Staff and Committee, Mirant Marsh Landing requires additional time to respond to Data Request 41. Mirant Marsh Landing has engaged its third party transmission consultant to prepare the requested study and the work is in progress. Mirant Marsh Landing will submit responses to Staff on a rolling basis as they become available from the consultant. Mirant Marsh Landing understands that its consultant will be able to finish all of the items requested in Data Request 41 by early February 2009.

DATA REQUEST

42. Please provide a Short Circuit Duty Analyses.

RESPONSE

As stated in the applicant's December 2, 2008 letter to the CEC Staff and Committee, Mirant Marsh Landing is unable to perform or provide the requested Short Circuit Duty Analyses. PG&E owns the existing transmission system and is the only entity that can perform these Short Circuit Duty Analyses. Neither Mirant Marsh Landing nor its consultant have access to the impedance models and equipment rating limitation of every serial element in the PG&E Bay Area system, which are needed to perform the Short Circuit Duty Analyses accurately. Additionally, Short Circuit Duty Analyses will be performed by PG&E at the request of the CAISO in later studies. It is expected that the equipment upgrades associated with Short Circuit Duty Analyses would be limited to inside the existing footprints of existing substations.

DATA REQUEST

43. Please provide a Dynamic Stability Analyses.

RESPONSE

As stated in the applicant's December 2, 2008 letter to the CEC Staff and Committee, Mirant Marsh Landing requires additional time to respond to Data Request 43. Mirant Marsh Landing has engaged its consultant to prepare the requested analysis and the work is in progress. Mirant Marsh Landing will submit the analysis when it becomes available from the consultant, which is expected no later than early February 2009.

DATA REQUEST

44. Please provide a Reactive Power Deficiency Analysis

RESPONSE

As stated in the applicant's December 2, 2008 letter to the CEC Staff and Committee, Mirant Marsh Landing requires additional time to respond to Data Request 44. Mirant Marsh Landing has engaged its consultant to prepare the requested analysis and the work is in progress. Mirant Marsh Landing will submit the analysis when it becomes available from the consultant, which is expected no later than early February 2009.

DATA REQUEST

45. Please provide system protection and substation evaluation.

RESPONSE

As stated in the applicant's December 2, 2008 letter to the CEC Staff and Committee, Mirant Marsh Landing is unable to perform or provide the requested system protection and substation evaluation. PG&E owns the existing transmission system and is the only entity that can perform this evaluation. Also, a thorough Short Circuit Duty Analysis is required to complete this request, and PG&E is best positioned to complete that, as explained in the response to Data Request 42. As explained in that response, neither Mirant Marsh Landing nor its consultant have access to the impedance models and equipment rating limitation of every serial element in the PG&E Bay Area system, which are needed to perform the Short Circuit Duty Analyses accurately. Additionally, Short Circuit Duty Analyses will be performed by PG&E at the request of the CAISO in later studies. It is expected that the equipment upgrades associated with Short Circuit Duty Analyses would be limited to inside the existing footprints of existing substations.

Technical Area: Waste Management

Author: Cheryl Closson

BACKGROUND

The Phase I Environmental Site Assessment (Phase I ESA) prepared by URS Corporation for the proposed Marsh Landing Generating Station (MLGS) project (Appendix R, Volume II of the project AFC) provides information on the main project site but does not address the areas associated with the gas and water supply linear features and the water treatment facility to be constructed as part of the project. A Phase I ESA, or equivalent information, is needed for the properties along the gas and water pipeline routes and for the water treatment facility site to determine if past or present uses of the property have caused, or threaten to cause, contamination that might impact, or be impacted by, construction and operation of the proposed project.

DATA REQUEST

46. Please provide a Phase I ESA, or equivalent information, addressing the past and present uses of property along and adjacent to the project's gas and water supply pipelines and at the water treatment facility site. The requested information should include an evaluation addressing whether or not past or present site conditions may have resulted in contamination, or potential contamination, that could impact construction and/or operation of the proposed project.

RESPONSE

The gas transmission line will be constructed within the property of the original Contra Costa Power Plant, which is addressed in the 1997 Phase I Environmental Site Assessment (ESA) and the 1998 Phase II ESA (see the response to Data Request 47).

Most of the water supply and wastewater pipeline route is also covered by the 1997 Phase I ESA and the 1998 Phase II ESA. In addition, the water supply and wastewater pipeline route is within the area covered by the record search for the 2008 Contra Costa Power Plant and MLGS Phase I ESA (provided as Appendix R of the AFC). The record search was performed to identify areas of potential hazardous substances, wastes or petroleum products that could impact the project site.

The water treatment facility site (i.e., BLS) is owned by DDSD. The applicant has requested a Phase I ESA or equivalent information from DDSD and will forward it to the CEC when it has been received.

BACKGROUND

The Phase I ESA prepared by URS for the proposed MLGS project cites and summarizes certain findings and recommendations contained in other environmental assessments, studies, and reports previously conducted to evaluate conditions in the area of the project site. The information provided in these assessments was used in part to support the conclusions and recommendations provided in the URS Phase I ESA. Review of these reports will assist Energy Commission staff's assessment of site conditions and potential impacts associated with the proposed MLGS project.

DATA REQUEST

47. Please provide copies of the following reports and publications identified in the Phase I ESA prepared by URS for the MLGS project.

- Phase I Environmental Site Assessment, Contra Costa Power Plant, Antioch, California. Prepared by Camp Dresser and McKee, October 1997.
- Phase II Environmental Site Assessment, Pacific Gas and Electric Company (PG&E), Contra Costa Power Plant, Antioch, California. Prepared by Fluor Daniel GTI, 1998.
- Hazardous Materials Business Plan, Contra Costa Switchyard, Antioch, California. Prepared by PG&E, March 2007.

RESPONSE

The Phase I ESA prepared by Camp, Dresser, and McKee was provided in the MLGS AFC, Appendix R – Phase I Environmental Site Assessment, as Appendix E – Previous Reports. It is therefore not resubmitted here.

The reference to the Contra Costa Switchyard Hazardous Materials Business Plan (HMBP) was incorrect. The reference should have been to the Hazardous Materials Business Plan, Contra Costa Power Plant, Contra Costa County, February 2007.

One set of the CCPP HMBP and the Phase II ESA is provided to the CEC along with these responses to Data Requests.

BACKGROUND

Portions of the MLGS facility would be constructed in an area of the existing Contra Costa Power Plant (CCPP) that is currently occupied by above-ground fuel oil storage tanks (Tanks 1 though 5). The project AFC states that Mirant Delta (the CCPP owner) plans to drain, clean, and demolish all of the existing storage tanks (Tanks 1 through 8) in 2008. However, should this not occur, the AFC states that demolition of Tanks 1 through 5 would be done as part of the proposed MLGS project. The Phase I ESA conducted for the proposed project identified the fuel tank area as a Recognized Environmental Condition (REC) and recommended sampling under and around the tanks to assess potential impacts from releases of fuel oil or other contaminants.

While the AFC states that demolition of the tanks may be done as part of the proposed project, there is limited information in the AFC addressing any sampling and remediation that may be needed in the area. As noted above, the tank area is identified as an REC. Any environmental investigation of the site after demolition and completion of any necessary remedial actions should be done well in advance of any project construction to ensure that possible contamination is identified and mitigated to a level of insignificance. Investigation and remediation of hazardous waste during the construction phase of a project should only be done as a contingency measure, when previously unknown contamination is encountered during the normal construction activities.

DATA REQUEST

48. Please provide an estimated date for the demolition of the fuel oil tanks on the proposed project site, along with a schedule and workplan for investigation and possible remediation of soils in the vicinity of the tanks. The schedule and workplan should also be reviewed and approved by the Department of Toxic Substances Control (DTSC) prior to submittal to the Energy Commission, unless other arrangements are made with staff to address or accommodate DTSC review.

RESPONSE

As stated in the applicant's December 2, 2008 letter to the CEC Staff and Committee, Mirant Marsh Landing requires additional time to respond to Data Request 48. Mirant Marsh Landing is not yet in a position to propose a work plan for investigation of soils and groundwater at the tank site. First, as stated in the AFC, demolition of the existing fuel oil tanks may not occur as part of the project proposed in the AFC. Instead, Mirant Delta, LLC (owner of the tanks and an affiliate of Mirant Marsh Landing) (Mirant Delta) may opt to conduct such demolition prior to certification of the MLGS project as part of Mirant Delta's ongoing operations of the site. Mirant Delta is still evaluating possible courses of action. Demolition of the tanks could begin as early as first quarter 2009 as part of Mirant Delta's operations. On the other hand, as stated in Table 2.7-3 of the AFC, demolition of the five tanks would occur during the first six months of construction if included as part of the MLGS project.

Second, Mirant Delta is contractually obligated to allow the former owner of the site to review work plans relating to certain instances of remediation at the site. This obligation arises from contractual arrangements in which the former owner retained responsibility for certain remediation activities at the site. Once Mirant Delta has finalized its plans relating to demolition of the existing fuel tanks and satisfied its contractual obligations with respect to the former owner of the site, Mirant Marsh Landing will follow up with Staff in response to Data Request 48.

Finally, the soils beneath the five fuel oil tanks are currently not accessible. Therefore, it is not feasible (or necessary) to undertake investigation activities in these areas until demolition and/or removal of these structures has been completed. Mirant Marsh Landing will address the need to further investigate any identified Recognized Environmental Conditions (RECs) in sufficient time to allow construction to proceed. As is typical for construction activities at heavy industrial sites such as a power plant, potential exposure to subsurface contaminants by construction workers or the public during construction activities would be managed through the development of a Site Safety Plan for activities during construction. This would provide proper monitoring, personnel protection equipment, and engineering controls during construction in order to minimize potential exposures.

BACKGROUND

The project's Phase I ESA also noted that there are several areas with "remedial issues" within the proposed project site. These areas were identified as RECs because they have petroleum hydrocarbons or arsenic in soil or groundwater at concentrations that exceed regulatory thresholds. The Phase I ESA also identified the CCPP septic system and leach field, the former construction debris piles, and the former paint storage shed area as RECs and an area of concern (AOC), respectively, due to potential soil and groundwater contamination. However, there is limited information in the AFC addressing any sampling and remediation that may be needed in these areas. As with the fuel oil tank areas, environmental investigation of these areas of the project site and completion of any necessary remedial action should be done well in advance of any project construction to ensure that any possible contamination is identified and mitigated to a level of insignificance.

DATA REQUEST

49. Please provide a schedule and workplan for investigation and possible remediation of soils and groundwater in all of the following areas of the proposed project site:

a. areas identified as having "remedial issues";
b. areas potentially impacted by the CCPP septic system discharges;
c. areas around the former construction debris piles; and
d. areas around the former paint storage shed.

The schedule and workplan should also be reviewed and approved by the Department of Toxic Substances Control (DTSC) prior to submittal to the Energy Commission, unless other arrangements are made with staff to address or accommodate DTSC review.

RESPONSE

As stated in the applicant's December 2, 2008 letter to the CEC Staff and Committee, Mirant Marsh Landing requires additional time to respond to Data Request 49. Mirant Marsh Landing is not yet in a position to propose a work plan for investigation of soils and groundwater at the identified areas.

There is no need to undertake investigation activities in these areas until the project has been approved for construction. Mirant Marsh Landing will address the need to further investigate any identified RECs in sufficient time to allow construction to proceed. As is typical for construction activities at heavy industrial sites such as a power plant, potential exposure to subsurface contaminants by construction workers or the public during construction activities would be managed through the development of a Site Safety Plan for activities during construction. This would provide proper monitoring, personnel protection equipment, and engineering controls during construction in order to minimize potential exposures.

Finally, Mirant Delta is contractually obligated to allow the former owner of the site to review work plans relating to certain instances of remediation at the site. This obligation arises from contractual arrangements in which the former owner retained responsibility for certain remediation activities at the site. Once Mirant Delta has satisfied its contractual obligations with respect to the former owner of the site, Mirant Marsh Landing will follow up with staff in response to Data Request 49.

Technical Area: Worker Safety and Fire Protection
Author: Alvin Greenberg

Background

Section 2.6 states that Figures 2.6-1 and 2.6-2 depict (amongst other things) the "access roads" to the MLGS site. However, the location of access points is not clear from these figures and therefore staff cannot determine if there are at least two access points. This is not discussed anywhere else in the AFC. Staff needs this information in order to assess fire and hazardous materials spill response.

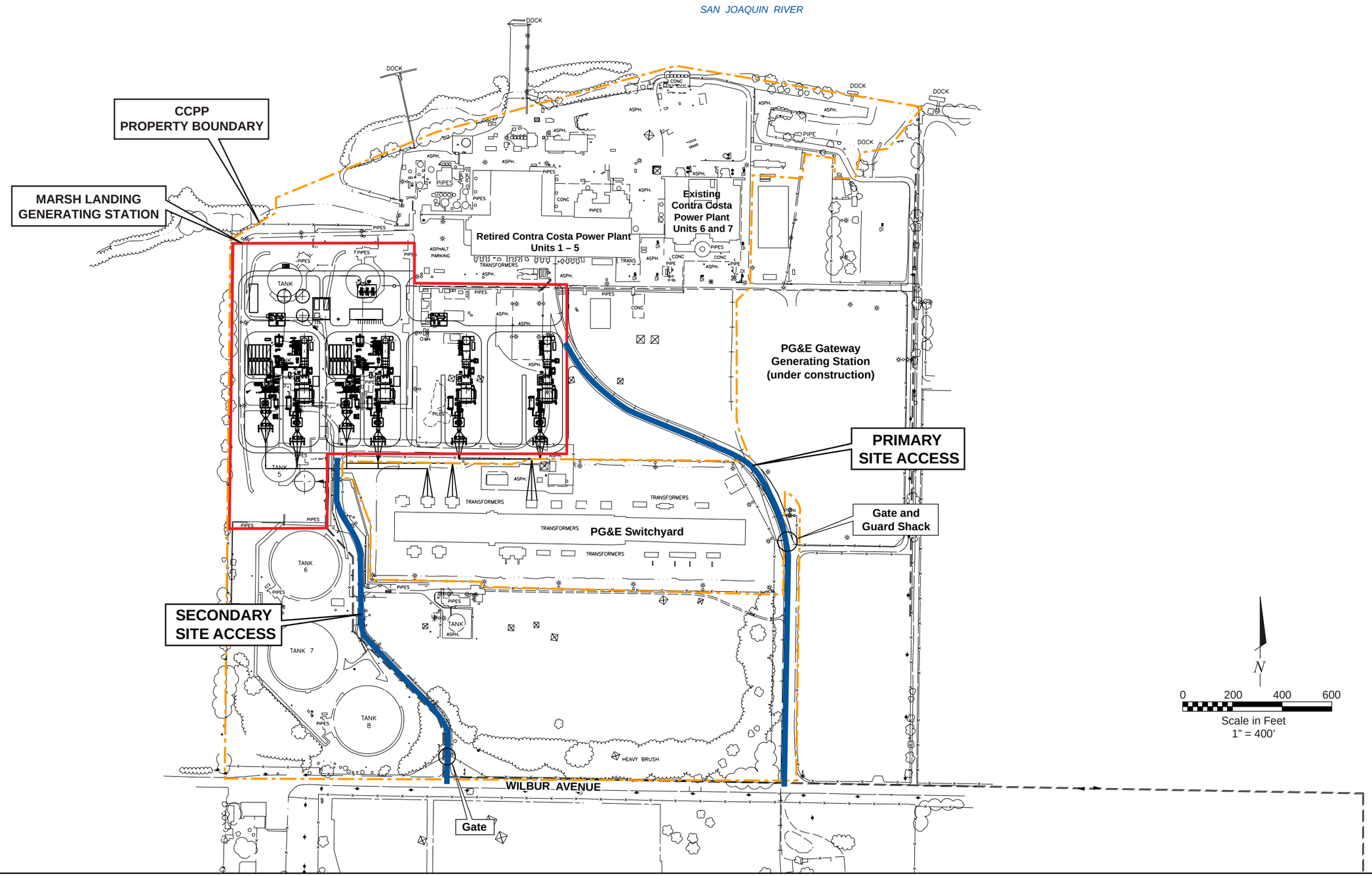
DATA REQUEST

50. Please provide a narrative description and a map showing primary and secondary access points and gates to the project site. The secondary access point can be one restricted to the use of emergency response personnel.

RESPONSE

The proposed power plant site will be accessed by the existing CCPP entrance on Wilbur Avenue. This entrance has a gate and guard. A secondary entrance is provided on Wilbur Avenue approximately 1,500 feet west of the primary entrance. This entrance is also gated.

Figure 50-1 shows the primary and secondary access points to the MLGS site.



Source:
CH2M Hill Lockwood Greene; General Arrangement Marsh Landing Generating Station,
Combined Cycle Siemens Flex 10s & Simple Cycle Layout;
Drawing No: MR-GA-ML-01-10 (Rev. C, 04/18/08)

SITE ACCESS PLAN

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

December 2008
28067344

URS

FIGURE 50-1

12/08/08 vsa ..\T:\Mirant Contra Costa-Marsh Landing\Graphics\DATA REQUESTS\DR_50-1_site access plan.ai

BACKGROUND

Technical Area: Biological Resources

Author: Laurel Cordonnier

BACKGROUND

The Marsh Landing Generating Station (MLGS) Application for Certification (AFC) did not state the hours in which construction would occur during the day. Due to the proximity to sensitive biological resources that could be affected by noise and night time lighting during construction, Energy Commission staff needs more information regarding the times construction would occur and any proposed measures to minimize impacts to nearby sensitive species.

DATA REQUEST

51. Please provide the daily work schedule when construction would likely occur.

RESPONSE

As stated on page 2-27 of the AFC, the construction schedule typically will be 10-hour days and 50-hour weeks. The majority of construction operations are expected to take place between 6:00 a.m. and 6:00 p.m., Monday through Friday.

DATA REQUEST

52. If construction would occur at night, please provide noise and lighting minimization measures which would be implemented to avoid noise and light impacts to offsite areas.

RESPONSE

In general, night construction is not anticipated. However, longer work days or work weeks may be necessary to make up schedule delays or complete critical construction activities. During the startup and testing phase of the project, some activities may continue 24 hours per day, 7 days per week.

As described in AFC Section 7.11, Visual Resources, the following design features were incorporated into the project to reduce the potential visual impacts related to lighting:

- Lighting on the project site will be limited to areas required for safety, will be directed on site to avoid backscatter, and will be shielded from public view to the extent practical.
- All lighting that is not required to be on during nighttime hours will be controlled with sensors or switches operated so that the lighting will be on only when needed.
- High-pressure sodium vapor fixtures will be used. These lights typically produce low-intensity amber light, which will reduce visual contrast with the night sky.

As discussed in AFC Section 7.5, Noise, predicted noise levels during construction of the facility are not predicted to exceed recommended noise compatibility guidelines at any sensitive receptors. Where nighttime or weekend construction must occur, shifts are usually smaller and noise levels correspondingly lower. In addition, two noise ordinances in the City of Antioch Code of Ordinances are applicable to construction and operation of the project. These are Ordinances § 5-17.04 and § 5-17.05, which regulate heavy construction equipment noise and construction activity noise. The project will comply with these ordinances. As such, even if certain construction activities are required beyond the normal daytime working hours, noise impacts are expected to be less than significant.

BACKGROUND

During an informal site visit to the proposed MLGS project site on September 29, 2008, Energy Commission staff observed a vegetated wetland area created by the Contra Costa Power Plant detention basin. This wetland area is adjacent to the proposed southern construction laydown, office, and parking area. This laydown area is located south of the PG&E switchyard and contains ruderal vegetation. The AFC stated that this construction laydown, office, and parking area would occupy 3.5 acres and is devoid of vegetation. Due to the presence of vegetation and trees, the area has the potential to be limited habitat for sensitive species such as the tricolored blackbird (*Agelaius tricolor*), burrowing owl (*Athene cunicularia*), Swainson's hawk (*Buteo swainsoni*), and Suisun song sparrow (*Melospiza melodia maxillaris*). Staff needs information regarding proposed impact minimization measures to protect this wetland area.

DATA REQUEST

53. Please provide a Phase I ESA, or equivalent information, addressing the past and present uses of property along and adjacent to the project's gas and water supply pipelines and at the water treatment facility site. The requested information should include an evaluation addressing whether or not past or present site conditions may have resulted in contamination, or potential contamination, that could impact construction and/or operation of the proposed project.

RESPONSE

No work will be conducted within the wetland area of the detention basin, south of the PG&E switchyard. The portion of the CCPP just to the south of the PG&E switchyard and north of the detention basin that will be used for construction laydown is elevated and outside of the detention basin. No ground-disturbing activities will be performed in this laydown area. All of this 3.5-acre area has previously been disturbed and is devoid of vegetation. The following avoidance and minimization measures are proposed to avoid indirect impacts to the vegetated areas of the detention basin and the species that these areas could support.

- Project Area: The project work area will be clearly marked and limited to the minimum area necessary. All construction activities will be limited to the approved construction work area. No vegetation removal is anticipated. Construction within wetlands and other sensitive areas within the detention basin will be avoided. Environmentally Sensitive Areas (ESAs) will be clearly marked on project plans. The work limits and all ESA limits will be clearly marked by fencing or signs to protect biological resources adjacent to the construction corridor by preventing inadvertent encroachment of construction activities into these areas.

- Construction Monitoring: A qualified biologist monitor will inspect ESA fencing and ensure adherence to avoidance and minimization requirements. While not anticipated, should vegetation need to be removed during construction activities, a qualified biologist will first inspect the area for sensitive species. The monitor will have authority to stop work should it threaten sensitive resources and will contact resource agencies where appropriate.

- Construction Discharges: No concrete, concrete washings, or water from concrete trucks will be allowed to flow into the wetland; all water and concrete washed out of concrete trucks will be contained until cured. Discharges from the job site of excessively turbid water will be prohibited. No discharges from

equipment will enter the detention basins. All equipment used on site will be well-maintained and free of leaks. However, as a preventive measure, equipment may be placed on pads underlain with plastic that would absorb any spillage and act as a barrier for any spillage. Appropriate spill containment equipment and supplies (e.g., absorbent pads) will be kept onsite for use in containing and cleaning up accidental spills or leaks.

- Staging/Storage Areas: Staging areas, storage areas and equipment parking will not occur within wetland or other sensitive areas. Equipment will be maintained at facilities more than 100 feet from any aquatic habitat. Staging and storage areas will be restricted to the minimum area necessary for completion of the project.

- Erosion control: Ground-disturbing construction activities will be avoided during periods of heavy rain. Temporary erosion control and slope stabilization best management practices (BMPs) shall be implemented during construction if heavy rainfall (0.5 inch or more per day) is anticipated and permanent erosion control measures shall be implemented upon completion of the project. Erosion control measures may include silt fencing, straw wattles, straw bales, coir blankets, sediment traps, and other protective measures to minimize the potential for erosion of sediment beyond the work area or degradation of water quality in adjacent aquatic habitats. Erosion control materials will be placed between project construction areas and detention basins, and will be specified on the project plans.

- Disposal: There will be no disposal of soil and plant materials from areas that support invasive species to areas that support stands dominated by native vegetation.

- Imported Material: Gravel and/or fill material to be placed in relatively weed-free areas will come from weed-free sources. Certified weed-free imported materials will be used.

In addition, the draft Storm Water Pollution Prevention Plan, which is included as Appendix G in the AFC, provides additional best management practices to be used during construction of the proposed project.

DATA REQUEST

54. Please provide a discussion of impact avoidance and minimization measures to be implemented to protect the wetland area, the surrounding trees, and sensitive species that could use this area during construction.

RESPONSE

There will be no construction activities in the detention basin. There will be no changes to the detention basin due to the project construction or operation.

REFERENCES

Aerial Photo BUU 268-23, 1939.

BAAQMD (Bay Area Air Quality Management District), 2008. "Engineering Evaluation for Proposed Amended Authority to Construct and Draft PSD Permit." Application 17182. Gateway Generating Station, Antioch, CA. June 2008.

BAAQMD (Bay Area Air Quality Management District), 2008. Cumulative Sources for Plant 19169 (Mirant Marsh Landing) and Plant 19203 (Mirant Willow Pass). August 2008.

Bertollini, Tom, 2007. Mirant Corporation. Electronic Data Reporting and Continuous Emissions Monitoring (CEMS) Data. December 2007.

Dames & Moore, 1949. *Report of Foundation Investigation, Proposed Contra Costa Steam Plant, Antioch, California for the Pacific Gas and Electric Company*.

DOC (Department of Conservation), 2006. Division of Land Resource Protection, 2006. Farmland Mapping and Monitoring Program. Contra Costa County Important Farmland 2006. http://www.conservation.ca.gov/dlrp/fmmp/Pages/Index.aspx.

GLO (Government Land Office), 1862. Plat T2N R2E.

McMahon, T. A., 1908. Official Map of Contra Costa County.

U.S. EPA (U.S. Environmental Protection Agency), 1992. *Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised*. EPA-454/R-92-019. October 1992.

U.S. EPA (U.S. Environmental Protection Agency), 1995. *Screen3 Model User's Guide*. EPA-454/B-95-004. September 1995.

USGS (U.S. Geological Survey), 1906. California Sacramento Valley. Sheet Q.

USGS (U.S. Geological Survey), 1908. Antioch, California Quadrangle.

USGS (U.S. Geological Survey), 1918. Collinsville, California Quadrangle (Antioch, California).

Whitcher, J. E., n.d. Map of Rancho Los Meganos, n.d. (circa 1853), Land Case No. 107, U.S. District Court, Northern District California, Bancroft Library, University of California, Berkeley.

APPENDIX A

AIR QUALITY

APPENDIX A-1

CONSTRUCTION EMISSIONS

Appendix A-1
CONSTRUCTION EMISSIONS - MARSH LANDING GENERATING STATION CONSTRUCTION

Contra Costa County, California

Construction Emissions tons/yr	**CO**	**CO_2**	**CH_4**	**N_2O**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_x**	**ROG[1]**
Workers Commute	15.49	1430.89	0.08	0.20	1.54	0.12	0.08	0.01	1.55
Material Delivery	0.10	18.60	8.55E-04	5.08E-04	0.18	6.84E-03	5.99E-03	2.14E-04	0.02
Rail Delivery	0.01	2.34	6.96E-05	2.32E-05	0.04	1.37E-03	1.26E-03	2.31E-05	2.21E-03
Total	**15.60**	**1451.84**	**0.08**	**0.20**	**1.76**	**0.13**	**0.08**	**0.01**	**1.57**

Appendix A-1
WORKER VEHICLE EXHAUST - MARSH LANDING GENERATING STATION CONSTRUCTION

Contra Costa County, California

Transportation Information	
- Average Number of Construction Workers (per month) =	216
- Average Miles Per Trip (1-way) =	16.8
- Trips Per Month Per Worker =	66.44
- Total Miles Per Month =	241,368
- Total Miles Per Year =	2,896,417

Comment

- Information Provided By Applicant
- URBEMIS2007 default values for Contra Costa County
- Assumes 22 working days per month and 3.02 one-way trips per day. The trip rate is based on URBEMIS2007 value for General Light Industry
- Worst-case scenario; each worker drives his own car.

DATA FROM EMFAC2007

		Tons Per Day								
Vehicle Description	**Vehicle Miles Traveled per Day**	**CO**	**CO_2**	**CH_4**	**N_2O**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_x**	**ROG[1]**
Light Duty Automobile (LDA)	13,268,000	61.54	5880.00	0.56	--	5.32	0.48	0.28	0.06	6.59
Light Duty Trucks (LDT)	9,048,000	54.84	4930.00	0.45	--	6.01	0.44	0.28	0.05	5.20

Note:

- Emission factors for on-road vehicles are based on results from Emfac Emissions Model 2007 Version 2.3 (BURDEN output). The values are the projected values for the LDA and LDT (Both Class I and II) vehicles within Costa Contra County in 2009. PM_{10} and PM2.5 values include brake wear and tire wear.
- Vehicle Miles Traveled per Day represents the vehicle miles traveled in Contra County on average and is based on the output from Emfac Emissions Model 2007 Version 2.3 (BURDEN output).
- N_2O factors are derived from California Climate Action Registry General Reporting Protocol Version 2.3 (March 2007), Table C.5 using the mileage accrual rates by age table from EMFAC2007 Version 2.3, November 1, 2006, California Air Resources Board, normalized accrual rates (annual odometer mileage weighted by population) for gasoline fueled light duty automobiles and trucks.

CALCULATION OF EMISSION FACTOR

	Pounds per Mile								
Vehicle Description	**CO**	**CO_2**	**CH_4**	**N_2O**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_x**	**ROG[1]**
Light Duty Automobile (LDA)	9.28E-03	8.86E-01	8.44E-06	1.08E-04	8.02E-04	7.24E-05	4.22E-05	9.04E-06	9.93E-04
Light Duty Trucks (LDT)	1.21E-02	1.09E+00	9.95E-05	1.68E-04	1.33E-03	9.73E-05	6.19E-05	1.11E-05	1.15E-03
Fleet Average Emission Factor	**1.07E-02**	**9.88E-01**	**5.40E-05**	**1.38E-04**	**1.07E-03**	**8.48E-05**	**5.20E-05**	**1.00E-05**	**1.07E-03**

Note:

- The values are based on above tons/day and miles traveled. The average emission factor is based on the assumption from URBEMIS2007 that the worker vehicle fleet mix will consist of 50% LDA and 50% LDT.

WORKER VEHICLE EMISSIONS - CONSTRUCTION

	Tons Emitted Per Year								
	CO	**CO_2**	**CH_4**	**N_2O**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_x**	**ROG[1]**
Worker Vehicle Fleet Mix	15.5	1,430.9	0.1	0.2	1.5	0.1	0.1	0.0	1.6

Note:

[1] Assuming ROGs are equivalent to VOCs

Appendix A-1

CONSTRUCTION DELIVERY TRUCK EXHAUST - MARSH LANDING GENERATING STATION CONSTRUCTION

Contra Costa County, California

Transportation Information		**Comment**
- No. of Vehicle Trips =	16	- Information provided by applicant in AFC table 7.10-10
- Average Miles Per Trip (1-way) =	24	- Distance to transport construction material from Port of Stockton to Project Site
- Total Miles Per Year =	9,216	- Worst case scenario calculated from average miles per trip, max. no. of vehicle trips per month

DATA FROM EMFAC2007

		Tons Per Day								
Equipment Description	**Vehicle Miles Traveled per Day**	**CO**	**CO_2**	**CH_4**	**N_2O**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_x**	**ROG[1]**
Heavy-Heavy Duty Diesel Truck	431,000	4.75	870.00	0.04	0.02	8.40	0.32	0.28	0.01	0.74

Note:

- Emission factors for on-road, heavy-heavy-duty vehicles are based on results from Emfac Emissions Model 2007 Version 2.3. The values are the projected values for the HHDT vehicles within Contra Costa County in the respective year. PM10 and PM2.5 values include break wear and tire wear.
- Vehicle Miles Traveled per Day represents the vehicle miles traveled in Contra County on average and is based on the output from Emfac Emissions Model 2007 Version 2.3 (BURDEN output).
- N_2O factors are derived from California Climate Action Registry General Reporting Protocol Version 2.2 (March 2007), Table C.4 using the mileage accrual rates by age table from EMFAC2007 Version 2.3, November 1, 2006, California Air Resources Board, normalized accrual rates (annual odometer mileage weighted by population) for heavy heavy duty diesel fueled trucks.

CALCULATION OF EMISSION FACTOR

	Pounds per Mile								
Equipment Description	**CO**	**CO_2**	**CH_4**	**N_2O**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_x**	**ROG[1]**
Heavy-Heavy Duty Diesel Truck 2007	2.20E-02	4.04E+00	1.86E-04	1.10E-04	3.90E-02	1.48E-03	1.30E-03	4.64E-05	3.43E-03

Note:

- The following equation was used to obtain the emission factors:

$$EF = ER / VMT * 2000$$

Where: EF= emission factor in pounds per mile
ER = Emission Rate in tons per day
VMT = Average vehicle miles traveled per day by heavy-heavy duty trucks

CONSTRUCTION DELIVERY TRUCK EMISSIONS

	Tons Emitted Per Year								
Equipment Description	**CO**	**CO_2**	**CH_4**	**N_2O**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_x**	**ROG[1]**
Heavy-Heavy Duty Diesel Truck	0.10	18.60	8.55E-04	5.08E-04	0.18	6.84E-03	5.99E-03	2.14E-04	0.02

Note:

- The following equation was used to obtain the emission factors:

$$M = EF * D / 2000$$

Where: M = Mass emissions rate from refinery related activities in tons per year
EF= emission factor in pounds per mile
D = Distance traveled by trucks to the refinery in miles per year.

[1] Assuming ROGs are equivalent to VOCs

Appendix A-1
CONSTRUCTION DELIVERY RAIL EMISSIONS - MARSH LANDING GENERATING STATION CONSTRUCTION

Contra Costa County, California

Assumptions

Average Round Trip Distance Traveled per Locomotive =	424	miles/locomotive

Reference: National Transportation Statistics for Locomotives, 2008 (http://www.bts.gov/publications/national_transportation_statistics)

Rail-cars per Locomotive =	62	rail-cars
Average Miles Traveled Per Locomotive =	69,900	miles/yr
Average Fuel Consumed Per Locomotive =	176,600	gallon/yr
Locomotive Fuel Efficiency =	0.13	mile/gal

Calculations For Locomotives in Motion

Reference: EPA's Technical Highlights: Emission Factors for Locomotives , 1997

EMISSION FACTORS (g/gal, except SOx)

Year	CO	CO_2	CH_4	N_2O	NO_x	PM_{10}	$PM_{2.5}$	SO_x	ROG[1]
2012	27.4	10084.0	0.30	0.10	158.5	5.6	5.152	15.0	8.9
2011	27.4	10084.0	0.30	0.10	161.0	5.7	5.2	15.0	9.1
2010	27.4	10084.0	0.30	0.10	163.0	5.7	5.2	15.0	9.1
2009	27.4	10084.0	0.30	0.10	168.3	5.9	5.4	15.0	9.4

Note:

- $PM_{2.5}$ emission factors were determined by multiplying PM_{10} numbers by a "$PM_{2.5}$ fraction of PM_{10}" value. Fractional values for $PM_{2.5}$ were taken from the SCAQMD guidance: Final - Methodology to Calculate $PM_{2.5}$ and $PM_{2.5}$ Significance Thresholds, October
  - $PM_{2.5}$ Fraction of PM_{10}, Train: 0.92
- California state regulation requires intrastate diesel-electric locomotives that operate 90 percent of the time in the state to use only California ultra low sulfur (15 parts per million) diesel fuel.
- Per EPA's Emission Facts <http://www.epa.gov/otaq/climate/420f05001.pdf>, CO_2 emissions from a gallon of diesel fuel are 10,084 g/gal diesel.
- CH_4 and N_2O factors are derived from California Climate Action Registry General Reporting Protocol Version 2.2 (March 2007), Table C.6 (Methane and Nitrous Oxide Emission Factors for Stationary Combustion by Sector and Fuel Type).

Calculations

# of Locomotives (Incremental) =	2	per year
# of Rail Cars =	2	per locomotive
Locomotive Fuel Efficiency =	0.13	mile/gal
Total Locomotive Distance Traveled =	847	mile/year
Locomotive Fuel Consumption =	6,519	gal/year
Average Density of Locomotive Diesel (taken from msds) =	7.32	lb/gallon
Total Weight of Locomotive Fuel =	47,693.40	lb/yr

MOBILE MASS EMISSION (tons/year)

Year	CO	CO_2	CH_4	N_2O	NO_x	PM_{10}	$PM_{2.5}$	SO_x	ROG[1]
2012	0.20	72.46	2.16E-03	7.19E-04	1.14	0.04	0.04	7.15E-04	0.06
2011	0.20	72.46	2.16E-03	7.19E-04	1.16	0.04	0.04	7.15E-04	0.07
2010	0.20	72.46	2.16E-03	7.19E-04	1.17	0.04	0.04	7.15E-04	0.07
2009	0.20	72.46	2.16E-03	7.19E-04	1.21	0.04	0.04	7.15E-04	0.07

Appendix A-1
CONSTRUCTION DELIVERY RAIL EMISSIONS - MARSH LANDING GENERATING STATION CONSTRUCTION

Contra Costa County, California

Calculations For Locomotives in Idle Mode

References: NOX and PM10 Emission Factors from EPA's Technical Highlights: Guidance for Quantifying and Using Long Duration Switch Yard Locomotive Idling Emission Reductions in State Implementation Plans, January 2004. ROG and CO Emission Factors from Sierra Research Group: Development of Railroad Emissions Methodology Development, June 2004

EMISSION FACTORS (g/hr, except SOx)

Year	CO	CO_2	CH_4	N_2O	NO_x	PM_{10}	$PM_{2.5}$	SO_x	ROG[1]
NA	492	40336	1.20E+00	4.00E-01	620	32	29	15	478

Note:

- $PM_{2.5}$ emission factors were determined by multiplying PM_{10} numbers by a "$PM_{2.5}$ fraction of PM_{10}" value. Fractional values for $PM_{2.5}$ were taken from the SCAQMD guidance: Final - Methodology to Calculate $PM_{2.5}$ and $PM_{2.5}$ Significance Thresholds, October
  - $PM_{2.5}$ Fraction of PM_{10}, Train: 0.92
- California state regulation requires intrastate diesel-electric locomotives that operate 90 percent of the time in the state to use only California ultra low sulfur (15 parts per million) diesel fuel.
- Per EPA's Emission Facts <http://www.epa.gov/otaq/climate/420f05001.pdf>, CO_2 emissions from a gallon of diesel fuel are 10,084 g/gal diesel. This factor was multiplied by fuel consumed per idle hour to get a factor in units of gal/hr
- CH_4 and N_2O factors are derived from California Climate Action Registry General Reporting Protocol Version 2.2 (March 2007), Table C.6 (Methane and Nitrous Oxide Emission Factors for Stationary Combustion by Sector and Fuel Type). The CH_4 and N_2O emission factors are multiplied by the fuel consumed per idle hours to get

Calculations

# of idling events per year =	2	per year
Idling time per event=	60	min
Total idling time per year =	2	hr
Fuel consumed per idle hour = **	4	gal/hr
Average Density of Locomotive Diesel (taken from msds) =	7.32	lb/gallon
Total Weight of Locomotive Fuel (idle) =	58.53	lb/yr

** Based on switcher idling information on EPAs web page: http://www.epa.gov/smartway/idlingimpacts.htm

IDLE MASS EMISSION (tons/year)

Year	CO	CO_2	CH_4	N_2O	NO_x	PM_{10}	$PM_{2.5}$	SO_x	ROG[1]
NA	1.08E-03	0.09	2.65E-06	8.82E-07	1.37E-03	7.05E-05	6.49E-05	8.77E-07	1.05E-03

Total Emissions

TOTAL MASS EMISSION (tons/year)

Year	CO	CO_2	CH_4	N_2O	NO_x	PM_{10}	$PM_{2.5}$	SO_x	ROG[1]
NA	0.20	72.55	2.16E-03	7.19E-04	1.21	0.04	0.04	7.15E-04	0.07

TOTAL MASS EMISSION FOR MLGS (tons/year)

Year	CO	CO_2	CH_4	N_2O	NO_x	PM_{10}	$PM_{2.5}$	SO_x	ROG[1]
NA	0.01	2.34	6.96E-05	2.32E-05	0.04	1.37E-03	1.26E-03	2.31E-05	2.21E-03

Note:
[1] Assuming ROGs are equivalent to VOCs

APPENDIX A-2

OPERATIONAL EMISSIONS

Appendix A-2
OPERATION EMISSIONS - MARSH LANDING GENERATING STATION

Contra Costa County, California

Construction Emissions tons/yr	**CO**	**CO_2**	**CH_4**	**N_2O**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_x**	**ROG[1]**
Operation Staff Commute	1.37	151.23	0.01	0.02	0.14	0.01	0.01	1.51E-03	0.14
Aqueous Ammonia Delivery	0.54	117.57	4.01E-03	3.20E-03	0.94	0.04	0.03	1.34E-03	0.09
Total	**1.91**	**268.80**	**0.02**	**0.02**	**1.07**	**0.05**	**0.04**	**2.84E-03**	**0.22**

Appendix A-2
OPERATION STAFF VEHICLE EXHAUST - MARSH LANDING GENERATING STATION

Contra Costa County, California

Transportation Information		Comment
- Average Number of Plant Operators (per month) =	8	- Information Provided By Applicant in Table 2.8-1
- Average Number of Other Plant Personnel (per month)	12	- Information Provided By Applicant in Table 2.8-1
- Average Miles Per Trip (1-way) =	16.8	- URBEMIS2007 default values for Contra Costa County
- Trips Per Month Per Plant Operator =	90.6	- Assumes 30 working days per month for plant operators and 22 working days per month for other plant personnel. Assumes 3.02 one-way trips per day. The trip rate is based on URBEMIS2007 value for General Light Industry
- Trips Per Month Per Other Plant Personnel =	66.44	
- Total Miles Per Month = 25,571		- Worst-case scenario; each worker drives his own car.
- Total Miles Per Year = 306,851		

DATA FROM EMFAC2007

		Tons Per Day								
Vehicle Description	**Vehicle Miles Traveled per Day**	**CO**	**CO_2**	**CH_4**	**N_2O**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_x**	**ROG[1]**
Light Duty Automobile (LDA)	13,697,000	50.32	6030.00	0.47	--	4.32	0.50	0.29	0.06	5.33
Light Duty Trucks (LDT)	9,203,000	48.18	5020.00	0.41	--	5.23	0.45	0.30	0.05	4.75

Note:
- Emission factors for on-road vehicles are based on results from Emfac Emissions Model 2007 Version 2.3. The values are the projected values for the LDA and LDT (Both Class I and II) vehicles within Costa Contra County in 2009. PM_{10} values include brake wear and tire wear
- Vehicle Miles Traveled per Day represents the vehicle miles traveled in Contra County on average and is based on the output from Emfac Emissions Model 2007 Version 2.3 (BURDEN output).
- N_2O factors are derived from California Climate Action Registry General Reporting Protocol Version 2.3 (March 2007), Table C.5 using the mileage accrual rates by age table from EMFAC2007 Version 2.3, November 1, 2006, California Air Resources Board, normalized accrual rates (annual odometer mileage weighted by population) for gasoline fueled light duty automobiles and trucks.

CALCULATION OF EMISSION FACTOR

	Pounds per Mile								
Vehicle Description	**CO**	**CO_2**	**CH_4**	**N_2O**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_x**	**ROG[1]**
Light Duty Automobile (LDA)	7.35E-03	8.80E-01	6.86E-05	1.08E-04	6.31E-04	7.30E-05	4.23E-05	8.76E-06	7.78E-04
Light Duty Trucks (LDT)	1.05E-02	1.09E+00	8.91E-05	1.68E-04	1.14E-03	9.78E-05	6.52E-05	1.09E-05	1.03E-03
Fleet Average Emission Factor	**8.91E-03**	**9.86E-01**	**7.89E-05**	**1.38E-04**	**8.84E-04**	**8.54E-05**	**5.38E-05**	**9.81E-06**	**9.05E-04**

Note:
- The values are based on above tons/day and miles traveled. The average emission factor is based on the assumption from URBEMIS2007 that the worker vehicle fleet mix will consist of 50% LDA and 50% LDT.

OPERATIONS STAFF VEHICLE EMISSIONS - CONSTRUCTION

	Tons Emitted Per Year								
	CO	**CO_2**	**CH_4**	**N_2O**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_x**	**ROG[1]**
Worker Vehicle Fleet Mix	1.37	151.23	0.01	0.02	0.14	0.01	0.01	1.51E-03	0.14

Note:
[1] Assuming ROGs are equivalent to VOCs

Appendix A-2
AQUEOUS AMMONIA DELIVERY TRUCK EXHAUST - MARSH LANDING GENERATING STATION

Contra Costa County, California

Transportation Information		Comment
- No. of Ammonia Delivery Trips/ mo. =	10	- Information provided by applicant in Section 7.12.2.2 shows an maximum of 120 1-way vehicle trips per year.
- No. of Misc. Delivery Trips/ mo. =	10	
- Average Miles Per Ammonia Delivery Trip from Dixon, CA (1-way) =	30.5	
- Average Miles Per Ammonia Delivery Trip from La Mirada, CA (1-way) =	352.68	
- Average Miles Per Misc. Delivery Trip (1-way) =	50	
- Total Miles Per Year =	57,982	- Worst case scenario, assuming 2 one-way trips per delivery. Assuming half of the ammonia delivery comes from Dixon, CA and other half from La Mirada, Ca

DATA FROM EMFAC2007

Equipment Description	Vehicle Miles Traveled per Day	Tons Per Day								
		CO	CO_2	CH_4	N_2O	NO_x	PM_{10}	$PM_{2.5}$	SO_x	ROG[1]
Heavy-Heavy Duty Diesel Truck	434,000	4.04	880.00	0.03	0.02	7.02	0.27	0.23	0.01	0.64

Note:
- Emission factors for on-road, heavy-heavy-duty vehicles are based on results from Emfac Emissions Model 2007 Version 2.3. The values are the projected values for the HHDT vehicles within Contra Costa County in the respective year. PM10 values include brake wear and tire wear.
- Vehicle Miles Traveled per Day represents the vehicle miles traveled in Contra County on average and is based on the output from Emfac Emissions Model 2007 Version 2.3 (BURDEN output).
- N_2O factors are derived from California Climate Action Registry General Reporting Protocol Version 2.2 (March 2007), Table C.4 using the mileage accrual rates by age table from EMFAC2007 Version 2.3, November 1, 2006, California Air Resources Board, normalized accrual rates (annual odometer mileage weighted by population) for heavy heavy duty diesel fueled trucks.

CALCULATION OF EMISSION FACTOR

Equipment Description	Pounds per Mile								
	CO	CO_2	CH_4	N_2O	NO_x	PM_{10}	$PM_{2.5}$	SO_x	ROG[1]
Heavy-Heavy Duty Diesel Truck 2007	1.86E-02	4.06E+00	1.38E-04	1.10E-04	3.24E-02	1.24E-03	1.06E-03	4.61E-05	2.95E-03

Note:
- The following equation was used to obtain the emission factors:

$$EF = ER / VMT * 2000$$

Where: EF= emission factor in pounds per mile
ER = Emission Rate in tons per day
VMT = Average vehicle miles traveled per day by heavy-heavy duty trucks

AQUEOUS AMMONIA DELIVERY TRUCK EMISSIONS

Equipment Description	Tons Emitted Per Year								
	CO	CO_2	CH_4	N_2O	NO_x	PM_{10}	$PM_{2.5}$	SO_x	ROG[1]
Heavy-Heavy Duty Diesel Truck	0.54	117.57	0.00	0.00	0.94	0.04	0.03	1.34E-03	0.09

Note:
- The following equation was used to obtain the emission factors:

$$M = EF * D / 2000$$

Where: M = Mass emissions rate from refinery related activities in tons per year
EF= emission factor in pounds per mile
D = Distance traveled by trucks to the refinery in miles per year.

[1] Assuming ROGs are equivalent to VOCs

APPENDIX A-3

ESTIMATED EMISSIONS DATA FROM SIEMENS

SIEMENS

Project x - Total Estimated Startup and Shutdown Emissions
SGT6-5000F in Flex Plant 10 Combined Cycle Operation on Natural Gas @ 62 °F and 41 °F

Mode	~ Time (minutes)	Total Emissions per Event (pounds)				Fuel Usage (lbs)
		NO_X	CO	VOC	PM	
Startup on Natural Gas @ 62 °F	12	24	259	12	3	23,029
Shutdown on Natural Gas @ 62 °F	7	10	131	5	1	6,239
Startup on Natural Gas @ 41 °F	12	25	267	13	3	24,173
Shutdown on Natural Gas @ 41 °F	7	10	135	5	1	6,525

General Notes

1.) All data is ESTIMATED, NOT guaranteed and is for ONE unit.
2.) Gas fuel must be in compliance with Siemens fuel specifications.
3.) Emissions are at the HRSG exhaust stack outlet and exclude ambient air contributions.
4.) Emissions are based on new and clean conditions.
5.) Please be advised that the information contained in this transmittal has been prepared and is being transmitted per customer request specifically for information purposes only. Such information is not intended to be used for evaluation of plant design and/or performance relative to contractual commitments. Data included in any permit application or Environmental Impact Statement is strictly the customer's responsibility. Siemens is available to review permit application data upon request.

Startup Emissions Notes

1.) Estimated startup (SU) data are from gas turbine (GT) ignition through 100% GT load plus 10 minutes.
2.) Estimated SU and shutdown (SD) data are based on the assumed times noted above and will be higher for longer times.
3.) Estimated SU and SD data are based on the ambient temperatures noted above and will be higher at lower ambient temperatures.
4.) NO_X emissions assume SCR is not in operation (no removal).
5.) CO emissions assume 20% removal from ignition to 100% GT load and 90% removal from 100% GT load on.
6.) SU assumes 5 minutes from turning gear to synchronization.
7.) SD assumes 100% load to FSNL with no cooldown at FSNL.
8.) Operator actions do not extend startup or shutdown.
9.) It is assumed that there is no restriction from the interconnected utility for loading the GT from synchronization to 100% load within the SU times considered.

SIEMENS

Total Estimated Startup and Shutdown Emissions and Fuel Use
SGT6-5000F(4) 9 ppm ULN in Simple Cycle Operation at 59 °F on Natural Gas

Mode	~ Time (minutes)	Total Pounds per Event				
		NO_X	CO	VOC	PM	Fuel Use
Startup	11	12	213	11	1	6,638
Shutdown	6	10	110	5	1	5,905

General Notes

1.) All data is ESTIMATED, NOT guaranteed and is for ONE unit.
2.) Gas fuel must be in compliance with Siemens fuel specifications.
3.) Emissions are at the exhaust stack outlet and exclude ambient air contributions.
4.) Emissions are based on new and clean conditions.
5.) NO_X as NO_2.
6.) VOC consist of total hydrocarbons excluding methane and ethane and are expressed in terms of methane (CH_4).
7.) Particulates are per US EPA Method 5/202 (front and back half).
8.) Estimated fuel use data is based on a heating value of 22,356 Btu/lb_m (HHV) and will be different for different heating values.
9.) Please be advised that the information contained in this transmittal has been prepared and is being transmitted per customer request specifically for information purposes only. Such information is not intended to be used for evaluation of plant design and/or performance relative to contractual commitments. Data included in any permit application or Environmental Impact Statement is strictly the customer's responsibility. Siemens is available to review permit application data upon request.

Startup Emissions Notes

1.) Estimated startup (SU) data are from gas turbine (GT) ignition through 100% load.
2.) Estimated SU and shutdown (SD) data are based on the assumed times noted above and will be higher for longer times.
3.) Estimated SU and SD data are based on the ambient temperature noted above and will be higher at lower ambient temperatures.
4.) Total SU time includes 5 minutes from turning gear to synchronization.
5.) SD assumes 100% load to FSNL with no cooldown at FSNL.
6.) Continuous Emissions Monitoring System (CEMS) may calculate emissions differently.
7.) Operator actions do not extend startup or shutdown.
8.) It is assumed that there is no restriction from the interconnected utility for loading the GT from synchronization to 100% load within the SU times considered.

APPENDIX B

LAND USE

APPENDIX B-1

SUBDIVISION APPLICATION INFORMATION

Excerpts from the Municipal Code of the City of Antioch

§ 9-4.1012 SCHEDULE OF DEVELOPMENT AND COMMITMENT OF FUNDS.

The city shall develop a schedule specifying how, when, and where it will use the land or fees, or both, to develop park or recreational facilities to serve the residents of the subdivision. Any fees collected under this article shall be committed within five years after the payment of such fees or the issuance of building permits on one-half of the lots created by the subdivision, whichever occurs later. If such fees are not committed, they shall be distributed and paid to the then record owners of the subdivision in the same proportion that the size of their lot bears to the total area of all lots within the subdivision.

('66 Code, § 9-4.1012) (Ord. 561-C-S, passed 1-19-84)

§ 9-4.1013 EXEMPTIONS.

Subdivisions containing less than five parcels and not used for residential purposes shall be exempted from the requirements of this article; provided, however, a condition may be placed on the approval of such parcel map that if a building permit is requested for the construction of a residential structure or structures on one or more of the parcels within four years, the fee may be required to be paid by the owner of each parcel as a condition to the issuance of such permit. The provisions of this article shall not apply to condominium projects or stock cooperatives which consist of the subdivision of airspace in an existing apartment building which is more than five years old when no new dwelling units are added.

('66 Code, § 9-4.1013) (Ord. 561-C-S, passed 1-19-84)

§ 9-4.1014 FEES TO BE PLACED IN THE PARK FEE TRUST FUND.

Fees received by the city pursuant to this article shall be deposited in a separate Park Fee Trust Fund. Moneys in said fund, including interest earned and accrued on such moneys, shall be expended solely for the purposes described in division (C) of § 9-4.1005 of this article. The Council shall receive a report at least annually on the fee and interest income, expenditures, and status of the Park Fee Trust Fund.

('66 Code, § 9-4.1014) (Ord. 561-C-S, passed 1-19-84)

ARTICLE 12: MINOR SUBDIVISIONS; PARCEL MAPS

§ 9-4.1201 APPLICATIONS; MINOR SUBDIVISION MAPS.

(A) If an applicant proposes to divide a parcel into four or less lots, or divide a parcel which comes within the provisions of subsections (a), (b), (c), or (d) of § 66426 of the Subdivision Map Act, an application for an exception from the requirements of this chapter may be made to the Engineering Division. The application shall specifically set forth each item upon which an exception is requested. The application, in addition to other matters that may be required by the Engineering Division, shall contain the following:

(1) *Information.* Sixteen copies, plus additional copies as required, of a minor subdivision map containing the following information:

(a) The parcel being divided, clearly and legibly drawn on one or more sheets to a standard

engineer's scale of 1" = 20', 1" = 40', or 1" = 100';

(b) A perimeter description of the entire parcel, together with intersecting property lines, abutting public and private roads, easements, and drainage installations adjoining the parcel;

(c) A vicinity sketch showing the roads, adjoining subdivisions, towns, creeks, railroads, and other data sufficient to locate the proposed subdivision and to show its relation to the surrounding area;

(d) A north arrow and scale of the map;

(e) All existing buildings and structures and the approximate locations of other improvements, existing contours, easements, drainage channels, and other structures and the general direction of the flow of storm waters;

(f) The names of adjacent property owners (not the applicant);

(g) The file number, to be issued by the Engineering Division when the map is submitted;

(h) The proposed layout of streets and lots, the lot numbers, and the areas of the lots shown on the map;

(i) The names, addresses, and tele-phone numbers of the applicants and owners;

(j) The method of sewage disposal and the source of water supply;

(k) Each item for which a variance is requested and the specific reasons for the request; and

(l) A proposed grading plan or a state-ment of grading as required by the City Engineer.

(2) *Fees.* The application fee shall be $30. However, the fee shall be reduced to $20 when applicable under the provisions of § 9-4.1205 of this article.

(3) *EIR and General Plan conformance.* The applicant shall comply with the Environmental Impact Report and General Plan Conformance set forth in Cal. Gov't Code §§ 65402 and 66473.5.

(B) The provisions of this section and the following sections regarding parcel maps shall be inapplicable when such maps propose a lot line adjustment between two or more adjacent parcels where the land taken from one parcel is added to an adjacent parcel and where a greater number of parcels than originally existed is not thereby created provided the lot line adjustment is approved by City Engineer and the lots created, in all other respects, will comply with legal requirements.

('66 Code, § 9-4.1201) (Ord. 275-C-S, passed 3-11-75; Am. Ord. 358-C-S, passed 2-23-78; Am. Ord. 943-C-S, passed 8-11-98)

§ 9-4.1202 ACTION BY THE COMMISSION.

(A) The Commission shall hold a duly noticed public hearing on the minor subdivision map within 50 days after the filing of the map and shall render a decision within 30 days, unless additional time is consented to by the subdivider and the Commission. In the event the map is disapproved, such report shall set forth the basis of disapproval.

(B) The Commission shall consider the appli-cation of the subdivider for exceptions to the provisions of this article.

('66 Code, § 9-4.1202) (Ord. 275-C-S, passed 3-11-75; Am. Ord. 439-C-S, passed 2-21-80)

§ 9-4.1203 TIME LIMITS; MINOR SUBDIVISION MAPS.

The approval of the Commission of any exception or variance shall expire within one year after the date of approval. Upon request, the Commission may grant a one-year extension of time.

('66 Code, § 9-4.1203) (Ord. 275-C-S, passed 3-11-75)

§ 9-4.1204 MINOR SUBDIVISION MAPS; APPEALS.

Appeals from decisions on exceptions or variances on minor subdivision map considerations shall be in accordance with the provisions of § 9-5.607 of Article 6 of Chapter 5 of this title.

('66 Code, § 9-4.1204) (Ord. 275-C-S, passed 3-11-75)

§ 9-4.1205 EXCEPTIONS.

If all of the following conditions are met by the application, the Engineering Division may grant an exception from the requirement of submitting a minor subdivision map without submission to the Commission:

(A) No more than two lots are proposed to be created and each of such lots cannot be further divided under the existing zoning classifications;

(B) Both lots, after divisions, will front on, or have access to a public or dedicated street;

(C) Dedication is not required for widening, extending, or creating a street; and

(D) The lots created will, in all other respects, comply with legal requirements.

('66 Code, § 9-4.1205) (Ord. 275-C-S, passed 3-11-75)

§ 9-4.1206 FORM AND CONTENT OF PARCEL MAPS.

(A) The parcel map shall be filed for minor subdivisions and shall be prepared from a field survey by a registered civil engineer or licensed land surveyor, except when parcels greater than five acres are created, or, with the City Engineer's approval, when adequate field control and field survey information exists, the map may be drawn from record data only.

(B) The parcel map shall conform to all the provisions of this section and the provisions of Cal. Gov't Code §§ 66444, 66445, 66447, 66448, and 66449.

(1) The parcel map shall show ties to the center line of streets or property lines bounding the property, required street widening, the proposed or adopted highway setback lines, and other information required as a condition of approval.

(2) The boundary of the minor subdivision shall be designated by a one-sixteenth inch black line applied over India ink in such a manner as not to obliterate the figures or other data.

(3) The engineer or land surveyor presenting the map for checking and recording shall affix the certificate for the City Engineer's signature to the title sheet in conformance with the provisions of Cal. Gov't Code § 66450.

(4) The title sheet shall contain the minor subdivision number conspicuously placed at the top of the sheet and the location of the property being subdivided with reference to maps which have been previously recorded or by reference to a plat of the United States Survey. In the event the property included within the subdivision lies wholly within the city, the following words shall appear on the title: "In the City of Antioch"; if partly in unincorporated territory and partly within the city, the following words shall be used: "Lying within the County of Contra Costa and partly within the City of Antioch".

(5) Affidavits, certificates, acknowledg-ments, endorsements, and the notarial seals required by law and this section shall appear only once on the title sheet. Such data may be printed thereon with opaque ink or by photographic reproduction. If more than three sheets are used, a key diagram shall be included on the first sheet to a scale of 1" = 600'.

(6) There shall appear on each map sheet the scale, the north point, and the basis of bearing. The scale shall be 1" = 20', 1" = 40', or 1" = 100', as required by the City Engineer. The basis of bearings shall be that approved by the Engineering Division, and the map shall show the equation of bearings to the true north.

(7) The following provisions shall apply to easements within the tract:

(a) Easements for an existing or proposed utility installation for the use of a private or nongovernmental agency shall not be shown on the map unless there is a recorded conveyance to such individual or corporation, except as is provided in subdivision (b) of this subdivision.

(b) Easements not disclosed by the records in the office of the County Recorder and found by the surveyor or engineer to be existing shall be specifically designated on such map, identifying the apparent dominant tenements for which they were created.

(c) All easements of record shall be shown on the map, together with the name of the grantee and sufficient recording data to identify the conveyance, that is, the County Recorder's serial number and the date or the book and page of the county records.

(d) The side lines of all such record easements shall be shown by dashed lines on the final map with the widths, lengths, and the bearings thereof, in figures, if available, from the record.

(8) The adjoining corners of all adjoining subdivisions shall be identified by subdivision number or name and references to the book and page of the Recorder's map showing such subdivisions; and, if no such subdivision is adjacent, then by the name of the owner and reference to the recorded deed by book and page number for the last recorded owner of such adjacent property.

(9) Sufficient linear, angular, and radial data shall be shown to determine the bearings and lengths of the boundary lines of the subdivision and of the boundary lines of every lot and parcel which is a part thereof. The length, radius, and total central angle or radial bearings of all curves shall be

shown.

(10) City boundaries which cross or join the subdivision shall be clearly designated.

(11) The location and description of all existing and proposed monuments shall be shown.

('66 Code, § 9-4.1206) (Ord. 275-C-S, passed 3-11-75)

§ 9-4.1207 PARCEL MAPS; SUPPLEMENTARY DOCUMENTS.

(A) *Public streets.* Where the conditions of the filing of the parcel map require improvements on existing city streets or on streets to be accepted for maintenance by the city, the following documents shall accompany the parcel map when presented to the Engineering Division;

(1) A subdivision agreement, to be executed by the subdivider or his agent, guaranteeing the completion of the construction of the improvements required by the governing body within a specified time and the payment thereof;

(2) A cash deposit, together with such additional surety, as required by the provisions of subdivision (1) of division (B) of § 9-4.506 of Article 5 of this chapter;

(3) A letter from the Tax Collector showing all payable taxes paid and a bond for the payment of taxes then a lien but not yet payable, as required by the Subdivision Map Act;

(4) The cash payment, or receipt thereof, of all fees required for the checking and filing of the maps and the inspection of the construction, payment for street signs to be furnished and installed by the city, and any other applicable fees or deposits;

(5) Deeds conveying easements or fees required for road or drainage purposes. Written evidence acceptable to the city in the form of rights of entry or permanent easements across private property outside the subdivision permitting or granting access to perform necessary construction work and permitting the maintenance of the required facility;

(6) Agreements acceptable to the city where street improvements are to be accepted by the city, executed by the owners of existing utility easements within the proposed street right-of-way, consenting to the dedication of the street or consenting to the joint use of the right-of-way as may be required by the city for the public use and conveyance of the street; and

(7) A parcel map improvement plan in accordance with the provisions of § 9-4.1208 of this article.

(B) *Private streets.* Where the conditions of the filing of the parcel map require the improvement of a private street which is to remain a private street, the following shall be submitted to the City Engineer:

(1) Four copies of the parcel map improvement plan, in accordance with the provisions of § 9-4.1208 of this article, showing the required improvements and any other topographical features affecting the improvements;

(2) An inspection fee in the amount of 3% of the value of the improvements required to be

constructed; and

(3) After the approval of such plans, but prior to the sale of any lot, filing of a parcel map, or issuance of any building permit, the installation of improvements shall be completed and the work approved by the City Engineer, or an agreement secured by a cash deposit or a corporate surety bond in the amount of the estimated cost of the improvements shall be executed to assure completion of the improvements within one year after the date of approval.

(C) *Disposition of cash bonds.* If cash has been deposited as security and, because of failure in the performance of any term or condition, notice of default has been given, the principal shall comply with the notice within the time specified. In the event the work is not completed within the time specified, the City Engineer may use the deposited cash to have the required work done by contract or other means as determined by the City Engineer. The balance, after deducting the cost of the work, plus 10% for supervision, shall be returned to the principal. If the deposit is insufficient, the principal shall be liable for any deficiency.

(D) *Right of entry.*

(1) In the event of default in the performance of any term or condition of the permit, the surety or his agent, the City Engineer or any person employed or engaged by him shall have the right to go on the premises to complete the required work or make it safe.

(2) No person shall interfere with or obstruct the egress to or from the premises by any authorized representative or agent of any surety or of the city engaged in completing the work required by the agreement or in complying with the terms or conditions of the permit.

(E) *Terms of surety bonds; completion.* The term of each bond shall begin on the date of its posting and shall end on the satisfactory completion of the terms and conditions of the agreement. Completion shall be evidenced by a certificate of completion, a copy of which shall be sent to any surety on request.

('66 Code, § 9-4.1207) (Ord. 275-C-S, passed 3-11-75) Penalty, see § 9-4.903

§ 9-4.1208 IMPROVEMENT PLANS.

(A) *Improvement plans.* When improvements are required by the Commission for existing public streets or drainage, improvement plans shall be submitted to the Engineering Division for review and approval. Improvement plans, standards, and inspection fees shall conform to the requirements of this chapter, unless a specific exception is granted by the Council. Before a lot is sold, a parcel map filed, or a building permit issued, the improvements shall either be completed or an agreement shall be executed with the city to complete the improvements within one year. An agreement shall be secured by a bond in the amount of the estimated costs of the improvements. Improvement plans shall comply with the provisions of Articles 4, 6, and 7 of this chapter.

(B) *Scope.* The requirements and standards specified in this article shall apply to all improvements.

(C) *Time limits for improvements.* Required improvements shall be constructed within one year after the approval of the minor subdivision map. An additional period of one year may be granted by the City Engineer where extenuating circumstances exist that prevent the completion of the improvements.

If the improvements are not completed within the time allowed, the city may, on approval of the Council, use the money from the cash deposit or enforce the surety bond to accomplish the completion of the improvements in accordance with the improvement plans on file.

(D) *Requests for exceptions.* Requests for exceptions may be made as provided in Article 8 of this chapter.

('66 Code, § 9-4.1208) (Ord. 275-C-S, passed 3-11-75) Penalty, see § 9-4.903

§ 9-4.1209 PARCEL MAP CHECKING; APPROVAL.

(A) *Map checking.*

(1) The subdivider shall submit three sets of prints of the map and certificate sheets to the Engineering Division for checking purposes before filing the map. The preliminary checking prints shall be accompanied by a preliminary title report.

(2) The error of closure in traverse in the subdivision and around the interior lots or blocks shall not exceed one part in 20,000.

(3) The Engineering Division, within 20 days, shall note any errors or omissions, if any, on one set of the preliminary prints and return them to the engineer or surveyor for the final revision of the maps.

(B) *Map approval.*

(1) The original tracing of the parcel map of the subdivision, prepared in accordance with the provisions of § 9-4.1206 of this article, shall be submitted to the Engineering Division for approval and transmitted to the County Recorder for filing.

(2) The parcel map shall be accepted for filing by the Engineering Division when the map and all of the required supplementary documents and fees have been presented and approved. The Engineering Division, within 60 days following receipt, shall present the parcel map to the County Recorder for filing.

(C) *Time limits for filing.* The time limit for filing the parcel map shall be one year from the date of the approval of the minor subdivision map by the Commission, unless an extension of time is granted as provided in § 9-4.1203 of this article.

(D) *Evidence of title.* The subdivider shall present to the County Recorder evidence of title as required by the Subdivision Map Act.

('66 Code, § 9-4.1209) (Ord. 275-C-S, passed 3-11-75)

§ 9-4.1210 CHECKING, RECORDING, AND INSPECTION FEES.

(A) *Checking fees.* The parcel map, when submitted for checking, shall be accompanied by a checking fee as specified by resolution.

(B) *Recording fees.* After the approval of the parcel map and prior to the signing of the certificate

on the title sheet, a recording fee as specified by resolution shall be deposited with the Engineering Division.

(C) *Inspection fees.* Where the improvement of an existing public street or the construction of a public street is a condition of the filing of the parcel map, an inspection fee as specified by resolution shall be paid.

('66 Code, § 9-4.1210) (Ord. 275-C-S, passed 3-11-75; Am. Ord. 628-C-S, passed 4-24-86)

§ 9-4.1211 BUILDING PERMITS.

No building permit shall be issued for a new structure on a lot or parcel created after February 9, 1972, unless such lot or parcel was created in accordance with the provisions of this article. Lots or parcels created prior to February 9, 1972, which were created in violation of the provisions of this article, shall be subject to approval as provided in this article prior to the issuance of a building permit.

('66 Code, § 9-4.1211) (Ord. 275-C-S, passed 3-11-75)

§ 9-4.1212 VOIDABLE SALES OR TRANSFERS.

Any deed of conveyance, sale, or contract to sell made in violation of or contrary to the provisions of this article shall be voidable to the extent and in the same manner as provided in Cal. Gov't Code § 66499.32.

('66 Code, § 9-4.1212) (Ord. 275-C-S, passed 3-11-75)

§ 9-4.1213 IN LIEU PARK AND RECREATIONAL LAND DEDICATION FEES.

In lieu park and recreational land dedication fees shall be required as set forth in Article 10 of this chapter.

('66 Code, § 9-4.1213) (Ord. 275-C-S, passed 3-11-75)

ARTICLE 13: REVERSION TO ACREAGE BY MAPS

§ 9-4.1301 REVERSION TO ACREAGE BY MAPS.

(A) *Authority.*

(1) *Subdivisions.* The Council shall be the delegated authority to approve or disapprove maps in the form of tentative or final maps which provide for reversions to acreage of land previously subdivided.

(2) *Minor subdivisions.* The Commission shall be the delegated authority to approve, conditionally approve, or disapprove the tentative or final maps of a minor subdivision which maps provide for reversions to acreage of land previously subdivided.

(B) *Procedure.*

Development Application

DEVELOPMENT APPLICATION

Community Development Department
P.O. Box 5007
Third & "H" Streets
Antioch, CA 94531-5007
Phone: (925) 779-7035 Fax: (925) 779-7034

SITE LOCATION: _____

ASSESORS PARCEL NO. (S): _____ TOTAL ACREAGE: _____

BRIEF DESCRIPTION OF REQUEST: _____

_____

_____

_____

PROPERTY OWNER OF RECORD

Name: _____

Company Name: _____

Address: _____

_____

_____

Telephone No. _____

Fax No. _____

Email: _____

Signature: _____

APPLICANT

Name: _____

Company Name: _____

Address: _____

_____

_____

Telephone No. _____

Fax No. _____

Email: _____

Signature: _____

ANY OTHER PERSON THAT YOU WOULD LIKE THE CITY OF ANTIOCH TO NOTIFY OF THE PUBLIC HEARING

Name: _____

Company Name: _____

Address: _____

_____

_____

Telephone No. _____

Fax No. _____

Email: _____

AGENT/DESIGNER

Name: _____

Company Name: _____

Address: _____

_____

_____

Telephone No. _____

Fax No. _____

Email: _____

For Office Use Only

Date Received: _____ File No: _____

Title: _____ _____

Planner: _____ Account No. _____

Type of Application:

____ Design Review	____ Amend General Plan	____ Minor Subd	____ 2ND Unit AUP	
____ Use Permit	____ Amend Spec Plan	____ Lot Line Adj	____ Rezone/Final Dev. Plan	
____ Variance	____ Amend Zoning Map	____ Subdivision	____ Annexation	
____ Signage	____ Prelim PD	____ Other		

_____

Return comments no later than _____

___ Engineering/PW	___ Building	___ Police
___ Engineering/E. Franzen	___ Fire	___ _____
___ Engineering/CD	___ PHBS	___ _____
___ Maintenance	___ DDSD	

PLEASE SIGN AND RETURN WITH YOUR APPLICATION

STATEMENT OF UNDERSTANDING

In signing this Statement of Understanding in conjunction with the attached application to the City of Antioch, Department of Community Development for Project:

_____

I understand that charges for materials and staff time spent processing this application will be billed monthly and is based on an hourly rate as identified in the current fiscal year fee schedule. Application processing includes but is not limited to plan checking and processing, meetings, phone calls, research, e-mail, and staff report preparation. Further, I understand that my initial deposit is not a fee and actual charges may be in excess of the deposit. The deposit will be returned to me at the conclusion of the process after all invoices have been paid. If invoices are not paid on a monthly basis, processing will be terminated until all past due amounts have been paid. Failure to pay invoices on a monthly basis may also result in an application being deemed incomplete; postponement of hearings or meetings; and/or inability to obtain a building permit.

I assume full responsibility for all costs incurred by the City in processing this application.

Further, I understand that approval of my project is NOT guaranteed and may be denied. In the case of a denial, I understand that I am still responsible for all costs incurred by the City in processing this application.

I hereby authorize employees, officials and agents of the City of Antioch to enter upon the subject property, as necessary, to inspect the premises and process this application.

DATE: _____

NAME: _____

SIGNATURE: _____

Property owner signature for authorization to enter property and process the application. This is required only if the applicant is not the property owner.

DATE: _____

NAME: _____

SIGNATURE: _____

Minor Subdivision Map Submittal Checklist

COMMUNITY DEVELOPMENT DEPARTMENT
(925) 779-7035

Procedures for Tentative Minor Subdivision Map

GENERAL

A Tentative Minor Subdivision Map, or Parcel Map, is required for all land divisions of four or fewer parcels. A Tentative Subdivision Map is required for all land divisions of five or more parcels. A different application is needed for a Subdivision Map.

PROCESS

Environmental Review

All Tentative Minor Subdivision Map applications will be required to include a completed environmental assessment form to determine whether or not an Environmental Impact Report will be necessary. The assessment is to be submitted at the time of the initial application and an environmental determination will be made prior to processing the Tentative Minor Subdivision Map.

The following fees are required by the State Department of Fish and Game when filing a Notice of Determination for a certified CEQA document. The appropriate fee is required at time of application.

- ☐ Negative Declaration or Mitigated Negative Declaration - $1,876.76
- ☐ Environmental Impact Report - $2,606.75
- ☐ Exempt for CEQA – no fee required

Planning staff will assist you in determining the appropriate fee for your project. This fee shall be made in a check payable to the City of Antioch. The fee will be paid to the County Clerk or State Clearinghouse when a Notice of Determination is filed as described in the attached memo.

Staff Review

Following receipt of the Tentative Minor Subdivision Map, staff will consider the proposal with particular attention to environmental effects, land uses, traffic circulations, and engineering design. Copies of the map will be distributed to interested agencies and comments will be solicited from those agencies.

Planning Commission Public Hearing

The Planning Commission is required to hold at least one public hearing on the application for a Tentative Minor Subdivision Map. At the hearing, staff will first present its report and recommendations. This presentation will be followed by testimony from the applicant and any interested persons who may wish to comment on the application. A decision will be made by the Planning Commission after evaluating the public testimony and the staff report. The Planning Commission decision is final unless appealed to the City Council.

Completion of the Division Process

Before the actual subdivision of the property is complete, a final Parcel Map must be prepared and submitted to the City Engineer for review and approval. After the City Engineer has approved the Parcel Map, it will be recorded in the County Recorders Office.

Estimated Time to Process

Typically, it will take 6 to 8 weeks from the time an ***application is deemed to be complete*** for a project to be scheduled for a hearing. The exact timing will depend on the complexity of the project, environmental status, etc. The Planning Commission meets on the first and third Wednesdays of the month at 7:00 p.m. in the City Council Chambers. Tentative Minor Subdivision Map review is a public hearing. Property owners within 300 feet will be notified, and notice of the hearing will be published in the newspaper. At the hearing a decision will be made to do one of the following:

1. Approve or conditionally approve the project as submitted.
2. Postpone action pending receipt of additional information or amended plans.
3. Deny the application.

A copy of the findings and decision will be provided to the applicant following the hearing.

The Planning Commissions decision is final unless appealed to the City Council. An APPEAL of the Planning Commission decision must be submitted to the City Clerk with a $50.00 fee, within five (5) working days of the date of the hearing.

TENTATIVE MINOR SUBDIVISION MAP SUBMITTAL CHECKLIST

APPLICANT: _____

PROJECT LOCATION: _____

___ Completed application form, with signature of property owner and applicant.

___ Current preliminary title report with complete legal description.

___ Deposit as listed in the master fee schedule.

___ List of property owners with addresses and assessors parcel numbers for properties within 300 feet of project and one(1) set of stamped, preaddressed envelopes without return address (no metered postage, please).

___ Completed Environmental Assessment form (attached).

___ The following fees are required by the State Department of Fish and Game (see attached memorandum dated December 19, 2006) when filing a Notice of Determination for a certified CEQA document). The appropriate fee is required at time of application.

- Negative Declaration or Mitigated Negative Declaration - $1,800.00
- Environmental Impact Report - $2,500.00
- Exempt for CEQA – no fee required

Planning staff will assist you in determining the appropriate fee for your project. This fee shall be made in a check payable to the City of Antioch. The fee will be paid to the County Clerk or State Clearinghouse when a Notice of Determination is filed as described in the attached memo.

___ 25 copies of Tentative Minor Subdivision Map FOLDED TO 8 ½ X 11 SIZE. Maps folded to a larger size will be returned to the applicant as an incomplete application. Information shown on the Tentative Minor Subdivision Map to include:

___ Map drawn to a standard engineers scale (1" = 20', 1" = 40', etc) with scale shown.
___ Boundary of all parcels are described by bearing and distance.
___ Vicinity map shows location of project relative to surrounding area.
___ Assessors Parcel number noted on map.
___ All existing buildings and other structures shown.
___ Location of other improvements approximately shown.
___ Intersecting property lines shown.
___ Abutting public and private roads shown and identified.
___ All easements of record are shown and identified.
___ Adjacent parcels are identified by names of property owners.
___ Proposed layout of streets and lots, lot numbers, and area of each lot.
___ Name, address, and telephone number of the applicant, owner, and engineer/surveyor.
___ Proposed method of sewage disposal and source of water supply.
___ Proposed grading plan or a statement of grading
___ All items for which a variance is requested are noted on the map and a variance application form is submitted (if applicable).

HOW TO COMPILE THE PROPERTY OWNERS' MAP AND LISTING

PURPOSE

Most applications to the City of Antioch Department of Development Services require notification of surrounding property owners. This is a requirement of State law which gives an opportunity for property owners on surrounding lands to comment on the application at a public hearing. Applicants are required to provide the names of the property owners and addressed, prestamped envelopes. Postal Service and City policy makes the use of predated and undated **METERED POSTAGE UNACCEPTABLE**. Please use current U.S. postage stamps as envelopes with ***metered postage will be returned to the applicant.***

ASSESSOR ROLL METHOD

Contra Costa County Assessor's office prepares both a set of tax maps and a tax roll. A person's property can be identified by an assessor's parcel number which resembles a Social Security Number. An example of an assessor's parcel number is 068-102-15. In this example the first set of numbers (068) is the book, the second set of numbers (102) is the block/page and the third set of number (15) is the parcel. The full number represents the assessor's parcel number.

Step 1 - Identify the assessor's parcel number and locate a series of assessor map books available at Contra Costa County Offices. Locate the parcel in the map book.

Step 2 - Assemble a map showing a 300 foot radius around the subject site. Multiple assessor pages may be necessary. Identify parcels which fall wholly or partially within 300 feet of the subject parcel. Include this map with the application.

Step 3 - List all the parcels **IN NUMERIC ORDER** by book, page and parcel on the attached sheet.

Step 4 - Using the parcel numbers identified in Step 3, use the assessment roll to find the names and addresses of the owners of the properties and write these in the spaces provided on the attached sheet along with the site address.

Step 5 - Submit this list to the Department of Development Services as part of the application. Sheets that are not legible will be returned. It is the applicant's responsibility to make sure these sheets are correct. Incorrect noticing could cause a delay to the processing of the project.

TITLE COMPANIES

Most title companies have this information on computer and charge a nominal fee for this service. An applicant may wish to use a title company instead of following the above process, however, we will still require that the "PROPERTY OWNERS' NOTIFICATION LISTING" be accurately filled out and included with each application.

MAILING

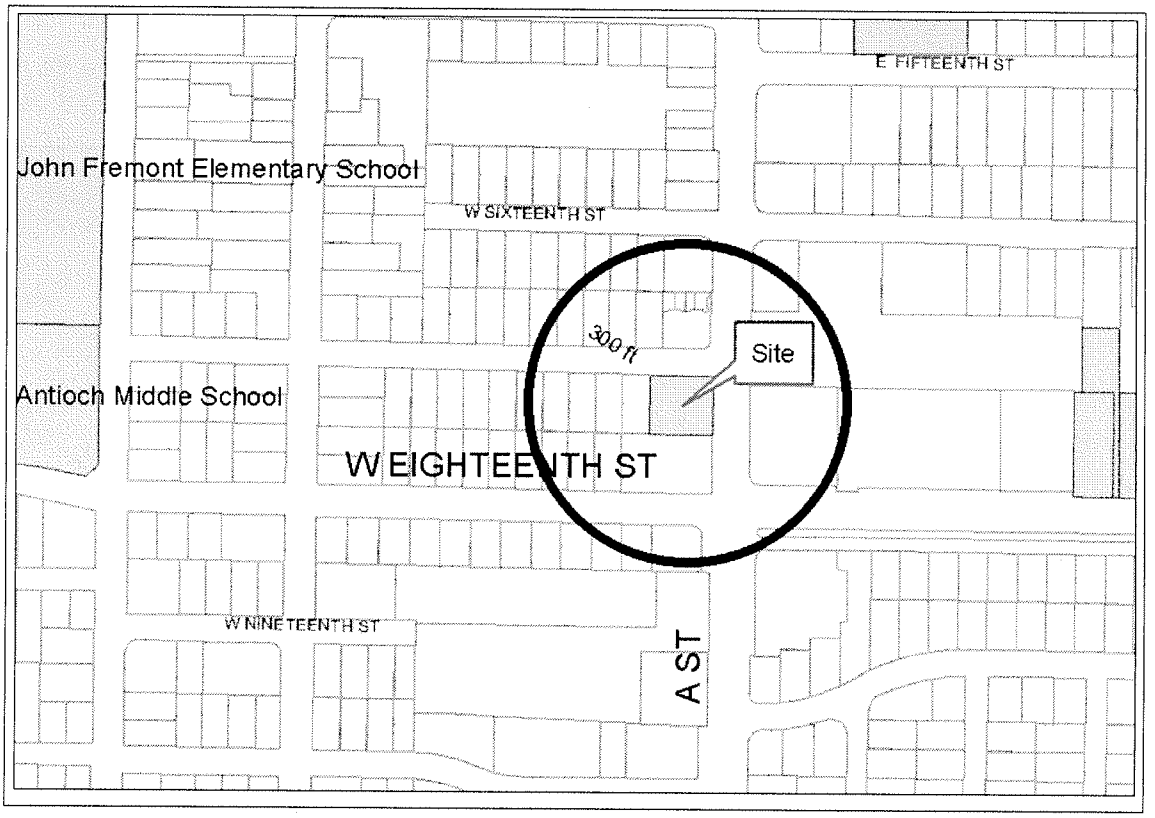
As part of the application, applicants will be required to supply a set of envelopes to be used by the City to mail the required notices:

- The envelopes shall be legal size, addressed, prestamped **(METERED POSTAGE CANNOT BE ACCEPTED)** envelopes.
- Bundle the envelopes in the same order as they appear on the Property Owners' Listing. ***Envelopes that are out of order will be returned to the applicant.***
- Property owners with multiple properties need only one envelope. Properties owned by the City of Antioch do not require envelopes.
- The upper left-hand corner of the envelope must be left blank so the City's return address may be placed on the envelope. In the event the Post Office is unable to deliver the notice of public hearing, it will be returned to the City for file.
- If you are making an application for a planned development, zoning, general plan or specific plan change, you should submit two (2) sets of envelopes.
- If an appeal is filed on an otherwise final decision, you will need to submit an additional set of envelopes for the required noticing.

See the samples in the following pages. Staff will be happy to answer any questions.

Sample of Map

Parcels that are within the 300 foot radius are to be notified of the public hearing



Site = Applicants Property
Parcels in radius are parcels affected by the 300' radius that need to be notified

City of Antioch GIS

SAMPLE OF PROPERTY OWNERS' NOTIFICATION LISTING

Within 300 feet of property located at:
Page 1 of 1

Project Address: **123 A St.**
Project Assessor Parcel No: **000-100-123**

099-134-181-0	Smith Construction Company	SITE: 10134 A St., Antioch, CA 94509 MAIL: P.O. Box 134, Antioch, CA 94587
099-134-182-0	Buyer, Bill and Betty Jo	SITE: 10138 A St., Antioch, CA 94509 MAIL: (SAME)
099-134-183-9	Developer, Joe	SITE: 10142 A St, Antioch, CA 94509 MAIL: (SAME)
099-135-001-0	DevCo Commercial	SITE: Deer Valley Road MAIL: 123 El Camino Real, Los Altos, CA 94022
	SAMPLE	

I certify that the above is from the most recent Contra Costa county tax assessment rolls.

I.M. Broker	*I. M. Broker*	January 1, 2003
Applicant (Print Name)	(Signature)	Date

Environmental Assessment Form

Environmental Assessment Form
Name of Project: _____

ENVIRONMENTAL ASSESSMENT

(To be completed by Applicant)

To Accompany Application for:

_____

Completeness and accuracy of the information provided by this form will help assure that your application can proceed without unnecessary delay. Attach additional sheets if necessary.

APPLICANT INFORMATION

Name: _____

Contact Name: _____

Address: _____

_____

Parcel No. _____

Telephone No. _____

File No. _____

GENERAL INFORMATION

1. List and describe any other related permits and other public approvals required for this project, including those required by city, regional, state and federal agencies:
_____
_____
_____
_____
2. Existing zoning and general plan districts: _____
3. Proposed use of site (project for which this form is filed):
_____
_____

PROJECT DESCRIPTION

4. Site size: _____
5. Building square footage: _____
6. Number of floors of construction: _____
7. Amount of off-street parking provided: _____
8. Percentage of landscaping: _____
9. Projects associated with this project:
_____
_____
10. Schedule of construction:
_____
11. If residential, include the number of units, schedule of unit sizes, range of sale prices or rents and type of household size expected:
_____
_____
12. If commercial, indicate the types of tenants, and whether neighborhood, city of regionally oriented:
_____
_____
13.
14. If industrial, indicate the type of tenants, hours of operation and estimated employment per shift:
_____
_____
15. If institutional, indicate the major function, estimated employment per shift, estimated occupancy, and community benefits to be derived from the project:
_____
_____

Environmental Assessment Form
Name of Project: _____

16. If the project involves a variance, conditional use permit or rezoning application, state this and indicate clearly why the application is required:

_____
_____
_____

Are the following items applicable to the project or its effects?

		YES	NO
17.	Change in existing features of any wetlands, tidelands, beaches, or hills, or substantial alteration of ground contours		
18.	Change in scenic views or vistas from existing residential areas or public lands or roads		
19.	Change in pattern, scale or character of general area of project		
20.	Create significant amounts of solid waste or litter		
21.	Change in dust, ash, smoke, fumes or odors in vicinity		
22.	Change in ocean, bay, lake, stream or ground water quality or quantity, or alteration of existing drainage patterns		
23.	Create substantial change in existing noise or vibration levels in the vicinity		
24.	Site on filled land or on slope of 10% or more		
25.	Use or disposal of potentially hazardous materials, such as toxic substances, flammables or explosives		
26.	Create a substantial change in demand for municipal services (police, fire, water, sewage etc.)		
27.	Substantially increase fossil fuel consumption (electricity, oil, natural gas, etc.)		
28.	Project related to a larger project or series of projects		

Discuss below all items checked "YES" (attach additional sheets as necessary)

_____
_____
_____
_____
_____
_____
_____

ENVIRONMENTAL SETTING

29. Describe the project site as it exists before the project, including information on topography, soil stability, plants and animals, and any cultural, historical or scenic aspects. Describe any existing structures on the site, and the use of the structures. Attach photographs of the site. Snapshots, Polaroid photos or digital photos will be accepted.

_____
_____
_____
_____
_____

30. Describe the surrounding properties, including information on plants and animals and any cultural, historical or scenic aspects. Indicate the type of land use (residential, commercial, etc.), intensity of land use (one-family, apartment houses, shops, department stores, etc.), and scale of development (height, frontage, setback, rear yard, etc.). Attach photographs of the vicinity. Snapshots, Polaroid photos or digital photos will be accepted.

_____
_____
_____
_____
_____

Environmental Assessment Form
Name of Project: _____

CERTIFICATION

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this initial evaluation to the best of my ability, and that the facts, statements, and information presented are true and correct tot the best of my knowledge and belief.

Date: _____

Name of Agency:_____

Name: _____

Signature: _____

Phone: _____

Stormwater Control Plan Checklist

STORMWATER CONTROL PLAN CHECKLIST

The following checklist is adapted from the Stormwater C.3 Guidebook which contains a detailed description and instructions for preparing a stormwater control plan. The Guidebook is available online at http://cccleanwater.org/construction/nd.php or it may be purchased from the City of Antioch. ***A stormwater control plan is required for projects that are creating more than one acre of impervious surface.***

CONTENTS OF PLAN:

Show on scaled (1"= 20', 40', 50' or 100') drawings:

- ☐ Existing natural hydrologic features (depressions, watercourses, relatively undisturbed areas) and significant natural resources.
- ☐ Soil types and depth to groundwater (if infiltration is proposed).
- ☐ Existing and proposed site drainage network and connections to drainage off-site.
- ☐ Proposed design features and surface treatments used to minimize imperviousness.
- ☐ Separate drainage areas, depending on complexity of drainage network.
- ☐ Existing condition of each drainage area, including pervious and impervious areas.
- ☐ For each drainage area, types of impervious area (roof, plaza/sidewalk, and streets/parking) and area of each.
- ☐ Proposed locations and approximate sizes of infiltration, treatment, or hydrograph modification BMPs.
- ☐ Pollutant source areas, including loading docks, food service areas, refuse areas, outdoor processes and storage, vehicle cleaning, repair or maintenance, fuel dispensing, equipment washing, etc., and corresponding required source controls from Appendix E of Stormwater C.3 Guidebook.

CONTENTS OF REPORT:

A report accompanying the drawings should include:

- ☐ Narrative analysis or description of site features and conditions that constrain, or provide opportunities for, stormwater control.
- ☐ Narrative description of site design characteristics that protect natural resources.
- ☐ Narrative description and/or tabulation of site design characteristics, building features, and pavement selections that reduce imperviousness of the site.
- ☐ Tabulation of pervious and impervious area, showing self-retaining areas and areas tributary to each infiltration, treatment, or hydrograph modification BMP.
- ☐ Preliminary designs, including calculations, for each treatment or hydrograph modification management BMP. Elevations should show sufficient hydraulic head for each.
- ☐ A table of identified pollutant source areas and for each, the source control measure(s) used to reduce pollutants to the maximum extent practicable. See worksheet in Appendix E, Stormwater C.3 Guidebook.
- ☐ Identification of any conflicts with codes or requirements or other anticipated obstacles to implementing the Stormwater Control Plan.
- ☐ Construction and annual maintenance cost estimates for proposed BMP.

- ☐ General description of maintenance needs for treatment/hydrograph modification BMPs.
- ☐ Brief summary of other BMP methods ***not chosen*** for the project (including basic cost and C-3 efficiency estimates).
- ☐ Means by which BMP maintenance will be financed and implemented in perpetuity.
- ☐ Statement accepting responsibility for interim operation & maintenance of treatment BMPs.
- ☐ Construction Plan C.3 Checklist.
- ☐ Certification by a licensed civil engineer, architect, and landscape architect.

APPENDIX C

SOIL & WATER

APPENDIX C-1

STORM WATER CONTROL PLAN

Draft Report

Stormwater Control Plan for the Marsh Landing Generating Station

Prepared for

Mirant Corporation

December 2008

CH2MHILL
2525 Airpark Drive
Redding, CA 96001

Contents

Page

Acronyms and Abbreviations ..... **iv**

1.0 Stormwater Control Plan **1**
- 1.1 Project Setting 1
  - 1.1.1 Project Description and Location 1
  - 1.1.2 Existing Site Condition 2
- 1.2 Measures to Limit Imperviousness 5
  - 1.2.1 Measures to Protect Natural Resources 5
  - 1.2.2 Measures to Limit Directly Connected Impervious Areas 6
  - 1.2.3 Table Summarizing Pervious and Self Retaining Areas 6
- 1.3 Preliminary Design of Treatment and Flow Control Facilities 7
  - 1.3.1 Locations and Elevations 7
  - 1.3.2 Sizing Calculations 7
  - 1.3.3 Summary of Impervious Areas and Treatment/Flow-control Facilities 7
- 1.4 Source Control Measures 7
  - 1.4.1 Description of Site Activities and Potential Sources of Pollutants 7
  - 1.4.2 Potential Sources, Permanent Source Control and BMPs 7
- 1.5 Permitting and Code Compliance Issues 10
- 1.6 Facility Maintenance 10
  - 1.6.1 Ownership and Responsibility for Maintenance 10
  - 1.6.2 Summary of Maintenance Requirements 11
- 1.7 Construction Plan C.3 Checklist 11
- 1.8 Certification 13
- 1.9 Works Cited 13

Appendices

A Marsh Landing Generating Station Preliminary Drainage Calculations
B Marsh Landing Plot Plan

Tables

1 Source Control Best Management Practices 7

2 Construction Plan C.3 Checklist 11

Contents, Continued

Figures

1 Site Plan

2 Project Location Map

3 Existing Land Uses in the Area Surrounding the Site

4 Existing Site Topographic Survey

5 Site Grading and Drainage Plan

6 Existing CCPP Drainage

Acronyms and Abbreviations

ac-ft	acre feet
APN	Assessor's Parcel Number
BGS	below ground surface
BLS	Bridgehead Lift Station
BMP	best management practice(s)
CCPP	Contra Costa Power Plant
DDSD	Delta Diablo Sanitation District
IPM	integrated pest management
msl	mean sea level
MLGS	Marsh Landing Generating Station
OWS	oil-water separator
PG&E	Pacific Gas & Electric
USGS	U.S. Geological Survey

1.0 Stormwater Control Plan

1.1 Project Setting

1.1.1 Project Description and Location

The proposed Marsh Landing Generating Station (MLGS) will consist of new natural-gas–fired generation facilities and ancillary systems. The proposed project consists of construction of new generating units that will become the MLGS; construction of electric and gas transmission lines adjacent to the facility; construction of water supply and wastewater pipelines; and construction of a water treatment facility at the Delta Diablo Sanitation District (DDSD) Bridgehead Lift Station (BLS) (Figure 1). The generator output from the MLGS will be stepped-up to 230-kV transmission voltage and consists of four power blocks: two Siemens Flex Plant 10 (FP10) combined-cycle units; and two Siemens 5000F combustion turbine units operating in simple-cycle mode (Simple Cycle units). The generator output from the MLGS will be interconnected to the existing PG&E switchyard located adjacent to the MLGS site.

The new MLGS units are to be constructed within the existing Contra Costa Power Plant (CCPP) site, located at 3201 Wilbur Avenue in unincorporated Contra Costa County, California, approximately 0.1 mile from the City of Antioch limits (Figure 2). The MLGS site is located on Sections 16, Township 2 North, Range 2 East, on the U.S. Geological Survey (USGS) Antioch North Topographic Quadrangle Map. The project site includes no unique features. The site is surrounded by industrial uses to the southeast and west, the San Joaquin River to the north and a commercial marina, industrial uses, and open space to the east.

The MLGS will be situated on a parcel of approximately 27 acres that will be created by a subdivision of the existing single parcel that constitutes the site of the CCPP. When completed, the MLGS will occupy approximately 27 acres in the western portion of the CCPP property, generally within the footprint of an area currently occupied by five fuel storage tanks, temporary buildings, and other ancillary facilities. Demolition of Tanks 1 through 5 will occur as a part of the MLGS project construction.

The MLGS will be constructed on the existing CCPP site; preliminary drainage calculations indicate that approximately 82 percent of the site is currently impervious. When MLGS is completed, there will be a decrease in the amount of impervious area from 82 to 50 percent (CH2M HILL 2008). While the amount of impervious area may be less than existing conditions, compaction of the soil to support the proposed facility would reduce the amount of infiltration. However, overall it is anticipated that there will be no increase in impervious area or runoff due to the MLGS.

Since there will be no increase in impervious area at the MLGS site, Option 1: No increase in impervious area (Contra Costa Clean Water Program, Stormwater C.3 Update June 2006) must be demonstrated. Many of the existing impervious areas will be demolished and replacement facilities will affect a significantly smaller footprint (approximately 40 percent

reduction of impervious facilities). Project drainage calculations are attached in Appendix A (CH2M HILL, 2008).

The project includes the following components that would be located outside the MLGS site but within the CCPP site or directly adjacent:

- Approximately 14 acres of construction laydown and parking areas
- Electric transmission lines connecting directly to the PG&E switchyard adjacent to the MLGS site
- An existing potable water line running north-south through the CCPP property to the City of Antioch water line that is located along Wilbur Avenue
- Two approximately 1-mile-long water pipelines between the MLGS site and the DDSD's BLS to deliver recycled water and return wastewater

These features will all be located on previously disturbed, graded, or paved areas of the CCPP. As indicated, the gas interconnection line will run east from the MLGS compressor building through the CCPP site to an existing gas transmission line (Line 400) adjacent to the GGS site. The underground gas line will occupy an existing easement across the GGS site. Water treatment facilities will be constructed at DDSD's BLS to produce recycled water for the project site. The BLS is an existing facility located on a 3.4-acre parcel on Bridgehead Road in the City of Antioch.

1.1.2 Existing Site Condition

The project site is approximately 27 acres in size and is currently occupied by five fuel oil tanks. Demolition of Tanks 1 through 5 will occur as a part of the MLGS project construction. The estimated percentage of existing impervious surfaces within the 27-acre site is approximately 82 percent. The land in the general vicinity of the project site contains a mix of industrial and commercial uses, undeveloped land, open space, and agricultural, recreational and residential uses (Figure 3).

The MLGS site is currently zoned as Heavy Industrial by Contra Costa County. The Contra Costa County General Plan designates the majority of the site as Heavy Industrial and a narrow strip of land along the river as Open Space. The Heavy Industrial classification is generally consistent with existing land use. According to the General Plan, the most appropriate uses in Open Space areas involve resource management. Currently, this designation applies to a portion of the CCPP site that includes developed areas (e.g., the administration building) and will also apply to a small portion of the proposed MLGS site where several of the existing fuel storage tanks are located.

The existing CCPP has a Stormwater Management Plan (SWMP), which includes a Stormwater Pollution Prevention Plan (SWPPP) and a Monitoring and Reporting Program, in accordance with National Pollutant Discharge Elimination System permit requirements for discharges associated with industrial activities.

1.1.2.1 Topography

The preconstruction site topography is shown on Figure 4. The grading plan and post-construction drainage is shown on Figure 5. The drainage flows shown on Figure 5 are

based on the maximum 24-hour, 25-year storm event. Figure 6 shows the drainage pattern and discharge points for the existing CCPP property on which the MLGS site occurs. Stormwater runoff discharges from the CCPP are permitted under the National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000001 (General Permit) Water Quality Order No. 97-03-DWQ Waste Discharge Requirements (WDR) for Discharge of Storm Water Associated with Industrial Activities Excluding Construction Activities and NPDES Permit Number CA0004863 for the CCPP.

Stormwater runoff from the 27-acre MLGS site currently collects and drains via a storm drain system and then discharges to the San Joaquin River via the existing discharge Outfall 001.

1.1.2.2 Groundwater

The MLGS is located within the Pittsburg Plain Groundwater basin, along the south shore of Suisun Bay. Aquifers in the basin area are hydrologically connected to the San Joaquin and Sacramento Rivers. The aquifer beneath the MLGS site is composed of fine to coarse-grained sands and thin layers of clay silt and peat. The thin layers become thicker as they approach the northeastern portion of the site and the San Joaquin River. The thin layers are less permeable, and may cause perched water to occur locally. At the site, the depth to groundwater ranges from 6 to 10 feet below ground surface (bgs) (CDM, 1997). The depths fluctuate with tidal influences from San Francisco Bay that affect water levels in the San Joaquin River as well as from seasonal forces. The direction of groundwater flow is north-northwest towards the San Joaquin River. As part of a previous groundwater monitoring program, eight groundwater monitoring wells were located on the CCPP property (CDM, 1997). Neither Mirant Delta nor PG&E, the former owner of the CCPP property, are required to monitor these wells. No monitoring wells are within the footprint of the MLGS project site. The groundwater quality in the Pittsburg basin is generally poor due to chlorides, total dissolved solids (TDS), and agricultural runoff. TDS in groundwater near the site is generally between 500 and 1,500 milligrams per liter (mg/L) (Planert and Williams, 1995). These TDS levels tend to increase with depth and are due to the lithology of the area.

1.1.2.3 Surface Water

The MLGS is situated in an area of the western Delta near the confluence of the Sacramento and San Joaquin Rivers. The only natural perennial surface water within 1 mile of the site is the San Joaquin River. The MLGS site is on the southern bank of the San Joaquin River, east of the City of Antioch in Contra Costa County and approximately 7 miles upstream from the Pittsburg Power Plant. The MLGS site is located within the Oakley Sub-basin, as described in the East Contra Costa County Habitat Conservation Plan Environmental Impact Statement. The Contra Costa Canal is located approximately 2 miles south of the site. No surface water bodies are present on the site. In general, all surface water runoff flows north to the San Joaquin River. The surface water quality of the San Joaquin River in the vicinity of the site is variable due to its position near the estuarine transition zone that separates the upstream, freshwater Delta from the downstream, saltwater bay. Near the site, the river ranges from freshwater during periods of high river flow to brackish water during periods of lower flow. The San Joaquin River is identified as being impaired for a variety of contaminants, including a number of pesticides, mercury, boron, and others

(CVRWQCB, 2006). This impaired listing indicates that the ambient concentrations of these constituents are too high to support the beneficial uses identified for this water body (CEC, 2001).

1.1.2.4 Constraints

Although there will be a reduction in impervious area (approximately a 40 percent footprint reduction), the soils may be compacted in some areas that would require compacted soils for structures.

Areas with shallow groundwater will need to be taken into consideration during design and implementation of treatment and flow-control facilities. Operation and maintenance of the facility could potentially affect groundwater quality through inadvertent spills or discharge that could then infiltrate and percolate down to groundwater, as depth to groundwater at the site is relatively shallow (approximately 6 to 10 feet bgs). The project will implement spill prevention and control measures to prohibit discharge of chemicals to groundwater.

Operation and maintenance of the project facility could affect surface water quality of San Joaquin River through inadvertent spills or discharges. Source controls at the facility will include best management practices at storm drain inlets to prevent surface water runoff contaminant from entering the river consistent with the facility SWMP and or Stormwater Facility Maintenance Plan (required prior to occupancy). Facility inspections and maintenance will incorporate verification that facilities are operated and maintained in good operating condition.

Due to the pre-existing site activities there is potential for contaminated soils. During equipment dismantling and removal, all machinery, tanks, pipelines, and appurtenances will be inspected for possible points of release. If it is determined that a release did occur, the affected area will be investigated and notifications will be made to appropriate parties. Where necessary, materials that have been affected by the release will be collected and analyzed to determine further action. All affected materials will be removed and disposed of in licensed landfills.

1.1.2.5 Opportunities

The stormwater system will be designed in accordance with the Contra Costa Countywide stormwater requirements. The existing points of discharge will be maintained. A Notice of Intent to comply with the General Permit for Industrial Activities will be submitted and a SWMP that includes a SWPPP and Monitoring and Reporting Plan will be prepared in accordance with the National Pollutant Discharge Elimination System General Industrial Permit requirements.

Portions of the site with the potential for stormwater contamination will be curbed and runoff from these areas will be contained and then conveyed to the project's new oil-water separator (OWS), with ultimate discharge to the wastewater discharge system (i.e., to DDSD). Several former storage tanks are currently on the MLGS site. These tanks are surrounded with berms that are covered in asphalt. Other portions of the 27-acre site are either compacted soil or covered in asphalt pavement. Stormwater runoff from the area within the berms surrounding the five fuel storage tanks currently collects and drains via a storm drain system to an OWS and then discharges to the San Joaquin River via the existing

discharge Outfall 001. Stormwater runoff from the areas outside the berms is discharged directly to the river via the existing discharge outfall or via overland flow. The only discharge to the river associated with the MLGS would be stormwater runoff.

Project features designed to be protective of water quality include curbs around areas with potential oil or chemical contamination and secondary spill containment around chemical delivery and storage areas, and transformers. Oil leakage from equipment is expected to be minimal. Nonetheless, all equipment that has potential for leakage of oil or hazardous chemicals will be located within spill containment areas. After passing through the OWS, water from the clear effluent chambers will be discharged to the wastewater discharge system. The oil from the oil containment chambers will be collected and shipped off site for recycling. Roof runoff will be directed to splash blocks, landscaped areas, or drainage channels.

The onsite OWS system will collect wastewater from equipment washdowns and leakage, sample drains, and miscellaneous plant drains. Water from areas that may accumulate small amounts of oil and miscible chemicals will be collected in a system of floor drains, equipment drains, curbed area drains, sumps, and piping, and routed through the OWS. After passing through the OWS, water from the clear effluent chambers will be discharged to the wastewater discharge system. The chemical feed area will be provided with a containment area to keep any spilled chemicals out of the plant drainage system. Wastewater collected in service water drains in areas that do not have the potential for contact with oils or chemicals is discharged directly to the wastewater discharge system.

Other opportunities to minimize directly connected impervious areas include directing runoff from impervious areas to pervious areas in locations where soils permit (such as flat areas); selecting permeable pavements and surface treatments such as crushed aggregate, turf block or pavers as a substitution for impervious concrete or asphalt pavement; using drainage features such as grassy swales, vegetated buffers, landscape areas, and bioretention areas within the site and landscape design; and designing landscape areas that can be utilized to detain or retain runoff. These opportunities will be considered throughout the design phase of the MLGS project.

1.2 Measures to Limit Imperviousness

1.2.1 Measures to Protect Natural Resources

1.2.1.1 Pipelines

New pipelines generally will be installed in a trench using standard pipeline installation techniques and in accordance with the manufacturer's requirements. Topsoil will be removed and stored prior to excavation of the pipeline trench. Any portion of existing roads or pavement that must be removed in the trenching process will be disposed of offsite in an appropriate disposal area. Spoils from trenching will be stored alongside the trench. To the extent possible, excavation spoils will be used for backfill. Where trenching spoils are not suitable, imported backfill will be used. Once backfilled, the surface will be repaved where applicable.

1.2.1.2 Best Management Practices

Impacts to surface water from erosion are expected to be minimal during construction. Erosion will be controlled in accordance with an approved Erosion Control Plan. In addition, all construction activities will be performed in accordance with the California NPDES General Permit for Stormwater Discharge Associated with Construction Activities (SWRCB, 1999), requiring the implementation of BMPs to control sediment and other pollutants mobilized from construction activities. Temporary BMPs are discussed in the SWPPP and may include slope stabilization, construction of berms and ditches, and sediment barriers such as fiber rolls or silt fences to prevent sediment discharges from the site.

Permanent erosion control measures include drainage systems and gravel or paved surfaces. Operation of the facility will be in conformance with the California NPDES General Permit for Stormwater Discharge Associated with Industrial Activities (SWRCB, 1997). In accordance with this permit, an industrial SWPPP will be prepared for the project that will be similar to the SWPPP for the existing CCPP. BMPs for the project would be similar to the BMPs currently being implemented to control pollutants in stormwater discharges for the PPP. BMPs will include refueling and maintenance of equipment only in designated lined and/or bermed areas, isolating hazardous materials from stormwater exposure, and preparing and implementing spill contingency plans in specified areas.

1.2.2 Measures to Limit Directly Connected Impervious Areas

1.2.2.1 Site Design Features

Measures that can be used to limit directly connected impervious areas include site design features, pervious pavements, and detention and drainage design. The following measures will be incorporated into the project to limit imperviousness and minimize stormwater-related impacts as shown on the drawing included as Appendix B.

- Site will use existing drainage features and discharge locations will be retained.
- Preserve existing vegetation.
- Development will be within the existing facility footprint.
- Implement geotextiles and mats in identified areas.
- The perimeter of the project site will be landscaped or graveled to help retain runoff.
- Directly connected impervious areas will be minimized.
- Roof runoff will be directed to landscaped areas.

1.2.3 Table Summarizing Pervious and Self Retaining Areas

The facility design is in progress and this information will be provided at 50 percent design.

1.3 Preliminary Design of Treatment and Flow Control Facilities

1.3.1 Locations and Elevations

The MLGS equipment yard drainage was configured to utilize existing drainage facilities. Land use within the site was categorized between pervious (landscape, open with gravel) and impervious (buildings, sidewalks, driveways, parking lots).

1.3.2 Sizing Calculations

The proposed project with utilize existing facilities to manage stormwater runoff. Approximate drainage areas are identified in Figure 6. New facilities that may be implemented in addition to existing facilities in order to improve drainage will be sized based on a 25-year, 24 hour storm event. Sizing calculations will continue to be developed and improved during project design consistent with requirements.

1.3.3 Summary of Impervious Areas and Treatment/Flow-control Facilities

As previously discussed, impervious areas will be reduced from pre-construction conditions. Flow control facilities will be conventional. As the project design moves forward, more information will become available.

1.4 Source Control Measures

1.4.1 Description of Site Activities and Potential Sources of Pollutants

Site activities include daily operations by employees and delivery companies to operate an energy generation facility. Onsite equipment includes vehicles, back-up generators, dry waste dumpsters, chemical storage facilities, and transformers. All of the potential sources of pollutants will be identified and addressed in the facility SWMP. This plan will include structural and nonstructural measures for pollution prevention, good housekeeping practices, preventive maintenance, spill prevention and response, and training. Compliance reviews are conducted routinely.

1.4.2 Potential Sources, Permanent Source Control and BMPs

Table 1 lists the source control best management practices (BMPs) that would minimize the potential for pollutants generated by everyday activities entering stormwater.

TABLE 1
Source Control Best Management Practices
Marsh Landing Generating Station

Potential Source	Permanent BMPs	Operational BMPs
Vehicle washing	All drainage from the bermed vehicle wash area will be routed to a concrete containment box. All accumulated wash- and rainwaters in the box are expected to evaporate; the box will be sized	Sludge from the concrete containment box will be removed as needed and transported offsite by a licensed hauler for proper disposal.

TABLE 1
Source Control Best Management Practices
Marsh Landing Generating Station

Potential Source	Permanent BMPs	Operational BMPs
	accordingly.	
Fuel storage	Fuel storage tanks will be housed within a concrete secondary containment feature.	Rainwater in the secondary containment area will be visually inspected for signs of contaminants before discharge. Absorbent pads will be used to remove petroleum hydrocarbon constituents, if any, in the ponded rainwater before discharge. Used absorbent materials will be stored in an appropriate container such designated and transported offsite for disposal by a licensed hauler.
Vehicle fueling	Fueling areas will have impermeable floors that are: a) graded at the minimum slope necessary to prevent ponding, and b) separated by a grade break that prevents run-on of stormwater to the maximum extent practicable. Drainage from the fueling areas will first pass through a sump with a sand/oil separator prior to being pumped to the stormwater retention pond.	The fueling area will be dry-swept regularly. Spill cleanup materials will be stored in fueling areas. The sump and sand/oil separator will be regularly maintained.
Future indoor and structural pest control	Building design features that discourage entry of pests will be incorporated. Drainage will be routed to landscaped areas and ultimately to the stormwater retention pond.	Employees responsible for pest control will be educated on and use Integrated Pest Management (IPM) measures.
Future vector control at the stormwater retention pond		Vector control management efforts will be coordinated with the Contra Costa Mosquito and Vector Control District.
Landscape fertilizer/pesticide use	Existing native trees, shrubs, and groundcover will be preserved to the maximum extent possible. Selection of landscaping materials will include pest-resistant plants (especially adjacent to hardscape) appropriate for local site conditions requiring minimal irrigation. Where landscaped materials are used to retain or detain stormwater, plants that are tolerant of saturated soil conditions will be selected. All drainage from landscaped areas will be routed to the stormwater	Employees responsible for landscape maintenance will be educated on and use IPM measures - landscaping will be maintained using minimum or no pesticides.

TABLE 1
Source Control Best Management Practices
Marsh Landing Generating Station

Potential Source	Permanent BMPs	Operational BMPs
	retention pond.	
Stormwater conveyance system		Drainage channels will be maintained and inspected regularly to remove any accumulated debris, sediment, or dumped objects that could potentially block waters and create an overflow.
Trash	All drainage from trash enclosures will be routed to the stormwater retention pond. Signs will be posted on or near dumpsters with the words “Do not dump hazardous materials here” or similar.	Good housekeeping practices will be in effect. An adequate number of trash receptacles with covers will be provided; those receptacles in disrepair will be replaced.
Shop/vehicle maintenance areas	Equipment/vehicle repair and maintenance will be done indoors as practical. Any outdoor work area will be bermed (temporarily or permanently) to prevent run-on and runoff of stormwater. Interior of shop/maintenance buildings will not have floor drains. No sinks will be used for parts cleaning or rinsing.	Employees will receive annual training on the proper handling, storage, cleanup, and disposal of any hazardous materials onsite. New employees will receive this training as part of orientation. No person will leave unattended drip parts or other open containers containing vehicle fluids, unless such containers are in use or in an area of secondary containment. No hazardous materials will be disposed of in the onsite septic system or stormwater retention pond. Unloaded materials will be moved inside as soon as practical. Containers will be supplied for the proper storage and disposal of hazardous wastes. Spill cleanup materials will be stored in shop and maintenance areas.
Roofing materials/equipment	All discharges of rooftops will be routed to landscaped areas and ultimately discharge to the stormwater retention pond. Roofing materials/equipment will not be manufactured from unprotected metal that could leach into runoff.	
Storage of equipment or materials	All onsite drainage will discharge to the stormwater retention pond.	A spill kit will be kept in material storage areas.

TABLE 1
Source Control Best Management Practices
Marsh Landing Generating Station

Potential Source	Permanent BMPs	Operational BMPs
	The storage area of non-hazardous liquids will be covered with a roof and be contained within a secondary containment feature. All hazardous materials will be stored indoors or within a secondary containment feature sized to accommodate the size of the largest container and rainfall. Storage of hazardous materials and wastes will be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the project site. Separate facilities (shop) are in place for the storage and use of hazardous materials.	Employees will receive annual training on the proper handling, storage, cleanup, and disposal of any hazardous materials onsite. New employees will receive this training as part of orientation. No hazardous materials will be disposed of in the onsite septic system or stormwater retention pond. Unloaded materials will be moved inside as soon as practical. Containers will be supplied for the proper storage and disposal of hazardous wastes.
Parking lots	All drainage from the parking lots will be routed to landscaped areas and ultimately discharge to the stormwater retention pond.	Paved areas will be swept regularly to prevent accumulation of litter and debris. Debris will not be allowed to enter the stormwater retention pond.
Miscellaneous drain or washwater	All onsite drainage will be routed to the stormwater retention pond.	

1.5 Permitting and Code Compliance Issues

There are no known conflicts between the proposed Storm Water Control Plan and Contra Costa County's or City of Antioch's ordinances or policies. Conflicts, if any, will be resolved upon discovery through the design review process or during subsequent permitting.

Conflicts with codes or requirements or other obstacles to implementing the Stormwater Control Plan have been reviewed and none have been identified.

1.6 Facility Maintenance

1.6.1 Ownership and Responsibility for Maintenance

All the flow-control, treatment and source control measures will be funded, implemented and maintained by MLGS as part of its operations budget.

MLGS agrees to provide any necessary rights of entry to Contra Costa County for access and inspection of stormwater BMPs. MLGS accepts responsibility for interim operation and maintenance of facilities.

A draft Storm Water Control Operation and Maintenance Plan will be submitted during project final design. The final plan will be submitted before issuance of a Certificate of Occupancy.

1.6.2 Summary of Maintenance Requirements

Routine maintenance of the stormwater facilities will occur as needed and will be recorded on an inspection form. Routine facility inspections will occur annually at a minimum prior to the rainy season and any corrective actions necessary for stormwater conveyance will be taken. Because the entire site will be covered by either hardscape or gravel, erosion and subsequent deposition of silt in the stormwater facilities is expected to be minimal.

Routine maintenance of the stormwater conveyance system will consist of removing accumulated debris or sediment, if any.

Routine maintenance of the landscaped areas will consist of mowing, replenishing mulch, as needed, irrigating adequately, but not in excess, replacing dead vegetation, weeding, and ensuring adequate vegetative cover to prevent erosion. Erosion, if any, at inflows will be repaired.

Routine maintenance of the concrete containment box for vehicle washwater will consist of removing sludge materials, as needed, to be transported offsite by a licensed hauler for appropriate disposal.

Routine maintenance of the sump with a sand-oil separator in the fueling area will consist of removing sludge materials and cleaning and servicing the separator, as needed. Waste materials will be transported offsite by a licensed hauler for appropriate disposal.

An annual employee training program to discuss IPM and spill prevention/cleanup measures will be in effect. Adequate spill containment/cleanup materials will be stored onsite and accessible to the employees.

Paved areas will be swept regularly to remove trash and other debris.

1.7 Construction Plan C.3 Checklist

Table 2 lists the Construction Plan C.3 Checklist to facilitate plan review when plans are compared to the Stormwater Control Plan.

TABLE 2
Construction Plan C.3 Checklist
Marsh Landing Generating Station

Stormwater Control Plan Reference	BMP Description	Plan Sheet Number
Table 1, Figure 1 and Section 1.3: Selection and Primary Design of Stormwater Treatment BMPs	Stormwater retention pond.	
Table 1, Figure 1	Concrete containment box for vehicle washwater.	
Table 1, Figure 1	Secondary containment for fuel	

TABLE 2
Construction Plan C.3 Checklist
Marsh Landing Generating Station

Stormwater Control Plan Reference	BMP Description	Plan Sheet Number
	storage tanks.	
Table 1	Fueling areas: impermeable floors, grade break, sump with a sand/oil separator.	
Table 1	Indoor and structural pest control: building design features to discourage entry of pests.	
Table 1	Spill kits: fueling areas, material storage areas, shop and maintenance areas.	
Table 1, Figure 1	Existing native trees, shrubs, and groundcover will be preserved to the maximum extent possible.	
Table 1	Selection of landscaping materials will include pest-resistant plants, appropriate for local site conditions requiring minimal irrigation.	
Table 1	Where landscaped materials are used to retain or detain stormwater, plants that are tolerant of saturated soil conditions will be selected.	
Table 1	Stormwater conveyance system.	
Table 1	Signs will be posted on or near dumpsters with the words “Do not dump hazardous materials here” or similar.	
Table 1	Equipment/vehicle repair and maintenance will be done indoors as practical.	
Table 1	Any outdoor maintenance work area will be bermed to prevent runoff and run-on of stormwater.	
Table 1	Interior of shops/maintenance buildings will not have floor drains.	
Table 1	No sinks will be used for parts cleaning or rinsing.	
Table 1	Adequate number of trash receptacles with covers will be provided.	
Table 1	All discharge of rooftops will be routed to landscaped areas.	
Table 1	Roofing materials/equipment will not be manufactured from unprotected metal that could leach	

TABLE 2
Construction Plan C.3 Checklist
Marsh Landing Generating Station

Stormwater Control Plan Reference	BMP Description	Plan Sheet Number
	into runoff.	
Table 1	Covered storage with secondary containment feature for non-hazardous liquids.	
Table 1	All hazardous materials will be stored indoors or larger containers (e.g., fuel tanks) within a secondary containment feature sized to accommodate the size of the largest container and rainfall.	

The project developer's signed statement accepting responsibility for maintenance from the time the facilities are constructed until responsibility for operation and maintenance is legally transferred will be completed when a contractor is selected. The project has not gone out to bid.

1.8 Certification

The selection, sizing, and preliminary design of treatment BMPs and other control measures in this plan meet the requirements of Regional Water Quality Control Board Order 97-03 DWQ and the Contra Costa Clean Water Program.

MLGS accepts responsibility for interim operation and maintenance of stormwater treatment and flow-control facilities until such time as this responsibility is formally transferred to a subsequent owner as noted and signed on the cover letter.

1.9 Works Cited

California Energy Commission (CEC). 2001. Final Staff Assessment for Contra Costa Power Plant Unit 8, Soil & Water Resources. March 2.

Camp Dresser and McKee (CDM). 1997. Phase I Environmental Site Assessment, Contra Costa Power Plant, Antioch, California. October 1997.

Central Valley Regional Water Quality Control Board (CVRWQCB). 2006. *CWA Section 303(d0 List of Water Quality Limited Segments.* SWRCB Approval October 25.

CH2M HILL. 2008. *Preliminary Drainage Calculations.*

Contra Costa Clean Water Program. 2008. *Stormwater C.3 Guidebook.* http://www.cccleanwater.org/new-developmentc3/stormwater-c3-guidebook/. Accessed December 9, 2008.

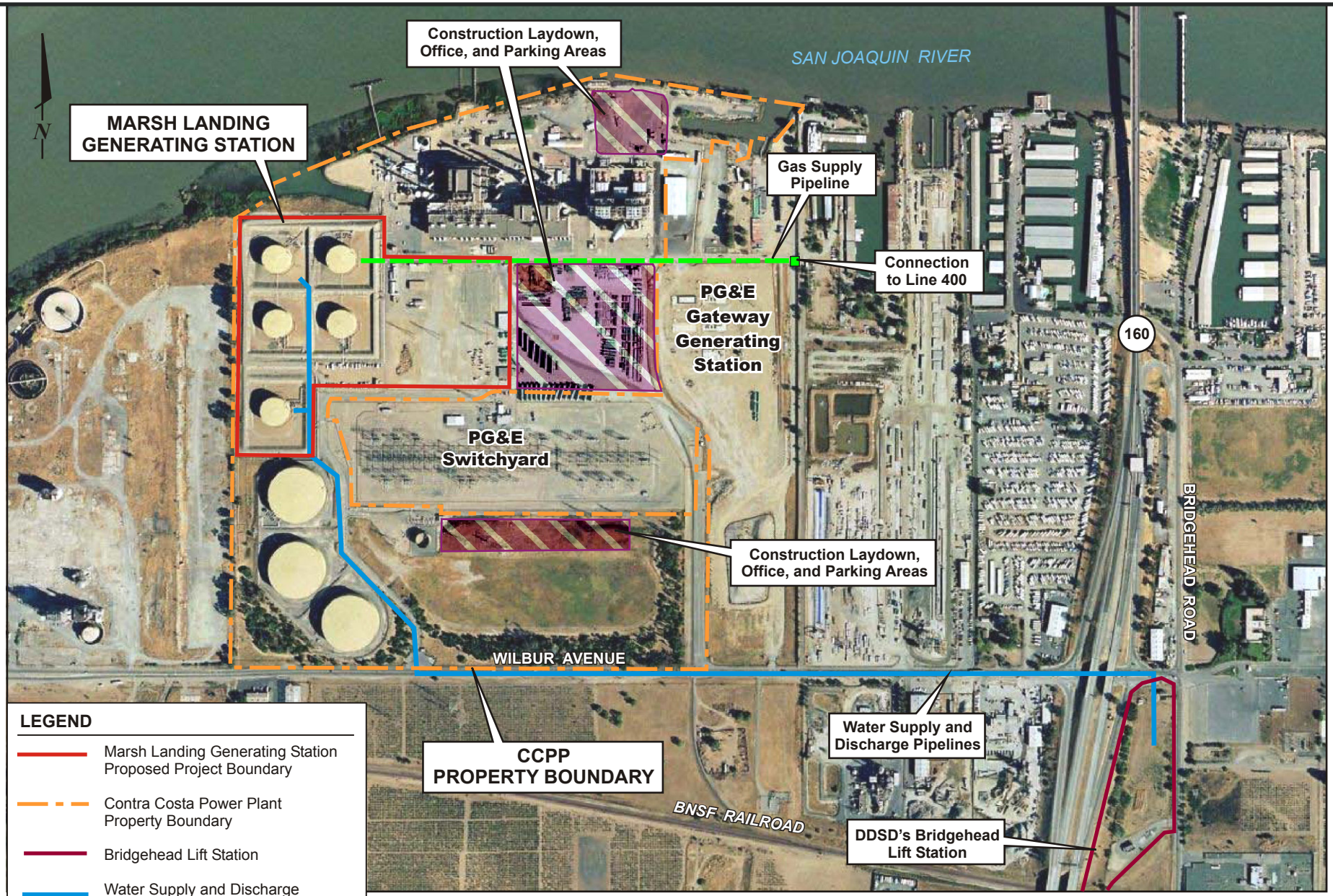
Planert, M. and J.S. Williams. 1995. *Groundwater Atlas of the United States – Segment 1 California and Nevada*: U.S. Geological Survey Hydrologic Investigations Atlas 730-B, 28 pp.

State Water Resources Control Board (SWRCB). 1997. National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000001 (General Permit) Water Quality Order No. 97-03-DWQ Waste Discharge Requirements (WDRs) for Discharge of Stormwater Associated with Industrial Activities Excluding Construction Activities.

SWRCB. 1999. National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction Activity (General Permit) Water Quality Order 99-08-DWQ.

URS. 2008. *Application for Certification for Marsh Landing Generating Station*.

Figures



LEGEND

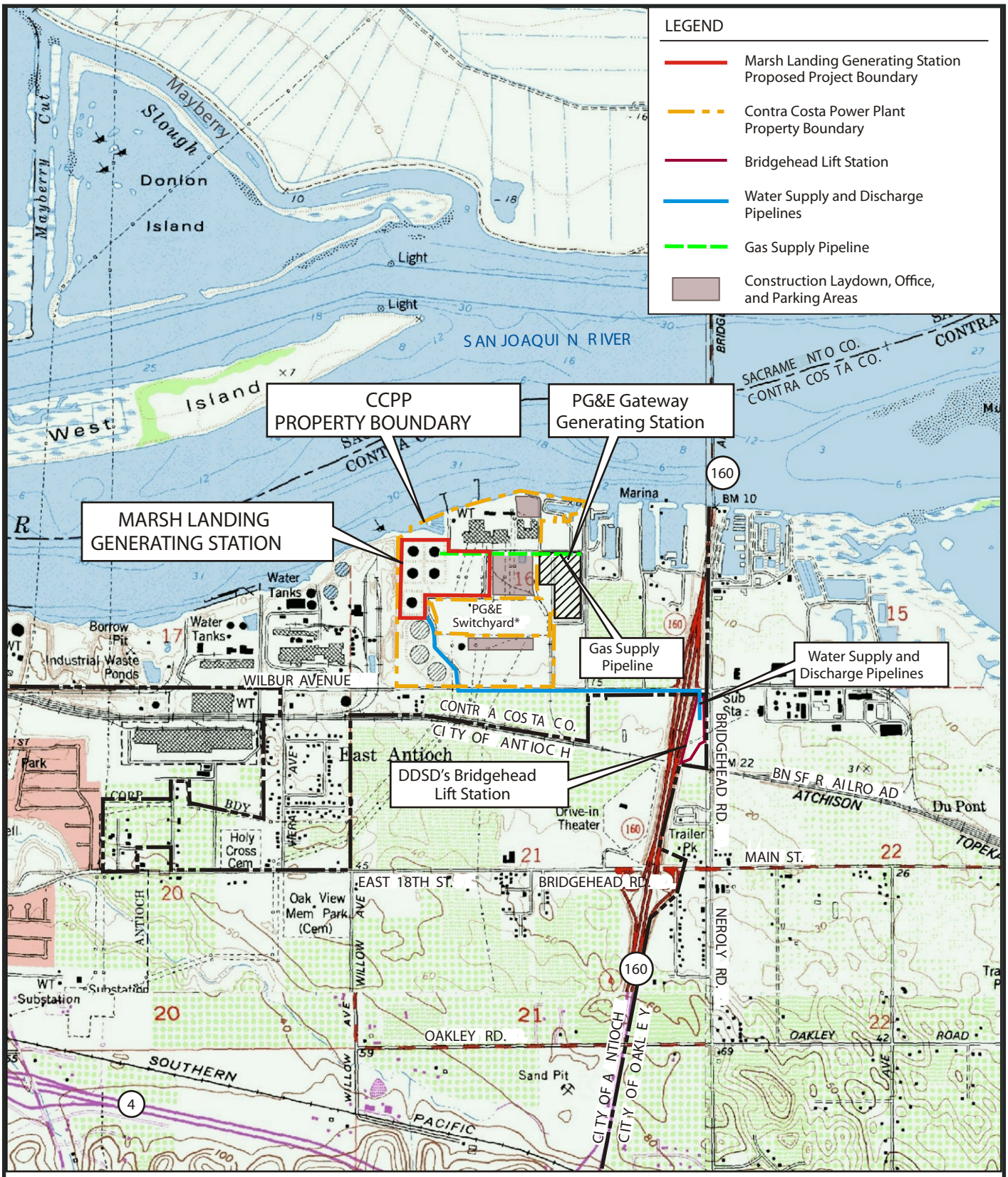
- Marsh Landing Generating Station Proposed Project Boundary
- Contra Costa Power Plant Property Boundary
- Bridgehead Lift Station
- Water Supply and Discharge Pipelines
- Gas Supply Pipeline
- Construction Laydown, Office, and Parking Areas

Source of Aerial:
Google Earth 2006

0 500 1000
Approximate Scale in Feet

FIGURE 1
SITE PLAN
STORMWATER CONTROL PLAN FOR THE MARSH LANDING GENERATING STATION

CH2MHILL



Source:
USGS Topographic Maps, 7.5 Minute Series:
Antioch North, California, 1978
Antioch South, California, 1980
Jersey Island, California, 1978
Brentwood, California, 1978

* The PG&E Switchyard and PG&E Gateway Project are not part of the Mirant Property.

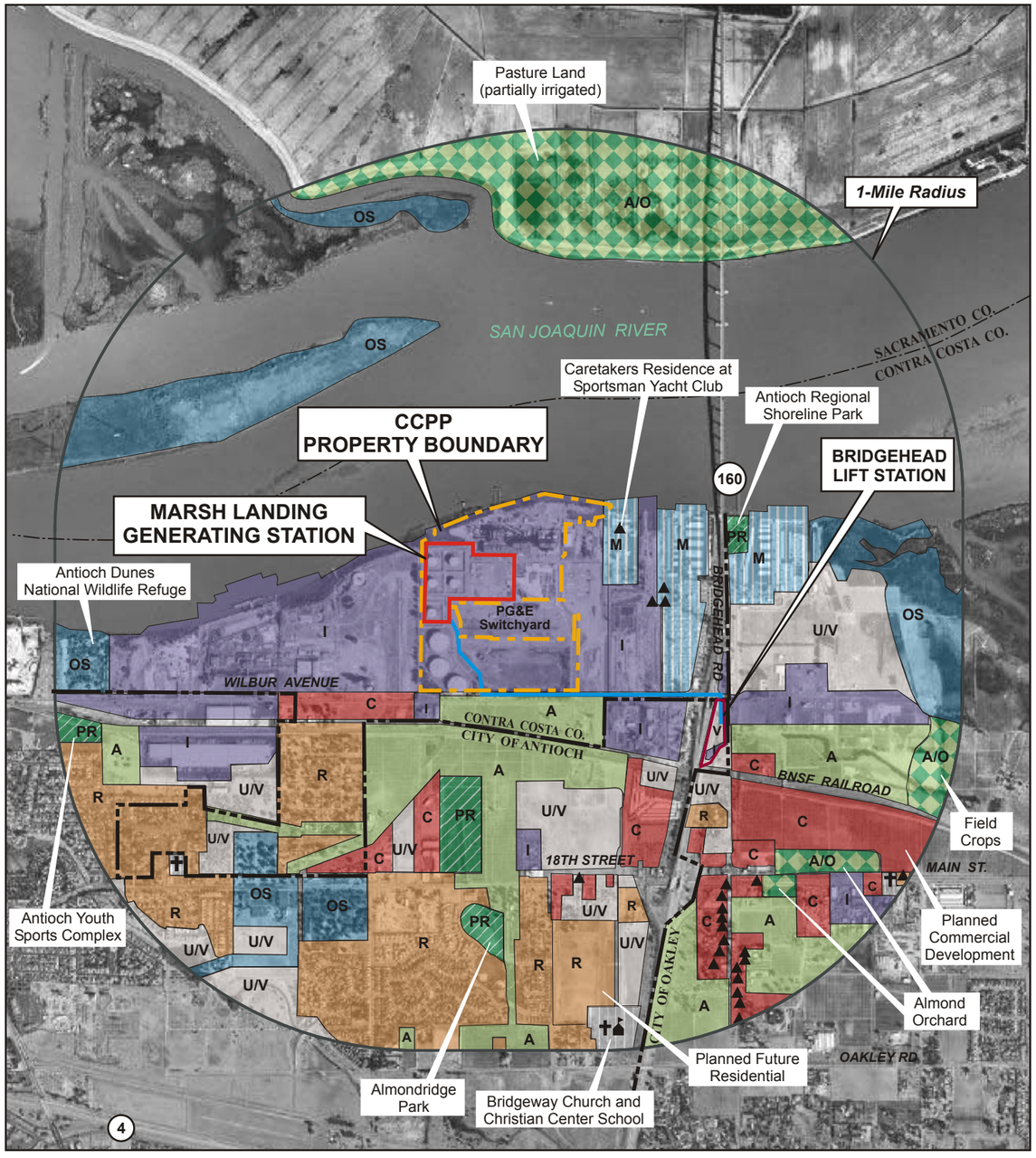
0 2000 4000

Scale in Feet
1:24,000

N

FIGURE 2
PROJECT LOCATION MAP
STORMWATER CONTROL PLAN FOR THE MARSH LANDING GENERATING STATION

CH2MHILL



Sources:
– Google Earth 2006
– URS site visit, November 2007

LEGEND

R	Residential
C	Commercial
I	Industrial
M	Marina
OS	Open Space
A	Agricultural: Vineyards+
A/O	Agricultural: Other (pasture land, field crops, almond orchard)+
PR	Parks, Recreational Areas
U/V	Undeveloped/Vacant
✝	Church
▲	Residence (Non-Residential Area)
	School
	Study Area Boundary
	Marsh Landing Generating Station Proposed Project Boundary
	Contra Costa Power Plant Property Boundary
	Bridgehead Lift Station
	Water Supply and Discharge Pipelines

+ All agricultural land is assumed to be irrigated unless otherwise noted

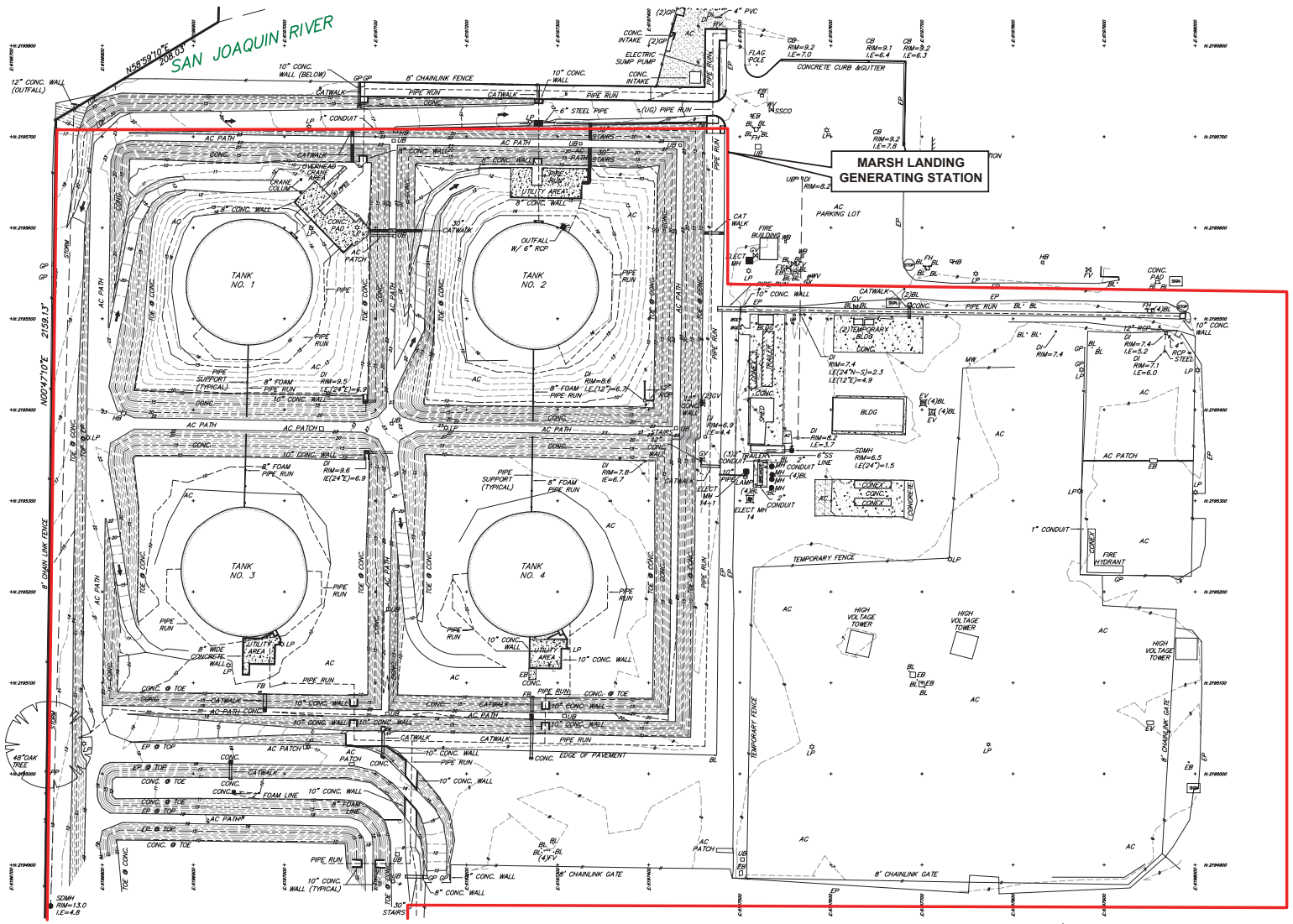
N

0 2000 4000

Scale in Feet
1:24,000

FIGURE 3
EXISTING LAND USES IN THE AREA SURROUNDING THE SITE
STORMWATER CONTROL PLAN FOR THE MARSH LANDING GENERATING STATION

CH2MHILL



Source:
Topographic Survey; WO 1769.00a; Mirant, 2008.

5/09/08 vsa ..\T:\Mirant Contra Costa-Marsh Landing\Graphics\2.0 Facility Description\2.6-1_site topo.ai

LEGEND:

AC . . . . . ASPHALTIC CONCRETE
BFC . . . . . BACK FACE OF CURB
BL . . . . . BOLLARD
BLDG . . . . BUILDING
BW . . . . . BACK OF WALK
CB . . . . . CATCH BASIN
CMP . . . . CORRUGATED METAL PIPE
CONC . . . . CONCRETE
DI . . . . . DRAIN INLET
D/W . . . . DRIVE WAY
EB . . . . . ELECTRIC BOX
EL . . . . . ELEVATION
ELEC . . . . ELECTRIC
EP . . . . . EDGE OF PAVEMENT
EV . . . . . ELECTRIC VAULT
FH . . . . . FIRE HYDRANT
FL . . . . . FLOWLINE
FR . . . . . FIRE RISER
GB . . . . . GRADE BREAK
GM . . . . . GAS METER
GP . . . . . GATE POST
GR . . . . . GROUND
GV . . . . . GATE VALVE
GWMW . . . GROUND WATER MONITORING WELL
LP . . . . . LIGHT POLE
LS . . . . . LICENSED SURVEYOR
MH . . . . . MANHOLE
SD . . . . . STORM DRAIN
SDA . . . . . STORM DRAIN EASEMENT
SDCB . . . . STORM DRAIN CATCH BASIN
SDE . . . . . STORM DRAIN EASEMENT
SSE . . . . . SANITARY SEWER EASEMENT
SDMH . . . . STORM DRAIN MANHOLE
SF . . . . . STRUCTURE FOOTING
SSCO . . . . SANITARY SEWER CLEANOUT
SSMH . . . . SANITARY SEWER MANHOLE
S/W . . . . . SIDE WALK
TC . . . . . TOP OF CURB
TW . . . . . TOP OF WALL
UB . . . . . UTILITY BOX
UG . . . . . UNDERGROUND
WM . . . . . WATER METER
WV . . . . . WATER VALVE
WVV . . . . . WATER VALVE VAULT
WB . . . . . WATER BOX
NW . . . . . MONITORING WELL
HB . . . . . FIRE HOSE BOX
FV . . . . . FIRE VALVE
PP . . . . . POWER POLE
OH . . . . . OVERHEAD UTILITY LINE

NOTES:

1. HORIZONTAL COORDINATES DATUM BASED UPON CALIFORNIA STATE PLANE COORDINATE SYSTEM 1983 (CCS83) NAD83 1997.0 EPOCH.
2. ELEVATIONS ARE BASED ON MEAN SEA LEVEL DATUM NGVD29 HOLDING MIRANT BRASS DISK ON THE INLET STRUCTURE ELEV.=9.19.
3. SURVEY CONDUCTED ON NOVEMBER 30, 2007

SURVEYOR'S STATEMENT

THIS MAP CORRECTLY REPRESENTS A SURVEY MADE BY ME OR UNDER MY DIRECTION IN CONFORMANCE WITH THE REQUIREMENTS OF THE PROFESSIONAL LAND SURVEYORS' ACT AT THE REQUEST OF MIRANT DELTA, LLC AND COMPLETED ON JANUARY 10, 2008.

DATED:_____

_____
DONALD M. ARNAUD P.L.S. 8025
LICENSE EXPIRES 12/31/08

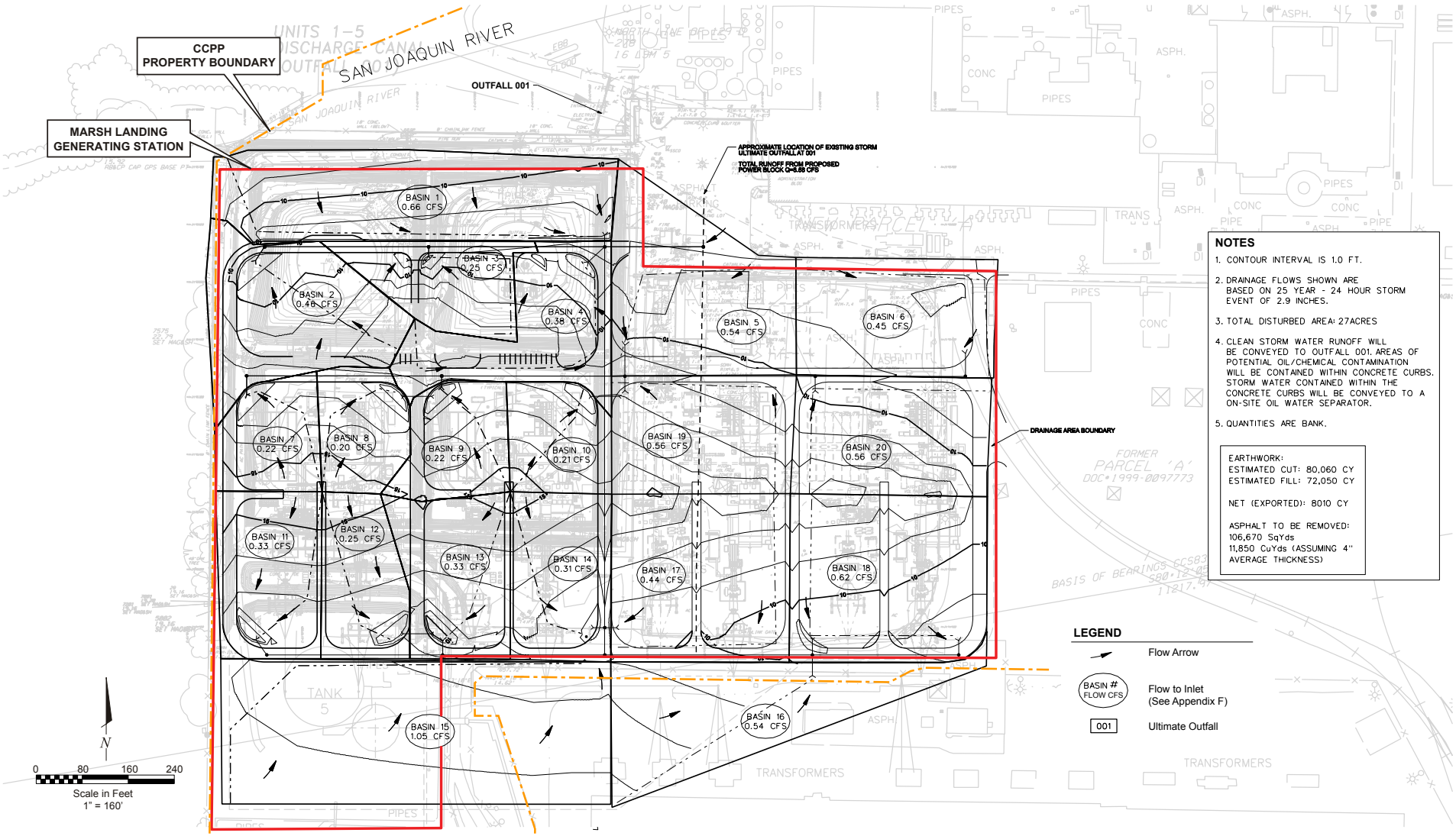
N

0 110
Scale in Feet
1" = Approx 110'

FIGURE 4
EXISTING SITE TOPOGRAPHIC SURVEY

STORMWATER CONTROL PLAN FOR THE
MARSH LANDING GENERATING STATION

CH2MHILL



NOTES

1. CONTOUR INTERVAL IS 1.0 FT.
2. DRAINAGE FLOWS SHOWN ARE BASED ON 25 YEAR - 24 HOUR STORM EVENT OF 2.9 INCHES.
3. TOTAL DISTURBED AREA: 27ACRES
4. CLEAN STORM WATER RUNOFF WILL BE CONVEYED TO OUTFALL 001. AREAS OF POTENTIAL OIL/CHEMICAL CONTAMINATION WILL BE CONTAINED WITHIN CONCRETE CURBS. STORM WATER CONTAINED WITHIN THE CONCRETE CURBS WILL BE CONVEYED TO A ON-SITE OIL WATER SEPARATOR.
5. QUANTITIES ARE BANK.

EARTHWORK:
ESTIMATED CUT: 80,060 CY
ESTIMATED FILL: 72,050 CY

NET (EXPORTED): 8010 CY

ASPHALT TO BE REMOVED:
106,670 SqYds
11,850 CuYds (ASSUMING 4" AVERAGE THICKNESS)

LEGEND

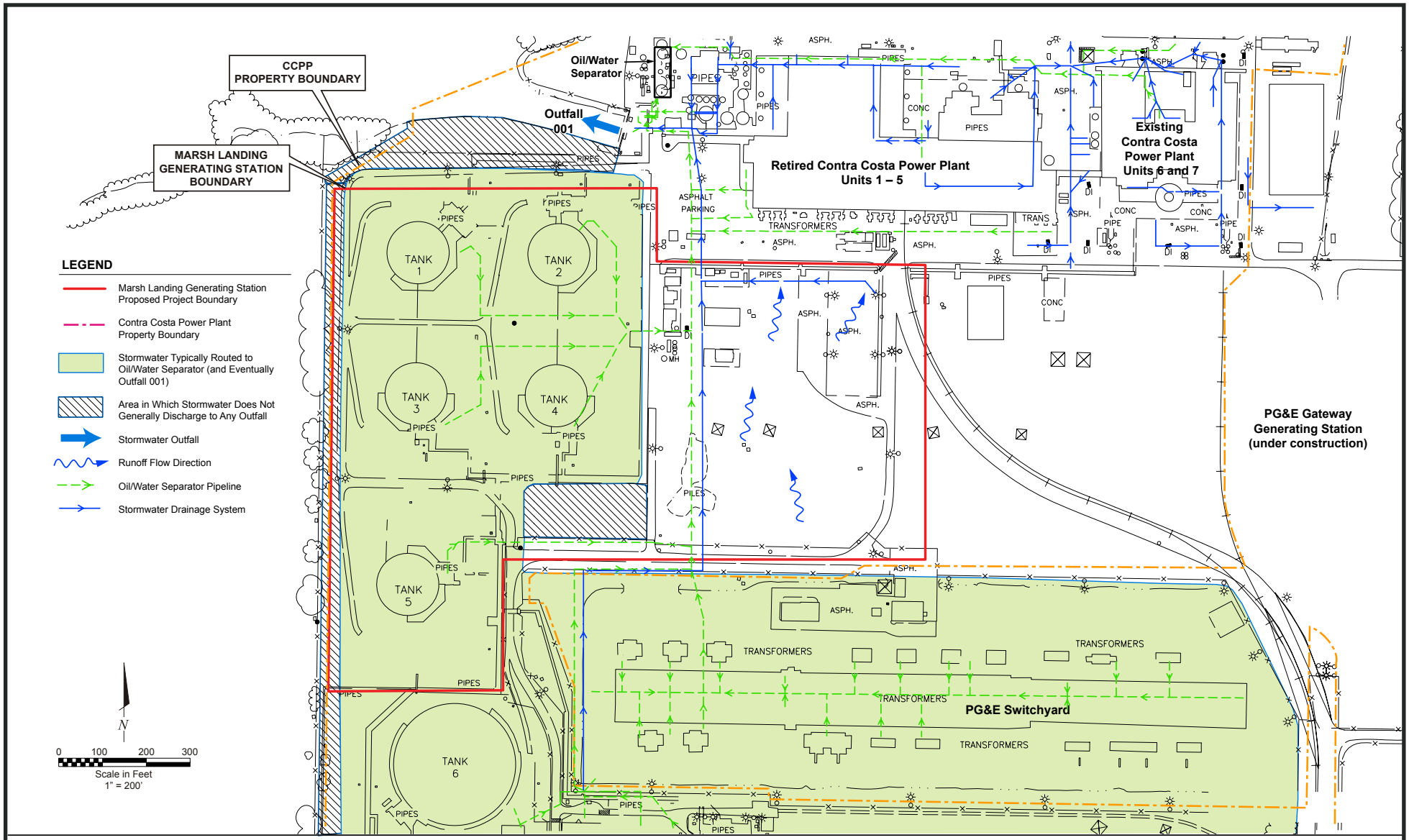
- Flow Arrow
- BASIN # / FLOW CFS — Flow to Inlet (See Appendix F)
- 001 — Ultimate Outfall

Source:
CH2MHill Lockwood Greene; Civil Marsh Landing Generating Station, Site Grading & Drainage Plan; Drawing No: MR-CE-CC-00-01 (Rev. D, 5/01/08)

FIGURE 5
SITE GRADING AND DRAINAGE PLAN

STORMWATER CONTROL PLAN FOR THE MARSH LANDING GENERATING STATION

CH2MHILL



Sources:

- CH2MHill Lockwood Greene; General Arrangement Marsh Landing Generating Station, Demolition Drawing; Drawing No: MR-GA-ML-01-18 (Rev. B, 04/01/08).
- Mirant, 2007.

FIGURE 6
EXISTING CCPP DRAINAGE
STORMWATER CONTROL PLAN FOR THE MARSH LANDING GENERATING STATION

CH2MHILL

Appendix A
Marsh Landing Generating Station Preliminary Drainage Calculations

ATTACHMENT D
COMPUTATION SHEET FOR DETERMING RUNOFF COEFFICIENT

CH2MHILL | **CALCULATION SUMMARY & CONTROL SHEET** | **CALCULATION SET NO. 1**

PRELIM.	FINAL	VOID	REVISION
X			B

Sheet 1 of 1

CLIENT: *MARSH LANDING GENERATING STATION*

Discipline *CIVIL*

PROJECT TITLE: *MIRANT*

Project No. *381690*

SUBJECT: *STORM DRAINAGE CALCULATIONS*

COMPLETED BY: *DAWN L. HATHAWAY* DATE: *4/21/2008*

CHECKED BY: *JOHN PURDY, P.E.* DATE: *5/1/2008*

APPROVED BY: *MARIO SCACCO, P.E.* DATE: *5/1/08*

REVISION SUMMARY:
Runs 2 and 5 revised

TOTAL NUMBER OF SHEETS IN THIS ISSUE: 42

SHEETS REVISED, ADDED, or DELETED: 14

PROBLEM STATEMENT: *PRELIMINARY DRAINAGE STUDY OF PEAK FLOWS TO STUCTURES FOR 25-YEAR AND 10 YEAR STORMS PER DESIGN BASIS CRITERIA.*

RESULTS & CONCLUSIONS: *SEE ATTACHMENTS FOR RESULTS.*

DESIGN BASIS & ASSUMPTIONS: *HYDROLOGY CALCULATION BASED ON 25-YEAR AND 100-YEAR STORM EVENTS*

UNVERIFIED ASSUMPTIONS/OPEN ITEMS:

REFERENCES: *INCLUDED WITH CALCULATIONS*

ATTACHMENTS (Including number of pages):

COMPUTER PROGRAM DISCLOSURE INFORMATION:

Program Used	Rev No./	CH2M Verified	Remarks/Number of Pages
SCS (NRCS) TR-55	Issue Date 12/2/2004	X Yes ___ No	

CHECKED BY: _____ DATE: _____

RUN BY: _____ DATE: _____

Marsh Landing Drainage Calculation 4/21/08

The Marsh Landing Generating Station Drainage Calculation considers a tributary drainage area of 32.3 acres. Of which 27 acres will be disturbed during project construction.

Existing site conditions consist of an industrial facility made up of approximately 82% impermeable surfacing.

The proposed power generating station finished site condition will approximately be 50% impervious.

Clean storm water will be conveyed by a system of ditches, swales, catch basins and pipes to the Outfall 001 located on the north end of the site. Areas of potential oil/chemical contamination will be contained within concrete curbs. Storm water contained within the containment will be conveyed to an on-site oil water separator.

Calculation Assumptions as follows:

- Calculation Method – SCS TR-55
- Total Tributary Area – 31.3 Acres
- Rainfall Distribution Type – Type 1A
- Hydrologic Soil Group – A (see NRCS Soil Map attached)
- Curve Number – 81 (Urban Industrial)

MIRANT

Marsh Landing Generating Station Site (Antioch) Rev B

25yr-24hr Storm

SUB-AREA	FLOW (cfs)
CC1	0.66
CC2	0.46
CC3	0.25
CC4	0.38
CC5	0.54
CC6	0.45
CC7	0.22
CC8	0.20
CC9	0.22
CC10	0.21
CC11	0.33
CC12	0.25
CC13	0.33
CC14	0.31
CC15	1.05
CC16	0.54
CC17	0.44
CC18	0.62
CC19	0.44
CC20	0.44

TOTAL AREA	TOTAL FLOW
31.30 acres	8.58 cfs

CHZHILL

KIRANT - 361690
Contr Costa Power Plant (1 OF 5)
Contra Costa County, California

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 2-Yr (cfs)	5-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)
SUBAREAS						
CC1	0.09	0.27	0.48	0.66	0.84	0.97
CC2	0.07	0.19	0.33	0.46	0.58	0.68
CC3	.00	0.10	0.18	0.25	0.32	0.37
CC4	0.05	0.15	0.27	0.38	0.48	0.55
REACHES						
OUTLET	0.21	0.71	1.26	1.76	2.22	2.56

55

CH2MHILL

MIRANT - 361690
Contr Costa Power Plant (1 OF 5)
Contra Costa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
1.5	2.0	2.5	2.9	3.25	3.5	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type IA
Dimensionless Unit Hydrograph: <standard>

MIRANT - 361690
Contr Costa Power Plant (1 OF 5)
Contra Costa County, California

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
CC1	2.44	0.137	81	Outlet	Northern
CC2	1.69	0.100	81	Outlet	SouthWest
CC3	.92	0.100	81	Outlet	Center
CC4	1.39	0.114	81	Outlet	SouthWest

Total Area: 6.44 (ac)

MIRANT - 361690
Contr Costa Power Plant (1 OF 5)
Contra Costa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	Mod Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
CC1							
SHEET	100	0.0412	0.011				0.022
SHALLOW	47	0.0412	0.050				0.004
CHANNEL	589	0.0050	0.020	1.32	8.88	1.474	0.111
					Time of Concentration		.137
CC2							
SHEET	100	0.0600	0.011				0.019
SHALLOW	193	0.0168	0.050				0.026
					Time of Concentration		0.1
CC3							
SHEET	100	0.0318	0.011				0.025
SHALLOW	60	0.0412	0.050				0.005
SHALLOW	140	0.0089	0.050				0.026
					Time of Concentration		0.1
CC4							
SHEET	100	0.0075	0.011				0.044
SHALLOW	219	0.0091	0.050				0.040
CHANNEL	158	0.0050	0.020	1.32	8.88	1.463	0.030
					Time of Concentration		.114

MIRANT - 361690
Contr Costa Power Plant (1 OF 5)
Contra Costa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
CC1	Industrial	A	2.44	81
	Total Area / Weighted Curve Number		2.44	81
CC2	Industrial	A	1.69	81
	Total Area / Weighted Curve Number		1.69	81
CC3	Industrial	A	.92	81
	Total Area / Weighted Curve Number		.92	81
CC4	Industrial	A	1.39	81
	Total Area / Weighted Curve Number		1.39	81

WinTR-55 Current Data Description

--- Identification Data ---

User: CH2MHILL
Project: MIRANT - 361690
SubTitle: Contr Costa Power Plant (1 OF 5)
State: California
County: Contra Costa
Filename: C:\Documents and Settings\dhathawa\Application Data\WinTR-55\MIRANT\Contra Costa Power Plant 1-5.w55

Date: 2/11/2008
Units: English
Areal Units: Acres

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
CC1	Northern	Outlet	2.44	81	.137
CC2	SouthWest	Outlet	1.69	81	0.1
CC3	Center	Outlet	0.92	81	0.1
CC4	SouthWest	Outlet	1.39	81	.116

Total area: 6.44 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
1.5	2.0	2.5	2.9	3.25	3.5	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type IA
Dimensionless Unit Hydrograph: <standard>

CH2MHILL

MIRANT - 361690
Contr Costa Power Plant (1 OF 5)
Contra Costa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs) (hr)	5-Yr (cfs) (hr)	10-Yr (cfs) (hr)	25-Yr (cfs) (hr)	50-Yr (cfs) (hr)	100-Yr (cfs) (hr)
SUBAREAS						
CC1	0.09	0.27	0.48	0.66	0.84	0.97
	8.04	8.02	8.02	8.01	8.00	8.00
CC2	0.07	0.19	0.33	0.46	0.58	0.68
	8.02	8.02	8.01	8.01	7.94	7.94
CC3	.06	0.16	0.18	0.25	0.32	0.37
	n/a	8.02	8.01	8.01	7.94	7.94
CC4	0.05	0.15	0.27	0.38	0.48	0.55
	8.03	8.02	8.01	8.01	7.96	7.95
REACHES						
OUTLET	0.21	0.71	1.26	1.76	2.22	2.56

MIRANT - 361690
Contra Costa Power Plant (2 OF 5) Rev2
Contra Costa County, California

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 2-Yr (cfs)	5-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)
SUBAREAS						
CC5	0.08	0.22	0.39	0.54	0.68	0.78
CC6	0.06	0.18	0.32	0.45	0.56	0.65
CC19	0.06	0.18	0.32	0.44	0.56	0.64
CC20	0.06	0.18	0.32	0.44	0.56	0.64
REACHES						
OUTLET	0.26	0.75	1.34	1.86	2.35	2.72

MIRANT - 361690
Contra Costa Power Plant (2 OF 5) Rev2
Contra Costa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
1.5	2.0	2.5	2.9	3.25	3.5	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type IA
Dimensionless Unit Hydrograph: <standard>

WinTR-55 Current Data Description

--- Identification Data ---

User: CH2MHILL
Project: MIRANT - 361690
SubTitle: Contra Costa Power Plant (2 OF 5) Rev2
State: California
County: Contra Costa
Filename: N:\Mirant\Structural\Civil\Contra-Costa\Calcs\Contra Costa Power Plant 2-5 Rev2.w55

Date: 4/21/2008
Units: English
Areal Units: Acres

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
CC5	West	Outlet	1.96	81	0.1
CC6	East	Outlet	1.63	81	0.1
CC19	south of CC5	Outlet	1.61	81	.124
CC20	south of CC6	Outlet	1.61	81	.128

Total area: 6.81 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
1.5	2.0	2.5	2.9	3.25	3.5	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type IA
Dimensionless Unit Hydrograph: <standard>

MIRANT - 361690
Contra Costa Power Plant (2 OF 5) Rev2
Contra Costa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs) (hr)	5-Yr (cfs) (hr)	10-Yr (cfs) (hr)	25-Yr (cfs) (hr)	50-Yr (cfs) (hr)	100-Yr (cfs) (hr)
SUBAREAS						
CC5	0.08	0.22	0.39	0.54	0.68	0.78
	8.02	8.02	8.01	8.01	7.94	7.94
CC6	0.06	0.18	0.32	0.45	0.56	0.65
	8.02	8.02	8.01	8.01	7.94	7.94
CC19	0.06	0.18	0.32	0.44	0.56	0.64
	8.04	8.02	8.01	8.01	8.00	7.96
CC20	0.06	0.18	0.32	0.44	0.56	0.64
	8.04	8.02	8.01	8.01	8.00	7.97
REACHES						
OUTLET	0.26	0.75	1.34	1.86	2.35	2.72

MIRANT - 361690
Contra Costa Power Plant (2 OF 5) Rev2
Contra Costa County, California

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
CC5	1.96	0.100	81	Outlet	West
CC6	1.63	0.100	81	Outlet	East
CC19	1.61	0.124	81	Outlet	south of CC5
CC20	1.61	0.128	81	Outlet	south of CC6

Total Area: 6.81 (ac)

MIRANT - 361690
Contra Costa Power Plant (2 OF 5) Rev2
Contra Costa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
CC5							
SHEET	100	0.0210	0.011				0.029
SHALLOW	130	0.0192	0.050				0.016
SHALLOW	174	0.0169	0.050				0.023
					Time of Concentration		0.1
CC6							
SHEET	100	0.0210	0.011				0.029
SHALLOW	209	0.0192	0.050				0.026
SHALLOW	168	0.0169	0.050				0.022
					Time of Concentration		0.1
CC19							
SHEET	100	0.0100	0.011				0.039
SHALLOW	83	0.0100	0.050				0.014
SHALLOW	292	0.0050	0.050				0.071
					Time of Concentration		.124
CC20							
SHEET	100	0.0100	0.011				0.039
SHALLOW	83	0.0100	0.050				0.014
SHALLOW	309	0.0050	0.050				0.075
					Time of Concentration		.128

MIRANT - 361690
Contra Costa Power Plant (2 OF 5) Rev2
Contra Costa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
CC5	Industrial	A	1.96	81
	Total Area / Weighted Curve Number		1.96	81
CC6	Industrial	A	1.63	81
	Total Area / Weighted Curve Number		1.63	81
CC19	Industrial	A	1.61	81
	Total Area / Weighted Curve Number		1.61	81
CC20	Industrial	A	1.61	81
	Total Area / Weighted Curve Number		1.61	81

MIRANT -361690
Contra Costa Power Plant (3 OF 3)
Contra Costa County, California

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 2-Yr (cfs)	5-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)
SUBAREAS						
CC7	.00	0.09	0.16	0.22	0.28	0.32
CC8	.00	0.08	0.14	0.20	0.25	0.29
CC9	.00	0.09	0.16	0.22	0.28	0.33
CC10	.00	0.08	0.15	0.21	0.26	0.30
REACHES						
OUTLET	.00	0.34	0.61	0.85	1.07	1.24

CH2MHILL

MIRANT -361690
Contra Costa Power Plant (3 OF 5)
Contra Costa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
1.5	2.0	2.5	2.9	3.25	3.5	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type IA
Dimensionless Unit Hydrograph: <standard>

MEMANT -361690
Contra Costa Power Plant (3 OF 5)
Contra Costa County, California

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
CC7	.80	0.100	81	Outlet	Most West
CC8	.72	0.100	81	Outlet	West
CC9	.82	0.100	81	Outlet	East
CC10	.76	0.100	81	Outlet	Most East

Total Area: 3.10 (ac)

MIRANT -361690
Contra Costa Power Plant (3 OF 5)
Contra Costa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
CC7							
SHEET	100	0.0160	0.011				0.032
SHALLOW	148	0.0176	0.050				0.019
				Time of Concentration			0.1
CC8							
SHEET	100	0.0180	0.011				0.031
SHALLOW	158	0.0158	0.050				0.022
				Time of Concentration			0.1
CC9							
SHEET	100	0.0170	0.011				0.031
SHALLOW	121	0.0165	0.050				0.016
				Time of Concentration			0.1
CC10							
SHEET	100	0.0180	0.011				0.031
SHALLOW	119	0.0151	0.050				0.017
				Time of Concentration			0.1

XIRANT -361690
Contra Costa Power Plant (2 OF 5)
Contra Costa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
CC7	Industrial	A	.6	81
	Total Area / Weighted Curve Number		.6	81
			==	==
CC8	Industrial	A	.72	81
	Total Area / Weighted Curve Number		.72	81
			===	==
CC9	Industrial	A	.82	81
	Total Area / Weighted Curve Number		.82	81
			===	==
CC10	Industrial	A	.76	81
	Total Area / Weighted Curve Number		.76	81
			===	==

WinTR-55 Current Data Description

--- Identification Data ---

User: CH2MHILL
Project: MIRANT -361690
SubTitle: Contra Costa Power Plant (3 OF 5)
State: California
County: Contra Costa
Filename: C:\Documents and Settings\dhathaway\Application Data\WinTR-55\MIRANT\Contra Costa Power Plant 3-5.w55

Date: 2/11/2008
Units: English
Areal Units: Acres

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
CC7	Most West	Outlet	0.8	81	0.1
CC8	West	Outlet	0.72	81	0.1
CC9	East	Outlet	0.82	81	0.1
CC10	Most East	Outlet	0.76	81	0.1

Total area: 3.10 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
1.5	2.0	2.5	2.9	3.25	3.5	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type IA
Dimensionless Unit Hydrograph: <standard>

CHZHILL

MIRANT -361690
Contra Costa Power Plant (3 OF 5)
Contra Costa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs) (hr)	5-Yr (cfs) (hr)	10-Yr (cfs) (hr)	25-Yr (cfs) (hr)	50-Yr (cfs) (hr)	100-Yr (cfs) (hr)
SUBAREAS						
CC7	.00	0.09	0.16	0.22	0.28	0.32
	n/a	8.02	8.01	8.01	7.94	7.94
CC8	.00	0.08	0.14	0.20	0.25	0.29
	n/a	8.02	8.01	8.01	7.94	7.94
CC9	.00	0.09	0.16	0.22	0.28	0.33
	n/a	8.02	8.01	8.01	7.94	7.94
CC10	.00	0.08	0.15	0.21	0.26	0.30
	n/a	8.02	8.01	8.01	7.94	7.94
REACHES						
OUTLET	.00	0.34	0.61	0.85	1.07	1.24

CH2MHILL

MIRANT - 361690
Contra Costa Power Plant (4 OF 5)
Contra Costa County, California

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 2-Yr (cfs)	5-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)
SUBAREAS						
CC11	.00	0.13	0.24	0.33	0.42	0.48
CC12	.00	0.10	0.18	0.25	0.31	0.36
CC13	.00	0.14	0.24	0.33	0.42	0.49
CC14	.00	0.12	0.22	0.31	0.39	0.46
CC15	0.14	0.41	0.75	1.05	1.34	1.58
REACHES						
OUTLET	0.14	0.91	1.63	2.28	2.88	3.32

MIRANT - 361690
Contra Costa Power Plant (4 OF 8)
Contra Costa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
1.5	2.0	2.5	2.9	3.25	3.5	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type IA
Dimensionless Unit Hydrograph: <standard>

MIRANT - 361690
Contra Costa Power Plant (4 OF 5)
Contra Costa County, California

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
CC11	1.20	0.100	81	Outlet	Most West
CC12	.91	0.100	81	Outlet	West
CC13	1.22	0.100	81	Outlet	East
CC14	1.14	0.100	81	Outlet	Most East
CC15	3.95	0.209	81	Outlet	South

Total Area: 8.42 (ac)

MIRANT - 361690
Contra Costa Power Plant (4 OF 5)
Contra Costa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
CC11							
SHEET	100	0.0150	0.011				0.033
SHALLOW	201	0.0129	1.5				0.030
					Time of Concentration		0.1
CC12							
SHEET	100	0.0150	0.011				0.033
SHALLOW	201	0.0129	1.5				0.030
					Time of Concentration		0.1
CC13							
SHEET	100	0.0160	0.011				0.032
SHALLOW	190	0.0126	1.5				0.029
					Time of Concentration		0.1
CC14							
SHEET	100	0.0150	0.011				0.033
SHALLOW	204	0.0108	1.5				0.034
					Time of Concentration		0.1
CC15							
SHEET	100	0.0028	0.011				0.068
SHALLOW	189	0.0048	1.5				0.047
CHANNEL	498	0.0050	0.020	1.32	8.88	1.472	0.096
					Time of Concentration		.209

MIRANT - 361690
Contra Costa Power Plant (4 OF 5)
Contra Costa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
CC11	Industrial	A	1.2	81
	Total Area / Weighted Curve Number		1.2	81
CC12	Industrial	A	.91	81
	Total Area / Weighted Curve Number		.91	81
CC13	Industrial	A	1.22	81
	Total Area / Weighted Curve Number		1.22	81
CC14	Industrial	A	1.14	81
	Total Area / Weighted Curve Number		1.14	81
CC15	Industrial	A	3.95	81
	Total Area / Weighted Curve Number		3.95	81

WinTR-55 Current Data Description

--- Identification Data ---

User: CH2MHILL
Project: MIRANT - 361690
SubTitle: Contra Costa Power Plant (4 OF 5)
State: California
County: Contra Costa
Filename: C:\Documents and Settings\dbacheme\Application Data\WinTR-55\MIRANT\Contra Costa Power Plant 4-5.w55

Date: 2/11/2008
Units: English
Areal Units: Acres

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
CC11	Most West	Outlet	1.2	81	0.1
CC12	West	Outlet	0.91	81	0.1
CC13	East	Outlet	1.22	81	0.1
CC14	Most East	Outlet	1.14	81	0.1
CC15	South	Outlet	3.95	81	.209

Total area: 8.42 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
1.5	2.0	2.5	2.9	3.25	3.5	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type IA
Dimensionless Unit Hydrograph: <standard>

CH2MHILL

MIRANT - 361690
Contra Costa Power Plant (4 OF 5)
Contra Costa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs) (hr)	5-Yr (cfs) (hr)	10-Yr (cfs) (hr)	25-Yr (cfs) (hr)	50-Yr (cfs) (hr)	100-Yr (cfs) (hr)
SUBAREAS						
CC11	.00	0.13	0.24	0.33	0.42	0.48
	n/a	8.02	8.01	8.01	7.94	7.94
CC12	.00	0.10	0.18	0.25	0.31	0.36
	n/a	8.02	8.01	8.01	7.94	7.94
CC13	.00	0.14	0.24	0.33	0.42	0.49
	n/a	8.02	8.01	8.01	7.94	7.94
CC14	.00	0.13	0.22	0.31	0.39	0.46
	n/a	8.02	8.01	8.01	7.94	7.94
CC15	0.14	0.41	0.75	1.05	1.34	1.55
	8.08	8.05	8.04	8.03	8.03	8.03
REACHES						
OUTLET	0.14	0.91	1.63	2.28	2.88	3.32

MIRANT - 361690
Contra Costa Power Plant (5 OF 5) Rev 2
Contra Costa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
1.5	2.0	2.5	2.9	3.25	3.5	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type IA
Dimensionless Unit Hydrograph: <standard>

WinTR-55 Current Data Description

--- Identification Data ---

User: CH2MHILL
Project: MIRANT - 361690
SubTitle: Contra Costa Power Plant (5 OF 5) Rev 2
State: California
County: Contra Costa
Filename: N:\Mirant\Structural\Civil\Contra-Costa\Calcs\Contra Costa Power Plant 5-5 Rev2.w55

Date: 4/21/2008
Units: English
Areal Units: Acres

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
CC16	southeast	Outlet	1.96	81	0.1
CC17	north of CC16	Outlet	1.61	81	.134
CC18	north of CC16	Outlet	2.27	81	.137

Total area: 5.84 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
1.5	2.0	2.5	2.9	3.25	3.5	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type IA
Dimensionless Unit Hydrograph: <standard>

MIRANT - 361690
Contra Costa Power Plant (5 OF 5) Rev 2
Contra Costa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs) (hr)	5-Yr (cfs) (hr)	10-Yr (cfs) (hr)	25-Yr (cfs) (hr)	50-Yr (cfs) (hr)	100-Yr (cfs) (hr)
SUBAREAS						
CC16	0.08	0.22	0.39	0.54	0.68	0.78
	8.02	8.02	8.01	8.01	7.94	7.94
CC17	0.06	0.18	0.32	0.44	0.56	0.64
	8.04	8.02	8.01	8.01	8.01	8.00
CC18	0.09	0.25	0.44	0.62	0.78	0.90
	8.04	8.02	8.02	8.01	8.00	8.00
REACHES						
OUTLET	0.22	0.64	1.15	1.60	2.01	2.32

MIRANT - 361690
Contra Costa Power Plant (5 OF 5) Rev 2
Contra Costa County, California

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
CC16	1.96	0.100	81	Outlet	southeast
CC17	1.61	0.134	81	Outlet	north of CC16
CC18	2.27	0.137	81	Outlet	north of CC16

Total Area: 5.84 (ac)

MIRANT - 361690
Contra Costa Power Plant (5 OF 5) Rev 2
Contra Costa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
CC16							
SHEET	100	0.0100	0.011				0.039
SHALLOW	282	0.0100	0.050				0.049
					Time of Concentration		0.1
CC17							
SHEET	100	0.0100	0.011				0.039
SHALLOW	164	0.0100	0.050				0.028
SHALLOW	277	0.0050	0.050				0.067
					Time of Concentration		.134
CC18							
SHEET	100	0.0100	0.011				0.039
SHALLOW	164	0.0100	0.050				0.028
SHALLOW	289	0.0050	0.050				0.070
					Time of Concentration		.137

MIRANT - 361690
Contra Costa Power Plant (5 OF 5) Rev 2
Contra Costa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
CC16	Industrial	A	1.96	81
	Total Area / Weighted Curve Number		1.96	81
CC17	Industrial	A	1.61	81
	Total Area / Weighted Curve Number		1.61	81
CC18	Industrial	A	2.27	81
	Total Area / Weighted Curve Number		2.27	81

MIRANT - 361690
Contra Costa Power Plant (5 OF 5) Rev 2
Contra Costa County, California

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 2-Yr (cfs)	5-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)
SUBAREAS						
CC16	0.08	0.22	0.39	0.54	0.68	0.78
CC17	0.06	0.18	0.32	0.44	0.56	0.64
CC18	0.09	0.25	0.44	0.62	0.78	0.90
REACHES						
OUTLET	0.22	0.64	1.15	1.60	2.01	2.32

Hydrologic Soil Group

455786	DELHI SAND, 2 TO 9 PERCENT SLOPES	A	632.4	59.2%
455804	JOICE MUCK	D	9.9	0.9%
455866	URBAN LAND		49.8	4.6%
455872	WATER		282.4	26.4%
461994	Fluvaquents, 0 to 2 percent slopes, frequently flooded	D	1.4	0.1%
461988	Xerorthents, 1 to 15 percent slopes	A	9.8	0.9%
461991	Water		82.6	7.7%
Totals for Area of Interest (AOI)			1,068.1	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

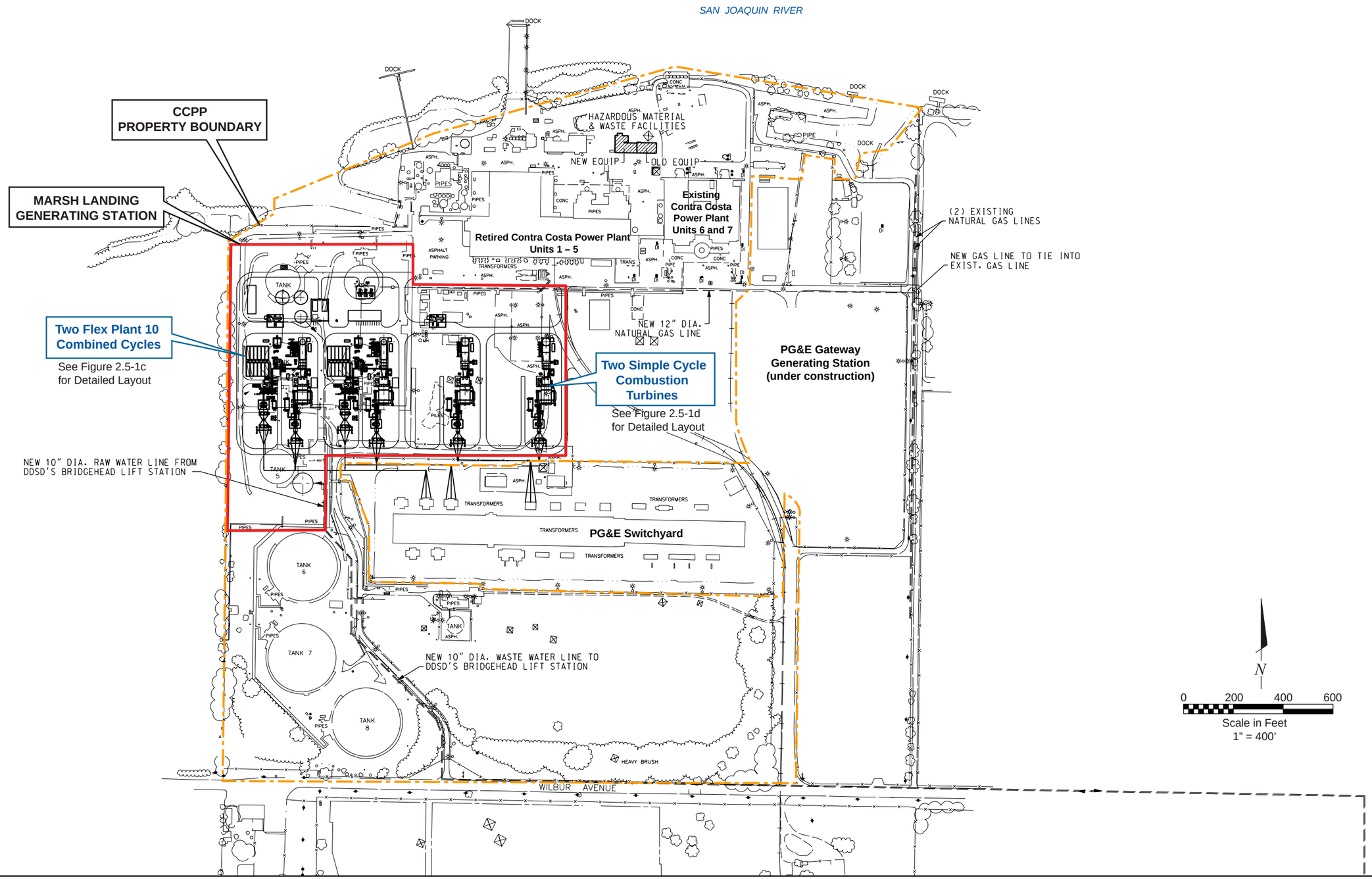
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Lower

Appendix B
Marsh Landing Plot Plan



Source:
CH2MHill Lockwood Greene; General Arrangement Marsh Landing Generating Station, Combined Cycle Siemens Flex 10s & Simple Cycle Layout;
Drawing No: MR-GA-ML-01-10 (Rev. C, 04/18/08)

APPENDIX B
PLOT PLAN
STORMWATER CONTROL PLAN FOR THE MARSH LANDING GENERATING STATION

CH2MHILL

APPENDIX D

TRANSMISSION

APPENDIX D-1

RECONDUCTORING PROJECT
PRELIMINARY ENVIRONMENTAL ANALYSIS

MARSH LANDING GENERATING STATION TRANSMISSION SYSTEM ENGINEERING RECONDUCTORING PROJECT PRELIMINARY ENVIRONMENTAL ANALYSIS

Prepared By

URS

December 2008

TABLE OF CONTENTS

1.0 INTRODUCTION AND PURPOSE 1

2.0 PROJECT DESCRIPTION 3
- 2.1 PROJECT LOCATION 3
- 2.2 CONSTRUCTION METHODS 4

3.0 ANALYSIS OF RECONDUCTORING 9
- 3.1 BIOLOGICAL RESOURCES 9
- 3.2 CULTURAL RESOURCES 12
- 3.3 LAND USE 14
- 3.4 NOISE 15
- 3.5 TRAFFIC AND TRANSPORTATION 17
- 3.6 TRANSMISSION LINE SAFETY AND NUISANCE 18
- 3.7 VISUAL RESOURCES 19
- 3.8 SOIL AND WATER RESOURCES 20
- 3.9 TRANSMISSION SYSTEM ENGINEERING 23
- 3.10 GEOLOGY AND PALEONTOLOGY 24

4.0 CONCLUSIONS 27

5.0 REFERENCES 29

TABLES

Table 1 FEMA-designed Floodplains along Transmission Line Corridors

FIGURES

Figure 1 Project Location Map
Figure 2 Topographic Map

ATTACHMENTS

Attachment 1 Species Reported Occurring Within 2 Miles of Transmission Line Reconductoring for the Marsh Landing Generating Station

1.0 INTRODUCTION AND PURPOSE

Mirant Marsh Landing, LLC (Mirant Marsh Landing) has prepared this report in support of the Application for Certification (AFC) 08-AFC-03 for the Marsh Landing Generating Station (MLGS) in Contra Costa County, California. The proposed MLGS will consist of new natural-gas–fired generation facilities and ancillary systems. Four components of the project will be constructed: new generating units that will become the MLGS; electric and gas transmission lines adjacent to the facility; water supply and wastewater pipelines; and a water treatment facility at the Delta Diablo Sanitation District Bridgehead Lift Station.

The new MLGS units will be wholly within the existing Contra Costa Power Plant (CCPP) site. The MLGS will consist of a 930 megawatt (MW) facility with four power blocks: two Siemens FP10 combined-cycle units and two Siemens 5000F Simple Cycle units. The generator output from the MLGS will be stepped-up to 230-kilovolt (kV) transmission voltage.

The MLGS will connect to the existing Pacific Gas & Electric (PG&E) transmission switchyard adjacent to the CCPP site and the proposed MLGS project site. Three single-circuit 230-kV transmission lines will be required to connect the MLGS to the PG&E switchyard to facilitate delivery of the project's electrical output to the transmission grid. The transmission line interconnections will be approximately 1,700 feet in total length. They will be located mostly within the MLGS site, but will cross a small portion of the CCPP site and then connect directly into the PG&E switchyard boundaries.

As part of its Generator Interconnection Process Reform (GIPR) program, the California Independent System Operator (CAISO) is reforming its process for conducting System Impact Studies (SIS) for new power generation facilities. While the CAISO's reform process is under consideration by the Federal Energy Regulatory Commission (FERC), the CAISO will not accept new SIS requests. Projects such as MLGS that have requested interconnection studies before June 2, 2008 have been grouped into the "Transition Cluster." In the meantime, the California Energy Commission (CEC) directed Mirant Marsh Landing to have a third-party consultant prepare a SIS for the project so that the CEC can complete its AFC review process.

Utility System Efficiencies, Inc. (USE) prepared a preliminary SIS for the MLGS project. This preliminary study was submitted to the CEC on September 18, 2008. Results of the study, using the 2013 Summer Peak Full-loop base case, indicate that under normal and contingency conditions, some 230 kV transmission lines in the study area will be loaded above their line ratings. All of these lines are owned by PG&E. The lines that would be overloaded are:

- Contra Costa–Brentwood
- Contra Costa–Wind Master–Delta Pump
- Las Positas–Newark
- Cayetano–Lone Tree

The actual need for reconductoring will be determined after PG&E has completed the Final Design Study or Cost Study for the Generator Facility Interconnection Agreement for the MLGS

project, and reaches agreement with Mirant Marsh Landing concerning funding of the needed reconductoring. Mirant Marsh Landing's preference is to re-rate all of the lines mentioned above. If re-rating is infeasible, PG&E would apply to the California Public Utilities Commission (CPUC) for authority to implement the reconductoring project, and to recover the cost of the reconductoring from Mirant Marsh Landing or PG&E ratepayers.[1]

An analysis of the potential effects on the transmission system caused by operation of the proposed facility shows that reconductoring of the Contra Costa–Brentwood, Contra Costa–Wind Master–Delta Pump, Cayetano–Lone Tree, and Las Positas–Newark 230-kV transmission lines are reasonably foreseeable events (USE, 2008). Because of this, and the requirement under the California Environmental Quality Act (CEQA) to examine foreseeable subsequent projects that result from the project, the potential impacts of reconductoring as it may pertain to the MLGS are presented herein.

The purpose of this reconductoring analysis is to inform the CEC of the potential indirect environmental and public health effects of the MLGS project. This analysis describes typical reconductoring activities and examines the nature and scope of the probable impacts of typical reconductoring, should it occur. This report also includes measures for mitigating these impacts to a less-than-significant level that PG&E could consider during implementation of the reconductoring project.

[1] The process for determining the cost and funding obligations for transmission system upgrades in California is the subject of a current FERC proceeding and has not been finally determined.

2.0 PROJECT DESCRIPTION

This section identifies the transmission line segments that are likely to require reconductoring as a result of the licensing of the MLGS if PG&E determines that re-rating is not an option. It provides an overview of typical reconductoring components and the basic work involved.

Until PG&E completes its own studies and engineering design, detailed information for each of the reconductored transmission lines, such as the number of tower modifications required, conductor types, sizes, and lengths, cannot be provided. Therefore, for the purposes of this preliminary reconductoring impact analysis, typical information has been assumed, as described below.

2.1 PROJECT LOCATION

The preliminary SIS report concluded that four lines could be overloaded during normal or emergency operation and therefore would require reconductoring, should re-rating not be considered feasible. The four lines are the Contra Costa–Brentwood line, Contra Costa–Wind Master–Delta Pump line, Cayetano–Lone Tree line, and Las Positas–Newark line, all of which are rated at 230 kV. These transmission line corridors are shown on Figure 1 and Figure 2.

The Contra Costa–Brentwood line is approximately 10 miles long. It starts at the Contra Costa Substation and runs southeast approximately 6 miles, then turns to the east and terminates at the Brentwood Substation approximately 4 miles to the east. The transmission corridor passes through agricultural and residential areas in the City of Antioch. South of Lone Tree Way, the transmission line crosses an agricultural field and Sand Creek. The land uses south of the creek are undeveloped and potential grazing lands with a slightly hilly topography. As the transmission lines turn to the east, they cross a golf course and additional residential development of the City of Brentwood and terminate at the Brentwood Substation amidst agricultural uses.

The Contra Costa–Wind Master–Delta Pump line is approximately 18 miles long. It starts at the Contra Costa Substation adjacent to the MLGS site and continues southeast to the Windmaster Substation, terminating at the Delta Pumps Substation. Similar to the Contra Costa–Brentwood line, this line crosses residential and agricultural uses in the City of Antioch and several creeks. Farther south, the transmission line passes through undeveloped areas with moderate topography changes (less than 400 feet of elevation change) and some additional creeks and rural residential land uses. Wind turbines are to the west of the Delta Pumps Substation, which is at the California Aqueduct north of the Bethany Reservoir State Recreation Area.

The Cayetano–Lone Tree line is approximately 6 miles long. It begins at the Cayetano Substation, north of Livermore, California, in Alameda County and runs approximately 2.5 miles to the east through primarily agricultural and rural residential areas where the topography is fairly flat. The transmission line then turns to the north, crosses into Contra Costa County and continues for approximately 3.5 miles to the Lone Tree Substation, just south of Los Vaqueros Reservoir. The area south of the Lone Tree Substation is generally undeveloped, characterized by rolling hills with elevation change less than 100 feet, and wind turbines.

The Las Positas–Newark line is approximately 21 miles long. It begins at the Las Positas Substation northeast of Livermore runs approximately 6 miles south, passing through residential areas, agricultural fields, and industrial uses, and then turns to the southwest and continues approximately 15 miles to the Newark Substation, passing through agricultural and grazing lands and crossing a few small creeks. Southeast of the intersection of I-680 and Vallecitos Road, the transmission line passes through a processing facility then through more undeveloped, slightly hilly land. The transmission line then passes through the residential and commercially developed areas between Fremont and Milpitas to the Newark Substation, adjacent to the Cargill salt ponds.

2.2 CONSTRUCTION METHODS

Prior to beginning reconductoring, PG&E would coordinate with the CAISO for permission to take the existing line out of service. This action would ensure that adequate power is redistributed to substations and customers when the line is out of service.

The existing transmission corridor would be accessed by trucks, all-terrain vehicles, by foot, and by helicopter. To the extent possible, access would be over existing roads. Where access roads to towers are not available, new temporary spur roads would be constructed, with minimal grading and minimal land disturbance. Best Management Practices (BMPs) would be implemented during construction. The roads would be removed and the disturbed areas would be restored to original conditions after project completion. In developed areas, access to towers would be from public roads or through developed private property or commercial lots. No new access roads would be constructed through drainages or wetlands. Helicopters may be used to string the lines and transport workers and materials to the towers. Helicopter reconductoring methods have proven highly effective where the terrain makes access difficult or there is a need to avoid disturbance to sensitive resources.

Reconductoring would involve the replacement of the existing conductors with a heavier duty conductor that would increase the current carrying capacity of the line. Reconductoring would also involve replacing insulators and installing temporary crossing structures to project roadways and existing utilities while installing the new conductors.

In general, reconductoring is accomplished by disconnecting the old line and using it like a rope to pull the new line through the temporary pulleys, called “travelers” or “sheave blocks,” mounted on each tower, until it reaches the other end. If the old line is not in good enough condition to be used to pull in the new line, it would be used to pull a carrier cable, or “sock line,” through the pulleys to the end of the segment to be replaced; the sock line would then be used to pull in the new line.

Typically, a work crew is set up at each end of the segment that is being replaced. Each crew generally consists of two large tractor trailer units, which either feed out the new line or wind in the old line on spools mounted on the trailers, plus various machinery such as cranes and two or three utility trucks carrying tools, other materials, and workers, for a total of about 10 trucks and about 20 workers involved in the work at any one time. One crew sets up at a "pull site" near a tower at one end of the pull, and the other at a “tensioning site” near a tower at the other end of the pull. The tensioning crew would employ a special tensioner truck, which is essentially a large

drum winch that is used to put back tension on the line being pulled. Each pull generally is limited to about 2 to 3 miles, and the crews generally pull three cables (one three-phased circuit) at once. Each pull station and tensioning station requires a construction staging area of approximately one acre. In residential or developed areas, the pull and tension sites can be selected to provide adequate space for construction staging.

The tensioning site crew either climbs the tower or uses a truck-mounted aerial bucket (also called a "cherry-picker") to access the tower, disconnects the old conductors, and attaches them through the tensioner truck to the new conductor on spools on the large trucks. The pull site crew also climbs the tower, disconnects the lines, and attaches them to the spools in the large trucks below the tower. Temporary clearance structures are placed at road crossings and other locations where the new conductors may accidentally come in contact with electrical or communication facilities or vehicular traffic during installation.

It is anticipated that all reconductoring work would be done within the existing PG&E right-of-way along the existing transmission lines and within the footprint of the existing substations. Temporary construction areas outside of the right-of-way would include material storage and laydown areas, temporary construction yards, and helicopter landing areas. These areas would be selected by engineering and construction personnel during the design phase. Approximately 2 to 5 acres are typically needed for transmission line projects. Work crews will have a great deal of flexibility in choosing the locations of the pull and tension sites and temporary staging areas; crews can generally select sites that avoid many environmental impacts. Use of private lands for temporary construction staging along the transmission corridors would be negotiated by PG&E at the time of reconductoring.

Because the potential for environmental impact is generally nonexistent except at the pull and tensioning sites, this analysis focuses on examining potential effects at the likely pulling and tensioning sites, as well as at other locations that could be disturbed by truck movement, such as the substation sites and sites near towers that may require modification as part of the reconductoring. Activities outside of the pull and tensioning sites are generally restricted to (1) accessing the towers (either by climbing or using a truck-mounted aerial bucket) to place the pulleys and to remove the conductor from-the pulleys and refasten it once stringing is completed; and (2) work on the tower structures to repair or replace spars that are damaged, or to replace insulators.

While determining the specific location of pull and tensioning sites is not feasible at this time, they are generally sited at "angle" towers, which are located where the line makes a change in direction of more than 10 degrees. Pulling the old lines and reeling out the new conductors is easier at these locations because the pulling and tensioning equipment can be arranged in line with the transmission line. Conversely, the crews try to avoid pulling the line through one or more angle towers because the conductors cannot be efficiently pulled through such an angle. Pulling and tensioning can also take place at "deadend" sites, which are towers where the transmission line is physically connected to the tower, rather than merely passing through the insulator clamps, and in general is where one spool of cable is spliced to the next spool. Deadend sites are generally at angle towers, but also can be located at towers that are in-line with the route, rather than at an angle to the route. Deadend towers have significant structural strength

and resist the forces of pulling. The locations of angle and deadend towers on the lines described above are not known at this time. The exact locations will be determined when PG&E develops final engineering plans for the reconductoring.

Reconductoring may require raising the height of the transmission towers to accommodate different sag characteristics of the new conductors. The new conductors may sag closer to the ground on hot days when the lines are fully loaded, and therefore some towers may need to be raised, typically on the order of 10 to 25 feet. This can be done through one of three methods: a "top cage" extension, where additional structure is added to the top of the tower to raise its top to the required level; a "waist cage" extension, where the top half of the tower is separated from the bottom half at about its mid-level, additional structure is inserted, and the top is replaced onto the new part of the structure; and a "base cage" extension, where the tower is separated from its concrete base, new structure is installed on the base, and then the tower is placed back on top of the new structure.

If the towers are modified, the existing concrete foundations may require some limited work. The need for foundation work would be determined during inspections conducted by PG&E during engineering design for the reconductoring project. Foundation work could range from patching minor cracks in the concrete, to complete replacement of the foundation, which would require excavation work around the base of the tower. If any of the towers need to be modified, work crews would also set up equipment at those towers as part of the reconductoring project. For the vast majority of reconductoring projects, however, excavation work near the towers is not needed.

The work areas needed to modify the height of towers would be similar in size to those for the pulling and tensioning sites. The equipment would consist of a truck-mounted crane capable of lifting the existing tower off its base, plus three or four smaller support vehicles. Workers would attach the crane to the tower, then separate the portion that would be elevated, and pull that portion up to provide clearance for the new structure. The new structure is welded or bolted in place, and the existing structure is then lowered back onto the new structure and welded or bolted in place. In most cases, the existing conductors would not need to be removed from the tower while it is modified. Some work may be required on tower foundations or footings.

During the reconductoring process, work crews may replace the insulators on the transmission towers on the line. This work usually involves accessing the tower with a truck-mounted aerial bucket or by climbing, removing the old insulator strings, and installing new ones. The new insulators are delivered and held in place by the aerial bucket and or rigging attached to the tower, or, for towers that cannot be accessed by truck, by helicopter. The towers are also inspected for corrosion prior to reconductoring and, if necessary, will be repaired. Repairs can include corrosion removal by mechanical means, regalvanizing, and repainting.

Modifications may be required at the substations where each of the lines terminates. These modifications would all occur within the existing footprint of the substations and could include replacing circuit breakers, bus structures, and switches.

A schedule for the reconductoring has not been developed at this time. However, it is anticipated that each reconductoring project could take approximately 4 to 6 months. Workers would occupy each pull and tension site for about 3 days. The reconductoring work would probably occur during times of relatively low electrical demand to protect system reliability while the lines are out of commission.

At the end of construction, all temporary structures will be removed. Construction debris will be removed and hauled away for recycling or disposal. Areas disturbed during construction will be returned to pre-construction conditions, unless otherwise agreed to with the landowner.

3.0 ANALYSIS OF RECONDUCTORING

This analysis focuses on the relevant technical areas that the CEC evaluates as a part of the AFC process for power plants. The relevant technical areas discussed for reconductoring include biological resources, cultural resources, geologic hazards, land use, noise and vibration, palaeontological resources, soils and water resources, traffic and transportation, transmission line safety, transmission system design, and visual resources. Other technical areas typically included in the CEC's evaluation of proposed projects are not included in this report because the potential for impacts due to reconductoring are considered not applicable or non-existent.

3.1 BIOLOGICAL RESOURCES

This section provides an analysis of the potential impacts to biological resources that could occur as a result of the proposed reconductoring of transmission lines associated with the MLGS project.

Potential impacts to biological resources could result at construction work sites during the reconductoring. These sites include pull and tensioning sites where new conductors will be placed in existing towers, towers that may require modification, staging areas, laydown yards, and access roads. Impacts may include disturbance, injury or death of special-status species or their nests, temporary ground or habitat disturbance, or temporary visual, wind, or noise disturbances. Avoidance and minimization measures are proposed to avoid, eliminate, and reduce these impacts to a less-than-significant level, or compensate for any impacts. The final reconductoring project will be subject to approval by the CPUC, and may incorporate additional avoidance and minimization measures or BMPs as required by the CPUC.

As described in Chapter 2, the proposed project involves reconducting of four transmission line segments.

Impacts of Reconductoring

This section presents the potential impacts to biological resources associated with the construction and operation of the proposed reconductoring transmission line segments. Potential impacts to biological resources during reconductoring of the transmission lines could occur at the pull and tensioning sites, the tower locations, and the temporary staging or laydown yard locations; specific locations and sizes of those sites have not yet been determined.

Impacts would most likely occur at the angle towers where conductor pull and tension sites and tower modification activities are required. Large trucks and other vehicles employed to perform the work could potentially damage, injure, or kill sensitive plant or animal species, compact soil, crush dens or burrows, destroy nests, introduce non-native species, or lead to soil erosion and sedimentation. Additionally, indirect impacts such as noise and visual disturbances could affect sensitive species during construction activities.

Although in-depth field investigation was not conducted as part of this preliminary evaluation, aerial photographs suggest that the primary vegetation community is California grassland. These areas are often dominated by non-native annual grasses and are used for grazing. Other vegetation types that may be present within the impact area could include buckwheat/sage scrub, oak woodlands, riparian woodlands and scrub, agriculture, and urban. While transmission lines may cross streams and wetland areas, towers are not expected to be located within these areas, and as such, no work is expected to occur within these communities.

A review of the California Natural Diversity Database (CNDDB) (California Department of Fish and Game, 2008) indicates that several historic occurrences of special-status species have been reported within 2 miles of the transmission lines (see Attachment 1). Based on habitat presumed to be present in the vicinity, the potential for each species to occur in the work area was evaluated. In total, eight species are highly likely to occur within the project area because suitable habitat is present for these species and there are numerous occurrences in the vicinity of the project. The eight species that are highly likely to breed, forage, aestivate, or dwell within the work or staging areas are: California tiger salamander (*Ambystoma californiense*), California red-legged frog (*Rana draytonii*), San Joaquin kit fox (*Vulpes macrotis mutica*), American badger (*Taxidea taxus*), Alameda whipsnake (*Masticophis lateralis euryxanthus*), burrowing owl (*Athene cunicularia*), big tarplant (*Blepharizonia plumosa*), and stinkbells (*Fritillaria agrestis*) (see Attachment 1).

Forty-seven species are considered to have low or moderate potential to occur in the project area. Habitat for these species is present, but the habitat is either limited in the project area or the species is very rare in the vicinity of the project area. Twenty-one species known to occur within 2 miles are unlikely to occur in the project area due to lack of available habitat within the project area (see Attachment 1).

The primary concern regarding impacts to biological resources is injury or death to sensitive species or habitats occurring within the transmission corridor or staging areas. Indirect impacts may disturb these species to the point of inhibiting successful nesting, breeding, foraging, aestivation, or other activity essential for maintaining a viable population. Attachment 1 lists sensitive species that are known to occur within 2 miles of the transmission corridor. Should suitable habitat be present within or near the impact area, these species could be directly or indirectly impacted as a result of this project.

Direct and indirect impacts to sensitive species may occur from a variety of construction activities such as clearing of staging areas, movement of equipment, or walking around the construction site. Potential impacts include noise, wind (if a helicopter is used), vegetation removal, crushing of plants and animals including ground-nesting birds, introduction of invasive species, disruption of food sources, release of liquids, and visual disturbance.

Mitigation

Avoidance and minimization measures may be implemented to reduce impacts. Potential avoidance and minimization measures include:

- Conduct rare plant surveys during the appropriate blooming season for the project area and areas within 150 feet of the project area.
- Conduct mammal burrow surveys prior to construction in all areas with potential ground disturbance (including vehicle traffic).
- Conduct pre-construction nesting bird surveys. Raptor surveys should be conducted within 0.5 mile of the project disturbance areas, whereas passerine surveys should be conducted within 150 feet of the project area.
- Avoid, to the maximum extent possible, any activity that necessitates tree, shrub, or ground cover disturbance.
- Clear vegetation during the non-breeding season for migratory birds (August 16 through February 14). If vegetation needs to be removed between February 15 and August 15, a nesting bird survey should be conducted beforehand. Activity near active nests should be avoided until the young have fledged. Buffer distances from nests are dependent on the species; a minimum buffer of 150 feet would be established.
- Depending on the results of the botanical, mammal, and bird surveys, construction activities may be restricted to avoid impacts to sensitive species. The months, season or time or day would be established for each sensitive species.
- Maintain vehicles to prevent leaks or spills, and keep a spill cleanup kit readily available at all work sites.
- Implement erosion control BMPs, as necessary, to prevent impacts to waterways, wetlands, and/or vernal pools. This may include installing silt fences or fiber rolls to reduce erosion and sedimentation. Weed-free erosion control would be used.
- Establish boundaries for staging and construction areas.
- Delineate and identify all Environmental Sensitive Areas, including habitats of sensitive species and wetlands and other waters (streams) of the United States.
- Use existing roadways to the maximum extent possible.
- Clean construction equipment with a pressure washer to minimize the potential spread invasive and non-native plants.
- Minimize the footprint of staging areas and activities to complete the project.
- Designate areas to sort and store staging materials.
- Limit vehicle use to control emissions.
- Store, re-fuel, and maintain heavy equipment more than 150 feet from wetlands, streams and water bodies.
- Limit heavy equipment to that with the least adverse effects (minimally sized with rubber tires).

Conclusion

Construction activities for this project are not expected to have adverse impacts on the surrounding environment or sensitive species. However, impacts cannot be fully evaluated until specific biological surveys are conducted and project plans are developed (with exact locations of staging and work areas). Before construction activities are initiated it will be necessary to consult with various regulatory agencies (e.g., U.S. Fish and Wildlife, California Department of Fish and Game, and U.S. Army Corps of Engineers). The implementation of botanical surveys, wildlife surveys, BMPs, and the proposed avoidance and minimization measures will reduce the potential impacts to sensitive species associated with the project.

3.2 CULTURAL RESOURCES

Cultural resources are defined as buildings, sites, structures, or objects, each of which may have historical, architectural, archaeological, cultural, and/or scientific importance. Numerous laws, regulations, and statutes on both the federal and state levels seek to protect and target the management of cultural resources.

The sections of transmission lines that could be reconductored for the MLGS project are all found within the eastern San Francisco Bay Area and adjoining sections of Sacramento-San Joaquin River Delta. This region has been one of the most intensively archaeologically studied areas in California. Studies have shown that human settlement in the region probably began sometime during the early Holocene period ca. 10,000 years ago.

The transmission lines in the Antioch and Tracy area were constructed prior to the 1920s and the lines between Newark and Tracy and Antioch and Clayton existed by the 1910s. The Contra Costa–Lone Tree–Cayetano line was likely constructed in conjunction with the construction of the CCPP in the early 1950s. Given their age, any of these lines and associated substations may themselves qualify as historical resources. It should be noted, however, that many of these lines have been modified in the last 20 years, and the Cayetano–Lone Tree line was modified within the last five years, which could affect their eligibility as historical resources.

Impacts of Reconductoring

Potential impacts to archaeological resources caused by the identified reconductoring projects could occur where ground-disturbing activities are necessary. Areas of disturbance include the pull and tensioning sites, where cable is drawn across the ground surface between towers, the transmission towers and substations requiring upgrade, and within the confines of temporary access routes and temporary construction areas.

Modification and/or replacement of the transmission towers and substations, if they are historical resources, could be an impact to cultural resources associated with the built environment.

Mitigation

It is recommended that once PG&E develops a work plan for the reconductoring work, including the identification of the temporary construction staging areas, access routes and extent of tower and substation modification, additional cultural resource surveys be conducted. A California Historical Resources Information System (CHRIS) record search that encompasses all of the areas that might be affected by reconductoring activities as well as surveys of the transmission corridors to identify cultural resources (including structures greater than 45 years old) should be conducted prior to construction activities.

Should resources be identified by either the record search or the site reconnaissance survey, measures should be implemented to protect the resources. This includes evaluating the resources' eligibility for the National Register of Historic Places (NRHP) or California Register of Historical Resources (CRHR) and whether the aspects of the cultural resource that makes it significant will be impacted by the project. Work crews will have flexibility in determining staging areas and pull and tensioning sites and can locate these activities to avoid identified cultural resources.

It is recommended that ground disturbance at archaeologically sensitive pull site locations or other areas where key project activities are occurring be monitored for cultural resource exposure. If cultural material is identified, ground disturbance should halt until the find can be evaluated. Additional mitigation measures would include formal site recordation, evaluation, and, if appropriate, data recovery and curation. Previously identified archaeological sites should be evaluated and if they meet the criteria for eligibility to either register and they cannot be avoided, data recovery should be conducted as a mitigation measure.

An impact to a historical resource is significant if the impact results in the material impairment of its significance. Whether actions of a project constitute a significant impact depends upon which criteria are applicable to the cultural resource. To ensure that there will not be a significant impact to a cultural resource, it is necessary to evaluate the potential resource according to criteria for eligibility to either the NRHP or the CRHR. It is appropriate to consider potential cultural resources that may be older than 45 years or exceptional for eligibility to the NRHP or the CRHR. After it is determined whether potential cultural resources meet the criteria for eligibility to the NRHP or the CRHR, then it is necessary to consider whether physical alteration may be an impact. Whether the resource has unique features may or may not play a role in whether it meets the criteria for eligibility to either register and is not a valid criterion for deciding whether or not to evaluate the resource.

Recordation may serve as mitigation for some impacts to NRHP- or CRHR-eligible historic resources.

Conclusion

Contingent on the outcome of the record search and the surveys, some of the proposed reconductoring routes could contain sensitive archaeological resources. Depending on the scope

of work associated with the reconductoring project, such as whether it would include new foundations or raising the height of some towers, some of the resources may be adversely affected as a result of the reconductoring effort. In general, after all cultural resources are identified and a determination is made regarding whether they meet the criteria for eligibility to either the NRHP or the CRHR, except in cases where a cultural resource is demolished, mitigation is usually possible through avoidance, recordation, or data recovery.

3.3 LAND USE

The land use analysis focuses on the project's compatibility with existing and planned land uses. The anticipated reconductoring involves transmission lines within four existing utility transmission corridors in Alameda and Contra Costa Counties, in the cities of Antioch, Brentwood, Livermore, and Newark.

Reconductoring these lines would require access to the transmission corridors at various points. This includes the temporary construction staging areas along the transmission lines, which may be co-located with the terminus points of each line at the substations.

The transmission lines pass through a variety of undeveloped land and agricultural land as well as commercial, industrial, and residentially developed areas as described in Section 2.1. It is assumed that PG&E has rights of access to all of their facilities for maintenance and upgrade work such as this reconductoring work. Areas needed for temporary construction staging along the transmission corridors would be negotiated with private landowners by PG&E at the time of reconductoring. In addition, work areas would be delineated so as to avoid sensitive agricultural, biological and cultural resources.

The Contra Contra–Windmaster–Delta Pumps line passes through areas mapped by the California Department of Conservation as Farmland of Statewide Importance, and Farmland of Local Importance, as well as a few areas mapped as Prime Farmland. The majority of the transmission corridor crosses developed and grazing land (which are not considered important farmlands). The majority of the Contra Costa–Brentwood line passes through developed land, with some sections of Farmland of Local Importance and Prime Farmland. The Cayetano–Lone Tree line crosses areas mapped as Grazing Land and Farmland of Local Importance. Similarly, the Las Positas–Newark line crosses small pockets of Farmland of Statewide Important and Unique Farmland, while the vast majority of the corridor passes through grazing and developed land.

Impacts of Reconductoring

Reconductoring of each line would be expected to last no longer than six months and therefore any disruption to adjacent land uses would be temporary. The locations of pull and tension sites would be selected to minimize the impacts to surrounding land uses (i.e., avoiding residential areas and areas mapped as important farmland). The appropriate land management agency and landowner(s) would approve these locations. Outside of the pull and tension sites, the construction work would be virtually unnoticeable from adjacent land uses.

The right-of-way for each transmission corridor would be restored to pre-project conditions when reconductoring activities are complete. Agricultural uses temporarily disrupted could be restored and no permanent impacts would be expected. Project-related debris would be removed from the right-of-way and disposed of at an appropriately licensed facility. Ruts and other similar disturbances would be smoothed. Any areas requiring revegetation would be seeded with a weed-free seed mix approved by the appropriate land management agency and landowner(s).

Mitigation

To reduce potential disruption to adjacent land uses during and after construction it is recommended that the following mitigation measures be implemented:

- Landowners adjacent to the transmission utility corridors should be notified of the upcoming project activities.
- The transmission corridor, construction staging areas and temporary access roads should be restored to pre-project condition once construction is complete.
- Construction staging areas, pull and tension sites, and temporary access roads should be sited to reduce or avoid impacts to land uses (i.e., avoiding nearby residences, areas designated as important farmland, and dividing communities).

Conclusion

Potential impacts to land use would be short term and confined to the work areas within existing transmission corridors and as negotiated with private landowners. Reconductoring would not change the existing land use or displace any existing uses. Implementation of the mitigation measures described above would avoid significant land use impacts along the electrical transmission line route related to reconductoring.

3.4 NOISE

Reconductoring the four transmission lines described above would require operation of heavy equipment at pull and tensioning sites, and at transmission towers that may require modification. Heavy equipment operation could disturb adjacent noise-sensitive land uses during the temporary construction period. After the reconductoring work is complete and the lines are operational, changes in corona noise levels are not anticipated.

Impacts of Reconductoring

Reconductoring work would require operation of construction-type equipment at the pull and tensioning sites. In some cases, a helicopter may be used to string line. A period of 4 to 6 months is estimated to complete the reconductoring of a line. Workers would occupy each pull or tension site for about 3 days as that part of the line segment is replaced. The workers would then move on to the next pull and tension sites and set up to replace that section of the line. The expected noise levels would not be likely to disturb surrounding agricultural or undeveloped land

uses. At adjacent residences, the increase in noise would be a noticeable temporary increase in the ambient noise levels. Although construction noise would be required to comply with local ordinances, it may still be disruptive. Therefore, to mitigate the temporary impacts in residential areas from construction-related noise, the work should only occur during daylight hours.

The reconductoring of the lines is not expected to substantially increase corona noise levels. Corona noise is a function of the line voltage and the condition of the line. Because voltage would remain the same after reconductoring and the condition of the line would be upgraded, corona noise may actually be reduced.

Mitigation

Given the temporary nature of noise impacts from reconductoring, the impacts would be expected to be less than significant. However, a detailed design has not yet been completed. Therefore, to ensure that potential construction-related noise impacts would be minimized, the following mitigation measures should be considered:

- Construction noise emission shall comply with all local laws, ordinances, regulations, and standards regarding hours of construction activity and permitted noise levels affecting adjacent uses.
- All construction equipment should be operated and maintained to minimize noise generation. Equipment and vehicles using internal combustion engines shall be equipped with mufflers, air-inlet silencers where appropriate, and other shrouds or noise-reducing features, in good operating condition that meets or exceed original factory specifications. Mobile or fixed "package equipment" shall be equipped with shrouds and noise control features that are readily available for that type of equipment.
- The use of noise-producing signals, including horns, whistles, electronic alarms, and sirens and bells, will be for safety warning purposes only.
- No construction-related public address, loudspeaker, or music system shall be audible at any adjacent noise-sensitive land use.
- The construction contractor shall implement a noise complaint process and hotline number for the surrounding community. The project owner will have the responsibility and authority to receive and resolve noise complaints.

Conclusion

By implementing mitigation measures similar to those that were proposed in the AFC for construction of the MLGS facility, potential noise impacts from reconductoring work would be less than significant.

3.5 TRAFFIC AND TRANSPORTATION

The majority of reconductoring activities would take place over undeveloped and agricultural lands in Contra Costa and Alameda counties. The transmission lines proposed for reconductoring also pass through industrial, commercial, and residentially developed areas of the cities of Antioch, Brentwood, Livermore, and Newark. The existing transportation network is comprised of local, regional and interstate roadways and would be used for transportation of equipment and access to the transmission corridor and temporary construction staging areas.

The reconductoring would require a crew of approximately 10 trucks and about 20 workers involved in the work at any one time at pull and tension sites, which would be located 2 to 3 miles apart.

The existing transmission corridor would be accessed by trucks, all-terrain vehicles, by foot, and by helicopter. To the extent possible, access would be over existing roads. Where access roads are not available to towers, new temporary spur roads would be constructed. The roads would be removed and the disturbed area would be restored to original conditions after project completion. In developed areas, access to towers would be from public roads or though developed private property or commercial lots. Helicopters may be used to string the lines and transport workers and materials to the towers.

Impacts of Reconductoring

Movement of heavy machinery on local roads would occur intermittently, but infrequently over the 4- to 6-month reconductoring project schedule. Reconductoring could result in the following impacts:

- Use of undesignated access roads or public roads could affect local traffic and create safety hazards.
- Use of public roads for parking construction vehicles and worker vehicles could affect local traffic.
- Occasionally during overhead construction projects, materials could fall onto the roadway, which would create a safety hazard.

Mitigation

Potential impacts related to traffic and transportation can be avoided through the following mitigation measures:

- All reconductoring-related vehicle movements outside the transmission right-of-way should be restricted to pre-designated access or specified public roads. Should unforeseeable circumstances occur during reconductoring activities, resulting in the disturbance of more areas than initially requested, the project owner should obtain permission from the landowner.

- All reconductoring-related parking should take place on pre-designated and contractor-acquired staging areas. The project owner should develop a parking and staging plan for all phases of project construction.
- Install netting, or provide other protective measures, as a safety precaution to reduce the potential for construction materials falling on motorists, bicyclists, or pedestrians during the tensioning/cable pulling process where reconductoring activities require the crossing of roadways.

Conclusion

The reconductoring activities proposed for the MLGS would not result in any substantial traffic or transportation impacts to local roadways. The small number of traffic trips generated from the reconductoring activities would not result in significant impacts. Additionally, implementation of the above mitigation measures would reduce any potential traffic and transportation impacts resulting from reconductoring to less-than-significant levels.

3.6 TRANSMISSION LINE SAFETY AND NUISANCE

The identified reconductoring would involve the substitution of new conductors for existing ones as necessary for effective and safe transmission of the additional energy from MLGS. The magnitude of electromagnetic fields (EMF) associated with transmission lines depends on line voltage and current levels. The potential for perceivable field impacts and significant field exposures would depend on the chosen design, the current levels, and distance from the line, which would be determined by PG&E at a later date.

Impacts of Reconductoring

Because the retrofitted lines would be operated at the same voltage (230 kV) as the existing lines, the magnitude of the electric field along each route would not change from current levels. The only field-related change from the retrofit (and its related increases in current flow) would be with respect to the magnetic field, whose intensity depends directly on current levels. Since the retrofitted lines would remain within their existing routes, the retrofit-related increases in magnetic field intensity could lead to corresponding increases in human exposure to line magnetic fields. The residences adjacent to the transmission lines, line workers, and individuals in transit under the transmission line would be subject to an increase or change in EMF exposure.

Mitigation

The CPUC’s way of ensuring the appropriate management of fields from high-voltage power lines (in light of the current health concern) is to require incorporation of specific field-reducing measures in the design for new or retrofitted lines. The applicable measures for the proposed MLGS lines and the lines that might be retrofitted are those specified in PG&E's guidelines prepared in compliance with current CPUC requirements. The reconductored lines would be constructed consistent with this CPUC policy as related to field strengths, perceivable field

effects, electric shocks, and human exposure. Since the reconductored lines would be designed and operated according to standard PG&E practices, it is expected that these lines would be operated in accordance with the applicable health and safety laws, ordinances, regulations and standards.

Conclusion

If the identified 230 kV lines are reconductored, they would be designed, built and operated (within their existing routes) according to CPUC's requirements, by PG&E consistent with their own guidelines to address transmission line safety and nuisance. Therefore, impacts would be less than significant.

3.7 VISUAL RESOURCES

This analysis examines the potential visual resource impacts associated with the anticipated reconductoring of lines in four transmission corridors described above.

The transmission lines traverse a variety of undeveloped, agricultural, industrial, commercial, and residentially developed lands in Contra Costa and Alameda counties. The transmission lines (and towers and substations) are existing features within an extensive utility network in the area.

Temporary construction staging areas would be required for storing equipment and materials near the construction sites. Existing transmission lines would be replaced with new lines. Substation facilities would require upgrades to components. Transmission towers may be modified or raised.

Impacts of Reconductoring

Construction equipment and activities would likely be visible at various locations along the transmission lines to motorists and nearby residences. Reconductoring of each line would be expected to last 4 to 6 months, with construction activity moving along the corridor approximately every three days. At the end of the construction period, all construction areas and rights-of-way would be restored to pre-project conditions. Therefore the adverse visual impacts associated with construction would be short term and less than significant.

Reconductoring involves replacement of existing electrical transmission wires with new wires. This change to the transmission lines would be undetectable to viewers of the lines. Upgrades to switches and breakers at the substations may also be required as a part of the reconductoring project. These changes would be minor and would occur within the fenced-in structures of the substation, and would not be expected to result in a change in the visual characteristics of the substation. Until the project is in the final design stages, it is not known whether it would be necessary to raise the height of existing towers or replace towers with stringer towers in order to accommodate the sag requirements and heavier weight of the new wires. Because the existing transmission line and towers are an established part of the setting for the areas surrounding them, the adverse visual impacts that could occur due to changes in tower height or design would likely

not be significant. However, a detailed design has not yet been completed. Therefore, to ensure that potential visual impacts would be minimized, the mitigation measures described below should be considered.

Mitigation

With the incorporation of the following typical mitigation measures, visual impacts associated with the reconductoring activities would be less than significant:

- During project construction, the work site should be kept clean of debris and construction waste.
- Construction staging areas should be selected to minimize views from public roads, and residences.
- All evidence of construction activities, including ground disturbance due to staging and storage areas, should be removed and remediated upon completion of construction. Construction areas and rights-of-way should be restored to their original grade and contouring. Any vegetation removed in the course of construction should be replaced on a one-to-one in-kind basis.
- Transmission towers that are modified or replaced should be treated with non-glare finishes and painted in colors that would blend with the surrounding environment.
- Non-specular conductors should be used.
- Insulators should be non-reflective and non-refractive.

Conclusion

Construction of the reconductoring project would require only temporary disturbance of the rights-of-way and construction staging areas. After reconductoring, the construction areas will be returned to pre-project conditions as described in the mitigation measures above.

The reconductoring project has the potential to cause long-term visual impacts. Feasible mitigation measures are available to reduce potential impacts of the modified/replaced transmission towers and conductors and insulators, and therefore visual impacts would be reduced to a less-than-significant level.

3.8 SOIL AND WATER RESOURCES

The transmission lines traverse a variety of undeveloped, agricultural, industrial, commercial and residentially developed lands. The transmission corridors generally cross the alluvial plains associated with the Sacramento-Bay Delta, the foothills of the coast range and through the Tri-valley area to the southeastern edge of the San Francisco Bay. Soils types and characteristics vary across this topography. The transmission lines cross several waterbodies:

Contra Costa–Brentwood line

- East Antioch Creek
- Contra Costa Canal
- Sand Creek
- Deer Creek
- Dry Creek
- Marsh Creek

Contra Costa–Windmaster–Delta Pumps line

- East Antioch Creek
- Contra Costa Canal
- Sand Creek
- Deer Creek
- Dry Creek
- Kellogg Creek
- Frisk Creek
- Brushy Creek
- California Aqueduct

Cayetano–Lone Tree

- Bee Barn Creek

Las Positas–Newark line

- Las Positas Creek
- Arroyo Mocho
- Arroyo del Valle
- San Antonio Creek
- Calaveras Creek
- Sheridan Creek
- Mission Creek

The transmission lines that may require reconductoring cross two water supply canals, the Contra Costa Canal and the California Aqueduct.

The Contra Costa Canal is approximately 48 miles long and is owned by the U.S. Bureau of Reclamation, but is operated and maintained by the Contra Costa Water District (CCWD). It begins at Rock Slough, near Oakley, California, and generally runs from east to west. With the exception of the first 4 miles, the canal is concrete lined. The primary purpose of the canal is to deliver drinking water from the Delta to treatment plants in Contra Costa County for distribution to customers.

The California Aqueduct was constructed in the 1970s and supplies agricultural and municipal areas in southern California. The California Aqueduct is the major conveyance feature for the California State Water Project, which brings water from northern to southern California. The aqueduct is 444 miles long and is mostly an open concrete-lined canal. Some portions of the aqueduct are underground pipelines, tunnels, and channels. The canal width and depth vary, but it is generally approximately 50 feet wide and approximately 30 feet deep.

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) for areas crossed by the transmission lines (FEMA, n.d.) were reviewed. The FIRMs show that the transmission lines pass over the FEMA-designated 100-year floodplain areas (i.e., FEMA-designated Zone A, which is the flood insurance rate zone that corresponds to areas within the 100-year floodplain zone). The floodplains are associated with the following waterbodies: East Antioch Creek, Sand Creek, Kellogg Creek, Brushy Creek, Las Positas Creek,

Arroyo Mocho, Arroyo del Valle, and Calaveras Creek. Approximately 1.8 miles, or less than 1 percent of the total transmission line to be reconductored, crosses through floodplain areas (see Table 1).

Table 1
FEMA-designated Floodplains along Transmission Line Corridors

Transmission Line	Approximate length of transmission line to be reconductored (miles)	Approximate length of 100-year Floodplain Area Crossed (miles)
Contra Costa–Brentwood	10	0.2
Contra Costa–Windmaster–Delta Pumps	18	0.2
Cayetano–Lone Tree	6	0
Las Positas–Newark	21	1.4
Total	55	1.8

Impacts of Reconductoring

During reconductoring projects, it may be necessary to raise the height of several towers to allow for greater conductor sag. Inspections prior to starting the reconductoring work may reveal that some towers require new foundations, which may increase the potential for earth disturbance and erosion. The transmission lines cross several water conveyance features; however, construction activities for tower modifications would not occur within any watercourses; therefore, impacts to water quality for construction and operation of the transmission lines would be less than significant. By implementing BMPs such as sediment trapping devices, limiting the amount of exposed areas at a given time, restabilizing disturbed areas, and avoiding earth-disturbance activities within watercourses, the overall impacts related to erosion and water quality would be less than significant.

Until surveys and design are completed, it is unknown whether any towers are located within floodplain areas, and whether they require modification. Impacts to floodplains during construction would be less than significant because construction activities would be temporary and would not require extensive grading. Changes to tower foundations would not be expected to substantially alter the floodplain; therefore, permanent impacts would be considered less than significant.

If existing towers are used or reinforced without construction of new foundations and footings, the potential for impacts to soils and water resources would be significantly reduced. Work sites using larger truck-mounted equipment and temporary construction staging areas can be selected to reduce potential impacts. For example, work sites can be located away from water bodies and in areas less susceptible to erosion. Standard construction BMPs also can be implemented to reduce erosion potential and protect waterbodies.

Mitigation

The following mitigation measures should be implemented for any ground-disturbing activities (i.e., tower foundation work, pull and tensioning sites, temporary access roads and temporary construction staging areas) to reduce any potential water resources and soils impacts to a less-than-significant level:

- Perform construction in accordance with an Erosion and Sediment Control Plan (ESCP). The ESCP should address erosion and sediment control BMPs during construction and revegetation measure following construction.
- If construction could affect land in aggregate greater than 1 acre, a Storm Water Pollution Prevention Plan (SWPPP) would be required by the Regional Water Quality Control Board (RWQCB) as required by the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activity (SWRCB, 1999) or the NPDES General Permit for Storm Water Discharges Associated with Construction Activity from Small Linear Underground/Overhead Projects (SWRCB, 2003).
- Use existing roads and rights-of-way to the extent possible.
- Revegetate construction areas and restore them to pre-project conditions.
- Minimize grading to the extent possible. When required, grading should be conducted away from water courses to reduce potential for the material to enter the watercourse.
- Site construction staging areas, pull and tensioning sites, and temporary access roads to avoid important agricultural lands and soils, water courses and their associated floodplains.

Conclusion

Significant environmental impacts to soils and water resources related to the construction and operation of the reconductoring project would be avoided by implementing the mitigation measures described above.

3.9 TRANSMISSION SYSTEM ENGINEERING

Reconductoring of the transmission lines described above, would involve removing the existing conductors and replacing them with higher-rated conductors, in a manner that complies with applicable safety and reliability standards. Each of these new conductors will significantly increase the ratings of the transmission lines. Insulators could also be removed and replaced with new strings, which would increase the line's capability to withstand voltage surges.

Impacts of Reconductoring

During construction, applicable safety and reliability laws, ordinances, regulations and standards would be implemented. These include CPUC General Order 95, Title 8 California Code of Regulations Construction Safety Orders, and PG&E Construction Standards. Additionally, to maintain system reliability, the CAISO must be advised per the CAISO scheduling protocol of scheduled circuit outages prior to occurrence. Such outages are scheduled about 30 days prior to occurrence and are verified just prior to actual outage. In the event that system reliability requires restoring such circuits, a "no work order" is given, and where practicable, circuits are restored.

Reconductoring of the transmission circuits described above would result in local system benefits, in that it would provide considerably greater flexibility in routing power in the area, even if the MLGS was not built. The reconductoring project would not only ensure that the MLGS project could generate power at its rated capacity, but would increase the capacity and reliability of power deliveries to and from the Greater Bay Area.

Mitigation

To mitigate potential safety and reliability impacts the above-stated laws, ordinances, regulations, and standards and CAISO scheduling protocols would be used. The CPUC ensures conformance with the above safety requirements; the CAISO would ensure conformance with its reliability requirements.

Conclusion

Conformance with applicable safety and reliability is likely to occur and would be successful in mitigating any safety or reliability implications of reconductoring.

3.10 GEOLOGY AND PALEONTOLOGY

The transmission lines discussed above for possible reconductoring are located in the central and eastern portion of the Coast Ranges physiographic province at the confluence of the Coast Ranges and the Sacramento River Delta. The Contra Costa–Brentwood and Contra Costa–Windmaster–Delta Pumps lines traverse the foothills of Mount Diablo, including the northernmost Altamont Hills as well as portions of the San Joaquin River Delta area. The Cayetano–Lone Tree and Las Positas–Newark lines cross the Tassajara Hills from the Livermore Valley area to the eastern edge of San Francisco Bay across the East Bay Hills.

This area contains active buried faults of the Coast Ranges-Sierran Block Boundary Zone (CRSBBZ), in addition to the Hayward, Calaveras and Marsh-Creek-Greenville Faults of the San Andreas Fault System.

As described for the MLGS AFC, fossil sites have been identified in sediments of Quaternary age in the vicinity of the proposed reconductoring work. Underlying rock units in the region

have been assigned a high sensitivity rating for their potential to contain paleontological resources.

Impacts of Reconductoring

No new facilities, including electrical transmission towers, are anticipated to be constructed as part of reconductoring related to the MLGS; therefore, the impacts to geologic and paleontologic resources would be limited to areas of potential ground disturbance, including temporary access routes, temporary construction staging areas and pull and tensioning sites. These sites would not require significant grading or other disturbance of soils at depth. Tower and tower foundations may be modified as a part of reconductoring, and the tower foundations would be inspected and evaluated for landsliding potential. If modification is required, the towers and towers foundations would be designed by a California-registered professional geotechnical engineer to address unstable slopes and seismic design criteria. As a result, geologic hazards should have minimal impact on the reconductoring work.

Since the geologic units present along electrical line linear routes may contain significant paleontologic resources, mitigation measures will be necessary to ensure that impacts are less than significant.

Mitigation

Though not anticipated for the reconductoring work identified above, there is a potential to uncover significant paleontological resources during any ground-disturbing activities that may be associated with the reconductoring of the electrical lines, such as during any needed excavation required to upgrade tower foundations. Therefore, the following mitigation measures should be implemented for work that includes excavation:

- Prior to construction, a qualified paleontologist should be retained to both design a monitoring and mitigation program and implement the program during all project-related ground disturbance. The paleontological resource monitoring and mitigation program should include:
  - Preconstruction coordination
  - Construction monitoring
  - Emergency discovery procedures
  - Sampling and data recovery, if needed
  - Preparation, identification, and analysis of the significance of fossil specimens salvaged, if any
  - Museum storage of any specimens and data recovered

- Reporting.

Earth-moving construction activities should be monitored wherever these activities will disturb previously undisturbed sediment. Monitoring will not need to be conducted in areas where sediments have been previously disturbed or in areas where exposed sediments will be buried but not otherwise disturbed.

- Pre-construction meetings will be held with key construction personnel to provide brief discussions pertaining to paleontological resource significance, visual identification, and fossil discovery notification procedures. A qualified paleontologist will consult with the project geologist and project engineer on a periodic basis regarding the scheduling and extent of subsurface excavations, particularly where undisturbed areas may be encountered.
- Prior to the start of construction, construction personnel involved with earth-moving activities should be informed that fossils may be discovered during excavating; that these fossils are protected by laws; on the appearance of common fossils; and on proper notification procedures. This worker training should be prepared and presented by a qualified paleontologist.

Conclusion

Impacts associated with geologic hazards or geologic and paleontological resources would be less than significant with the implementation of the mitigation measures described above.

4.0 CONCLUSIONS

Chapters 2 and 3 of this report describe the process and the potential impacts of reconductoring the Contra Costa–Brentwood, Contra Costa–Windmaster-Delta Pumps, Cayetano–Lone Tree and Las Positas–Newark transmission lines. This analysis presents the potential indirect environmental and public health effects of the MLGS project.

As the owner of the transmission lines, PG&E will be responsible for the design and construction associated with the reconductoring and compliance with all applicable LORS. With the implementation of BMPs and appropriate mitigation measures, reconductoring of the transmission lines described above has very little potential for creating significant, unmitigated impacts to public safety or the environment.

5.0 REFERENCES

CDFG (California Department of Fish and Game), 2008. California Natural Diversity Database RareFind 3, November.

FEMA (Federal Emergency Management Agency), n.d. Flood Insurance Rate Maps, Contra Costa and Alameda Counties, California.

SWRCB (State Water Resources Control Board), 1999. National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction Activity (General Permit) Water Quality Order 99-08-DWQ.

SWRCB (State Water Resources Control Board), 2003. National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction Activity from Small Linear Underground/Overhead Projects, Water Quality Order 2003-0007-DWQ.

USE (Utility System Efficiencies, Inc.), 2008. System Impact Study for the Marsh Landing Generating Station, September.

Attachment 1
Species Reported Occurring within 2 Miles of Transmission Line Reconductoring for the Marsh Landing Generation Station

Scientific Name	Common Name	Federal	State	CNPS	Critical Habitat	Preferred Habitat	Potential to Occur
Amphibians							
Ambystoma californiense	California tiger salamander	T	CSC	N/A	NO	Needs underground refuges, especially ground squirrel burrows and vernal pools or other seasonal water sources for breeding.	High
Rana draytonii	California red-legged frog	T	CSC	N/A	YES	Habitat is characterized by dense, shrubby riparian vegetation associated with deep (2.5 feet), still or slow-moving water. Juvenile frogs seem to favor open, shallow aquatic habitats with dense submergents. Breeds in pools with emergent vegetation; typically absent in pools where predatory fish are present; require adequate hibernacula such as small mammal burrows and moist leaf litter.	High
Spea hammondi	Western spadefoot toad	None	CSC	N/A	NO	Occurs primarily in grassland habitats, but can be found in valley-foothill hardwood woodlands. Vernal pools are essential for breeding and egg-laying.	Moderate
Invertebrates							
Apodemia mormo langei	Lange's metalmark butterfly	E	None	N/A	NO	Inhabits stabilized dunes along the San Joaquin River. Endemic to Antioch dunes, Contra Costa County. Primary host plant is *Eriogonum nudum* var. *auriculatum*; feeds on nectar of other wildflowers, as well as host plant.	Low
Branchinecta conservatio	Conservancy fairy shrimp	E	None	N/A	NO	Endemic to the grasslands of the northern two-thirds of the Central Valley; found in large, turbid pools. Inhabits astatic pools located in swales formed by old, braided alluvium; filled by winter/spring rains, which last until June.	Low
Branchinecta longiantenna	Longhorn fairy shrimp	E	None	N/A	NO	Endemic to the eastern margin of the Central Coast Mountains in seasonally astatic grassland vernal pools. Inhabits small clear water depressions in sandstone and clear to turbid clay/grass bottomed pools in shallow swales.	Moderate

Attachment 1
Species Reported Occurring within 2 Miles of Transmission Line Reconductoring for the Marsh Landing Generation Station

Scientific Name	Common Name	Federal	State	CNPS	Critical Habitat	Preferred Habitat	Potential to Occur
Branchinecta lynchi	Vernal pool fairy shrimp	T	None	N/A	YES	Known to occur in a wide range of vernal pool habitats in the southern and Central Valley areas of California, and in two vernal pool habitats within the "Agate Desert" area of Jackson County, Oregon. Occupies a variety of different vernal pool habitats, from small, clear, sandstone rock pools to large, turbid, alkaline, grassland valley floor pools. Although the species has been collected from large vernal pools, including one exceeding 25 acres, it tends to occur in smaller pools. It is most frequently found in pools measuring less than 0.05 acre.	Moderate
Desmocerus californiacus dimorphus	Valley elderberry longhorn beetle	T	None	N/A	NO	The species is nearly always found on or close to its host plant, elderberry (*Sambucus* species). In order to serve as habitat, the shrubs must have stems that are 1.0 inch or greater in diameter at ground level. Use of the plants by the animal is rarely apparent. Frequently, the only exterior evidence of the shrub's use by the beetle is an exit hole created by the larva just before the pupal stage. Adults are active feeding and mating from March to June.	Moderate
Elaphrus viridis	Delta green ground beetle	T	None	N/A	NO	Restricted to the margins of vernal pools in the grassland area between Jepson Prairie and Travis Air Force Base. Prefers the sandy mud substrate where it slopes gently into the water, with low-growing vegetation, 25 to 100 percent cover.	None
Euphydryas editha bayensis	Bay checkerspot butterfly	T	None	N/A	NO	Restricted to native grasslands on outcrops of serpentine in the vicinity of San Francisco Bay.	Low
Lepidurus packardi	Vernal pool tadpole shrimp	E	None	N/A	NO	Inhabits vernal pools and swales in the Sacramento Valley containing clear to highly turbid water. Pools are commonly found in grass-bottomed swales of unplowed grasslands. Some pools are mud-bottomed and highly turbid.	Moderate

Attachment 1
Species Reported Occurring within 2 Miles of Transmission Line Reconductoring for the Marsh Landing Generation Station

Scientific Name	Common Name	Federal	State	CNPS	Critical Habitat	Preferred Habitat	Potential to Occur
Mammals							
Vulpes macrotis mutica	San Joaquin kit fox	E	T	N/A	NO	The historical range included the California Central Valley and adjacent foothills, but has since been reduced to the southern and western portions of the San Joaquin Valley. Inhabits grasslands and agricultural areas. Can be found on virtually every soil type.	High
Corynorhinus townsendii	Townsend's big-eared bat	None	CSC	N/A	NO	Throughout California in a wide variety of habitats. Most common in mesic sites. Roosts in the open, hanging from walls and ceilings. Roosting sites limiting. Extremely sensitive to human disturbance.	Moderate
Lasiurus blossevillii	Western red bat	None	CSC	N/A	NO	Roosts primarily in trees, 2 to 40 feet above ground, from sea level up through mixed conifer forests. Prefers habitat edges and mosaics with trees that are protected from above and open below with open areas for foraging.	Moderate
Reithrodontomys raviventris	Salt marsh harvest mouse	E	E	N/A	NO	Only in the saline emergent wetlands of San Francisco Bay and its tributaries. Pickleweed (*Salicornia* sp.) is primary habitat. Does not burrow; builds loosely organized nests. Requires higher areas to escape floods.	None
Taxidea taxus	American badger	None	CSC	N/A	NO	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient food, friable soils and open, uncultivated ground. Preys on burrowing rodents.	High
Plants							
Amsinckia grandiflora	Large-flowered fiddleneck	E	E	1B.1	NO	Cismontane woodland, valley and foothill grassland. Annual grassland in various soils. 900 to 1,800 feet.	Moderate
Arctostaphylos auriculata	Mt. Diablo manzanita	None	None	1B.3	NO	Chaparral. In canyons and on slopes. On sandstone. 400 to 1,640 feet.	Low

Attachment 1
Species Reported Occurring within 2 Miles of Transmission Line Reconductoring for the Marsh Landing Generation Station

Scientific Name	Common Name	Federal	State	CNPS	Critical Habitat	Preferred Habitat	Potential to Occur
Astragalus tener var. *tener*	Alkali milk-vetch	None	None	1B.2	NO	Alkali playa, valley and foothill grassland, vernal pools. Low ground, alkali flats, and flooded lands; in annual grassland or in playas or vernal pools. 3 to 560 feet.	Moderate
Atriplex cordulata	Heartscale	None	None	1B.2	NO	Chenopod scrub, valley and foothill grassland, meadows. Alkaline flats and scalds in the Central Valley, sandy soils. 3 to 500 (2,000) feet.	Moderate
Atriplex depressa	Brittlescale	None	None	1B.2	NO	Chenopod scrub, meadows, playas, valley and foothill grassland, vernal pools. Usually in alkali scalds or alkali clay in meadows or annual grassland; rarely associated with riparian, marshes, or vernal pools. 3 to 1,050 feet.	Moderate
Atriplex joaquiniana	San Joaquin spearscale	None	None	1B.2	NO	Chenopod scrub, alkali meadow, valley and foothill grassland. In seasonal alkali wetlands or alkali sink scrub with *Distichlis spicata*, *Frankenia*, etc. 3 to 820 feet.	Moderate
Blepharizonia plumosa	Big tarplant	None	None	1B.1	NO	Valley and foothill grassland. Dry hills and plains in annual grassland. Clay to clay-loam soils; usually on slopes and often in burned areas. 50 to 1,500 feet.	High
California macrophylla	Round-leaved filaree	None	None	1B.1	NO	Cismontane woodland, valley and foothill grassland. Clay soils. 50 to 4,000 feet.	Moderate
Campanula exigua	Chaparral harebell	None	None	1B.2	NO	Chaparral. Rocky sites, usually on serpentine in chaparral. 1,000 to 4,100 feet.	Low
Centromadia parryi ssp. *congdonii*	Congdon's tarplant	None	None	1B.2	NO	Valley and foothill grassland. Alkaline soils, sometimes described as heavy white clay. 3 to 750 feet.	Moderate
Chorizanthe robusta	Robust spineflower	E	None	1B.1	NO	Robust spineflower is commonly associated with cismontane woodland, coastal dunes, coastal scrub. Sandy terraces and bluffs or in loose sand. 10 to 450 feet.	None
Cordylanthus mollis	Soft bird's-beak	E	R	1B.2	NO	Prefers coastal salt marsh with saltgrass (*Distichlis* sp.), pickelweed (*Salicornia* sp.) and alkali heath (*Frankenia* sp.), etc. 0 to 12 feet.	None

Attachment 1
Species Reported Occurring within 2 Miles of Transmission Line Reconductoring for the Marsh Landing Generation Station

Scientific Name	Common Name	Federal	State	CNPS	Critical Habitat	Preferred Habitat	Potential to Occur
Cordylanthus mollis ssp. *hispidus*	Hispid bird's-beak	None	None	1B.1	NO	Meadows, playas, valley and foothill grassland. In damp alkaline soils, especially in alkaline meadows and alkali sinks with *salt grass (Distichlis* sp.). 33 to 510 feet.	Low
Cordylanthus palmatus	Palmate-bracted bird's-beak	E	E	1B.1	NO	Found in chenopod scrub and valley and foothill grassland. Usually on Pescadero silty clay which is alkaline, with saltgrass (*Distichlis* sp.*)*,and alkali heath *(Frankenia* sp.*)*, etc. 20 to 500 feet.	Low
Cryptantha hooveri	Hoovers cryptantha	None	None	1A	NO	Valley and foothill grassland. In coarse sand. ? to 500 feet.	Moderate
Deinandra bacigalupii	Livermore tarplant	None	None	1B.2	NO	Meadows and seeps. Alkaline meadows. 500 to 600 feet.	Low
Delphinium recurvatum	Recurved larkspur	None	None	1B.2	NO	Chenopod scrub, valley and foothill grassland, cismontane woodland. On alkaline soils; often in valley saltbush or valley chenopod scrub. 10 to 2,250 feet.	Moderate
Eriogonum truncatum	Mt. Diablo buckwheat	None	None	1B.1	NO	Chaparral, coastal scrub, valley and foothill grassland. Dry, exposed clay or sandy substrates. 330 to 1,080 feet.	Moderate
Eryngium aristulatum var. *hooveri*	Hoover's button celery	None	None	1B.1	NO	Vernal pools, alkaline depressions, roadside ditches and other wet places near the coast. 20 to 150 feet.	Moderate
Erysimum capitatum spp.	Contra Costa wallflower	E	E	1B.1	NO	Stabilized dunes of sand and clay near Antioch along the San Joaquin river. 10 to 65 feet.	None
Eschscholzia rhombipetala	Diamond-petaled California poppy	None	None	1B.1	NO	Valley and foothill grassland. Alkaline, clay slopes and flats. 0 to 3,200 feet.	Moderate
Fritillaria agrestis	Stinkbells	None	None	4.2	NO	Cismontane woodland, chaparral, valley and foothill grassland. Sometimes on serpentine; mostly found in nonnative grassland or in grassy openings in clay soil. 33 to 5,100 feet.	High

Attachment 1
Species Reported Occurring within 2 Miles of Transmission Line Reconductoring for the Marsh Landing Generation Station

Scientific Name	Common Name	Federal	State	CNPS	Critical Habitat	Preferred Habitat	Potential to Occur
Helianthella castanea	Diablo helianthella	None	None	1B.2	NO	Broadleaved upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, valley and foothill grassland. Usually in chaparral/oak woodland interface in rocky, azonal soils. Often in partial shade. 80 to 3,800 feet.	Moderate
Hesperolinon breweri	Brewer's western flax	None	None	1B.2	NO	Chaparral, cismontane woodland, valley and foothill grassland. Often in rocky serpentine soil in serpentine chaparral and serpentine grassland. 100 to 2,900 feet.	Low
Lasthenia conjugens	Contra Costa goldfields	E	None	1B.1	YES	Valley and foothill grassland, vernal pools, cismontane woodland. Extirpated from most of its range; extremely endangered. Vernal pools, swales, low depressions, in open grassy areas. 3 to 1,450 feet.	Moderate
Lathyrus jepsonii var. *jepsonii*	Delta tule pea	None	None	1B.2	NO	Freshwater and brackish marshes. Often found with cattails (*Typha* spp.), Suisun marsh aster(*Aster lentus*), California rose (*Rosa calificornia*), rushes (*Juncus* spp.), bulrushes (*Scirpus* spp.), etc. Usually on marsh and slough edges.	None
Lilaeopsis masonii	Mason's lilaeopsis	None	R	1B.1	NO	Freshwater and brackish marshes, riparian scrub. Tidal zones, in muddy or silty soil formed through river deposition or river bank erosion. 0 to 33 feet.	None
Limosella subulata	Delta mudwort	None	None	2.1	NO	Riparian scrub, freshwater marsh, brackish marsh. Probably the rarest of the suite of delta rare plants. Usually on mud banks of the delta in marshy or scrubby riparian associations; often with Mason's lilaeopsis (*Lilaeopsis masonii)*. 0 to 10 feet.	None
Madia radiata	Showy golden madia	None	None	1B.1	NO	Valley and foothill grassland, cismontane woodland, chenopod scrub. Mostly on adobe clay in grassland or among shrubs. 80 to 3,700 feet.	Moderate
Navarretia prostrata	Prostrate vernal pool navarretia	None	None	1B.1	NO	Coastal scrub, valley and foothill grassland, vernal pools. Alkaline soils in grassland, or in vernal pools. Mesic, alkaline sites. 50 to 2,300 feet.	Moderate

Attachment 1
Species Reported Occurring within 2 Miles of Transmission Line Reconductoring for the Marsh Landing Generation Station

Scientific Name	Common Name	Federal	State	CNPS	Critical Habitat	Preferred Habitat	Potential to Occur
Neostapfia colusana	Colusa grass	T	None	1B.1	NO	Usually in large, or deep vernal pool bottoms; adobe soils. 20 to 360 feet.	Low
Oenorthera deltoids spp.	Antioch Dunes evening-primrose	E	E	1B.1	NO	Remnant river bluffs and sand dunes east of Antioch. 0 to 100 feet.	None
Plagiobothrys glaber	Hairless popcorn-flower	None	None	1A	NO	Meadows and seeps, marshes and swamps. Coastal salt marshes and alkaline meadows. 20 to 590 feet.	Low
Streptanthus albidus ssp. *peramoenus*	Most beautiful jewel-flower	None	None	1B.2	NO	Chaparral, valley and foothill grassland, cismontane woodland. Serpentine outcrops, on ridges and slopes. 400 to 2,400 feet.	Low
Suaeda californica	California sea blite	E	T	1B.1	NO	Margins of coastal salt marshes. 0 to 0 feet.	None
Symphyotrichum lentum	Suisun Marsh aster	None	None	1B.2	NO	Marshes and swamps (brackish and freshwater). Most often seen along sloughs with *Phragmites*, *Scirpus*, *Rubus*, *Typha*, etc. 0 to 10 feet.	None
Trifolium depauperatum var. *hydrophilum*	Saline clover	None	None	1B.2	NO	Marshes and swamps, valley and foothill grassland, vernal pools. Mesic, alkaline sites. 0 to 1,000 feet.	Low
Tropidocarpum capparideum	Caper-fruited tropidocarpum	None	None	1B.1	NO	Valley and foothill grassland. Alkaline clay. 0 to 1,500 feet.	Moderate
Reptiles							
Actinemys marmorata	Western pond turtle	None	CSC	N/A	NO	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches with aquatic vegetation. Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat for egg-laying.	Low
Anniella pulchra pulchra	Silvery legless lizard	None	CSC	N/A	NO	Sandy or loose loamy soils under sparse vegetation. Soil moisture is essential. Prefers soils with high moisture content.	Low

Attachment 1
Species Reported Occurring within 2 Miles of Transmission Line Reconductoring for the Marsh Landing Generation Station

Scientific Name	Common Name	Federal	State	CNPS	Critical Habitat	Preferred Habitat	Potential to Occur
Masticophis laterali euryxanthus	Alameda whipsnake	T	T	N/A	YES	Restricted to valley-foothill hardwood habitat of the coast ranges between vicinity of Monterey and North San Francisco Bay. Inhabits south-facing slopes and ravines where shrubs form a vegetative mosaic with oak trees and grasses.	High
Phrynosoma coronatum (frontale population)	Coast (California) horned lizard	None	CSC	N/A	NO	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes. Open areas for sunning, bushes for cover, patches of loose soil for burial and abundant supply of ants and other insects.	Moderate
Thamnophis gigas	Giant garter snake	T	T	N/A	NO	Prefers freshwater marsh and low gradient streams. Has adapted to drainage canals and irrigation ditches. This is the most aquatic of the garter snakes in California.	Low
Fish							
Acipenser medirostris	Green sturgeon	T	None	N/A	NO	Spawns in the Sacramento River at temperatures between 46 and 57 ºF. Preferred spawning substrate is large cobble, but can range from clean sand to bedrock.	None
Archoplites interruptus	Sacramento perch	None	CSC	N/A	NO	Historically found in the sloughs, slow-moving rivers, and lakes of the central valley. Prefers warm water. Aquatic vegetation is essential for young. Tolerates wide range of physio-chemical water conditions.	None
Hypomesus transpacificus	Delta smelt	T	T	N/A	YES	Euryhaline species, primarily living in brackish water. Shortly before spawning, adults migrate upstream from the brackish-water habitat and disperse widely into river channels and tidally-influenced backwater sloughs, spawning in shallow, fresh or slightly brackish water upstream of the mixing zone.	None
Oncorhynchus mykiss	Central California Coastal steelhead	T	None	N/A	NO	From Russian River, south to Soquel Creek but not including Pajaro River. Also San Francisco and San Pablo Bay basins.	None
Oncorhynchus mykiss	Central Valley steelhead	T	None	N/A	NO	Populations can be found in the Sacramento and San Joaquin Rivers and their tributaries.	None

Attachment 1
Species Reported Occurring within 2 Miles of Transmission Line Reconductoring for the Marsh Landing Generation Station

Scientific Name	Common Name	Federal	State	CNPS	Critical Habitat	Preferred Habitat	Potential to Occur
Oncorhynchus tshawytscha	Central Valley spring-run chinook salmon	T	None	N/A	NO	Sacramento River below Keswick Dam. Spawns in the Sacramento River but not in tributary streams. Requires clean, cold water over gravel beds with water temperatures between 43 and 57 ºF for spawning.	None
Oncorhynchus tshawytscha	Winter-run chinook salmon	E	None	N/A	NO	Sacramento River below Keswick Dam. Spawns in the Sacramento River but not in tributary streams. Requires clean, cold water over gravel beds with water temperatures between 43 and 57 ºF for spawning.	None
Birds							
Agelaius tricolor	Tricolored blackbird	None	CSC	N/A	NO	Highly colonial species, most numerous in Central Valley and vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey within a few miles of the colony.	Moderate
Athene cunucularia	Western burrowing owl	None	CSC	N/A	NO	Open, dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably the California ground squirrel.	High
Buteo swainsoni	Swainson's hawk	None	T	N/A	NO	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	Moderate
Charadrius alexandrinus nivosus	Western snowy plover	T	None	N/A	NO	Sandy beaches, salt pond levees and shores of large alkali lakes. Needs sandy, gravelly or friable soils for nesting.	None
Falco peregrinus anatum	American peregrine falcon	FD	E	N/A	NO	Near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, human-made structures. Nests consist of a scrape on a depression or ledge in an open site.	Low

Attachment 1
Species Reported Occurring within 2 Miles of Transmission Line Reconductoring for the Marsh Landing Generation Station

Scientific Name	Common Name	Federal	State	CNPS	Critical Habitat	Preferred Habitat	Potential to Occur
Haliaeetus leucocephalus	Bald eagle	FD	E	N/A	NO	Ocean shore, lake margins, and rivers for both nesting and wintering. Most nests within 1 mile of water. Nests in large, old-growth, or dominant live tree with open branches, especially ponderosa pine. Roosts communally in winter.	Low
Melospiza melodia pusillula	Alameda song sparrow	None	CSC	N/A	NO	Resident of salt marshes bordering south arm of San Francisco bay. Inhabits pickleweed (*Salicornia* sp.) marshes; nests low in gumplant (*Grindelia* sp.) bushes (high enough to escape high tides) and in pickleweed.	Low
Rallus longirosris obsoletus	California clapper rail	E	E	N/A	NO	Salt water and brackish marshes traversed by tidal sloughs in the vicinity of San Francisco bay. Associated with abundant growths of pickleweed (*Salicornia* ssp.), but feeds away from cover on invertebrates from mud-bottomed sloughs.	None
Riparia riparia	Bank swallow	None	T	N/A	NO	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting holes.	Low
Sternula antillarum	California least tern	E	E	N/A	NO	Nests along the coast from San Francisco Bay south to Northern Baja California. Colonial breeder on bare sparsely vegetated, flat substrates: sand beaches, alkali flats, land fills, or paved areas.	None

Source:
California Department of Fish and Game, California Natural Diversity Database RareFind 3, November 2008

Key:
Federal and Endangered Species Act
- E Federally Endangered
- T Federally Threatened
- FD Federally Delisted

California Endangered Species Act
- CSC California Department of Fish and Game Species of Special Concern
- R State Rare
- E State Endangered
- T State Threatened

California Native Plant Society

1A. Presumed extinct in California
1B. Rare or Endangered in California and elsewhere
2. Rare or Endangered in California, more common elsewhere
4. Plants of limited distribution-watch list

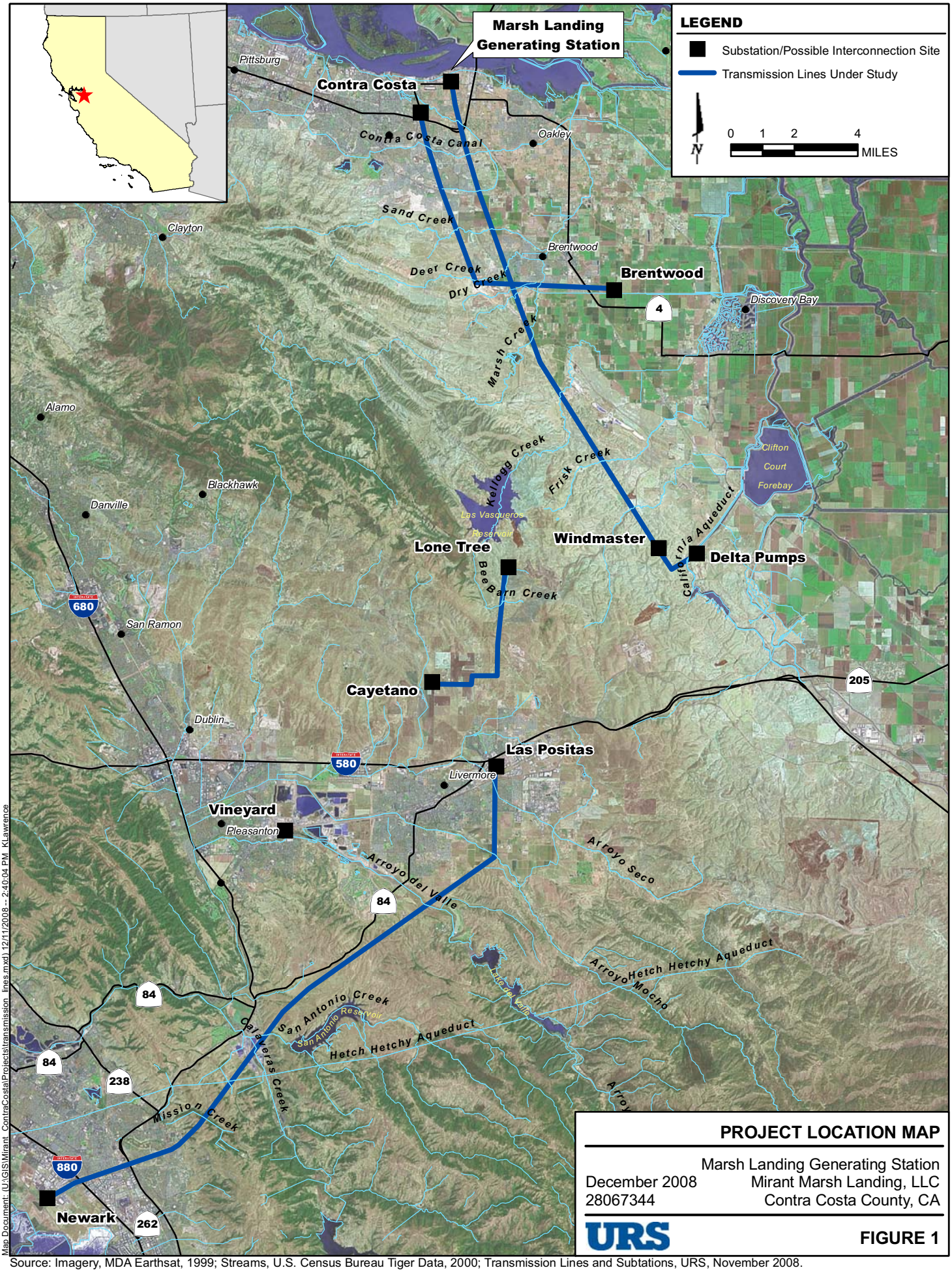
.1 Seriously endangered in California (over 80% of occurrences threatened/high degree and immediacy of threat)
.2 Fairly endangered in California (20-80% occurrences threatened)
.3 Not very endangered in California (less than 20% of occurrences threatened or no current threats known)

Critical Habitat

Yes – The proposed project area falls within the critical habitat area, as defined by the USFWS
No – The project area does not overlap USFWS designated critical habitat

Potential To Occur

High – These species are considered highly likely to occur in the project area because aerial imagery suggests that suitable habitat is present within the project area for these species and there are numerous occurrences in the vicinity of the project area.
Moderate – These species are considered moderately likely to occur in the project area because while habitat appears to be present, it is limited or there are few nearby occurrences.
Low – These species are considered to have a low likelihood of occurring in the project area because habitat appears to be limited and there are few nearby occurrences; however, there is some potential.
None – These species are not expected to occur in the project area due to lack of suitable habitat (based on aerial imagery) or because the project area is out of the species range or elevation requirements.



PROJECT LOCATION MAP

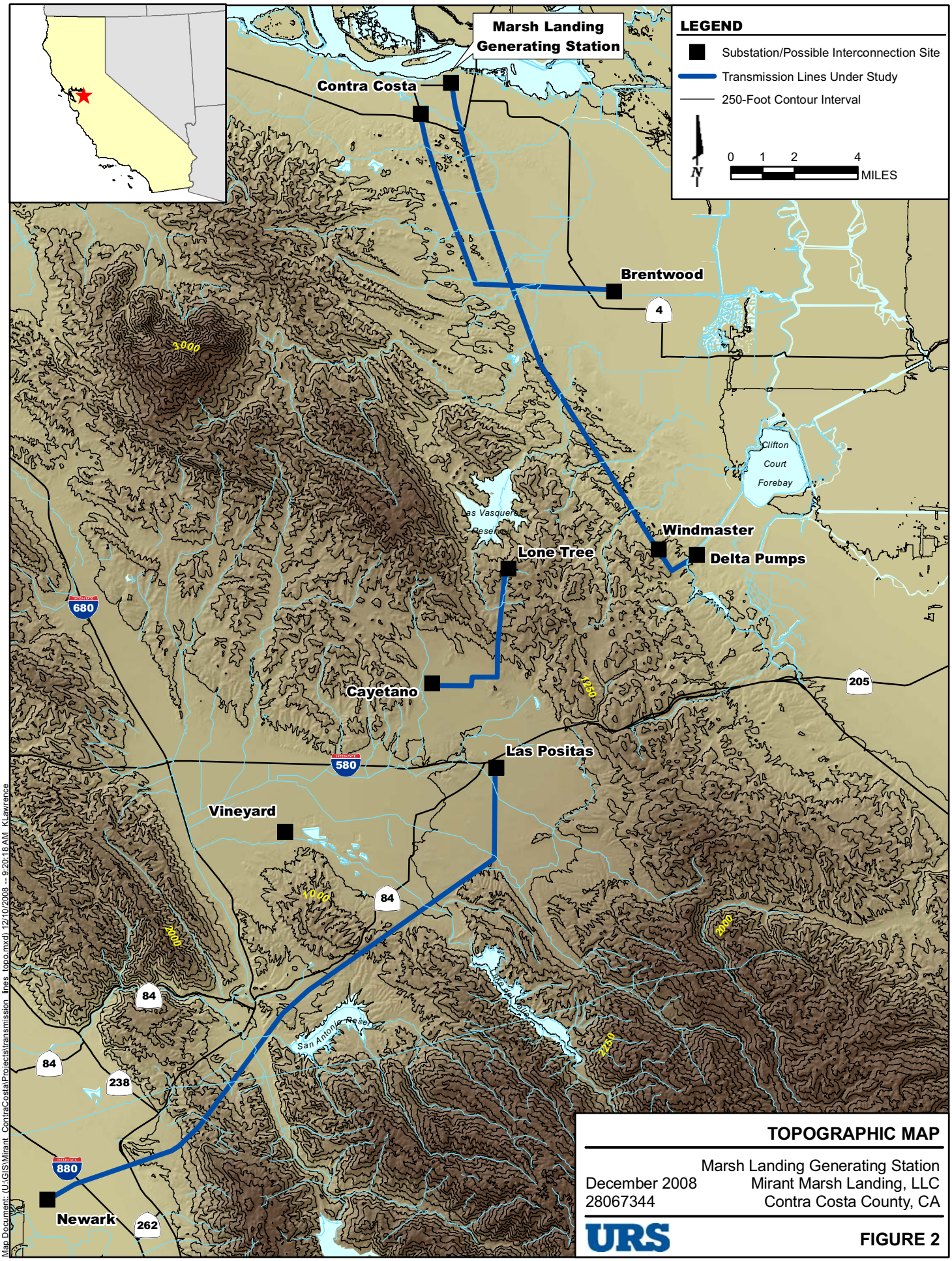
Marsh Landing Generating Station
December 2008 Mirant Marsh Landing, LLC
28067344 Contra Costa County, CA

URS

FIGURE 1

Source: Imagery, MDA Earthsat, 1999; Streams, U.S. Census Bureau Tiger Data, 2000; Transmission Lines and Subtations, URS, November 2008.

Map Document: (U:\GIS\Mirant_ContraCosta\Projects\transmission_lines.mxd) 12/11/2008 -- 2:40:04 PM KLawrence



Map Document: (U:\GIS\Mirant_ContraCosta\Projects\transmission_lines_topo.mxd) 12/10/2008 -- 9:20:18 AM KLawrence

TOPOGRAPHIC MAP

Marsh Landing Generating Station
December 2008 Mirant Marsh Landing, LLC
28067344 Contra Costa County, CA

URS

FIGURE 2

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 10/24/2008)

INSTRUCTIONS: All parties shall 1) send an original signed document plus 12 copies OR 2) mail one original signed copy AND e-mail the document to the web address below, AND 3) all parties shall also send a printed OR electronic copy of the documents that shall include a proof of service declaration to each of the individuals on the proof of service:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 08-AFC-03
1516 Ninth Street, MS-15 Sacramento, CA
95814-5512
docket@energy.state.ca.us

APPLICANT

***Chuck Hicklin, Project Manager**
Mirant Corporation
P.O. Box 192
Pittsburg, CA 94565
chuck.hicklin@mirant.com

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

APPLICANT'S CONSULTANTS

Anne Connell
Dale Shileikis
URS Corporation
221 – Main Street, Ste. 600
San Francisco, CA 94105
anne_Connell@URSCorp.com
dale_shileikis@urscorp.com

COUNSEL FOR APPLICANT
Lisa Cottle
Winston & Strawn, LLP
101 California Street
San Francisco, CA 94111
lcottle@winston.com

INTERESTED AGENCIES
California ISO
P.O. Box 639014
Folsom, CA 95763-9014
e-recipient@caiso.com

Mike Monasmith
Project Manager
mmonasm@energy.state.ca.us

INTERVENORS

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

ENERGY COMMISSION

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

KAREN DOUGLAS
Commissioner and Associate Member
kldougla@energy.state.ca.us

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

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

DECLARATION OF SERVICE

I, Catherine Short, declare that on December 12, 2008, I deposited copies of the attached **Responses to Data Requests Set 1 (#1-54)** in the United States mail at San Francisco, California with first-class postage thereon fully prepaid and addressed to those identified on the Proof of Service list above.

OR

Transmission via electronic mail was consistent with the requirements of California Code of Regulations, title 20, sections 1209, 1209.5, and 1210. All electronic copies were sent to all those identified on the Proof of Service list above.

C Short

* indicates change