Supplemental Filing

Supplement III in Response to Data Requests

1 through 93 and April 25 Workshop Queries

In support of the

Application for Certification

for the

Sun Valley Energy Project

Romoland, California

(05-AFC-03)

Submitted to the:

California Energy Commission

Submitted by:

Valle del Sol Energy, LLC

A wholly owned subsidiary of

EDISON MISSION ENERGY®

An EDISON INTERNATIONAL® Company

With Technical Assistance by:

CH2MHILL

Sacramento, California

August 2006

Contents

Introduction

Attached are Valle del Sol Energy, LLC's (VSE's) third supplemental responses to Data Requests for the Sun Valley Energy Project (SVEP) (05-AFC-03). The CEC Staff served these data requests as part of the discovery process for the SVEP project. VSE has provided written Data Request Responses to the data requests. In some cases, however, full responses were deferred for additional time. In addition, Staff asked for additional information during the Data Request Response Workshop held on April 25, 2006, relating to some data requests or topic areas, and issued additional data requests on June 23, 2006. This document provides additional information in response to the formal Data Requests and in response to the informal requests made at the workshop or during subsequent conversations between representatives of the Staff and Applicant. If information is provided in response to a specific data request, the response is keyed to a Data Request number. If the information is provided in response to a workshop query, the response is numbered sequentially with a "WSQ" prefix.

The responses are grouped by individual discipline or topic area. Within each discipline area, the responses are presented in the same order as CEC Staff presented them and are keyed to the Data Request numbers. New or revised graphics or tables are numbered in reference to the Data Request number. For example, the first table used in response to Data Request #15 would be numbered Table DR15-1. The first figure used in response to Data Request #28 would be Figure DR28-1, and so on. Other supporting information in response to a data request (supporting data, stand-alone documents such as plans) is found at the end of a discipline-specific section as numbered attachments. These additional pieces of information are not sequentially page-numbered consistently with the remainder of the document, but may have their own internal page numbering system.

Air Quality

Air Quality

Fine Particulate Matter ($PM_{2.5}$) Mitigation

DR6. Please provide proposal(s) to mitigate the facility's potentially significant $PM_{2.5}$ impacts.

Response: VSE expects to offset $PM_{2.5}$ impacts through the South Coast Air Quality Management District (SCAQMD) Priority Reserve bank. Analysis of the credits available in this bank demonstrates that credits for PM_{10} will adequately offset $PM_{2.5}$ impacts. This analysis is described in Attachment AIR-6.

Cumulative Impacts Analysis

DR27. Please clarify whether an air quality cumulative impact analysis has been performed. If it has, please provide the modeling assumptions, model input and output files, and modeling results.

DR28. If a cumulative impact analysis has not been performed, please discuss the status of obtaining a list of projects near the Sun Valley project site that meet the criteria listed in Section 8.1H "Cumulative Impacts Analysis Protocol". If the aforementioned list has been obtained, please submit the list of the emission sources to be included in the cumulative air quality impacts analysis.

DR29. Upon staff's review and concurrence of the sources, please perform a cumulative impact analysis using the modeling method proposed in the AFC.

Response*:* Under the CEC's power plant site certification regulations (Title 20, California Code of Regulations, Chapter 5, Appendix B), Applicants are required to submit with the application a protocol for conducting a modeling analysis of the project's potential air quality impacts in combination with other stationary sources "within a six-mile radius that have received construction permits but are not yet operational, or are in the permitting process (Title 20, Appendix B[g]8][iii])." A protocol for this analysis was submitted as Appendix 8.1H to the Application for Certification. This protocol outlined the methods that would be used for an air dispersion analysis to assess the potential project cumulative impacts on a localized basis. This protocol recognized the CEC Staff's request that potential cumulative impacts be considered for projects within an 6-mile radius of the project site. The purpose of the analysis was to assess whether emissions concentrations from the project would contribute to a violation of ambient air quality standards.

Localized impacts from SVEP could result from emissions of carbon monoxide (CO), oxides of nitrogen (NOx), sulfur oxides (SOx), and directly emitted particulate matter less than 10 microns in diameter (PM_{10}). A dispersion modeling analysis of potential cumulative air quality impacts was performed for each of these pollutants.

Projects that exist and have been in operation prior to 1-1-2005 will be reflected in the ambient air quality data that has been used to represent background concentrations; consequently, no further analysis of the emissions from this category of facilities were performed. The cumulative impacts analysis adds the modeled impacts of selected facilities to the maximum measured background air quality levels, thus ensuring that these existing projects are taken into account.

Based on the results of the air quality modeling analyses described in the AFC, "significant" air quality impacts, as that term is defined in federal air quality modeling guidelines, were only shown for 24-hour PM_{10} for the SVEP project. Typically, if the project's impacts do not exceed the significance levels, no cumulative impacts would be expected to occur, and no further analysis would be required. Notwithstanding the above, a cumulative impacts analysis was prepared for all projects identified within a search area with a radius of 6 miles beyond the project's impact area. Table DR29-1 lists the facilities within this search area that were included in the analysis.

TABLE DR29-1
Facilities Included in the Cumulative Air Impacts Analysis

Facility	Source Type	Id No.
International Env. Solutions Corp.	Natural gas-fired kiln	122334
Cal Mat Co.	Asphalt blending/batching equip.	128319
Inland Empire Energy Center, LLC	Power production facility	129818
Pomeroy Corporation	Concrete batch equipment	141807
Redmart Retail Interiors	N/A	144179
Cemex Construction Materials, LP	Concrete batch equipment	144650

This list of sources having non-zero emissions within the project region, and that met certain criteria for inclusion in the cumulative air impacts analysis as identified by CEC staff, was provided by the SCAQMD.

Given the potentially wide geographic area over which the dispersion modeling analysis may be performed, the ISCST3 model was used to evaluate cumulative localized air quality impacts. The detailed modeling procedures, ISCST3 options, and meteorological data used in the cumulative impacts dispersion analysis were the same as those described in the AFC Air Quality section.

Dispersion Modeling Methods

The dispersion modeling analysis of cumulative localized air quality impacts for the proposed project was evaluated in combination with other reasonably foreseeable projects and air quality levels attributable to existing emission sources, and the impacts were compared to state or federal air quality standards to determine significance. The maximum modeled concentrations were used to demonstrate compliance with California ambient air quality standards (CAAQS) and Federal (USEPA) National ambient air quality standards (NAAQS).

Supporting information used in the analysis included the following:

- Each source's respective coordinate locations

- Stack parameters for sources included in the cumulative air quality impacts dispersion modeling analysis
- Output files for the dispersion modeling analysis

Stack characteristics and emissions for Inland Empire Energy Center, LLC (IEEC) were obtained from the Application for Certification and are shown below in Tables DR29-2 and DR29-3, respectively. These data included building dimensions for modeling building downwash.

TABLE DR29-2
IEEC Modeled Stack Characteristics

Source	UTM-X (m)	UTM-Y (m)	Elev. (m)	Stack Ht. (m)	Temp. (K)	Velocity (m/s)	Diameter (m)
HRSG151	484284.0	3733075.0	440.44	59.436	339.039	18.187	6.706
HRSG152	484284.0	3732979.0	440.44	59.436	339.039	18.187	6.706
BOILER01	484306.0	3733028.0	440.44	30.480	415.928	19.249	1.219
EMER01	484284.0	3733070.9	440.44	22.860	798.872	38.689	0.508
EMER02	484284.0	3732974.9	440.44	22.860	798.872	38.689	0.508
FIRE01	484211.0	3733018.0	440.44	4.572	665.372	53.245	0.1524
CT01	484241.8	3732883.6	440.44	15.484	296.089	10.220	9.754
CT02	484258.2	3732883.6	440.44	15.484	296.089	10.220	9.754
CT03	484274.6	3732883.6	440.44	15.484	296.089	10.220	9.754
CT04	484291.0	3732883.6	440.44	15.484	296.089	10.220	9.754
CT05	484307.4	3732883.6	440.44	15.484	296.089	10.220	9.754
CT06	484323.8	3732883.6	440.44	15.484	296.089	10.220	9.754
CT07	484340.2	3732883.6	440.44	15.484	296.089	10.220	9.754
CT08	484356.6	3732883.6	440.44	15.484	296.089	10.220	9.754
CT09	484373.0	3732883.6	440.44	15.484	296.089	10.220	9.754
CT10	484389.4	3732883.6	440.44	15.484	296.089	10.220	9.754
CT11	484405.8	3732883.6	440.44	15.484	296.089	10.220	9.754
CT12	484422.2	3732883.6	440.44	15.484	296.089	10.220	9.754
CT13	484438.6	3732883.6	440.44	15.484	296.089	10.220	9.754
CT14	484455.0	3732883.6	440.44	15.484	296.089	10.220	9.754
CT15	484471.4	3732883.6	440.44	15.484	296.089	10.220	9.754
CT16	484487.8	3732883.6	440.44	15.484	296.089	10.220	9.754

TABLE DR29-3
IEEC Modeled Emissions (g/s)

Source	1-hour NO_X	Annual NO_X	1-hour CO	8-hour CO	24-hour PM_{10}	Annual PM_{10}	1- and 3-hour SO_2	24-hour SO_2	Annual SO_2
HRSG151	2.372261	3.033939	2.166527	5.266632	1.260000	1.260000	0.230642	0.230642	0.230642
HRSG152	2.372261	3.033939	2.166527	5.266632	1.260000	1.260000	0.230642	0.230642	0.230642
BOILER01	0.165948	0.044329	0.721696	0.721696	0.141120	0.037696	0.013907	0.013907	0.003715
EMER01	5.259965	0.030023	0.798882	0.599161	0.004627	0.000106	0.124578	0.031145	0.000711
EMER02	5.259965	0.030023	0.798882	0.599161	0.004627	0.000106	0.124578	0.031145	0.000711
FIRE01	N/A	0.002473	N/A	N/A	N/A	0.000040	N/A	N/A	0.000071

TABLE DR29-3
IEEC Modeled Emissions (g/s)

Source	1-hour NO_X	Annual NO_X	1-hour CO	8-hour CO	24-hour PM_{10}	Annual PM_{10}	1- and 3-hour SO_2	24-hour SO_2	Annual SO_2
CT01	N/A	N/A	N/A	N/A	0.027557	0.027557	N/A	N/A	N/A
CT02	N/A	N/A	N/A	N/A	0.027557	0.027557	N/A	N/A	N/A
CT03	N/A	N/A	N/A	N/A	0.027557	0.027557	N/A	N/A	N/A
CT04	N/A	N/A	N/A	N/A	0.027557	0.027557	N/A	N/A	N/A
CT05	N/A	N/A	N/A	N/A	0.027557	0.027557	N/A	N/A	N/A
CT06	N/A	N/A	N/A	N/A	0.027557	0.027557	N/A	N/A	N/A
CT07	N/A	N/A	N/A	N/A	0.027557	0.027557	N/A	N/A	N/A
CT08	N/A	N/A	N/A	N/A	0.027557	0.027557	N/A	N/A	N/A
CT09	N/A	N/A	N/A	N/A	0.027557	0.027557	N/A	N/A	N/A
CT10	N/A	N/A	N/A	N/A	0.027557	0.027557	N/A	N/A	N/A
CT11	N/A	N/A	N/A	N/A	0.027557	0.027557	N/A	N/A	N/A
CT12	N/A	N/A	N/A	N/A	0.027557	0.027557	N/A	N/A	N/A
CT13	N/A	N/A	N/A	N/A	0.027557	0.027557	N/A	N/A	N/A
CT14	N/A	N/A	N/A	N/A	0.027557	0.027557	N/A	N/A	N/A
CT15	N/A	N/A	N/A	N/A	0.027557	0.027557	N/A	N/A	N/A
CT16	N/A	N/A	N/A	N/A	0.027557	0.027557	N/A	N/A	N/A

Other than IEEC, the SCAQMD did not provide stack parameters for the sources in the cumulative inventory and has no method to track these parameters. Thus, based on guidance from EPA, emissions for each of the other facilities were modeled out of a single stack that was 0.1 meters in height with a stack diameter of 0.1 meters, ambient exhaust temperature, and an exit velocity of 0.01 meters/second. Facility locations were provided by SCAQMD or were obtained from the facility address using mapping software (Microsoft Streets & Trips) and converted from latitude/longitude to UTM coordinates using the US Army Corps of Engineers program CORPSCON. Stack elevations were set equal to the SVEP stack base elevation. Emissions provided by the SCAQMD and modeled facility locations are shown in Table DR29-4.

TABLE DR29-4
Modeled Stack Locations and Emissions (lbs/day)

Facility ID	UTM-X (km)	UTM-Y (km)	NOx (lb/day)	CO (lb/day)	PM10 (lb/day)	SOx (lb/day)
122334	483.279	3733.727	18	4	0	0
128319	484.090	3733.391	21	125	8	10
141807	479.337	3735.816	14	9	4	1
144179	479.245	3736.149	0	0	1	0
144650	483.408	3733.812	0	0	16	0

The proposed project was modeled with these sources in the cumulative multisource analysis to determine maximum concentrations. Then, the maximum background concentrations were added to this total and compared to CAAQS and NAAQS.

Dispersion Modeling Results

Table DR29-5 below summarizes the results of the cumulative modeling analysis.

DR29-5
Cumulative Impacts Modeling Results (μg/m³)

Pollutant	Averaging Time	Maximum Multisource Concentration (μg/m³)	Background (μg/m³)	Total Ambient Concentration (μg/m³)	SVEP Contribution (μg/m³)	State Standard (μg/m³)	Federal Standard (μg/m³)
NO_2	1-hour	1,751.1[a]	191.3	1,942.4	0	470	-
	Annual	22.4	45.9	68.3	0.0009	-	100
SO_2	1-hour	460.1	53.2	513.7	0	650	-
	3-hour	190.9	53.2	244.1	0	-	1300
	24-hour	53.5	39.9	93.4	0	109	365
	Annual	10.1	8.0	18.1	0.00003	-	80
CO	1-hour	5,756.4	8,153.1	13,909.5	0	23,000	40,000
	8-hour	1,588.9	4,607.0	6,195.9	0	10,000	10,000
PM_{10}	24-hour	59.7	164.0	223.7[b]	0	50	150
	Ann.Geo.	9.2	58.5	67.7	0.0006	30	-
	Ann.Arith.	9.2	58.5	67.7	0.0006	-	50

[a] Occurs within IEEC fenceline
[b] Occurs within 200 meters of the Cemex Construction Materials facility

As can be seen, maximum modeled concentrations are greater than the CAAQS for 1-hour NO_2 and 24-hour PM_{10}. Maximum modeled concentrations for all other pollutants and averaging times are less than the CAAQS and NAAQS. Maximum ambient (modeled plus background) concentrations are greater than the CAAQS for 1-hour NO_2 and greater than the CAAQS/NAAQS for 24-hour and annual PM_{10}. Maximum ambient (modeled plus background) concentrations exceed the additional PM_{10} standards because the background concentrations already exceed the applicable standards. Maximum modeled concentrations for all other pollutants and averaging times (NO_2 for annual averaging times, SO_2 for all averaging times, and CO for all averaging times) are less than the CAAQS and NAAQS.

The maximum ambient 1-hour NO_X concentration (modeled plus background concentrations) of 1942.4 μg /m³ is due to emissions from the IEEC (Inland Empire) emergency generators and occur inside the IEEC fenceline. This is not considered an exceedance of the CAAQS because impacts within fence line are not considered ambient air. Since emergency generators are normally tested less than 1-hour per week, it is highly unlikely that both the IEEC emergency generators and the SVEP fire pump would be tested at the same time. Therefore, additional 1-hour NOx analyses were performed with only the IEEC emergency generators or SVEP fire pump (but not both facilities) being tested at any one time. Results of these analyses show that the maximum 1-hour NO_X impacts by the SVEP facility on modeled CAAQS exceedances are less than 15.1 μg /m³ when the IEEC emergency generators are being tested and 4.6 μg /m³ when the SVEP fire pump is being tested. Thus, maximum modeled 1-hour SVEP impacts are less than the 1-hour NO_2

significant impact level of 19 µg /m^3 at receptors with ambient 1-hour NO_X concentrations (modeled plus background) greater than the 1-hour CAAQS of 470 µg /m^3.

The maximum modeled 24-hour PM_{10} concentration of 59.7 µg/m^3 is due primarily to PM_{10} emissions from Cemex Construction Materials facility (contributes 59.6 µg/m^3 to this impact). Only one receptor, located less than 200 meters from the modeled Cemex Construction Materials stack location, had maximum modeled 24-hour PM_{10} concentrations greater than the 24-hour CAAQS, and then only during one 24-hour period. The 24-hour PM_{10} impact for SVEP emissions at this location was 0.0 µg/m^3, (i.e., there were no SVEP contributions to this impact). The proposed project will therefore not cause or contribute to this exceedance.

Conclusion

The modeled cumulative 1-hour NO_2 concentration and modeled 24-hour PM_{10} concentration exceed the 1-hour NO_2 and 24-hour PM_{10} standards prior to the addition of background air quality data. At the locations where the exceedances took place, the SVEP contribution was less than the significance levels for both pollutants. Thus, the proposed project is not expected to contribute to this exceedance and will comply with all air quality standards.

Attachment AIR-6

Analysis of PM_{10} Offsets in the Priority Reserve

Fraction of Directly Emitted $PM_{2.5}$ in South Coast Air Basin PM_{10} Priority Reserve Credits

PREPARED FOR: Edison Mission Energy

PREPARED BY: Bill Dennison, CH2M HILL

DATE: August 30, 2006

As part of the Application for Certification (AFC) approval process for the Edison Mission Energy Walnut Creek Energy Park and Sun Valley Energy Project, California Energy Commission (CEC) staff has requested information regarding the amount of $PM_{2.5}$ in Priority Reserve PM_{10} Credits that are proposed to be used as emission offset mitigations.

Priority Reserve Credits are unique to the South Coast Air Basin. This pool of emission reduction credits was established with the June 1990 amendments to the SCAQMD Regulation XIII, its New Source Review regulation. This pool of credits and a defined rate for future funding of the credit pool was developed to ensure that sufficient offsets would be available for innovative technology projects, research operations and essential public service projects, such as schools, hospitals, sewage treatments plants, landfills, etc. Emission reduction credits were to be made available to eligible projects at no cost. The SCAQMD has funded the Priority Reserve pool with stationary source emission reductions from its New Source Account, including "orphan shutdown credits."

Temporary access to the Priority Reserve pool of emission credits was provided to Electric Generating Facilities (EGF) under certain conditions for projects with applications submitted between 2001 and 2003. Recognizing that there is a significant need to increase energy production to avoid the type of energy crisis that California experienced in 2000-2001, the SCAQMD has proposed to again provide access to emissions reduction credit access for EGFs through its Priority Reserve pool of credits. The mechanism to effect this access will be proposed modifications to District Rule 1309.1.

While there are now ambient air quality standards for $PM_{2.5}$, State Implementation Plans (SIP), including the District's Air Quality Management Plan (AQMP), are in the developmental stages and are not required to be completed before 2007. Changes to the New Source Review (NSR) rules and programs to specifically identify $PM_{2.5}$ will occur later. Thus, both the traditional Emission Reduction Credits (ERCs) and Priority Reserve pool of credits list particulate emissions as PM_{10}. Conversion to $PM_{2.5}$ or issuance of $PM_{2.5}$ emissions credits would not be expected until after the changes to the NSR program and rules are effected.

Presently, there is no official listing of $PM_{2.5}$ ERCs or accounting of the $PM_{2.5}$ portion of ERCs or Priority Reserve credits, as there has been no requirement for agencies such as the SCAQMD to track this information. However, since both ERCs and Priority Reserve credits are derived from stationary source emission reductions, the fraction of $PM_{2.5}$ in PM_{10} credits should be reflective of existing stationary source emissions. Both the SCAQMD and CARB have published South Coast Air Basin emission inventories that have identified both PM_{10} and the subset $PM_{2.5}$ emissions for stationary, area and mobile sources. The SCAQMD's 2007 AQMP, which will contain the SCAQMD's latest emission inventory, is currently in preparation.

The most current published emission inventory information is contained in the California Almanac of Emissions and Air Quality, 2006 Edition. Using source-specific PM speciation profiles, CARB has developed PM_{10}/$PM_{2.5}$ emission inventories that cover the period from 1975 through 2020. Speciation data from the Almanac for the period from 1990 through 2005 have been excerpted from the Almanac, as these data should more accurately reflect emission reductions that the District accumulated for the Priority Reserve pool of credits. A summary of these speciated data is presented in the following table and the attached chart. The more detailed data and specific PM_{10} and $PM_{2.5}$ emissions pages from the Almanac are also attached to this report. As shown in Table 1 and the attached graph, directly emitted $PM_{2.5}$ emissions, over the period from 1990 to 2005, constituted 79.7 to 85.7 percent of stationary source PM_{10} emissions. Thus, it is reasonable to assume that the $PM_{2.5}$ fraction of PM_{10} ERCs or Priority Reserve credits that would be used to offset emissions from proposed EGFs would be approximately 80 percent.

TABLE 1
South Coast Air Basin – Directly Emitted PM10/PM2.5 Stationary Source Emissions (tons/day, annual average)

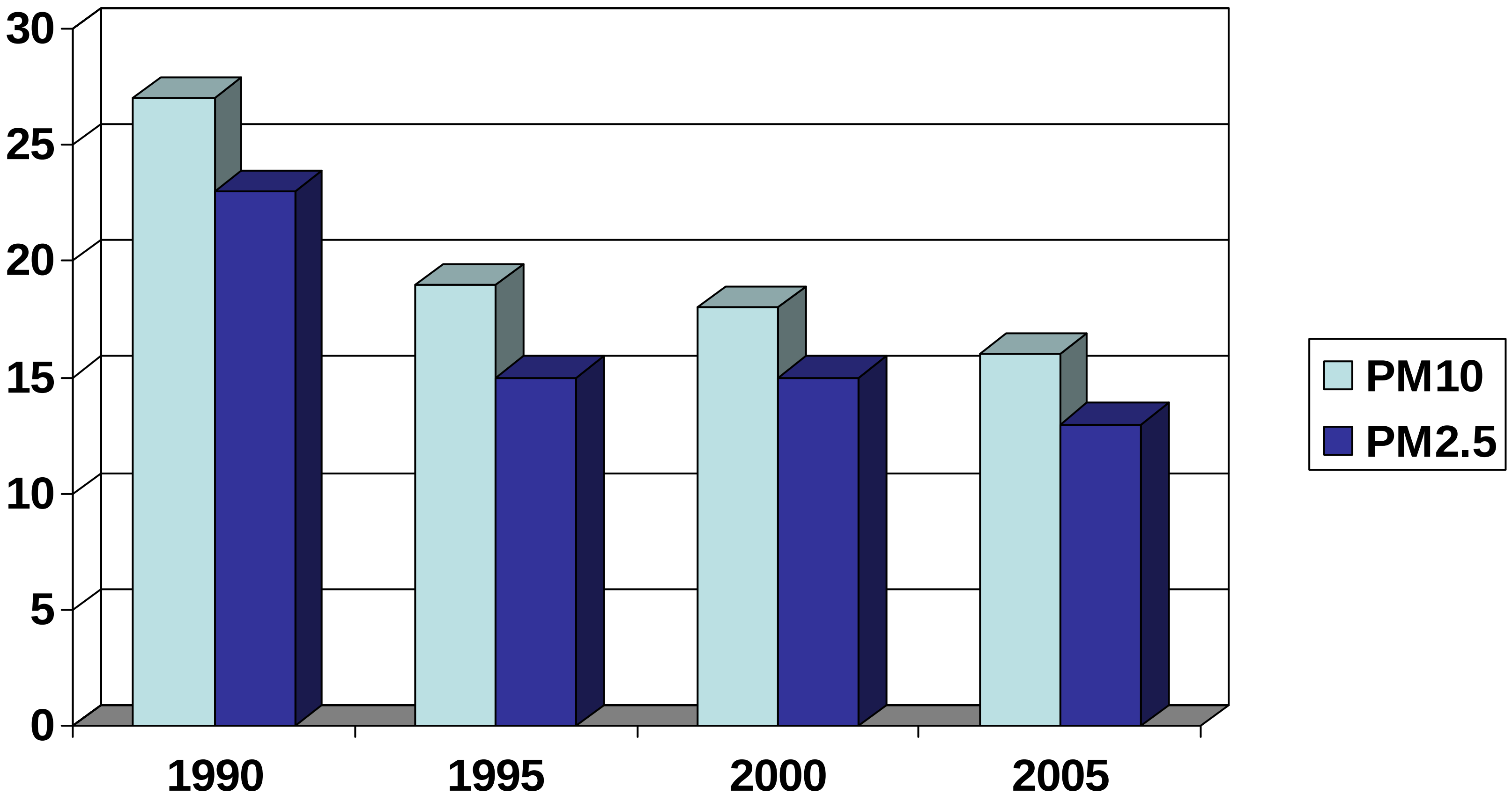
	1990		1995		2000		2005	
Summary Category Name	**PM10**	**PM2.5**	**PM10**	**PM2.5**	**PM10**	**PM2.5**	**PM10**	**PM2.5**
Fuel Combustion	12.163	12.003	7.940	7.833	7.710	7.599	6.320	6.253
Waste Disposal	0.433	0.403	0.281	0.263	0.370	0.311	0.444	0.420
Cleaning and Surface Coating	0.728	0.701	0.048	0.046	0.135	0.130	0.535	0.407
Petroleum Production and Marketing	2.578	2.354	2.048	1.871	1.279	0.951	1.109	0.895
Industrial Processes	11.173	7.736	8.380	5.122	8.259	5.560	7.318	4.552
Total Stationary Sources	27.075	23.198	18.698	15.136	17.753	14.550	15.726	12.527
PM2.5 Percent		**85.7**		**80.9**		**82.0**		**79.7**

Source: California Air Resources Board, The California Almanac of Emissions and Air Quality – 2006 Edition

South Coast Air Basin

Stationary Source PM_{10}/$PM_{2.5}$ Emissions

(tons/day, annual avg day)



Source: The California Almanac of Emissions and Air Quality – 2006 Edition

South Coast Air Basin
Directly Emitted $PM_{2.5}$ Emission Trends and Forecasts

Direct emissions of $PM_{2.5}$ have decreased slightly in the South Coast Air Basin since 1975. Stationary source emissions have been decreasing, while area-wide emissions have been increasing. A more significant decrease in emissions would have been observed, if not for growth in emissions from area-wide sources, primarily fugitive dust from paved and unpaved roads and other sources. The increase in activity of these area-wide sources reflects the increased growth and VMT in the air basin.

Particulate matter can be directly emitted into the air (primary PM) or, similar to ozone, it can be formed in the atmosphere (secondary PM) from the reaction of gaseous precursors such as NO_x, SO_x, ROG, and ammonia. The $PM_{2.5}$ emission inventory includes only directly emitted particulate emissions. On an annual average basis, directly emitted $PM_{2.5}$ emissions contribute approximately 40 percent of the ambient $PM_{2.5}$ in the South Coast Air Basin.

Directly Emitted $PM_{2.5}$ Emission Trends (tons/day, annual average)

Emission Source	1975	1980	1985	1990	1995	2000	2005	2010	2015	2020
All Sources	*119*	*110*	*108*	*125*	*108*	*107*	*97*	*97*	*98*	*100*
Stationary Sources	52	34	22	23	15	15	13	13	13	14
Area-wide Sources	35	41	46	63	62	61	53	54	55	57
On-Road Mobile	11	13	19	17	14	13	13	13	13	13
Gasoline Vehicles	6	5	5	6	6	7	8	9	10	10
Diesel Vehicles	5	9	14	11	8	6	5	4	3	3
Other Mobile	22	22	21	22	17	18	18	18	17	16
Gasoline Fuel	2	2	2	3	3	3	4	4	4	5
Diesel Fuel	19	19	17	18	13	12	11	10	8	7
Other Fuel	1	1	1	1	2	2	3	4	4	5

Table 4-7

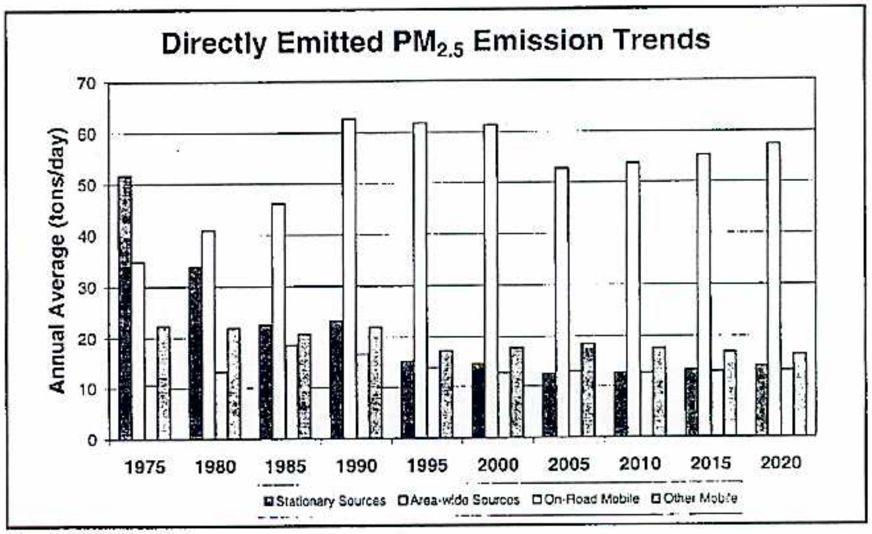


Figure 4-7

South Coast Air Basin
Directly Emitted PM_{10} Emission Trends and Forecasts

Direct emissions of PM_{10} have been increasing in the South Coast Air Basin since 1975. A decrease in emissions would have been observed, if not for growth in emissions from area-wide sources, primarily fugitive dust from paved and unpaved roads and other sources. The increase in activity of these area-wide sources reflects the increased growth and VMT in the air basin.

Particulate matter can be directly emitted into the air (primary PM) or, similar to ozone, it can be formed in the atmosphere from the reaction of gaseous precursors such as NO_x, SO_x, ROG, and ammonia (secondary PM). The PM_{10} emission inventory includes only directly emitted particulate emissions. On an annual average basis, directly emitted PM_{10} emissions contribute approximately 65 percent of the ambient PM_{10} in the South Coast Air Basin.

Directly Emitted PM_{10} Emission Trends (tons/day, annual average)

Emission Source	1975	1980	1985	1990	1995	2000	2005	2010	2015	2020
All Sources	228	239	261	347	330	325	276	278	284	292
Stationary Sources	56	40	28	27	19	18	16	16	17	17
Area-wide Sources	133	157	186	273	273	269	221	223	229	236
On-Road Mobile	15	17	24	22	19	19	19	19	20	20
Gasoline Vehicles	10	8	9	10	11	12	13	15	16	17
Diesel Vehicles	5	9	15	12	8	6	6	4	3	3
Other Mobile	25	24	23	24	19	20	21	20	19	19
Gasoline Fuel	3	3	3	4	4	4	5	5	6	6
Diesel Fuel	21	20	19	19	14	13	12	11	9	7
Other Fuel	1	1	1	1	2	2	3	4	5	5

Table 4-6

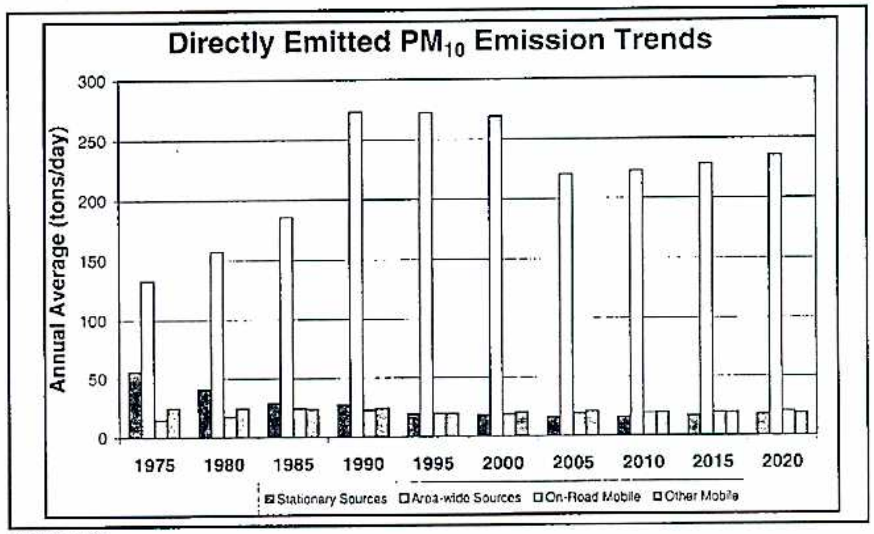


Figure 4-6

Welcome to California

Air Resources Board

2006 Almanac Data

Particulate Matter < 10 Microns Projected Emission Inventory

SOUTH COAST AIR BASIN

REPORT TYPE: GROWN AND CONTROLLED
SEASON: ANNUAL AVERAGE
BASE YEAR: 2005

All emissions are represented in Tons per Day and reflect the most current data provided to ARB
Download this data as a comma delimited file.
Download more detail data as a comma delimited file.

STATIONARY SOURCES				
SUMMARY CATEGORY NAME	**1990**	**1995**	**2000**	**2005**
FUEL COMBUSTION				
ELECTRIC UTILITIES	1.300	0.810	0.759	1.398
COGENERATION	0.896	0.053	0.665	0.073
OIL AND GAS PRODUCTION (COMBUSTION)	0.044	0.041	0.203	0.159
PETROLEUM REFINING (COMBUSTION)	3.918	3.536	2.315	1.689
MANUFACTURING AND INDUSTRIAL	1.904	1.214	1.443	1.114
FOOD AND AGRICULTURAL PROCESSING	0.928	0.209	0.197	0.160
SERVICE AND COMMERCIAL	2.235	1.680	1.596	1.446
OTHER (FUEL COMBUSTION)	0.938	0.398	0.531	0.281

* TOTAL FUEL COMBUSTION	12.163	7.940	7.710	6.320
WASTE DISPOSAL				
SEWAGE TREATMENT	0.004	0.000	0.000	0.003
LANDFILLS	0.213	0.174	0.168	0.313
INCINERATORS	0.104	0.036	0.082	0.103
OTHER (WASTE DISPOSAL)	0.111	0.072	0.121	0.025
* TOTAL WASTE DISPOSAL	0.433	0.281	0.370	0.444
CLEANING AND SURFACE COATINGS				
LAUNDERING	0.001	0.000	0.000	0.000
DEGREASING	0.032	0.000	0.000	0.000
COATINGS AND RELATED PROCESS SOLVENTS	0.603	0.048	0.133	0.446
PRINTING	0.025	0.000	0.000	0.000
ADHESIVES AND SEALANTS	0.000	0.000	0.000	0.000
OTHER (CLEANING AND SURFACE COATINGS)	0.067	0.000	0.001	0.088
* TOTAL CLEANING AND SURFACE COATINGS	0.728	0.048	0.135	0.535
PETROLEUM PRODUCTION AND MARKETING				
OIL AND GAS PRODUCTION	0.006	0.001	0.024	0.004
PETROLEUM REFINING	2.547	2.028	1.226	1.079
PETROLEUM MARKETING	0.021	0.020	0.029	0.026
OTHER (PETROLEUM PRODUCTION AND MARKETING)	0.004	0.000	0.000	0.000
* TOTAL PETROLEUM PRODUCTION AND MARKETING	2.578	2.048	1.279	1.109
INDUSTRIAL PROCESSES				
CHEMICAL	0.949	0.302	0.521	0.537
FOOD AND AGRICULTURE	0.234	0.091	0.197	0.174
MINERAL PROCESSES	4.497	1.903	2.936	2.042
METAL PROCESSES	1.706	0.378	0.832	0.483
WOOD AND PAPER	2.584	3.044	3.390	3.558
GLASS AND RELATED PRODUCTS	0.497	0.135	0.227	0.265
ELECTRONICS	0.012	0.001	0.002	0.006
OTHER (INDUSTRIAL PROCESSES)	0.694	2.527	0.153	0.253
* TOTAL INDUSTRIAL PROCESSES	11.173	8.380	8.259	7.318

** TOTAL STATIONARY SOURCES	27.075	18.698	17.753	15.726
GRAND TOTAL FOR SOUTH COAST	27.075	18.698	17.753	15.726

* Emissions from natural sources are excluded.

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Welcome to California

Air Resources Board

2006 Almanac Data

Particulate Matter < 2.5 Microns Projected Emission Inventory

SOUTH COAST AIR BASIN

REPORT TYPE: GROWN AND CONTROLLED
SEASON: ANNUAL AVERAGE
BASE YEAR: 2005

All emissions are represented in Tons per Day and reflect the most current data provided to ARB
Download this data as a comma delimited file.
Download more detail data as a comma delimited file.

STATIONARY SOURCES				
SUMMARY CATEGORY NAME	**1990**	**1995**	**2000**	**2005**
FUEL COMBUSTION				
ELECTRIC UTILITIES	1.289	0.808	0.758	1.395
COGENERATION	0.872	0.050	0.661	0.069
OIL AND GAS PRODUCTION (COMBUSTION)	0.044	0.041	0.201	0.157
PETROLEUM REFINING (COMBUSTION)	3.862	3.464	2.268	1.660
MANUFACTURING AND INDUSTRIAL	1.892	1.206	1.430	1.107
FOOD AND AGRICULTURAL PROCESSING	0.909	0.206	0.194	0.158
SERVICE AND COMMERCIAL	2.227	1.678	1.592	1.444
OTHER (FUEL COMBUSTION)	0.908	0.381	0.496	0.262

*** TOTAL FUEL COMBUSTION**	12.003	7.833	7.599	6.253
WASTE DISPOSAL				
SEWAGE TREATMENT	0.003	0.000	0.000	0.003
LANDFILLS	0.213	0.174	0.168	0.301
INCINERATORS	0.085	0.025	0.070	0.092
OTHER (WASTE DISPOSAL)	0.103	0.064	0.073	0.025
*** TOTAL WASTE DISPOSAL**	0.403	0.263	0.311	0.420
CLEANING AND SURFACE COATINGS				
LAUNDERING	0.001	0.000	0.000	0.000
DEGREASING	0.031	0.000	0.000	0.000
COATINGS AND RELATED PROCESS SOLVENTS	0.580	0.046	0.128	0.321
PRINTING	0.024	0.000	0.000	0.000
ADHESIVES AND SEALANTS	0.000	0.000	0.000	0.000
OTHER (CLEANING AND SURFACE COATINGS)	0.065	0.000	0.001	0.085
*** TOTAL CLEANING AND SURFACE COATINGS**	0.701	0.046	0.130	0.407
PETROLEUM PRODUCTION AND MARKETING				
OIL AND GAS PRODUCTION	0.005	0.001	0.021	0.004
PETROLEUM REFINING	2.325	1.852	0.902	0.867
PETROLEUM MARKETING	0.021	0.019	0.028	0.025
OTHER (PETROLEUM PRODUCTION AND MARKETING)	0.004	0.000	0.000	0.000
*** TOTAL PETROLEUM PRODUCTION AND MARKETING**	2.354	1.871	0.951	0.895
INDUSTRIAL PROCESSES				
CHEMICAL	0.906	0.288	0.504	0.497
FOOD AND AGRICULTURE	0.037	0.017	0.061	0.028
MINERAL PROCESSES	2.941	1.056	2.000	1.108
METAL PROCESSES	1.388	0.311	0.622	0.341
WOOD AND PAPER	1.563	1.833	2.042	2.158
GLASS AND RELATED PRODUCTS	0.385	0.110	0.223	0.250
ELECTRONICS	0.009	0.000	0.002	0.003
OTHER (INDUSTRIAL PROCESSES)	0.507	1.506	0.106	0.166
*** TOTAL INDUSTRIAL PROCESSES**	7.736	5.122	5.560	4.552

** TOTAL STATIONARY SOURCES	23.198	15.136	14.550	12.527
GRAND TOTAL FOR SOUTH COAST	23.198	15.136	14.550	12.527

* Emissions from natural sources are excluded.

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Visual Plume Analysis

Visual Plume Analysis

Visible Plume Modeling Results

DR67. If the applicant performed a visible plume modeling analysis in support of the AFC Visual Resources conclusion, please provide the modeling results, any meteorological data used in the analysis, a full discussion of all assumptions, the name and version of the model used, and all model input and output files. If a modeling analysis was not performed, please provide any analysis that supports the visible water vapor plume discussion in the AFC.

Response: The visual plume modeling analysis is included as Attachment VP-1.

Cooling Tower Data

DR91. Please confirm the cooling tower data provided in the supplemental data response, or provide corrections to this data as necessary.

DR92. Please explain the rationale for the low air flow for this cooling tower and describe the technical differences between the cooling for this project and the cooling for combined cycle projects that allow for the higher cooling water temperatures and very low cooling tower air flows.

DR93. Please discuss whether the cooling tower would be redesigned to allow for higher air flow rates (around 15 kg/s/MW), or whether there are other design changes that would effectively reduce the frequency of visible plumes.

Response: Experience with an LMS-100 installation for another project, the Basin Electric Project in South Dakota, has led to changes in cooling tower design for the SVEP. Although these are minor changes, they affect various project operating parameters. Attachment VP-2 is a redline-strikethrough version of portions of the AFC (portions of Chapters 2.0, 7.0, and 8.15), reflecting these changes in design.

The following is brief description of the effects of the cooling tower design change in terms of the 16 AFC Environmental Resources disciplines:

Air Quality—The proposed changes to the cooling tower will result in a slight decrease of PM_{10} emissions. Since PM_{10} emissions will be less than what was originally proposed and the project design originally proposed did not produce any air significant quality impacts, there was no need to update the air quality modeling.

Biological Resources—There would be no significant change in project effects.

Cultural Resources--There would be no significant change in project effects.

Geological Hazards and Resources-- There would be no significant change in project effects.

Hazardous Materials Handling—Quantities of hazardous materials handling and handling methods would not change.

Land Use--There would be no significant change in project effects.

Noise—The newly designed cooling tower would not differ appreciably in noise emissions from the previous design.

Paleontological Resource—There would be no significant change in project effects.

Public Health—The proposed changes to the cooling tower will result in a net decrease in the emissions of hazardous air pollutants, compared with the design proposed in the Application for Certification. Because modeling of hazardous air pollutants conducted for the AFC showed that the cooling tower would not cause a health risk, it is not necessary to revise the cooling tower modeling.

Socioeconomics—There would be no significant change in project effects.

Soils and Agriculture—There would be no significant change in project effects.

Traffic and Transportation—There would be no significant change in project effects.

Visual Resources—The newly designed cooling tower would appear slightly different, as it would be made of fiberglass, instead of wood, and would be approximately one foot taller than the previous model. The effects of this change on visual resources would be minor and negligible, however. Visual resources analyses conducted for the AFC determined that the project features most visible to the public are the combustion turbine generator enclosures, SCR housings, exhaust stacks, and VBV silencer stacks and also determined that the project as proposed would not cause adverse visual impacts, based on simulated views of the project at key observation points (KOPs). Although the cooling tower is visible from two of the KOPs, a change in the structure's height of one foot would barely be noticeable.

Waste Management—There would be no significant change in the management of project wastes.

Water Resources—The project's use of water would change slightly. The attached redline-strikethrough version of applicable revised AFC sections (Chapters 2.0, 7.0, and 8.15; Attachment VP-2) identifies these changes in detail. The overall effect on the project's water use, however, would be negligible. The amounts of water used and discharged would not significantly change. Project wastewater discharges would not violate applicable water quality standards.

Worker Health & Safety—There would be no significant change in project effects.

Attachment VP-1

Visible Plume Analysis

Cooling Tower Plume Modeling Analysis for the Edison Mission Energy Sun Valley Energy Project

Prepared by:

Atmospheric Dynamics, Inc.
2925 Puesta del Sol Rd.
Santa Barbara, CA 93105

August 29, 2006

Cooling Tower Plume Modeling Analysis
Edison Mission Energy - Sun Valley Energy Project

Introduction

This report was prepared to summarize an analysis of the potential for visible water vapor plumes to form above the cooling tower at the proposed Sun Valley Energy Project. This study supports various environmental documents that have been prepared for the Application for Certification before the California Energy Commission for this project.

EME is proposing to use a five (5) cell wet mechanical-draft cooling tower to reject heat to the atmosphere. The air leaving the cooling towers is usually saturated with moisture and warmer than the ambient air, causing a wet exhaust plume to be created. The saturated exhaust plume may be or may not be visible depending on the specific meteorological conditions. The potential for visible plume formation is also based on cooling tower operational factors that can occur in conjunction with existing meteorological conditions. Visible plume formation from the five (5) natural gas-fired turbines is not expected to occur since the turbine exhaust is hot and contains very little moisture.

Potential issues associated with cooling tower plumes include the presence of visual plumes and the occurrence of ground level fogging and/or icing episodes that involve the ground contact of visible plumes. In order to evaluate the effects on the local and regional environment, a modeling analysis was conducted to simulate the cooling tower plumes from the proposed project using four (5) years of meteorological data.

Modeling Techniques

The Seasonal/Annual Cooling Tower Impact Program (SACTI, Version 11-01-90) was used to assess potential impacts from the cooling tower. SACTI was developed by Argonne National Laboratory[1] for the Electric Power Research Institute (EPRI) to address the following potential adverse impacts of cooling towers:

- plume visibility
- deposition of cooling tower drift
- ground-level fogging and icing
- shadowing by the plume & reduction of solar energy

SACTI contains algorithms for both natural and mechanical draft cooling towers arranged singly

[1]Argonne National Laboratory, 1984. Users Manual: Cooling-Tower -Plume Prediction Code. Prepared for Electric Power Research Institute, 3412 Hillview Avenue, Palo Alto, CA 9404, EPRI CS-3403-CCM, April, 1984.

or in clusters. Plume merging and associated enhanced plume rise are treated by the routines contained in the model. While the SACTI model does not have any official regulatory endorsement, this model has been applied for a large number of projects where cooling tower impact assessments were required. The characteristics of the tower and the preparation of the meteorological data set are discussed below.

The characteristics of the proposed cooling tower are listed in Table 1. These input parameters were obtained from Edison Mission Energy's engineering consultant based on preliminary seasonal design data for the facility.

A five (5) year meteorological data set was constructed using hourly surface observations from the Riverside International Airport meteorological station, located near the proposed project location, for the years 2001 through 2005. As discussed below, night-time hours were removed from the meteorological data set, as were day-time hours for which where weather or other phenomenon would impair visibility. Figure 1 displays a wind rose constructed from all hours of the five (5) year data. The average wind speed is 3.3 m/s and high winds greater than 6 m/s are infrequent (8 percent for the five year data set). Wind speeds either missing or less than the threshold of the anemometer at Riverside occur for 34% of the total time period. A lack of precision for light winds is not expected to unduly influence the outcome of the modeling for ground-level fogging as such fogging effects require plume touchdown and would typically be associated with high wind conditions.

Given the length of time of the data used in the SACTI analysis, the data used are considered representative of the climatic conditions of the area where plume formation can occur. Even with this representative data set, short-term variability in conditions can affect the prediction of cooling tower plume impacts. Therefore, the results of the analysis are considered an indicator of likely occurrence and not an absolute predictor of events.

Modeling Results

Cooling Tower

SACTI was applied to simulate plumes from the proposed cooling towers using the five (5) year meteorological data set and tower design characteristics described previously. Default options were assumed for the input variables controlling the model's operation. The five (5) year data set was input into SACTI to produce a five (5) year average frequency distribution for condensed plume length, condensed plume height, plume shadowing, and ground-level fogging. Although the model provides information on plume shadowing and drift deposition, the focus of our analysis and the discussion that follows is on visible plume dimensions and ground based fogging.

Table 1. Cooling Tower Input Parameters

Parameter	Value
Type	linear mechanical draft 1 tower, 5 cells
Heat Dissipation Rate (MW)	190
Circulation Rate (gpm)	32,500
Total Tower Air Flow (kg/s)	5230 – 5382
Max Drift Rate (%)	0.0005
Salt Concentration (gm/gm)	2.03E-3
Orientation	One banks of 5 in-line cells aligned east to west
Height (m)	12.2
Equivalent Total Cell Diameter (m)	20.4
Exit Velocity & Temperature	variable, calculated by the model assuming saturation conditions

Conditions favoring a long condensed plume occur more frequently in the fall and winter seasons as atmospheric conditions, such as air temperature and relative humidity, are more favorable during these periods for plume formation. Also, plume formation tends to occur more frequently during night-time hours and during adverse weather conditions. Since EME has committed to a lighting plan that minimizes illumination, these cooling tower plumes would not be visible at night. Unless illuminated by on-site sources, these cooling tower plumes would not be visible. The SACTI meteorological data set was modified by removing all nocturnal hours, which accounted for 50% of all the hours in the five (5) year data set. In addition, daytime observations with fog, precipitation, visibility less than 3 miles, or ceiling heights less than 500 feet were excluded from the meteorological data set as under these conditions, a visible plume from the cooling tower would be obscured by these local weather phenomena. For the Riverside meteorological data set, these adverse weather conditions account for 9.7% of the total valid (daylight hours) observations. Table 2 summarizes these statistics.

Table 2	Total hours	Day hours	Night Hours Removed from Analysis	Limited Visibility Hours Removed from Analysis	Total Hours Modeled With SACTI
Year					
2001	8352	4077	4275	477	3600
2002	8423	4184	4239	487	3697
2003	8608	4330	4278	414	3916
2004	8636	4323	4313	351	3972
2005	8612	4331	4281	327	4004

Thus, the five (5) year meteorological data set was modified by removing both night-time hours and hours with weather obscuring phenomena. In total, these conditions accounted for 55% of all the hours (day, night, and obscuring weather) in the data set. The SACTI was then applied to the remaining data set to assess the cooling tower plumes under daytime conditions when a condensed plume would most likely also be a visible plume. Of particular interest was the analysis of visible plume formation during the months when such formation is most likely, namely the fall and winter seasons. The occurrence of low temperatures coupled with high(er) relative humidity occurs with a greater frequency during these seasons. Plume formation is favored during these types of low temperature/high humidity conditions since the ability of the atmosphere to absorb water vapor is greatly reduced because the air mass is at or near saturation.

The results of the cooling tower analysis are summarized in Attachments 1-5 for the tower for the annual and seasonal seasons. The attachments present the frequency distributions of the primary model output variables, namely plume length and height, which are listed by downwind sector and radial distance from the center of the cooling tower array.

Cooling Tower Plume Formation

The SACTI results for all seasons are summarized in Table 3 below. The annual values indicate that the majority of visible plume lengths will be less than 40 meters (130 feet). Modeling results indicate that plume formation will occur 20% of the time during valid visible hours only at locations within the facility boundary during all seasons. Larger downwind visible plume lengths (annually) are possible, but the downwind visible plume length will be less than 75 meters (250 feet) for 90 percent of all the hours where a visible plume will form. This results in a plume length exceeding 250 feet for only 4.4 percent of the time during the season. When translated into total hours for the season, on average, 161 hours per year will have plume lengths up to but not exceeding 250 feet. SACTI also predicts that the probability that a visible plume height averages 35 meters, and has a median radius of 20 meters (66 feet). For the winter season, the average plume length (when visible) will be larger, at 75 meters (250 feet). For winter, SACTI predicts an average visible plume height of 35 meters, with a median radius of 25 meters (80 feet), similar to the annual values.

TABLE 3 Seasonal Plume Characteristics from SACTI

	Annual	Winter	Spring	Summer	Fall
Plume Characteristics (m)					
Median Length	200	300	300	200	200
Median Height	150	150	150	100	150
Median Radius	30	40	40	30	30
Limit of Shadowing [a]	50	100	25	150	50

a- 80% of visible plumes

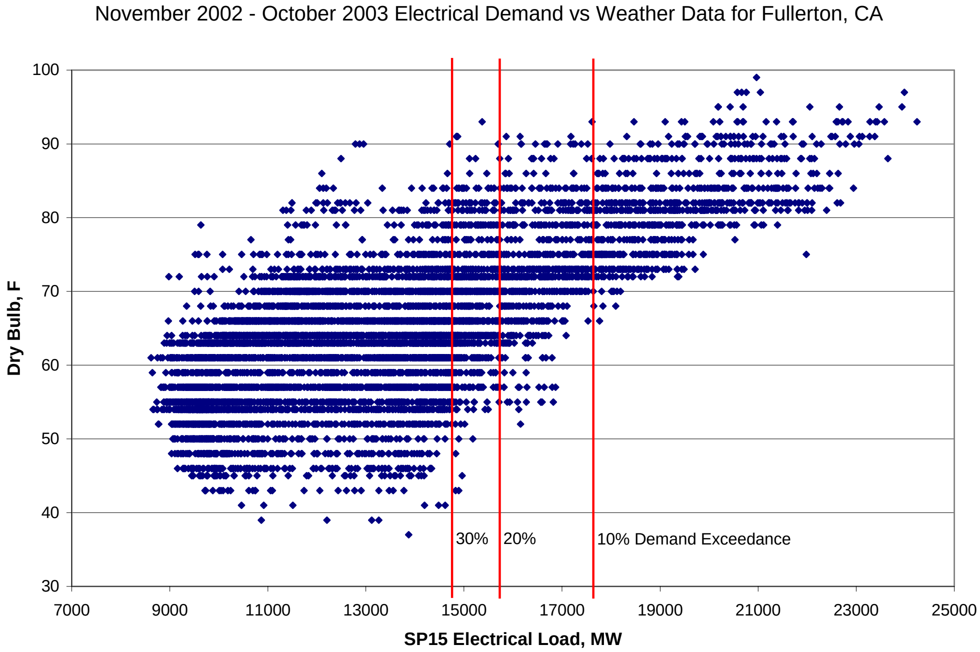
Ground level fogging

The potential for ground-level fogging on nearby areas was also assessed with SACTI. Potential fogging conditions can occur when atmospheric conditions allow the cooling tower plume to generate a cloud that contacts the ground. This can occur under periods of high humidity or high wind speed and favorable temperatures and stabilities with the fog being nucleated or generated by the cooling tower plume. Should fog be generated across a highway or other thoroughfare, it may become a potential hazard, and mitigation measures such as signs and traffic assistance may be needed. In order for fogging to affect roadway operations, the cooling tower plume must touchdown on the road surface and be condensed. This requires high winds (low plume rise), the right wind direction, low dew-point depression, and low temperatures.

SACTI was run with all hours of the five (5) year data base, including nighttime and low-visibility hours. There were no hours of predicted fogging from the cooling tower, considering all wind directions.

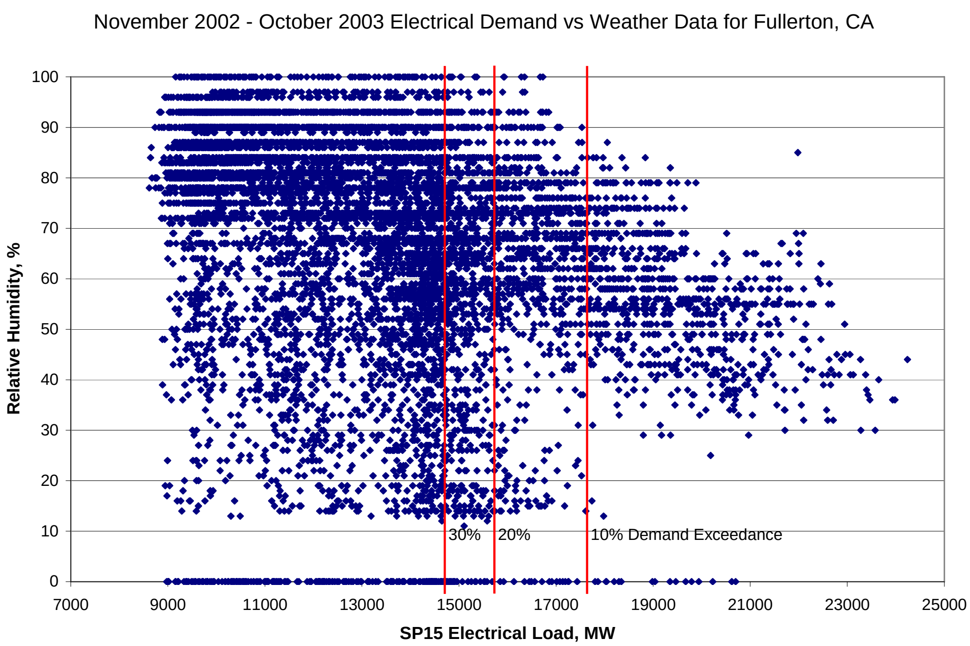
Project Operation

The SACTI model was modified to produce an output listing of the meteorological conditions that produced a visible plume. The SACTI cooling tower plume modeling output shows that a visible plume generally only occurs when relative humidity exceeds 85%. In order to evaluate the likelihood of this atmospheric condition coinciding with plant operation, hourly electric load data from the California ISO for the SP15 zone (effectively SCE's and SDG&E's service area) for the period of November 2002 through October 2003 was obtained, and hourly weather data for Fullerton, CA for the same period was obtained. As one would expect, regional electrical loads are highest when dry bulb temperatures are highest due to air-conditioner use on hot summer days, as illustrated in the chart below.

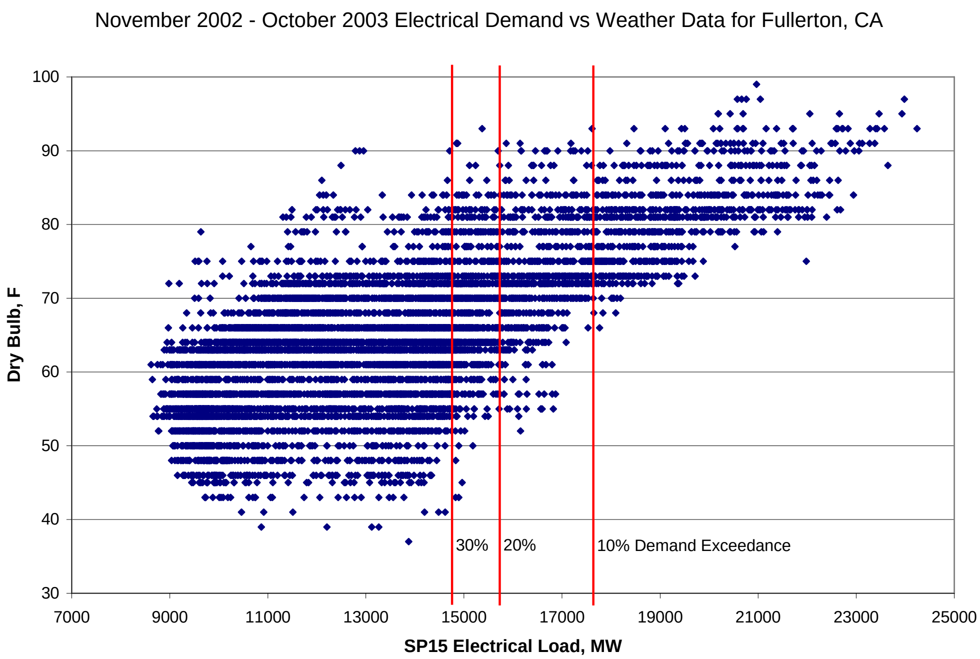


The vertical red lines indicate the SP15 electrical loads that are exceeded 10%, 20% and 30% of the time (i.e., 10%, 20% and 30% of the data points are to the right of the respective lines). Although a peaking powerplant may occasionally be called on to run to alleviate a power grid emergency or unexpected outage of a baseload powerplant, almost all operation of peaking powerplants will be during the highest electrical loads.

On hot summer days, as dry bulb temperatures (and corresponding electrical loads) increase to afternoon peaks, relative humidity naturally decreases due to the increased moisture-holding ability of the warmer air. It would be expected, then, that high electrical loads would correlate negatively with high relative humidity. The chart below is a plot of the same electrical loads as those in the preceding chart, but versus the relative humidity prevailing at the time of those loads, and illustrates the expected negative correlation.



The chart below is a frequency distribution of the relative humidity during the hours corresponding to the highest 20% of electrical loads. Relative humidity only exceeds the 85% level at which visible plume may occur during 3.8% of the hours in which the highest 20% of electrical loads occurred during the one year period for which data was obtained. Expressed as a percent of the entire year, 3.8% of 20% of the year is an incidence of less than 0.8%.



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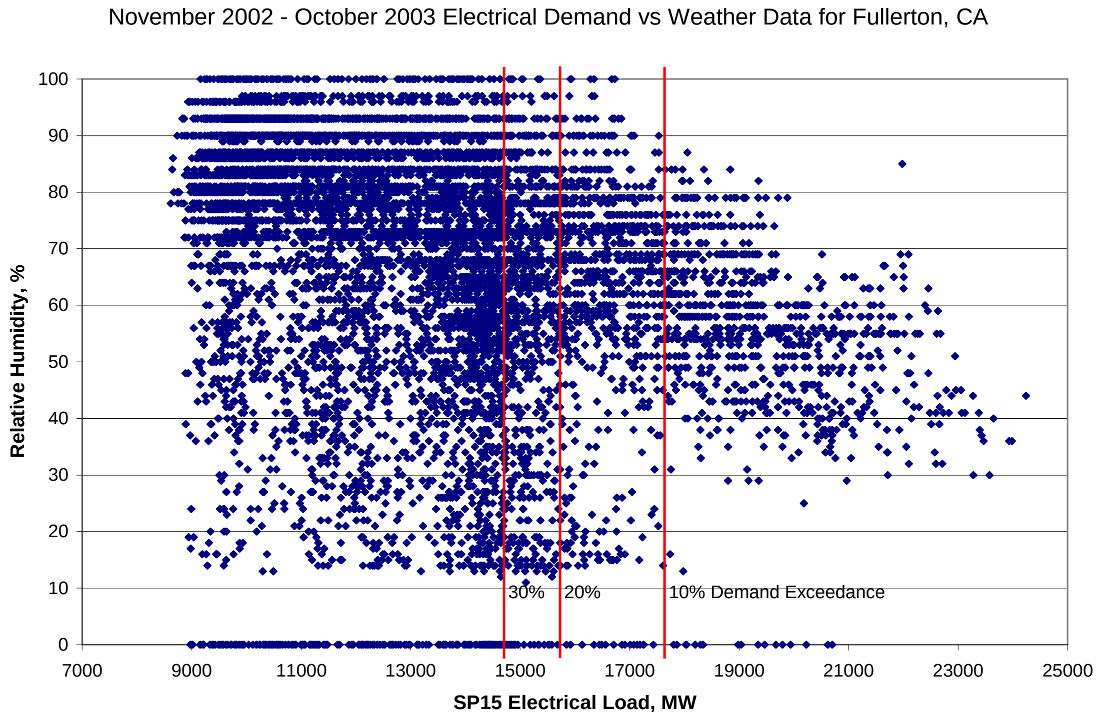

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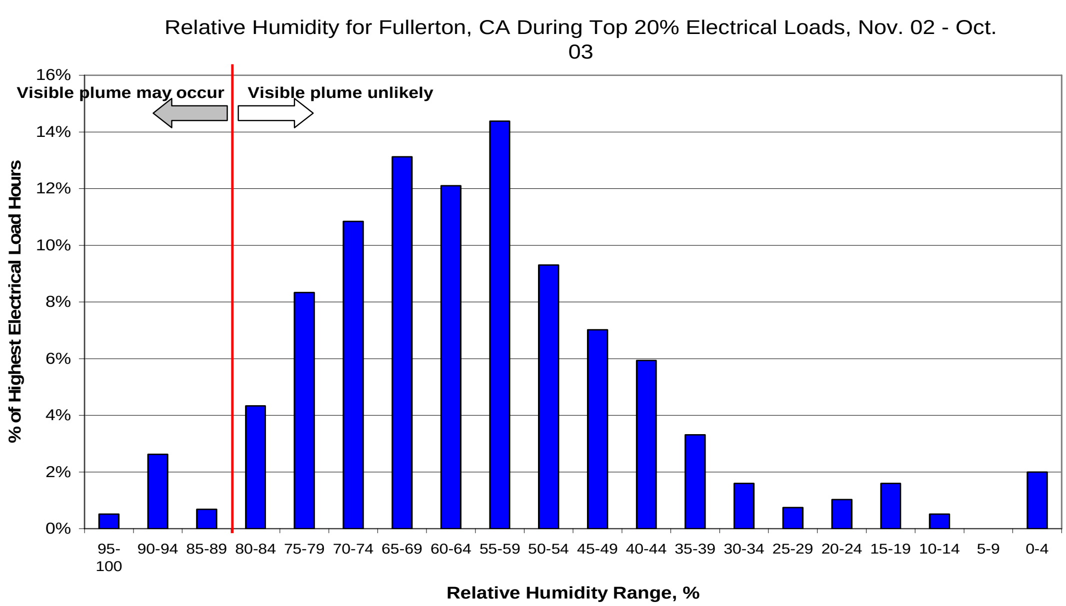
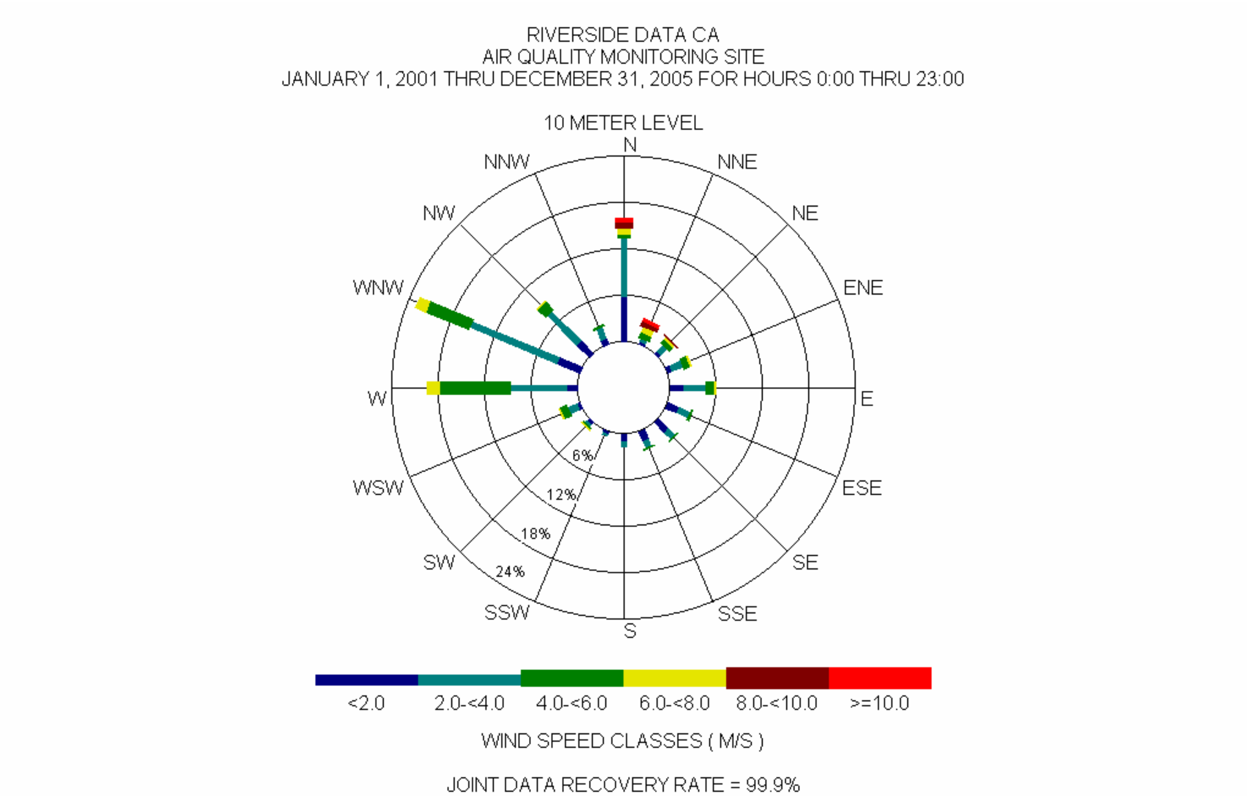
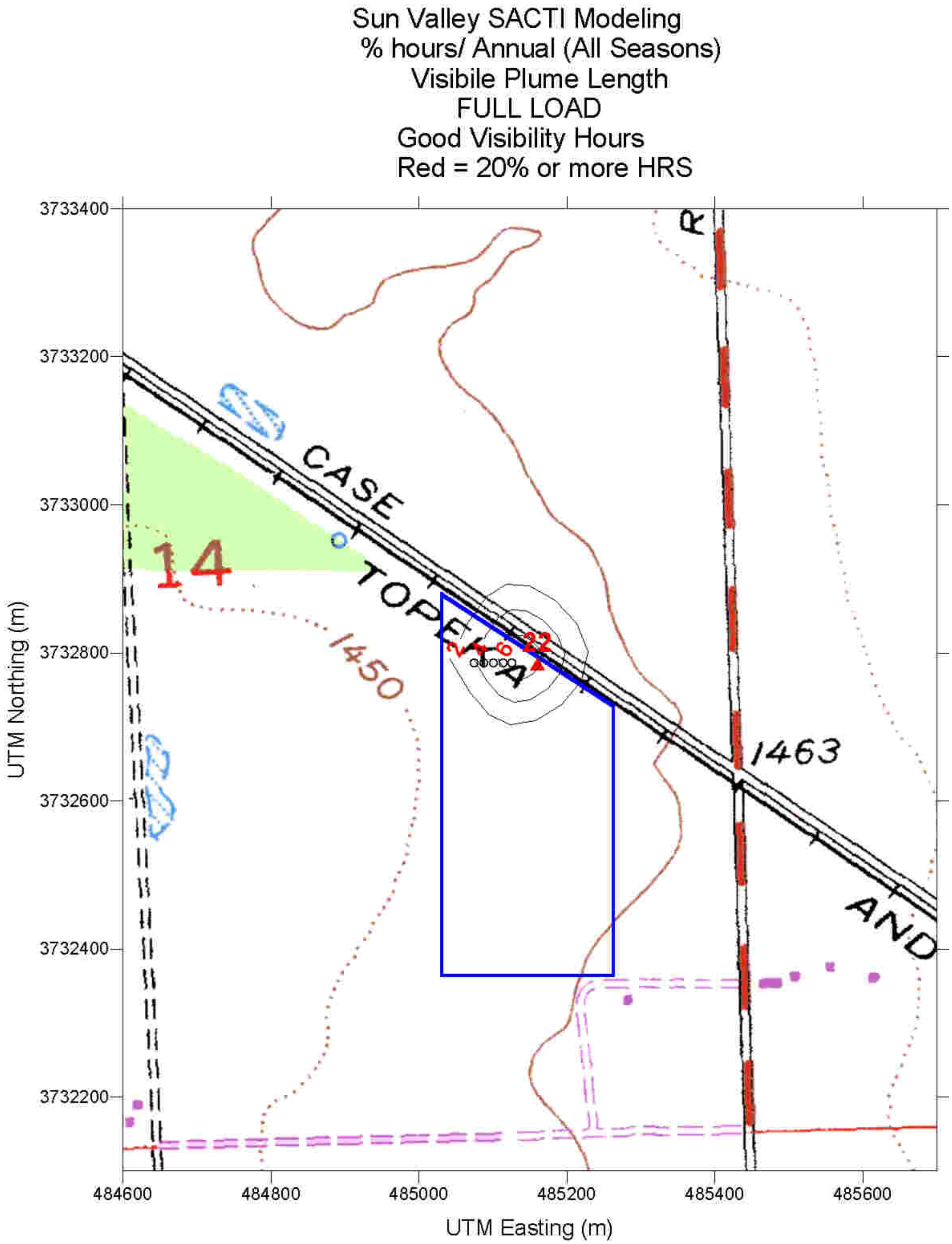


Summary

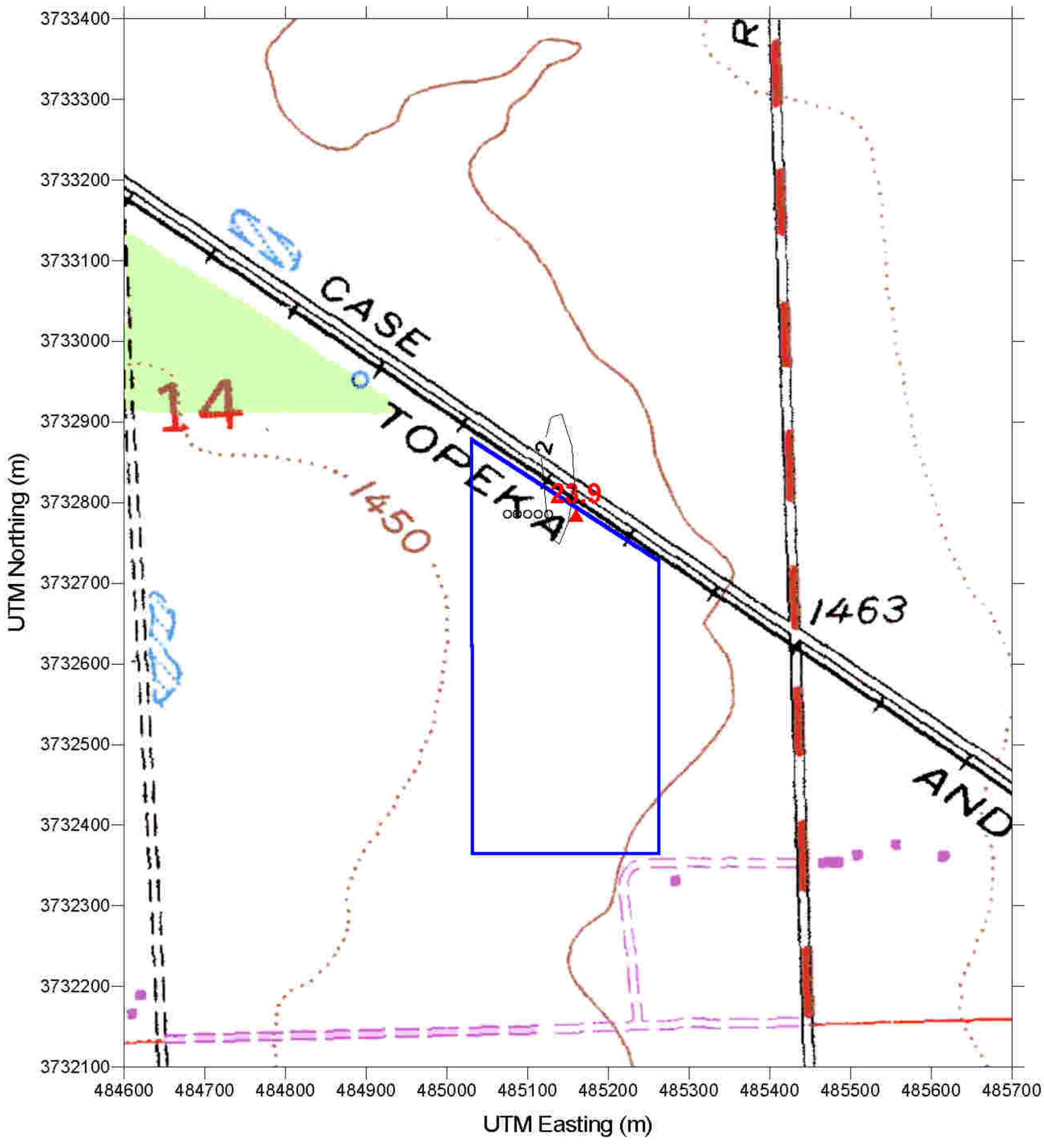
A cooling tower modeling analysis was conducted using SACTI and five (5) years of Ontario Airport meteorological data. Model simulations indicate that visible plumes will occur, but will be moderate in size (height and length). The 20 percent visible plume significance levels will only be equaled or exceeded immediately adjacent to the cooling tower with the 20 percent plume being contained on-site. The probability of formation of long visible plumes in excess of 230 feet is less than five percent. No plume fogging is also predicted to occur in the general vicinity of the project site. Analysis of the conditions under which visible plumes might be likely to form, in addition, shows that these conditions occur very infrequently when there are very high electrical loads corresponding to times when a peaking power plant such as the SVEP would be likely to operate (approximately 0.8 percent of the time) and therefore, no significant adverse impacts would result from the project.

Figure 1
Annual Wind Rose (2001-2005)
Riverside, CA Airport

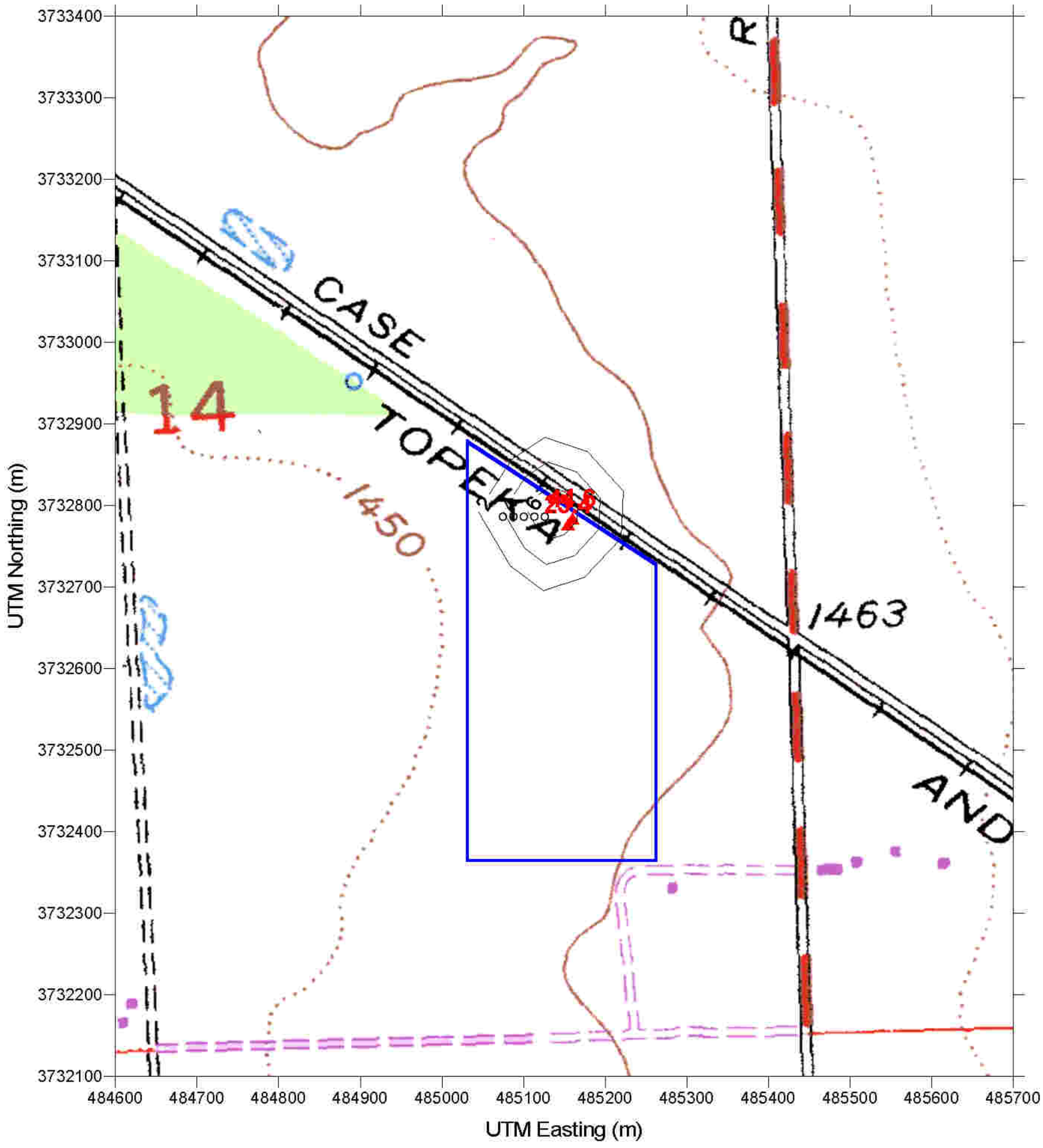



Sun Valley SACTI Modeling
% hours/ Annual (All Seasons)
Visibile Plume Length
FULL LOAD
Good Visibility Hours
Red = 20% or more HRS
3733400
3733200
3733000
3732800
3732600
3732400
3732200
UTM Northing (m)
484600
484800
485000
485200
485400
485600
UTM Easting (m)
CASE
TOPEKA
AND
R
14
1450
1463
22
6
4
2

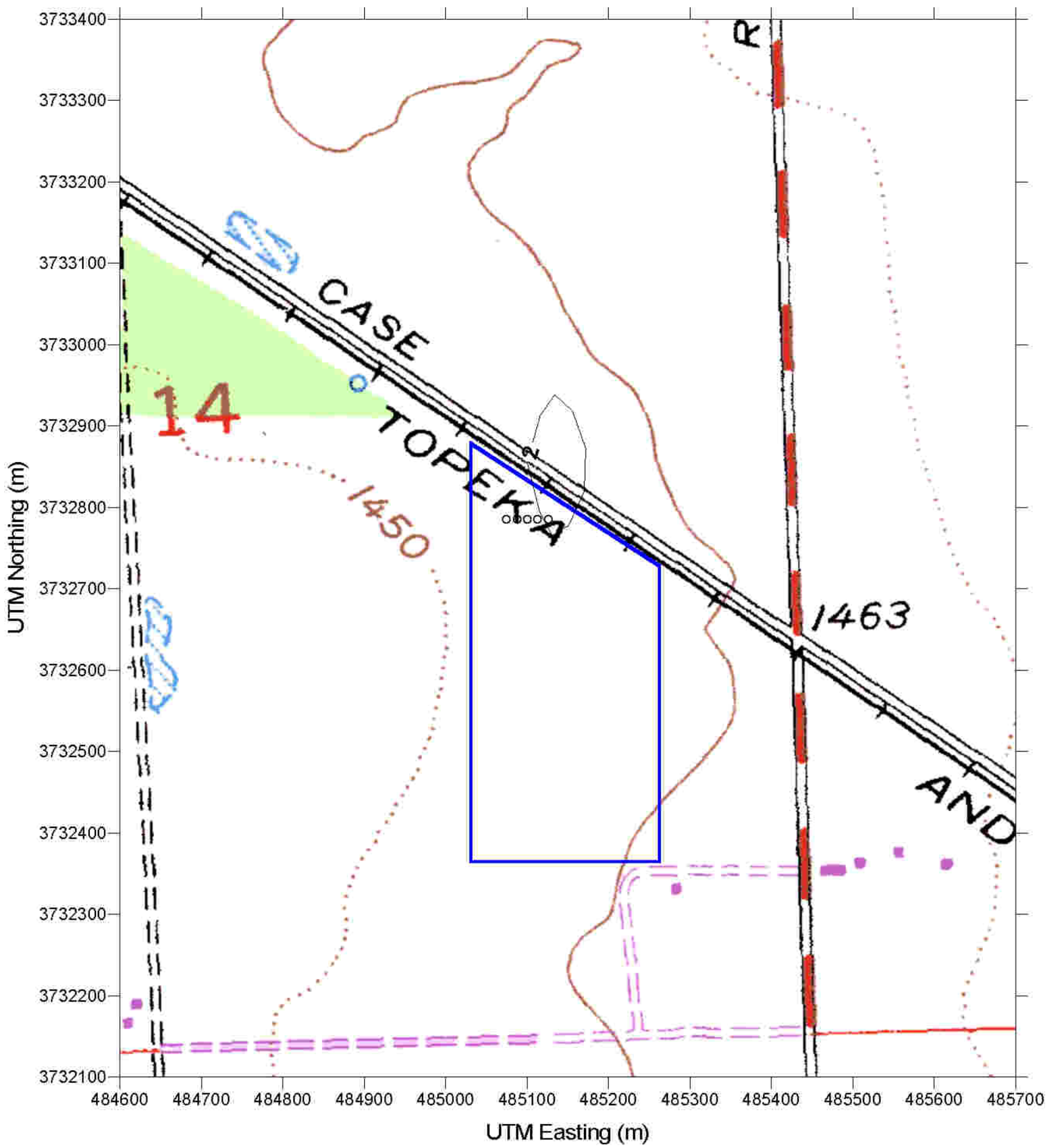
Sun Valley SACTI Modeling
% hours/ Spring (All Years)
Visibile Plume Length
FULL LOAD
Good Visibility Hours
Red = 20% or more HRS



Sun Valley SACTI Modeling
% hours/ Summer (All Years)
Visibile Plume Length
FULL LOAD
Good Visibility Hours
Red = 20% or more HRS



Sun Valley SACTI Modeling
% hours/ Fall (All Years)
Visibile Plume Length
FULL LOAD
Good Visibility Hours
Red = 20% or more HRS



Attachment VP-2

Revised AFC Pages

SECTION 2.0

Project Description

The Sun Valley Energy Project (SVEP) will be a nominal 500-megawatt (MW) peaking facility consisting of five GE Energy LMS100 natural gas-fired turbine-generators and associated equipment. The facility will be located near Romoland in unincorporated Riverside County on an approximately 20-acre parcel. Although the project site is currently in agricultural use, the land is zoned Manufacturing-Service Commercial. The legal description of the project site is provided in Appendix 1A. Mailing address labels for all property owners within 1,000 feet of the site boundaries are provided in Appendix 1B. The project site is located at 29500 Rouse Road, Romoland, California. The Assessor's Parcel Numbers are 331-250-019 and -020. The site is located in Township 5S, Range 3W, Section 14 (San Bernardino Base and Meridian).

Figure 2.1-1 shows the project site plan, and appurtenant facilities, including the electric transmission line, natural gas supply line, reclaimed water supply line, potable water supply line, and waste water disposal line. Three of these appurtenant facilities will connect to utility lines located on easements immediately adjacent to the project parcel (reclaimed water, potable water, sanitary sewer). The project will require a 750-foot-long natural gas pipeline between the project boundary and Menifee Road that will be entirely located within one of the project parcels. It will also require a 0.75-mile-long non-reclaimable water pipeline.

SVEP will connect to Southern California Edison's (SCE) electrical transmission system at the Valley Substation, which is approximately 600 feet north of the project site. This connection will require approximately 600 feet of 115-kV transmission line connecting to the south end of the Valley Substation and one off-site transmission tower in an existing SCE transmission easement. Interconnection at this specific substation minimizes downstream impacts to the SCE's transmission system, as well as reducing transformation losses from the 500-kV transmission supply to the Valley Substation, while providing efficient peaking power for use during peak demand as projected by SCE.

Reclaimed water for cooling tower and evaporative cooler makeup, site landscape irrigation, and demineralized water makeup will be supplied via a 12-inch-diameter direct connection to a reclaimed water pipeline in a utility easement immediately north of the project site. The Eastern Municipal Water District will supply, on average, approximately **834** ~~851~~ acre-feet per year (ac-ft/yr) of reclaimed water for the project. Appendix 7A contains a "will-serve" letter from the District.

Potable water will be supplied from through a 4-inch-diameter pipeline, fire water will be supplied through a 10-inch-diameter connection, and domestic sewage will discharge to an existing line located in the same utility easement adjacent to and north of the project site. Non-reclaimable wastewater will be discharged through an 8-inch-diameter pipeline that will run west from the project along Matthews Road to McLaughlin Road for 0.75 mile and will connect with the Inland Empire Energy Center's non-reclaimable waste water line located at McLaughlin and Antelope Roads.

The project will connect with Southern California Gas Company's (SoCalGas's) natural gas pipeline via a 12-inch-diameter and 750-foot-long connection to the existing pipeline that runs along Menifee Road east of the project site.

2.1 Generating Facility Description, Design, and Operation

This section describes the facility's conceptual design and proposed operation.

2.1.1 Site Arrangement and Layout

Figure 2.1-1 shows the general arrangement and layout of the facility, and Figures 2.1-2a and 2.1-2b are typical elevation views. Primary access to the site will be provided from the south via Rouse (Russell) Road. Access during operation will be via Rouse Road and Junipero Road, from the south. The project site is located in an area that is designated for industrial land use, zoned manufacturing-service commercial, and that is currently in agricultural use. It is surrounded to the south, east, and west, by industrial and agricultural uses. To the north are the Burlington Northern and Santa Fe (BNSF) railroad and SCE Valley Substation. To the northwest are areas zoned industrial that are in agricultural use or industrial use, including the Inland Empire Energy Center, which is under construction. To the east is an open agricultural field planned for Light Industrial uses and, east of Menifee Road, the Menifee Valley Ranch residential development, which has recently begun construction. To the south are agricultural and residential uses.

2.1.2 Process Description

The generating facility will consist of five GE Energy LMS100 natural gas-fired combustion turbine-generators (CTGs), each equipped with water injection capability to reduce oxides of nitrogen (NO_x) emissions, selective catalytic reduction (SCR) equipment containing catalysts to further reduce NO_x emissions, and an oxidation catalyst to reduce carbon monoxide (CO) emissions. The total nominal generating capacity will be 500 MW. Auxiliary equipment will include an inlet air filter house with evaporative cooler, turbine inter-cooler, 5-cell mechanical-draft cooling tower and circulating water pumps, natural gas compressors, generator step-up and auxiliary transformers, and water storage tanks.

Each CTG will generate approximately 100 MW at the summer design ambient conditions. The project is expected to have an annual capacity factor of approximately 20 to 40 percent, depending on dispatch to meet customer loads. The generating facility base case heat balance is shown on Figure 2.1-3. This balance is based on an ambient dry bulb temperature of 90 degrees Fahrenheit (°F) (the summer average condition) with evaporative cooling of the inlet combustion air.

Associated equipment will include emission control systems necessary to meet the proposed emission limits. NO_x emissions will be controlled to 2.5 parts per million by volume, dry basis (ppmvd) corrected to 15 percent oxygen with the combination of water injection in the CTGs and SCR systems in the catalyst housing. A CO catalyst will also be installed in the catalyst housing to limit CO emissions from the CTGs to 6 ppmvd at 15 percent oxygen.

2.1.3 Generating Facility Cycle

CTG combustion air flows through the inlet air filter and evaporative cooler and associated air inlet ductwork. The air is then compressed in the gas turbine low-pressure compressor section and cooled through the intercooler before it enters the high-pressure compressor. The compressed air then flows to the CTG combustor. Natural gas fuel is injected into the compressed air in the combustor and ignited. The hot combustion gases expand through the power turbine sections of the CTGs, causing them to rotate, driving the electric generators and CTG compressors. Integrating an intercooler between compressor stages in the LMS100, together with higher combustor firing temperatures, results in gross turbine generator efficiencies of approximately 44 percent. The hot combustion gases exit the turbine sections at approximately 770 °F and then pass through the catalyst housing for exposure to NO_x and CO emissions catalysts, and then exit the exhaust stacks.

2.1.4 Combustion Turbine Generators

Electricity is produced by the five CTGs. The following paragraphs describe the major components of the generating facility.

2.1.4.1 Combustion Turbine Generators

Thermal energy is produced in the CTGs through the combustion of natural gas, which is converted into mechanical energy required to drive the combustion turbine compressors and electric generators. Five GE Energy LMS100 CTGs have been selected for SVEP. The LMS100 integrates features of GE Energy's frame and aeroderivative CTG design systems. The low-pressure compressor is derived from the heavy-duty frame engine system and the high pressure compressor, combustor, and power turbine are derived from the aeroderivative system. Each CTG consists of a stationary combustion turbine-generator, and associated auxiliary equipment. The CTGs will be equipped with water injection capability to control NO_x emissions formed in the combustion process. While GE Energy anticipates future units will be capable of using steam injection and Dry Low Emissions (DLE) combustors, these design options are not as suitable for peaking operation. Each CTG will also have a variable bleed valve vent that allows the venting of compressed air to the atmosphere under certain transient compressor operating conditions.

The CTGs will be equipped with the following required accessories to provide safe and reliable operation:

- Evaporative coolers
- Inlet air filters
- Metal acoustical enclosure
- Duplex shell and tube lube oil coolers for the turbine and generator
- Annular combustor combustion system
- Compressor wash system
- Fire detection and protection system
- Compressor intercooler
- Hydraulic starting system
- Water injection system
- Compressor variable bleed valve vent

The metal acoustical enclosure, which contains the CTGs and accessory equipment, will be located outdoors.

2.1.4.2 Catalyst Housing

The catalyst housings, one for each CTG, are equipped with catalyst modules to further reduce emissions. The SCR emission control system will use ammonia vapor in the presence of a catalyst to reduce CTG exhaust gas NO_x. Diluted ammonia (NH_3) vapor will be injected into the exhaust gas stream via a grid of nozzles located upstream of the catalyst module. The subsequent chemical reaction will reduce NO_x to nitrogen and water, resulting in a NO_x concentration in the exhaust gas no greater than 2.5 ppmvd at 15 percent oxygen (on a 3-hour average basis).

An oxidation catalyst will also be installed within the housing to reduce the concentration of CO in the exhaust gas emitted to atmosphere to no greater than 6 ppmvd at 15 percent oxygen. The exhaust from each catalyst housing will be discharged from individual 90-foot-tall, 13.5-foot diameter exhaust stacks.

2.1.5 Major Electrical Equipment and Systems

The bulk of the electric power produced by the facility will be transmitted to the power grid through the 115-kV connection with the SCE Valley Substation. A small amount of electric power will be used onsite to power auxiliaries such as pumps, natural gas compressors, cooling tower fans, control systems, and general facility loads including lighting, heating, and air conditioning. Some will also be converted from alternating current (AC) to direct current (DC), and will be used as backup power for control systems and other uses.

Power will be generated by the five CTGs at 13.8 kV and stepped up by five fan-cooled generator step-up transformers to 115 kV for transmission to the grid. Auxiliary power will be back-fed through two of the step-up transformers. Once the units are running, they will supply their own auxiliary power. Surge arresters will be provided at the high-voltage bushings to protect the transformers from surges on the 115-kV system caused by lightning strikes or other system disturbances. The transformers will be set on concrete pads within berms designed to contain the non-PCB transformer oil in the event of a leak or spill. Fire protection systems will be provided. The high-voltage side of the step-up transformers will be connected to gas insulated (SF6) circuit breakers then to overhead cables to SCE's Valley substation. From the substation, power will be transmitted to the grid via transmission lines owned by SCE. The transmission connect to the SCE Valley Substation is approximately 600 feet long and will require one conductor support tower, to be located adjacent to the Valley Substation. Section 5.0, Electrical Transmission contains additional information regarding the electrical transmission system as well as a summary of the System Impact Study.

2.1.6 Fuel System

The CTGs will be designed to burn natural gas. Natural gas requirements at the summer average condition of 78ºF are approximately 850 million British thermal units per hour (MMBtu/hr), per unit, on a higher heating value basis.

Natural gas will be delivered to the site via a connection to one or more of the three existing 30-inch pipelines located in a utility easement within the project parcel along Menifee Road. The natural gas will flow through gas scrubber/filtering equipment, gas compressors, a gas pressure control station, and a flow-metering station prior to entering the combustion turbines. Historical data indicates that gas pressure in SoCalGas's Line distribution pipeline varies between 400 and 800 psig. Due to a high compressor pressure ratio, the GE Energy LMS100 unit requires a pressure at the turbine connection of 960 psig, plus or minus 20 psig. Three, 50-percent-capacity on-site electric motor-driven gas compressors will be used to boost the pipeline pressure to the level required by the gas turbine. Additional information about natural gas supply can be found in Section 6.0 Natural Gas Supply.

2.1.7 Water Supply and Use

This section describes the quantity of water required, the source of the water supply, and water treatment requirements. Additional information on water supply and use is found in Section 7.0, Water Supply.

2.1.7.1 Water Requirements

The estimated water usage for the plant is provided in Table 2.1-1.

TABLE 2.1-1
Raw Water Usage

Condition	Expected Usage	
Peak Usage (Maximum Summer Condition)	**1,778** ~~1,704~~ gpm	**1,031** ~~1,003~~ ac-ft/yr[a]
Average Annual Usage	**1,372** ~~1,510~~ gpm	**875** ~~851~~ ac-ft/yr[b]

[a] At a 40 percent capacity factor

[b] At a 34 percent capacity factor

gpm = gallons per minute

ac-ft/yr = acre-feet per year

2.1.7.2 Water Supply

Reclaimed water for CTG evaporative cooling, landscape irrigation, process system makeup, and cooling will be provided by the Eastern Municipal Water District via the existing 12-inch diameter reclaimed water supply line. Water supply reliability is ensured by the fact that EMWD can draw recycled water from several treatment plants.

2.1.7.3 Water Quality and Treatment

Process water includes the demineralized water used for NO_x injection into the CTG and for evaporative cooling. Potable water will be furnished from the city's water system for drinking and sanitary use and makeup to the plant hose stations.

Water treatment will be provided onsite prior to use for water injection. Demineralized water will be used for NO_x injection water. The demineralized water will be produced by a reverse osmosis (RO) and Ion Exchange system and will be stored in a 100,000-gallon demineralized water storage tank. Water quality is described further in Sections 7.0 Water Supply, and 8.15 Water Resources.

SVEP water use can be divided into the following three levels based on the quality required: (1) cooling water; (2) demineralized water for NO_x injection water, and (3) potable water.

2.1.7.4 Cooling Tower System

Makeup water will be pumped from the reclaimed water storage tank to the cooling tower basins as required to replace water lost from evaporation, drift, and blowdown. A chemical feed system will supply water conditioning chemicals to the circulating water to minimize corrosion and control the formation of mineral scale and biofouling. Sulfuric acid will be fed into the circulating water system in proportion to makeup water flow for alkalinity reduction to control the scaling tendency of the circulating water. The acid feed equipment will consist of a bulk sulfuric acid storage tank and two full-capacity sulfuric acid metering pumps.

To further inhibit scale formation, a polyacrylate solution will be fed into the circulating water system as a sequestering agent in an amount proportional to the circulating water blowdown flow. The scale inhibitor feed equipment will consist of a chemical solution bulk storage tank and two full-capacity scale inhibitor metering pumps.

To prevent biofouling in the circulating water system, sodium hypochlorite will be fed into the system. The hypochlorite feed equipment will consist of a bulk storage tank and 2 full-capacity hypochlorite metering pumps. A small storage tank, or 100- to 400-gallon totes, and 2 full-capacity metering pumps will be provided for the feeding of either stabilized bromine or sodium bromide as alternate biocides.

2.1.7.5 Reclaim Water Treatment

To remove suspended solids which may be produced from seasonal algae blooms in the Winchester reclaimed water storage reservoirs, the reclaimed water supply to the site will be treated on an as-needed basis with a dissolved air flotation (DAF) system. The DAF will be placed into service on high turbidity using a continuous analyzer in the reclaimed water supply pipe. The algae skimmings from the DAF will be collected in a skim tank and disposed of off-site. The clarified water will be pumped to the reclaimed water storage tank.

2.1.8 Plant Cooling Systems

A cooling tower will be provided for the gas turbine auxiliary cooling requirements. Two 50-percent-capacity circulating water pumps will provide water to cool three closed-cooling water heat exchangers; rated at approximately 33 percent capacity each. The closed-cooling water heat exchangers will provide high quality cooling water to a GE-provided pump skid for each combustion turbine. The pump skid provides cooling water to the CT compressor intercooler and to the lubrication systems.

2.1.9 Waste Management

Waste management is the process whereby all wastes produced at SVEP are properly collected, treated if necessary, and disposed of. Wastes include wastewater, solid nonhazardous waste, and both liquid and solid hazardous waste. Waste management is discussed in more detail in Section 8.14.

2.1.9.1 Wastewater Collection, Treatment, and Disposal

The primary wastewater collection system will collect process wastewater from all of the plant equipment, including the cooling tower and water treatment equipment. The second wastewater collection system will collect sanitary wastewater from sinks, toilets, showers, and other sanitary facilities, and discharge to the city sanitary sewer system. The two wastewater systems are described below.

2.1.9.1.1 Circulating Water System Blowdown

Circulating water system blowdown will consist of the reclaimed makeup water and other recovered process wastewater streams that have been concentrated by evaporative losses in the cooling towers, and residues of the chemicals added to the circulating water. The cooling tower concentrates these streams near the mineral solubility limit for the constituents of concern (calcium, silica and total dissolved solids), based on EMWD discharge limits. This concentrated water must then be removed from the cooling tower via blowdown to prevent the formation of mineral scale in heat transfer equipment. The chemicals added to the circulating water control scaling and biofouling of the cooling tower and control corrosion of the circulating water piping and intercooler. Cooling tower blowdown will be discharged to the non-reclaimable waste water line. This pipeline will return the non-reclaimable waste water through EMWD's system including the Temescal Valley Regional Interceptor (TVRI) and Santa Ana Regional Interceptor (SARI) pipeline system to the (Orange County Sanitation District (OCSD) wastewater treatment plant, which discharges to an ocean outfall.

2.1.9.1.2 Plant Drains and Oil/Water Separator

General plant drains will collect area washdown, sample drains, and drainage from facility equipment areas. Water from these areas will be collected in a system of floor drains, hub drains, sumps, and piping and routed to the wastewater collection system. Drains that potentially could contain oil or grease will first be routed through an oil/water separator. Wastewater from combustion turbine water washes will be collected in a holding tank. If cleaning chemicals were not used during the water wash procedure, the wastewater will be discharged to the oil/water separator and then recycled as makeup to the cooling tower. Wastewater containing cleaning chemicals will be trucked offsite for disposal at an approved wastewater disposal facility.

2.1.9.1.3 Solid Wastes

SVEP will produce maintenance and plant wastes typical of natural gas-fueled power generation operations. Generation plant wastes include oily rags, broken and rusted metal and machine parts, defective or broken electrical materials, empty containers, and other solid wastes, including the typical refuse generated by workers. Recyclable materials will be taken offsite. Waste collection and disposal will be in accordance with applicable regulatory requirements to minimize health and safety effects.

2.1.9.1.4 Hazardous Wastes

Several methods will be used to properly manage and dispose of hazardous wastes generated by SVEP. Waste lubricating oil will be recovered and reclaimed by a waste oil recycling contractor. Spent lubrication oil filters will be disposed of in a Class I landfill. Spent SCR and oxidation catalysts will be reclaimed by the supplier or disposed of in accordance with regulatory requirements. Workers will be trained to handle hazardous wastes generated at the site.

Chemical cleaning wastes will consist of detergent solutions used during turbine washing. These wastes, which are subject to high metal concentrations, will be temporarily stored onsite in portable tanks and disposed of offsite by the chemical cleaning contractor in accordance with applicable regulatory requirements.

2.1.10 Management of Hazardous Materials

There will be a variety of chemicals stored and used during the construction and operation of SVEP. The storage, handling, and use of all chemicals will be conducted in accordance with applicable laws, ordinances, regulations, and standards (LORS). Chemicals will be stored in appropriate chemical storage facilities. Bulk chemicals will be stored in storage tanks, and other chemicals will be stored in returnable delivery containers. Chemical storage and chemical feed areas will be designed to contain leaks and spills. Berm and drain piping design will allow a full-tank capacity spill without overflowing the berms. For multiple tanks located within the same bermed area, the capacity of the largest single tank will determine the volume of the bermed area and drain piping. Drain piping for volatile chemicals will be trapped and isolated from other drains to eliminate noxious or toxic vapors. After neutralization, if required, water collected from the chemical storage areas will be directed to the cooling tower basin, or trucked offsite for disposal at an approved wastewater disposal facility.

The aqueous ammonia storage area will have spill containment and ammonia vapor detection equipment. Aqueous ammonia will be transported, and stored on site, in a 19 percent solution, by weight.

Safety showers and eyewashes will be provided in the vicinity of all chemical storage and use areas. Hose connections will be provided near the chemical storage and feed areas to flush spills and leaks to the plant wastewater collection system. Approved personal protective equipment will be used by plant personnel during chemical spill containment and cleanup activities. Personnel will be properly trained in the handling of these chemicals and instructed in the procedures to follow in case of a chemical spill or accidental release. Adequate supplies of absorbent material will be stored onsite for spill cleanup.

A list of the chemicals anticipated to be used at the generating facility and their locations is provided in the Hazardous Materials Handling section (Section 8.5). This list identifies each chemical by type, intended use, and estimated quantity to be stored onsite.

2.1.11 Emission Control and Monitoring

Air emissions from the combustion of natural gas in the CTGs will be controlled using state-of-the-art systems. Emissions that will be controlled include NO_x, volatile organic compounds (VOCs), CO, and particulate matter. Section 8.1, Air Quality, includes additional information on emission control and monitoring.

2.1.11.1 NO_x Emission Control

Selective catalytic reduction will be used to control NO_x concentrations in the exhaust gas emitted to the atmosphere to 2.5 ppmvd at 15 percent oxygen from the gas turbines/SCRs. The SCR process will use aqueous ammonia. Ammonia slip, or the concentration of unreacted ammonia in the exiting exhaust gas, will be limited to 5 ppmvd at 15 percent oxygen from the catalyst housing. The SCR equipment will include a reactor chamber, catalyst modules, ammonia storage system, ammonia vaporization and injection system, and monitoring equipment and sensors.

2.1.11.2 Carbon Monoxide

An oxidizing catalytic converter will be used to reduce the CO concentration in the exhaust gas emitted to the atmosphere to 6 ppmvd at 15 percent oxygen from the gas turbines.

2.1.11.3 Particulate Emission Control

Particulate emissions will be controlled by the use of natural gas, which is low in particulates, as the sole fuel for the CTGs.

2.1.11.4 Continuous Emission Monitoring

Continuous emission monitors (CEMs) will sample, analyze, and record fuel gas flow rate, NO_x and CO concentration levels, and percentage of O_2 in the exhaust gas from the three catalyst housing stacks. This system will generate reports of emissions data in accordance with permit requirements and will send alarm signals to the plant distributed control system (DCS) when emissions approach or exceed pre-selected limits.

2.1.12 Fire Protection

The fire protection system will be designed to protect personnel and limit property loss and plant downtime in the event of a fire. Fire water will be supplied via a 10-inch-diameter connection with an existing water line in a utility easement immediately adjacent to and north of the SVEP site. This connection will be sized in accordance with National Fire Protection Association (NFPA) guidelines to provide 2 hours of protection from the onsite worst-case single fire (2,000 gpm).

Fire water from the fire water main will be provided to a dedicated underground fire loop piping system. Both the fire hydrants and the fixed suppression systems will be supplied from the fire water loop. Fixed fire suppression systems will be installed at determined fire risk areas. Sprinkler systems will also be installed in the Administration/Maintenance Building as required by NFPA and local code requirements. The CTG units will be protected by a CO_2 fire protection system. Hand-held fire extinguishers of the appropriate size and rating will be located in accordance with NFPA 10 throughout the facility. The cooling tower will be constructed of wood and will include a fire protection sprinkler system and a wetting pump to keep the wood wet during periods of inactivity. The project will include a diesel fire pump if the Los Angeles County Fire Department determines this to be necessary.

Section 8.5, Hazardous Materials Handling, includes additional information for fire and explosion risk, and Section 8.10, Socioeconomics, provides information on local fire protection capability.

2.1.13 Plant Auxiliaries

The following systems will support, protect, and control the generating facility.

2.1.13.1 Lighting

The lighting system provides personnel with illumination for operation under normal conditions and for egress under emergency conditions, and includes emergency lighting to perform manual operations during an outage of the normal power source. The system also provides 120-volt convenience outlets for portable lamps and tools.

2.1.13.2 Grounding

The electrical system is susceptible to ground faults, lightning, and switching surges that result in high voltage that constitute a hazard to site personnel and electrical equipment. The station grounding system provides an adequate path to permit the dissipation of current created by these events.

The station grounding grid will be designed for adequate capacity to dissipate heat from ground current under the most severe conditions in areas of high ground fault current concentration. The grid spacing will maintain safe step voltage gradients.

Bare conductors will be installed below-grade in a grid pattern. Each junction of the grid will be bonded together by an exothermic weld or compression connection.

Ground resistivity readings will be used to determine the necessary numbers of ground rods and grid spacing to ensure safe step and touch potentials under severe fault conditions.

Grounding stingers will be brought from the ground grid to connect to building steel and non-energized metallic parts of electrical equipment.

2.1.13.3 Distributed Control System

The DCS provides modulating control, digital control, monitoring, and indicating functions for the plant power block systems.

The following functions will be provided:

- Controlling the CTGs and other systems in a coordinated manner
- Controlling the balance-of-plant systems in response to plant demands
- Monitoring controlled plant equipment and process parameters and delivery of this information to plant operators
- Monitoring the CTG CEMs units for critical alarms, and collecting data for historical log-in
- Providing control displays (printed logs, operator interface) for signals generated within the system or received from input/output (I/O)
- Providing consolidated plant process status information through displays presented in a timely and meaningful manner
- Providing alarms for out-of-limit parameters or parameter trends, displaying on operator interface units and recording on an alarm log printer
- Providing storage and retrieval of historical data

The DCS will be a redundant microprocessor-based system and will consist of the following major components:

- LCD flat screen operator displays

- Engineer work station
- Distributed processing units
- I/O cabinets
- Historical data unit
- Printers
- Data links to the combustion turbine

The DCS will have a functionally-distributed architecture comprising a group of similar redundant processing units linked to a group of operator consoles and the engineer work station by redundant data highways. Each processor will be programmed to perform specific dedicated tasks for control information, data acquisition, annunciation, and historical purposes. By being redundant, no single processor failure can cause or prevent a unit trip.

The DCS will interface with the control systems furnished by the CTG supplier to provide remote control capabilities, as well as data acquisition, annunciation, and historical storage of turbine and generator operating information.

The system will be designed with sufficient redundancy to preclude a single device failure from significantly affecting overall plant control and operation. This also will allow critical control and safety systems to have redundancy of controls, as well as an uninterruptible power source.

2.1.13.4 Cathodic Protection

The cathodic protection system will be designed to control the electrochemical corrosion of designated metal piping buried in the soil. Depending upon the corrosion potential and the site soils, either passive or impressed current cathodic protection will be provided.

2.1.13.5 Freeze Protection

Not required.

2.1.13.6 Service Air

The service air system will supply compressed air to hose connections for general plant use. Service air headers will be routed to hose connections located at various points throughout the facility.

2.1.13.7 Instrument Air

The instrument air system provides dry air to pneumatic operators and devices. An instrument air header will be routed to locations within the facility equipment areas and within the water treatment facility where pneumatic operators and devices will be located.

2.1.14 Interconnect to Electrical Grid

The five CTGs will connect with an approximately 600-foot-long 115 kV transmission line to SCE's Valley Substation.

2.1.15 Project Construction

Construction of the generating facility, from site preparation and grading to commercial operation, is expected to take place from March 2007 to August 2008. Major milestones are listed in Table 2.1-2.

TABLE 2.1-2
Project Schedule Major Milestones

Activity	Date
Begin Construction	Spring 2007
Startup and Test	Spring 2008
Commercial Operation	August 2008

There will be an average monthly and peak monthly workforce of approximately 220 and 408, respectively, of construction craft people, supervisory, support, and construction management personnel onsite during construction (see Table 8.10-8 in the Socioeconomics section).

Construction will be scheduled to occur between 7 a.m. and 7 p.m., Monday through Saturday. Additional hours may be necessary to make up schedule deficiencies, or to complete critical construction activities. During some construction periods and during the startup phase of the project, some activities will continue 24 hours per day, 7 days per week.

The peak construction site workforce level is expected to last from Month 6 through Month 9 of the construction period.

Table 2.1-3 provides an estimate of the average and peak construction traffic during the 12-month construction period.

TABLE 2.1-3
Average and Peak Construction Traffic

Vehicle Type	Average Daily Trips	Peak Daily Trips
Construction Workers	220	408
Delivery	5	8
Heavy Trucks	5	10
Total	**230**	**426**

Construction laydown and parking areas will be within existing site boundaries, east of the power block area. Construction access will be from Matthews Road, as shown on Figure 2.1-1. Materials and equipment will be delivered by truck.

2.1.16 Generating Facility Operation

SVEP will be operated by two operators per shift, plus two relief operators and one maintenance technician, for a total staff of nine. The facility will be capable of being dispatched throughout the year, but is expected to operate primarily during the utility-defined on-peak and mid-peak periods.

SVEP is designed as a peaking facility to serve load during periods of high demand, which generally occur during daytime hours, and more frequently during the summer than other portions of the year. However, because the LMS100 CTGs are more efficient than any previous peaking generators, and more efficient that any of the aging gas-fired steam generation facilities in Southern California, SVEP will be economical to operate more than is typical for peaking generators, and will operate on the order of approximately a 20 to 40 percent annual capacity factor. The actual capacity factor in any month or year will depend on weather-related customer demand, load growth, hydroelectric supplies, generating unit retirements and replacements, the level of generating unit and transmission outages, and other factors. All of the electricity produced by the plant will be sold under contract or on a merchant basis to the power market. The exact operational profile of the plant will be dependent on weather conditions and the power purchaser's economic dispatch decisions.

Because the capacity will be sold through contract and the prices that will be offered for spot purchases are unknown at this time, the exact mode of operation cannot be described. It is conceivable, however, that the facility could be operated in one or all of the following modes:

- **Summer Design Load**. The facility would be operated at maximum continuous output for as many hours per year as dispatched by the power purchaser. As the facility is designed to be a peaking facility, it is expected to operate only during high ambient temperature periods and/or periods of peak demand.
- **Load Following**. The facility would be available at contractual load but operated at less than maximum available output at high load times of the day. The output of each unit would therefore be adjusted periodically, either by schedule or automatic generation control, to meet whatever load proved profitable to the power purchaser or necessary by CAISO.
- **Partial Shutdown**. Less than all five CTGs would be operating at full load or in load following mode, and the remaining units would be shut down. If the shutdown units are not undergoing maintenance, they will in most cases be available to the power purchaser and the CAISO as non-spinning reserve units. This mode of operation can be expected to occur during average- to low-load hours (off-peak hours, weekends, and shoulder months).
- **Full Shutdown**. This would occur if forced by equipment malfunction, fuel supply interruption, transmission line disconnect, or scheduled maintenance of equipment common to all units. Because SVEP is a peaker, full shutdown for economic reasons would be expected for a majority of the off-peak hours of the year, although non-spinning reserve capability would still be available.

In the unlikely event of a situation that causes a longer-term cessation of operations, security of the facilities will be maintained on a 24-hour basis, and the California Energy Commission (CEC) will be notified. Depending on the length of shutdown, a contingency plan for the temporary cessation of operations may be implemented. Such contingency plan will be in conformance with all applicable LORS and protection of public health, safety, and the environment. The plan, depending on the expected duration of the shutdown, could include the draining of all chemicals from storage tanks and other equipment and the safe shutdown of all equipment. All wastes will be disposed of according to applicable LORS. If the cessation of operations becomes permanent, the plant will be decommissioned (see Section 4.0, Facility Closure).

2.2 Facility Safety Design

SVEP will be designed for safe operation. Potential hazards that could affect the facility include earthquake, flood, and fire. Facility operators will be trained in safe operation, maintenance, and emergency response procedures to minimize the risk of personal injury and damage to the plant**.**

2.2.1 Natural Hazards

The principal natural hazard associated with the SVEP site is earthquakes. The site is located in Seismic Risk Zone 4. Structures will be designed to meet the seismic requirements of CCR Title 24 and the latest edition of the California Building Code (CBC). (See Section 8.4, Geologic Hazards and Resources.) This section includes a review of potential geologic hazards, seismic ground motion, and potential for soil liquefaction due to ground-shaking. Potential seismic hazards would be mitigated by implementing the CBC construction guidelines. Appendix 10B, Structural Engineering, includes the structural seismic design criteria for the buildings and equipment.

Flooding is not a hazard of concern. According to the Federal Emergency Management Agency (FEMA), the site is not within either the 100- or 500-year flood plain. Section 8.15, Water Resources, includes additional information on the potential for flooding.

2.2.2 Emergency Systems and Safety Precautions

This section discusses the fire protection systems, emergency medical services, and safety precautions to be used by project personnel. Section 8.10, Socioeconomics, includes additional information on area medical services, and Section 8.16, Worker Safety, includes additional information on safety for workers. Appendices 10A through 10G contain the design practices and codes applicable to safety design for the project. Compliance with these requirements will minimize project effects on public and employee safety.

2.2.2.1 Fire Protection Systems

The project will rely on both onsite fire protection systems and local fire protection services.

2.2.2.1.1 Onsite Fire Protection Systems

The fire protection systems are designed to protect personnel and limit property loss and plant downtime from fire or explosion. The project will have the following fire protection systems.

CO_2 Fire Protection System

This system protects the combustion turbine, generator, and accessory equipment compartments from fire. The system will have fire detection sensors in all compartments. Actuating one sensor will provide a high-temperature alarm on the combustion turbine control panel. Actuating a second sensor will trip the combustion turbine, turn off ventilation, close ventilation openings, and automatically release the CO_2. The CO_2 will be discharged at a design concentration adequate to extinguish the fire.

Transformer Protection

A concrete fire wall is planned for each step-up transformer to limit a potential transformer fire to its concrete basin area.

Fire Hydrants/Hose Stations

This system will supplement the plant fire protection system. Water will be supplied from the plant underground fire water/domestic water system. The project will include a diesel fire pump if the Los Angeles County Fire Department determines this to be necessary.

Fire Extinguisher

The plant Administrative/Maintenance Building, water treatment facility, and other structures will be equipped with portable fire extinguishers as required by the local fire department.

2.2.2.1.2 Local Fire Protection Services

In the event of a major fire, the plant personnel will be able to call upon the local Fire Department for assistance. The Hazardous Materials Risk Management Plan (see Section 8.5, Hazardous Materials Handling) for the plant will include all information necessary to permit all fire-fighting and other emergency response agencies to plan and implement safe responses to fires, spills, and other emergencies.

2.2.2.2 Personnel Safety Program

SVEP will operate in compliance with federal and state occupational safety and health program requirements. Compliance with these programs will minimize project effects on employee safety. These programs are described in Section 8.16, Worker Safety.

2.3 Facility Reliability

This section discusses the expected facility availability, equipment redundancy, fuel availability, water availability, and project quality control measures.

2.3.1 Facility Availability

Because of SVEP's predicted high efficiency relative to other units traditionally used for peaking service, it is anticipated that the facility will normally be called upon to operate at annual capacity factors between 20 and 40 percent. Each combustion turbine will be designed to operate between 50 and 100 percent of base load to support dispatch service and automatic generation control in response to customer demands for electricity.

SVEP will be designed for an operating life of 30 years. Reliability and availability projections are based on this operating life. Operation and maintenance procedures will be consistent with industry standard practices to maintain the useful life status of plant components.

The percent of time that the power plant is projected to be operated is defined as the "service factor." The service factor considers the amount of time that a unit is operating and generating power, whether at full or partial load. CAISO market data available to the public is not sufficient to predict a difference between capacity factor and service factor. The projected service factor, which considers the projected percent of time of operation, differs from the equivalent availability factor (EAF), which considers the projected percent of energy production capacity achievable.

The EAF may be defined as a weighted average of the percent of full energy production capacity achievable. The projected EAF for SVEP is estimated to be approximately 92 to 98 percent.

The EAF, which is a weighted average of the percent of energy production capacity achievable, differs from the "availability of a unit," which is the percent of time that a unit is available for operation, whether at full load, partial load, or standby.

2.3.2 Redundancy of Critical Components

The following subsections identify equipment redundancy as it applies to project availability. A summary of equipment redundancy is shown in Table 2.3-1.

2.3.2.1 Simple-cycle Power Block

Five separate combustion turbine power generation trains will operate in parallel within the simple-cycle power block. Each CTG will provide approximately 20 percent of the total power block output. The major components of the simple-cycle power block consist of the following subsystems.

TABLE 2.3-1
Major Equipment Redundancy

Description	Number	Note
CTGs	Five trains	
Circulating water pumps	Two, 50 percent capacity	
Cooling tower	One, multi-cell tower	Cooling tower is multi-cell mechanical draft design
Demineralizer—RO Systems	Two, 60 percent trains	Rental ion exchange units, off-site regeneration.
Natural Gas Compressors	Three, 50 percent capacity	

2.3.2.1.1 Combustion Turbine Generator Subsystems

The combustion turbine subsystems include the combustion turbine, inlet air filtration and evaporative inlet cooling system, generator and excitation systems, and turbine control and instrumentation. The combustion turbine is comprised of a compressor section, a combustion section, and a turbine section. Air compressed in the compressor section of the combustion turbine is heated by the combustion of natural gas in the combustion section, and then allowed to expand in the turbine section, where the expansion turns the rotor to produce mechanical energy to drive the compressor and generator. Exhaust gas from the combustion turbine will be directed into an SCR to control NO_x emissions and an oxidation catalyst to control CO emissions. The generator will be air cooled. The generator excitation system will be a solid-state static system. Combustion turbine control and instrumentation (interfaced with the DCS) will cover the turbine governing system, and the protective system.

2.3.2.2 Distributed Control System

The DCS will be a redundant microprocessor-based system that will provide the following functions:

- Control the CTG, and other systems in response to unit load demands (coordinated control)
- Provide control room operator interface
- Monitor plant equipment and process parameters and provide this information to the plant operators in a meaningful format
- Provide visual and audible alarms for abnormal events based on field signals or software-generated signals from plant systems, processes, or equipment

The DCS will have functionally-distributed architecture comprising a group of similar redundant processing units linked to a group of operator consoles and an engineer workstation by redundant data highways. Each processor will be programmed to perform specific dedicated tasks for control information, data acquisition, annunciation, and historical purposes.

Plant operation will be controlled from the operator panel located in the control room. The operator panel will consist of two individual CRT/keyboard consoles and one engineering workstation. Each CRT/keyboard console will be an independent electronic package so that failure of a single package does not disable more than one CRT/keyboard. The engineering workstation will allow the control system operator interface to be revised by authorized personnel.

2.3.2.3 Demineralized Water System

Makeup to the demineralized water system will be from the reclaimed water storage tank. The demineralized water system will consist of two 60 percent capacity makeup RO and mixed-bed demineralizer trains. Demineralized water will be stored in one 100,000-gallon demineralized water storage tank.

2.3.2.4 Water Injection Makeup and Storage

The water injection makeup and storage subsystem will provide demineralized water storage and pumping capabilities to supply high-purity water for water injection. Major components of the system are the demineralized water storage tank, providing approximately a four-hour supply of demineralized water at peak load and two full-capacity, horizontal, centrifugal, cycle makeup water pumps.

2.3.2.5 Circulating Water System

The circulating water system will provide cooling water to three closed-cooling water heat exchangers, rated at 33 percent capacity each. Three closed-cooling water heat exchangers will supply water to cool the combustion turbine intercooler and lube oil systems. There will be two 50-percent-capacity circulating water pumps supplying water to the closed cooling water heat exchangers.

2.3.2.6 Compressed Air

The compressed air system comprises the instrument air and service air subsystems. The service air system supplies compressed air to the instrument air dryers and to hose connections for general plant use. The service air system will include three 50 percent capacity air motor-driven compressors, service air headers, distribution piping, and hose connections. The instrument air system supplies dry compressed air at the required pressure and capacity for all control air demands, including pneumatic controls, transmitters, instruments, and valve operators. The instrument air system will include two 100 percent capacity air dryers with prefilters and after filters, an air receiver, instrument air headers, and distribution piping.

2.3.3 Fuel Availability

Fuel for the facility will be supplied by SoCalGas. The project will connect with one or more of the three existing 30-inch natural gas pipelines owned by SoCalGas adjacent to the site. There is sufficient capacity in the transmission gas lines to supply SVEP under most demand conditions. Under conditions of extreme peak gas demand on San Diego Gas & Electric's (SDGE's) distribution system, full requirements firm gas supply to SVEP may be dependent on the delivery of gas to the south end of SDGE's distribution system at the Otay Mesa receipt point. The Otay Mesa receipt point is where re-gasified LNG deliveries from Sempra's Costa Azul LNG facility in Baja Mexico will be made. The Costa Azul facility is currently under construction and is projected to be in commercial operation on or before January 2008, well before SVEP will require natural gas. See Section 6.0, Natural Gas Supply, for a more detailed description.

2.3.4 Water Availability

Reclaimed water and potable water for SVEP will be provided by the Eastern Municipal Water District. The availability of water to meet the needs of SVEP is discussed in more detail in Section 7.0, Water Supply.

2.3.5 Project Quality Control

The Quality Control Program that will be applied to SVEP is summarized in this section. The objective of the Quality Control Program is to ensure that all systems and components have the appropriate quality measures applied during all project phases, including design, procurement, fabrication, construction, or operation. The goal of the Quality Control Program is to achieve the desired levels of safety, reliability, availability, operability, constructability, and maintainability for the generation of electricity.

The required quality assurance for a system is obtained by applying controls to various activities, according to the activity being performed. For example, the appropriate controls for design work are checking and review, and the appropriate controls for manufacturing and construction are inspection and testing. Appropriate controls will be applied to each of the various activities for the project.

2.3.5.1 Project Stages

For quality assurance planning purposes, the project activities have been divided into the following eight stages that apply to specific periods of time during the project.

1. **Conceptual Design Criteria**—Define the requirements and engineering analyses.
2. **Detail Design**—Prepare calculations, drawings, and lists needed to describe, illustrate, or define systems, structures, or components.
3. **Procurement Specification Preparation**—Compile and document the contractual, technical and quality provisions for procurement specifications for plant systems, components, or services.
4. **Manufacturer's Control and Surveillance**—Ensure that the manufacturers conform to the provisions of the procurement specifications.
5. **Manufacturer Data Review**—Review manufacturers' drawings, data, instructions, procedures, plans, and other documents to ensure coordination of plant systems and components, and conformance to procurement specifications.
6. **Receipt Inspection**—Inspect and review of product at the time of delivery to the construction site.
7. **Construction/Installation**—Inspect and review of storage, installation, cleaning, and initial testing of systems or components at the facility.
8. **System/Component Testing**—Controlled operation of generating facility components in a system to ensure that the performance of systems and components conform to specified requirements.

The design, procurement, fabrication, erection, and checkout of each generating facility system will progress through the eight stages defined above.

2.3.5.2 Quality Control Records

The following quality control records will be maintained:

- Project instructions manual
- Design calculations
- Project design manual
- Quality assurance audit reports
- Conformance to construction records drawings
- Procurement specifications (contract issue and change orders)
- Purchase orders and change orders
- Project correspondence

For procured component purchase orders, a list of qualified suppliers and subcontractors will be developed. Before contracts are awarded, the subcontractors' capabilities will be evaluated. The evaluation will consider suppliers' and subcontractors' personnel, production capability, past performance, financial strength, and quality assurance program.

During construction, field activities are accomplished during the last four stages of the project: receipt inspection, construction/installation, system/component testing, and plant operations. The construction contractor will be contractually responsible for performing the work in accordance with the quality requirements specified by contract.

The subcontractors' quality compliance will be surveyed through inspections, audits, and administration of independent testing contracts.

A plant operation and maintenance program, typical of a project this size, will be implemented by SVEP to control operation and maintenance quality. A specific program for this project will be defined and implemented during initial plant startup.

2.4 Laws, Ordinances, Regulations, and Standards

The applicable LORS for each engineering discipline are included as part of the Engineering Appendixes 10A through 10G.

SECTION 7.0

Water Supply

This chapter describes the quantity and quality of water required, the primary and back-up water supply sources, water quality, and wastewater discharges for the Sun Valley Energy Project (SVEP).

7.1 Water Supply and Use

The Eastern Municipal Water District (EMWD) will provide the industrial process water supply via a 12-inch reclaimed water supply pipeline that is located adjacent to and north of the project site in a utility easement. This pipe will supply tertiary treated Title 22 reclaimed water to meet cooling and process makeup requirements. Cooling and process demands include water for cooling tower evaporation, drift, and blow down; combustion turbine-generator (CTG) air inlet cooling; CTG wash water; CTG water injection for control of oxides of nitrogen (NO_x) and increased power output. A "will-serve" letter from the EMWD that describes the EMWD's commitment of reclaimed water supply to the project and to accept industrial and sanitary wastewater is included in Appendix 7A. One **nominal 180,000-** ~~150,000-~~gallon tank will be constructed on site to store reclaimed water.

Water required for potable uses (sinks, toilets, showers, drinking fountains, eye wash/safety showers, plant hose stations, etc.) will be provided from the water main in the utility easement immediately north of the project site.

The following water balances show the project's use of reclaimed and potable water:

- Base load operation under average ambient conditions (Figure 7.1-1)
- Peak load operation under summer ambient conditions (Figure 7.1-2)

Taking into account anticipated seasonal operation**,** ~~of~~ the SVEP will require **an estimated 1,372** ~~approximately 1,510~~ gallons per minute (gpm) of reclaimed water **as an annual average** ~~for operation at under average ambient conditions (62°F dry bulb temperature [DBT])~~. Under summer ambient conditions (**92°F** ~~97°F~~ DBT), the SVEP will require approximately **1,778** ~~1,704~~ gpm of reclaimed water for operation at peak load. Peak load operation assumes all CTGs operating at 100 percent load. On an annual ~~average~~ basis, the SVEP is estimated to require approximately **875** ~~851~~ ac-ft/yr of reclaimed water. SVEP potable water demands are estimated to average 3.0 gpm, less than 5 acre-feet per year.

Potable water for consumption and sanitary purposes will be provided through a 4-inch-diameter tap to the water main in a utility easement adjacent to and directly north of the project site.

7.2 Water Quality

Table 7.2-1 describes the quality of the reclaimed water that will be supplied to the project.

TABLE 7.2-1
Summary of Design Basis ~~Average~~ Water Quality Characteristics for Reclaimed Source Water

Water Quality Parameter	Reclaimed Water (cooling and process supply)[a]	Drinking Water Standard	Secondary Drinking Water Standard
General Parameters:			
Alkalinity (as $CaCO_3$)	~~123~~ **129**	no standard (mg/L)	
Hardness (as $CaCO_3$)	~~75~~ **254**	200 mg/L	
Nitrate as NO_3	~~31~~ **9.0**	45 mg/L	
pH	~~7.3~~ **6.1 – 8.1**	6.0 – 9.0 units	6.5 – 8.5
Total Dissolved Solids	~~676~~ **705**	1,500 mg/L	500 mg/L
Total Solids	~~678~~ **805**		
Turbidity	~~< 2 NTU~~ **2 – 50 NTU**	1-5 NTU	
Chemical Parameters:			
Arsenic	~~0.0022~~ **0.0019**	0.05 mg/L[b]	
Boron[b]	~~0.48~~ **0.52**	no standard (mg/L)	
Cadmium	~~0.00006~~ **0.000022**	0.005 mg/L	
Calcium	~~57.2~~ **65.3**	no standard (mg/L)	
Chloride	~~195~~ **230**	500 mg/L	250 mg/L
Chromium (total)	~~0.0047~~0.**0027**	0.05 mg/L (0.1 mg/L)	
Copper (at tap)	~~0.005~~ **0.004**	TT[c] action level 1.3 mg/L	1 mg/L
Fluoride	~~0.48~~ **0.55**	2 mg/L	2 mg/L
Iron	~~0.1~~ **0.17**	0.30 mg/L	0.3 mg/L
Lead (at tap)	~~0.00035~~ **0.0014**	TT[c] action level 0.015 mg/L	
Magnesium	~~18.3~~ **21.6**	no standard (mg/L)	
Manganese	~~0.048~~ **0.07**	no standard (mg/L)	0.05 mg/L
Mercury (inorganic)	~~0.000047~~ **0.00011**	0.002 mg/L	
Nickel	~~0.0139~~ **0.011**	no standard (mg/L)	
Potassium	~~16.9~~ **18.2**	no standard (mg/L)	
Silver	~~0.0006~~ **0.00015**	no standard (mg/L)	0.01 mg/L
Sodium	~~148~~ **151**	350 mg/L	
Sulfate	~~143~~ **166**	500 mg/L	250 mg/L
Zinc	~~0.14~~ **0.04**	no standard (mg/L)	5 mg/L

Source: U.S. Environmental Protection Agency. 2004. Drinking Water Standards and Health Advisories. Winter.

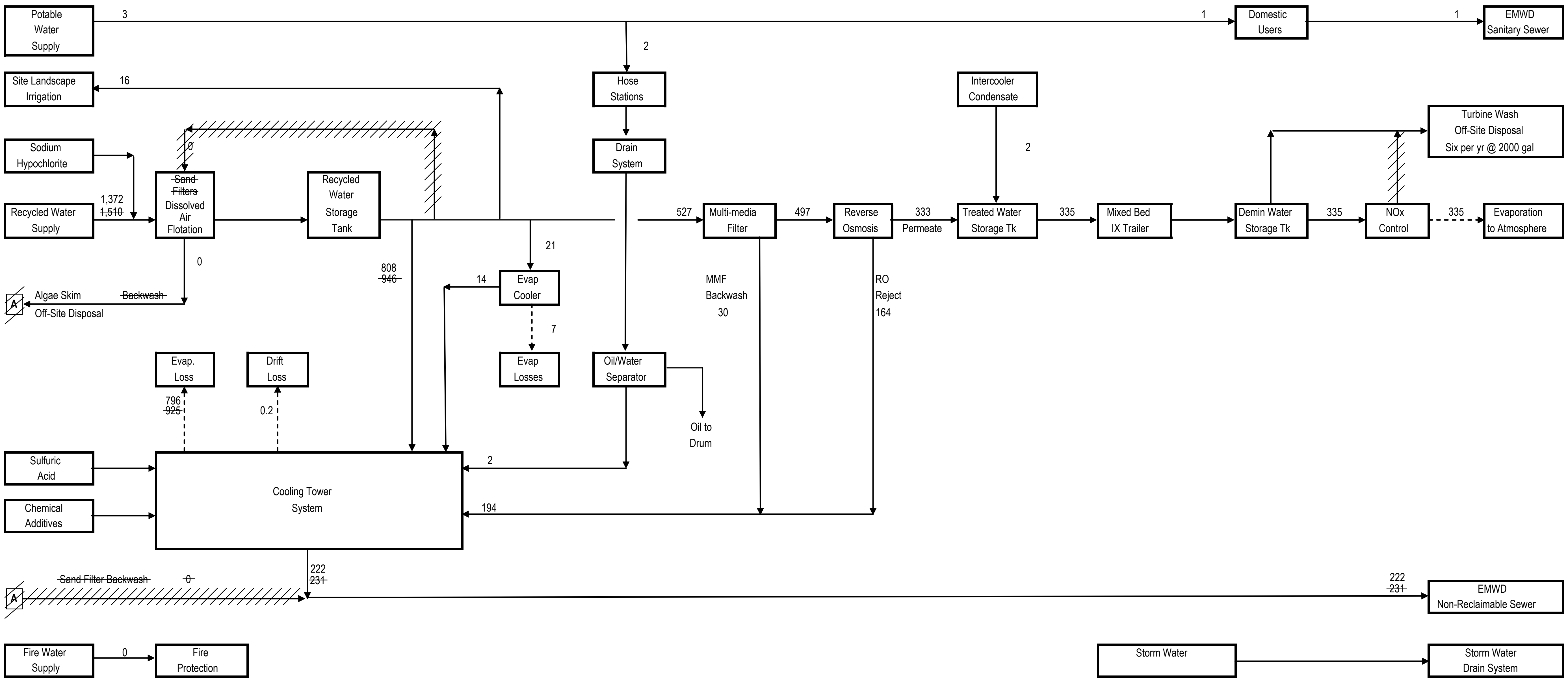
[a] Data are from Eastern Municipal Water District Regional Water Reclamation **Facilities** ~~Facility~~. Units are mg/L unless otherwise indicated.

[b] Arsenic standard will change to 0.01 mg/L as of 1/23/06. Boron standard is under review.

[c] TT = Treatment technique indicates that there is a required process to reduce the level of a contaminant in drinking water. The action level for copper is 1.3 mg/L. For lead it is 0.015 mg/L

[d] National Secondary Drinking Water Regulations (NSDWRs or secondary standards) are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as undesirable taste, odor, or color) in drinking water.

mg/L = milligrams per liter



Notes:

1. Numerical values represent steady state flow in gpm
2. Dissolved Air Flotation system is ~~Recycled Water Sand Filters are~~ used only during periods of high inlet turbidity
3. Cooling Tower Blowdown is estimated at normal maximum operating cycles of concentration (6.1 ~~5~~ X Recycle Water Supply concentration)
4. ~~Ambient temperature assumed for this water balance is 62 F DBT/54 F WBT~~

FIGURE 7.1-1
PLANT WATER FLOW — ANNUAL AVERAGE FLOW
SUN VALLEY ENERGY PROJECT
ROMOLAND, CALIFORNIA

CH2MHILL

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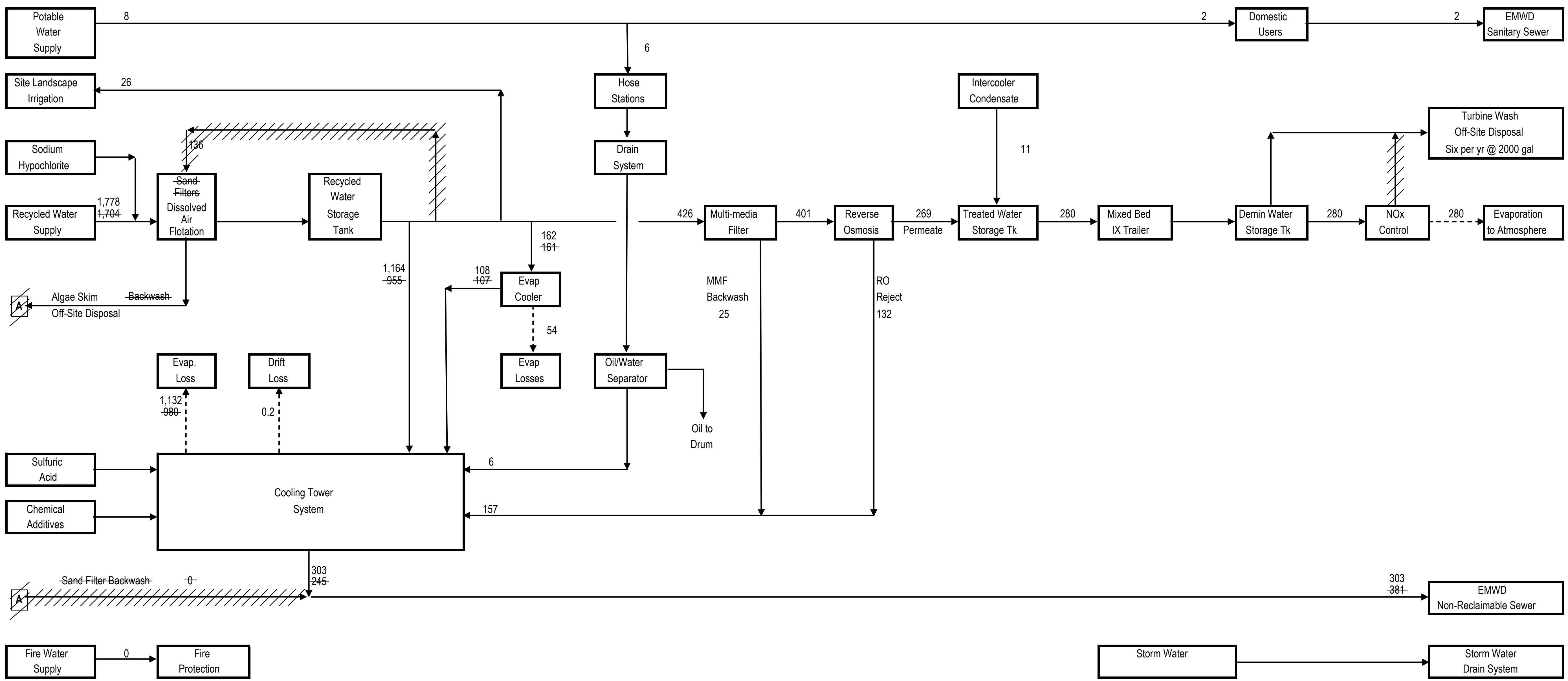

Notes:

1. Numerical values represent steady state flow in gpm
2. Dissolved Air Flotation System is ~~Recycled Water Sand Filters are~~ used only during periods of high inlet turbidity
3. Cooling Tower Blowdown is estimated at normal maximum operating cycles of concentration (5.8 ~~5~~ X Recycle Water Supply concentration)
4. Ambient temperature assumed for this water balance is 92 ~~97~~ F DBT/ 72 ~~67.3~~ F WBT

FIGURE 7.1-2
PLANT WATER FLOW — MAXIMUM DAILY FLOW
SUN VALLEY ENERGY PROJECT
ROMOLAND, CALIFORNIA

CH2MHILL

7.3 Water Treatment

Water treatment will be provided onsite prior to use for water injection. Demineralized water will be used for NO_x injection water. The demineralized water will be produced by a reverse osmosis (RO) and Ion Exchange (IX) system. The demineralized water will be stored in a 100,000-gallon demineralized water storage tank.

To remove suspended solids which may be produced from seasonal algae blooms in the Winchester reclaimed water storage reservoirs, the reclaimed water supply to the site will be treated on an as-needed basis with a dissolved air flotation (DAF) system. The DAF will be placed into service on high turbidity using a continuous analyzer in the reclaimed water supply pipe. The algae skimmings from the DAF will be collected in a skim tank and disposed of off-site. The clarified water will be pumped to the reclaimed water storage tank.

Makeup water will be pumped from the reclaimed water storage tank to the cooling tower basins as required to replace water lost from evaporation, drift, and blowdown. A chemical feed system will supply water conditioning chemicals to the circulating water to minimize corrosion and control the formation of mineral scale and biofouling. Sulfuric acid will be fed into the circulating water system in proportion to makeup water flow for alkalinity reduction to control the scaling tendency of the circulating water. The acid feed equipment will consist of a bulk sulfuric acid storage tank and two full-capacity sulfuric acid metering pumps.

To further inhibit scale formation, a polyacrylate solution will be fed into the circulating water system as a sequestering agent in an amount proportional to the circulating water blowdown flow. The scale inhibitor feed equipment will consist of a chemical solution bulk storage tank and two full-capacity scale inhibitor metering pumps.

To prevent biofouling in the circulating water system, sodium hypochlorite will be fed into the system. The hypochlorite feed equipment will consist of a bulk storage tank and two full-capacity hypochlorite metering pumps. A small storage tank, or 300-gallon totes, and two full-capacity metering pumps will be provided for the feeding of either stabilized bromine or sodium bromide as alternate biocides.

7.4 Wastewater Collection, Treatment, and Disposal

Circulating (or cooling) water system blowdown will consist of reclaimed makeup water and other recovered process wastewater sources that have been concentrated by evaporative losses in the cooling tower, and residues of the chemicals added to the circulating water. These chemicals will control scaling and biological growth in the cooling tower and corrosion of the circulating water piping and condenser tubes. Cooling water treatment will require the addition of a pH control agent (acid), a mineral scale dispersant (that is, polyacrylate polymer), corrosion inhibitors (phosphate based), and biocide (that is, sodium hydroxide or equivalent). The estimated quality of the circulating water is listed in Table 7.4-1. **A portion of this concentrated water will then be removed from the cooling tower via the blowdown to prevent the mineral scale formation on heat transfer surfaces.** Operating at **6.1** ~~5~~ cycles of concentration times the reclaimed water makeup quality, the volume of blowdown is expected to be about **222** ~~231~~ gpm under annual average climatic conditions and about **303** ~~245~~ gpm under maximum daily climatic conditions **operating at 5.8 cycles of concentration**. ~~A portion of this concentrated water will then be removed from the cooling tower via the blowdown to prevent the mineral scale formation on heat transfer surfaces.~~ **This** ~~The~~ non-reclaimable wastewater will be discharged to the non-reclaimable wastewater line, which will run 0.75 miles west to connect with the Inland Empire Energy Center non-reclaimable wastewater line. This pipeline will return the non-reclaimable wastewater through EMWD's system to the TVRI (Temescal Valley Regional Interceptor) and SARI (Santa Ana Regional Interceptor) pipeline system to the Orange County Sanitation District wastewater treatment plant, which discharges to an ocean outfall.

TABLE 7.4-1
Estimated Recirculating Cooling Water Composition at Design ~~Maximum~~ Concentration

Water Quality Parameter	Cooling Water Composition at Design ~~Maximum~~ Concentration*
General Parameters:	
Alkalinity (as $CaCO_3$)	100
Hardness (as $CaCO_3$)	~~1,612~~ **1,473**
Nitrate as NO_3	~~229~~ **52**
pH	7.6
Total Dissolved Solids	~~5,000~~ **4,089**
Total Solids	~~5,050~~ **4,139**
Turbidity	< 100 NTU
Chemical Parameters:	
Arsenic	~~0.016~~ **< 0.011**
Boron	~~3.55~~ **3.0**
Cadmium	~~0.0004~~ **< 0.00013**
Calcium	~~423~~ **379**
Chloride	~~1,442~~ **1,334**
Chromium, T	~~0.0348~~ **< 0.016**
Copper	~~0.037~~ **0.023**
Fluoride	~~3.55~~ **3.2**
Iron	~~0.74~~ **1.0**
Lead	~~0.00259~~ **< 0.0081**
Magnesium	~~135~~ **125**
Manganese	~~0.36~~ **0.41**
Mercury	~~0.000348~~ **< 0.00064**
Nickel	~~0.0103~~ **< 0.064**
Potassium	~~125~~ **106**
Silver	~~0.0044~~ **< 0.00087**

TABLE 7.4-1
Estimated Recirculating Cooling Water Composition at Design ~~**Maximum**~~ Concentration

Water Quality Parameter	Cooling Water Composition at Design ~~Maximum~~ Concentration*
Sodium	~~1,095~~ **876**
Sulfate	~~1,836~~ **1,580**
Zinc	~~1.035~~ **0.23**

* Assumes **5.8** ~~7.4~~ cycles of concentration as a **design** ~~maximum~~ concentration **at maximum daily flow conditions**. Units are mg/L unless otherwise indicated.

7.4.1 Cooling Tower Drift

Since high efficiency drift eliminators will be used in the cooling towers, the amount of total dissolved solids (TDS) emitted to the atmosphere will be very low. The drift quality is equivalent to the blowdown quality. The drift volume is typically expressed as a percentage of the circulating water rate (in this case 0.0005 percent of **32,500** ~~40,000~~ gpm, or 0.2 gpm). At **5.8** ~~5~~ cycles of concentration, the TDS in the drift is expected to be approximately **4,089** ~~3,380~~ mg/L.

The TDS emitted from the cooling tower in the form of drift is treated as a particulate emission (PM_{10}). In order to conservatively estimate the cooling tower particulate emissions, the TDS was assumed to be 5,000 mg/L. At a drift rate of 0.2 gpm, this is equivalent to about 0.5 pounds/hour of particulate emissions (see Section 8.1, Air Quality).

7.4.2 Sanitary Wastewater

Sanitary wastewater from sinks, toilets, showers and other sanitary facilities will be discharged to the sewer that runs adjacent to the project parcel. The sanitary wastewater flow will average about 1.0 gpm (1,440 gpd).

7.4.3 Plant Drainage

Miscellaneous general plant drainage will consist of cleanup, sample drainage, equipment leakage, and drainage from facility containment areas. Water from these areas will be collected in systems of floor drains, sumps, and pipes within the SVEP and discharged to an oil/water separator. The oil-free discharge water will be recycled to the cooling tower basin. An average flow of 2 gpm and a peak flow of 6 gpm are projected. The water will have essentially the same characteristics as the reclaimed water supplied to SVEP. The site plan in Appendix 7B shows plant drainage after construction and indicates how best management practices would be applied for storm water. Plant drainage and storm water discharge permitting is addressed further in Section 8.15, Water Resources. Appendix 7C contains a description of the water calculations used to determine the volume of storm water.

7.5 References

U.S. Environmental Protection Agency. 2004. *Drinking Water Standards and Health Advisories*. Winter.

8.15 Water Resources

This section provides a discussion of the existing water resources in the vicinity of the SVEP site and assesses the potential effects of project construction and operations on water resources. Specifically, this chapter discusses the SVEP and its potential effects in the following areas:

- Use of recycled water for cooling and process water
- Water supply and quality
- Disposal of waste water
- Compliance with federal, state, and local water policies
- Storm water discharge
- Flooding

Section 8.15.1 discusses the existing hydrologic environment. Potential environmental effects of the SVEP construction and operation on water resources are assessed in Section 8.15.2. Section 8.15.3 discusses proposed mitigation measures that will prevent significant impacts. A discussion of cumulative project impacts is presented in Section 8.15.4. Section 8.15.5 presents applicable LORS related to water resources. Section 8.15.6 lists relevant regulatory agencies and contacts. Section 8.15.6 discusses permits that relate to water resource, and lists the agencies that administer those permits and contacts at those agencies. References cited are listed in Section 8.15.7.

8.15.1 Affected Environment

8.15.1.1 Water Features, Rainfall, and Drainage

The project site is located near the unincorporated community of Romoland, California, approximately 22 miles southeast of Riverside, in Riverside County. The project site is located within the Menifee Valley portion of the San Jacinto River watershed, with limited surface drainage in the project area (Figure 8.15-1). The San Jacinto River watershed encompasses an area of 753 square miles and the San Jacinto River ends at Lake Elsinore, a terminal lake. Climate in the project area is semiarid. Long-term average rainfalls range from 10.85 inches at Moreno Valley to 12.96 inches at San Jacinto.

8.15.1.2 Groundwater

Groundwater underlying the project area is part of the 188,000-acre San Jacinto Groundwater Basin (SJGB). The SJGB is bounded on the north and northeast by the Box Mountains and the San Timoteo Badlands; on the east by the San Jacinto Mountains; and on the south by the Santa Rosa Hills and Bell Mountain (Figure 8.15-2).

The SJGB contains sediments that have filled valleys and underlying canyons incised into crystalline basement rock. The valley fill deposits are generally divided into younger and older alluvium (TechLink, 2002, as cited by California Department of Water Resources [DWR], 2004). Confined groundwater is found in the eastern part of the basin between the Casa Loma and Claremont fault (DWR, 1959; TechLink, 2002, as cited by DWR, 2004).

Recharge of the groundwater basin is primarily from percolation of flow in the San Jacinto River and its tributary streams, with some recharge occurring from infiltration of rainfall.

Groundwater extraction has produced groundwater depressions. From the 1970s through the 1990s groundwater levels have declined approximately 20 to 40 feet in the northern and southeastern parts of the basin, however during the 1970s through the 1980s, groundwater levels rose 80 to 200 feet in the western portion of the basin due to infiltration from Lake Perris (TechLink, 2002, as cited by DWR, 2004). Average extraction during 1984 through 1999 was estimated at 78,714 af/yr (TechLink, 2002, as cited by DWR, 2004).

8.15.1.3 Flooding Potential

The project site is currently classified as flood zone "C" by the Federal Emergency Management Agency (FEMA, 1996). Zone "C" is defined as areas of minimal flooding, and are considered moderate, minimal hazard areas (FEMA, 2005). Local floodplains are shown in Figure 8.15-3.

8.15.2 Environmental Consequences

Project effects on water resources can be evaluated relative to significance criteria derived from the CEQA Appendix G checklist. Under CEQA, the project is considered to have a potentially significant effect on water resources if it would:

- Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, in a manner which will result in substantial erosion or siltation on- or offsite, or in flooding on- or offsite.
- Create or contribute runoff water which will exceed the capacity of existing or planned storm water drainage systems, or provide substantial additional sources of polluted runoff.
- Violate any water quality standards or waste discharge requirements, or otherwise substantially degrade water quality.
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there will be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells will drop to a level which will not support existing land uses or planned uses for which permits have been granted).
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.
- Place within a 100-year flood hazard area structures that will impede or redirect flood flows.
- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.
- Cause inundation by seiche, tsunami, or mudflow.

8.15.2.1 Potable and Reclaimed Water Use

The average and maximum volume of water used by the SVEP are shown in the water balance diagram in Section 7.0, Water Supply as Figures 7.1-1 and 7.1-2, together with projected volumes of outflow of water either discharged to the non-reclaimable sewer system, sanitary sewer system, or lost to evaporation.

Potable and reclaimed water is supplied to the project area by the Eastern Municipal Water District (EMWD). The EMWD utilizes a variety of water supplies to meet the needs of its customers. Current supplies include imported water purchased from the Metropolitan Water District of Southern California, imported seasonal storage, locally produced groundwater, desalinated groundwater, and transfers. Current recycled water customers include: agricultural irrigators, golf courses, municipal irrigators (schools, parks, and greenbelts), and the California Department of Fish and Game's San Jacinto Wildlife Area.

Average and maximum daily and annual water demand for the SVEP are provided in Table 8.15-1. The reclaimed water supply will be treated with a **dissolved air flotation unit as required during the episodes of high turbidity followed by pumping** ~~90-minute contact time using sodium hypochlorite solution and pumped~~ to a recycled water storage tank. ~~This disinfection process will ensure that the reclaimed water meets the Title 22 criteria for recycled water.~~ The Title 22 recycled water will then be divided into supply for the cooling towers and supply for NO_x suppression injection and compressor evaporative cooling. Cooling water treatment may require the addition of chemicals such as a pH control agent (acid or caustic), a mineral scale dispersant (i.e., polyacrylate polymer), a corrosion inhibitor (phosphate based), and a biocide (hypochlorite or equivalent). The water to be used for NO_x suppression injection and compressor evaporative cooling will be further treated, beginning with a reverse osmosis system followed by an ion exchange system.

TABLE 8.15-1
Daily and Annual Water Usage for SVEP Operations

Water Use	Water Source	Daily Use (gpm[a])		Annual Use (ac-ft/yr [b])
		Average	Maximum	Average[c]
Process Water	EMWD	**1,372** ~~1,510~~	**1,778** ~~1,704~~	**875** ~~484~~
Potable Water Service	EMWD	3	8	1.2

[a] gpm = gallons per minute

[b] ac-ft/yr = acre-feet per year

[c] ~~Average~~ Annual Use is based on **anticipated operations over a full annual cycle** ~~equal to the average daily water use (averaged over all days in a year on which the plant is operating) multiplied by the number of hours the plant would operate per year under the base case operating scenario~~. See Chapter 2 for a full description of the operating parameters.

The SVEP provides a market use for recycled water produced by the EMWD, and does not require potable water use other than during emergencies and for *de minimus* onsite use. Therefore, impacts to water supplies would be less than significant.

During construction of the project, water will be required primarily for dust suppression. Because of the short duration of construction activities and the relatively limited water requirements of the construction phase of the project, no significant adverse impacts to water supply are expected to result.

The State Water Resources Control Board (SWRCB) Policy 75-58 specifies that to protect water quality and quantity, water rights applications for cooling water for power plants can only be approved if other sources of water are not feasible. This resolution applies to the use of inland surface waters for cooling purposes. Since the project proposes to use recycled water for cooling water and is not applying for new water rights, Policy 75-58 is not applicable to this project.

8.15.2.2 Wastewater Discharges and Disposal

Estimated average and maximum daily and annual wastewater discharge rates are provided in Table 8.15-2. EMWD is responsible for all sanitary sewer and industrial wastewater collection and treatment within its service area. EMWD operates five regional water recycling facilities treating over 32 mgd of wastewater each year. Wastewater flows are anticipated to increase to 56 mgd by the year 2020 (EMWD, 2000). Non-reclaimable wastewater (also called "brine") will also be produced by the EMWD water reclamation facilities and collected from the EMWD service area. The EMWD does not presently produce or collect non-reclaimable wastewater.

TABLE 8.15-2
Operational Wastewater Discharges from SVEP

		Daily Discharge (gpm[a])		Annual Discharge (MG/yr[b])
Waste Discharge Stream	**Discharge Location**	**Average Day Operation**	**Maximum Day Operation**	**Average Day Operation[c]**
Cooling tower blowdown ~~and sand filter backwash~~	Brine Line	**222** ~~231~~	**303** ~~381~~	**43.5** ~~39.5~~
Domestic wastewater	EMWD Sanitary Sewer	1	2	**0.2** ~~0.12~~

[a] gpm = gallons per minute

[b] MG/yr = million gallons per year

[c] ~~Average~~ Annual ~~Use~~ **Discharge** is **based on anticipated operations over a full annual cycle** ~~equal to the average daily water use [averaged over all days in a year on which the plant is operating] multiplied by the number of hours the plant would operate per year under the base case operating scenario. Maximum Annual Use is equal to the maximum daily water use multiplied by the maximum number of hours the plant would operate per year~~. See Chapter 2 for a full description of the operating parameters.

As discussed in Section 2.0, cooling tower blowdown will be discharged to the plant's wastewater sump as required to maintain the level of dissolved solids in the cooling water within acceptable ranges. Backwash water from **multi-media** ~~ultra~~ filters, reject water from the reverse osmosis unit, and wash water will ~~also~~ be **returned to the cooling tower for additional recovery** ~~discharged to the wastewater sump~~. ~~This~~ **The cooling tower blowdown** wastewater would then be conveyed through the Temescal Valley Regional Interceptor and Santa Ana Regional Interceptor pipeline systems to the Orange County Sanitation District's (OCSD) wastewater treatment plant, Plant No. 1, which discharges to an ocean outfall. The discharge would be permitted by EMWD.

Table 8.15-3 summarizes the estimated water quality of wastewater discharges to the non-reclaimable sewer system and the sanitary sewer system. The constituents listed below were selected based on OCSD's local discharge limits as implemented by the EMWD's Waste Discharge Permit. The table lists worst-case **peak hourly** discharge concentrations, based on **7.1** ~~7.4~~ cycles of concentration. Normal operation of the SVEP will be at **6.1** ~~5~~ cycles of concentration.

TABLE 8.15-3
Summary of Peak Hourly ~~Maximum~~ Water Quality Concentrations for Wastewater

Constituent	Wastewater* (mg/L)
pH (pH units)	7.6
Total Suspended Solids	5,050
Total Dissolved Solids	5,000
Arsenic	~~0.016~~ **0.014**
Cadmium	~~0.0004~~ **0.00016**
Chromium	~~0.0348~~ **0.0192**
Copper	~~0.037~~ **0.028**
Lead	~~0.00259~~ **0.00993**
Mercury	~~0.000348~~ **0.00078**
Nickel	~~0.0103~~ **0.078**
Silver	~~0.0044~~ **0.0011**
Zinc	~~1.035~~ **0.28**

* Assumes **7.1** ~~7.4~~ cycles of concentration as a maximum concentration.

Quality and quantity of industrial wastewater discharges to the EMWD/OCSD's non-reclaimable sewer system and sanitary sewer system must be in compliance with a Waste Discharge Permit to be issued by EMWD. The discharge would be required to meet the discharge limitations from the EMWD Waste Discharge Permit and other numeric and narrative standards discussed in the Applicable Laws and Ordinances section. Meeting these industrial discharge limitations indicates that water quality downstream of the treatment plant will be protected.

Domestic wastewater generated at the SVEP, estimated at 1 gpm average and 2 gpm maximum daily average, will be discharged to the EMWD sanitary sewer system. This volume would be considered a *de minimus* increase in demand on the sewer system, not measurable within the overall dry weather flow and well within the treatment, conveyance, and disposal capacities of EMWD's system.

The construction phase of SVEP will require no, or at least very minimal, dewatering. Water used for dust control, soil compaction, and equipment washing during construction will not result in discharge. Some water would be used for equipment and pipeline testing. Disposal of these low-threat wastewater flows will be consistent with SWRCB standards.

During the construction period, sanitary waste will be collected in portable toilets (no discharge) supplied by a licensed contractor for collection and disposal of sanitary wastes at an appropriate receiving facility.

8.15.2.3 Groundwater

The SVEP would not make any direct use of groundwater resources during construction or operation.

8.15.2.4 Storm Water Runoff and Drainage

The existing site is unpaved, and storm water runoff currently percolates to the ground. Construction of the SVEP will increase the impervious area of the project site, causing an increase in storm water runoff. This excess runoff will be collected on the project site in a storm water retention pond (see Section 2.0, Project Description, and Figure 2.2-1, General Arrangement). This storm water retention pond will collect storm water runoff from all parts of the SVEP site and will hold the water for percolation into the ground water. Appendix 7B includes drainage diagrams showing the project site both before and after construction, the direction of storm water flow after construction. Appendix 7C contains calculations used to determine the size of the storm water pond, which will be capable of containing the 25-year storm.

Construction wastewater could include storm water runoff, groundwater from dewatering, equipment wash down water, and water from pressure testing the gas lines. During construction, development and implementation of the site-specific Construction Storm Water Pollution Prevention Plan (SWPPP) will ensure that storm water runoff and construction wastewater do not present a risk of impact to water quality. Storm water pollution prevention measures during construction will include but not be limited to those established by the *Stormwater Best Management Practice Handbook for Construction* (California Stormwater Quality Association, 2003) and will potentially including such measures such as collecting all construction wastewater in a baker tanks for subsequent disposal, and placement of erosion and runoff containment to prevent accidental discharge or release of construction wastewater.

8.15.3 Cumulative Impacts

The SVEP will not cause or contribute to cumulative impacts on water resources. Good engineering practices and Best Management Practices (BMPs) will be used in the project design and operation. Storm water discharge will adhere to a SWPPP and Santa Ana Regional Water Quality Control Board (SARWQCB) and local agency water quality standards. No significant impacts to surface water or groundwater quality are expected during construction or operation of the project. The project will contribute to water conservation by making use of reclaimed water for power plant cooling.

8.15.4 Proposed Mitigation Measures

This section presents mitigation measures proposed to reduce impacts to water resources in areas affected by the project.

- Implement BMPs designed to minimize soil erosion and sediment transport during construction of the plant site and project corridor features. Design appropriate erosion and sediment controls for slopes, catch basins, culverts, stream channels, and other areas prone to erosion.

- Conduct operations at the plant site in accordance with the U.S. Environmental Protection Agency's (USEPA's) Storm Water Phase I Final Rule (for construction activities disturbing 1 acre or more). Design and implement the BMPs to prevent or control pollutants potentially associated with the operation of the plant from entering storm water sewers.
- Perform refueling and maintenance of mobile construction equipment only in designated lined and/or bermed areas located away from stream channels. Prepare and implement spill contingency plans in areas where they are appropriate.
- During construction of pipelines implement BMPs to control soil erosion.
- Prepare and submit a Title 22 Engineer's Report to the State Department of Health Services (DHS) and SARWQCB to ensure safe use of recycled water for the cooling water. Adhere to Reclamation Requirements issued by the SARWQCB.
- Prepare and submit an SWPPP to ensure quality of discharged storm water. Because the project is located in the San Jacinto watershed, an impaired water body, the SARWQCB, not the SWRCB, will issue the Waste Discharge Identification number and will review the SWPPP for construction and will also review the project's operational water management design.

The mitigation measures proposed are prescribed by storm water and erosion control management programs mandated under the National Pollutant Discharge Elimination System (NPDES) permitting system. These programs have been in place for a number of years and the prescribed measures have proven effective. Under the General NPDES Permit for Construction, for example, various specific measures are prescribed, and a program of monitoring is required. The programs are at least 90 percent effective, have been in place, for a number of years as mandated by the Clean Water Act, and have proven effective.

8.15.5 Applicable Laws, Ordinances, Regulations, and Standards

Federal, state, and local LORS applicable to water resources aspects of the SVEP are discussed in this section and summarized in Table 8.15-4.

TABLE 8.15-4
Laws, Ordinances, Regulations, and Standards Applicable to SVEP Water Resources

LORS	Applicability	How Conformance Is Achieved
Federal		
Clean Water Act (CWA)/Water Pollution Control Act. P.L. 92-500, 1972; amended by Water Quality Act of 1987, P.L. 100-4 (33 USC 466 et seq.); National Pollutant Discharge Elimination System (NPDES) (CWA, Section 402); Toxic and Pretreatment Effluent Standards (CWA, Section 307)	Prohibits discharge of pollutants to receiving waters unless the discharge is in compliance with an NPDES permit. Applies to all wastewater discharges, including industrial wastewater, storm water runoff and dewatering, during both construction and operation. Sets forth pretreatment requirements for the industrial discharges into publicly-owned treatment works.	Compliance with state implementation requirements as indicated by the California Regional Water Quality Control Board, Santa Ana Region (see below under State).
State		
Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code, Sections 13000-14050),	Implements and enforces the federal NPDES permit program through conformance with beneficial uses and water quality objectives in the Basin Plan as well as conformance with any applicable Total Maximum Daily Load requirements and industrial pretreatment requirements.	Operational discharges of industrial and sanitary wastewater streams are conveyed to the EMWD & OCSD sewer system for treatment and disposal; discharges are regulated under an existing NPDES permit. Operational discharges of storm water runoff from the site are conveyed through the storm water sewer system; discharges are regulated under an existing NPDES permit.
California Water Code §13550 et seq. and State Water Resources Control Board Resolution 75-58	Encourages the conservation of water resources and the maximum reuse of wastewater, particularly in areas where water is in short supply.	CA Water Code §13550 et seq. provides that use of potable water for specified uses is a prohibited waste of water resources when recycled water is currently available, as defined in that section. The SVEP proposes to use recycled water for process and cooling water and is, therefore, in conformance with these code sections. Res. No. 75-58 applies only to use of inland surface waters for cooling; but because the SVEP would use recycled water for cooling, this does not apply to this project.
Title 22 of the CCR (Division 4, Chapter 15)	Sets forth requirements for treatment and quality of recycled water for cooling.	Recycled water will be disinfected tertiary recycled water, in conformance with Title 22 requirements.
Local		
Ordinance 59.5, Regulations for Waste Discharge and Sewer Use	Regulates all discharges to the EMWD sewer system.	The Applicant will comply with Ordinance 59.5 for all domestic wastewater discharges to the sewer system and will obtain a Waste Discharge Permit. The Applicant will comply with all permit conditions, including the following: discharge limitations, pretreatment requirements, peak flow restrictions, dewatering discharges, payment of fees, and monitoring and reporting requirements.

TABLE 8.15-4
Laws, Ordinances, Regulations, and Standards Applicable to SVEP Water Resources

LORS	Applicability	How Conformance Is Achieved
Ordinance 91, Regulations for Waste Discharge and Sewer Use	Regulates all nonreclaimable wastewater discharges to the EMWD sewer system.	The Applicant will comply with Ordinance 91 for all nonreclaimable wastewater discharges to the sewer system and will obtain a Waste Discharge Permit. The Applicant will comply with all permit conditions, including the following: discharge limitations, pretreatment requirements, peak flow restrictions, dewatering discharges, payment of fees, and monitoring and reporting requirements.
Order No. R8-220-0011, Waste Discharge Requirements	Regulates all discharges to the storm water sewer system.	The Applicant will comply with Order no. R8-220-0011 for all discharges to the storm water sewer system and will prepare a Water Quality Management Plan, as specified by the Riverside County Flood Control and Water Conservation District.

8.15.5.1 Federal Clean Water Act

The federal Clean Water Act and subsequent amendments, under the enforcement authority of the USEPA, was established "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." The CWA established the NPDES program to protect water quality of receiving waters. Under the Clean Water Act, Section 402, discharge of pollutants to receiving waters is prohibited unless the discharge is in compliance with an NPDES permit. In California, the USEPA has determined that the SWRCB and its nine Regional Water Quality Control Boards have sufficient authority under state law to administer and enforce the federal NPDES permitting program. Surface and ground water in the project vicinity are under the jurisdiction of the SARWQCB. Discharges of industrial wastewater from SVEP would flow to either Reclamation Plant No. 1 or Treatment Plant No. 2, both owned by the OCSD, which operates under an existing NPDES permit issued by the SARWQCB. Storm water from SVEP would flow to the Riverside County Flood Control and Water Conservation District storm collection system, which is regulated under an existing NPDES permit.

In addition, Section 307 of the Clean Water Act requires pretreatment of industrial discharges into publicly-owned treatment works. Industrial discharges from the SVEP would be subject to these requirements, as implemented and enforced by the EMWD, Ordinance 59.5. Because the industrial pretreatment standards would be enforced by the EMWD, they are discussed below under local regulations.

8.15.5.2 State

8.15.5.2.1 Porter-Cologne Water Quality Control Act and the Basin Plan

The Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) governs the regulation of water quality within California and establishes the authority of the SWRCB and the nine Regional Boards. The SARWQCB established regulatory standards and objectives for water quality in the *Santa Ana River Basin Water Quality Control Plan*, commonly referred to as the "Basin Plan" (SARWQCB, 1995). The Basin Plan identifies existing and potential beneficial uses and provides numerical and narrative water quality objectives designed to protect those uses.

8.15.5.2.2 Clean Water Act, Section 303d, Impaired Water Bodies

In accordance with Section 303(d) of the Clean Water Act, each state must present the USEPA with a list of impaired water bodies. The project site is located within the San Jacinto River Watershed. None of the main watercourses within the project area, Perris Valley Drain, San Jacinto River and Salt Creek are listed as impaired waters; however, Lake Elsinore, also located within the San Jacinto river watershed, is designated an impaired water body. Impaired waters are defined as those that do not meet water quality standards, even after point sources of pollution have implemented pollution control technology. The law requires the development of action plans, known as Total Maximum Daily Loads (TMDLs), to improve water quality of impaired water bodies. The TMDL is a calculation of the total amount of a pollutant that a water body can receive and still meet water quality objectives for a pollutant identified as causing impairment. The TMDL report allocates permissible quantities for discharge from specific sources. The pollutants that have been identified as causing impairment Lake Elsinore include organic enrichment/low dissolved oxygen, nutrients, and sediment and siltation (SARWQCB, 2002a).

8.15.5.2.3 Industrial Storm Water NPDES Permit

The SWRCB implements regulations under the federal Clean Water Act requiring that point source discharges (a point source discharge of storm water is a flow of rainfall runoff in some kind of discrete conveyance such as a pipe, ditch, channel, or swale) of storm water associated with industrial activity that discharge either directly to surface waters or indirectly through municipal separate storm sewers must be regulated by an NPDES permit (SWRCB, 1997). The SWRCB has issued Waste Discharge Requirements for discharges of storm water associated with industrial activities, such as the proposed project, and excluding construction activities. Urban runoff occurring within Riverside County is regulated under an existing NPDES permit (Order No. R8-2002-0011), as regulated by the SARWQCB. Industrial storm water discharge permits for SVEP will be administered by the SARWQCB.

8.15.5.2.4 Construction Storm Water NPDES Permit

The federal Clean Water Act effectively prohibits discharges of storm water from construction sites unless the discharge is in compliance with an NPDES permit. The SARWQCB has issued Order No. 01-34 which regulates storm water discharge associated with new developments (construction activities) including clearing, grading, and excavation activities that disturb one acre of total land area. This permit was issued specifically to regulate pollutants in discharges of associated with storm water associated with new development to surface waters tributary to Lake Elsinore and Canyon Lake (both located within the San Jacinto River Watershed) (SARWQCB, 2001). Within the San Jacinto watershed, the provisions of Order No. 01-34 supersede those of the SWRCB's General Storm Water Construction Activity (Water Quality Order No. 99-08-DWQ), also called the General Construction NPDES permit (SWRCB, 1999).

Order No. 01-34 requires SWPPPs for projects in the San Jacinto watershed, as does the General Construction NPDES permit, but contain additional SWPPP specifications. These include: (1) additional monitoring and reporting requirements, (2) a monitoring program, and (3) a post-construction management plan that must be submitted for approval in advance of construction activities, and (4) additional offset provisions. Approval under the NPDES permit for storm water discharge associated with construction activities is administered by the Riverside County Flood Control and Water Conservation District, and is discussed further below under “local policies.”

8.15.5.2.5 California Water Code Sections 13550, 13551, 461, and SWRCB Resolution No. 75-58

These water code sections and policy statements encourage the conservation of water resources and the maximum reuse of wastewater, particularly in areas where water is in short supply. California Water Code 13550, et seq., provides that use of potable water for specified uses is a prohibited waste of water resources when recycled water is available. The SVEP proposes to use recycled water for process and cooling water, as well as for dual plumbing, and therefore is in conformance with these code sections. State Water Resources Control Board Resolution 75-58 sets forth the state’s water quality control policy on the use and disposal of inland waters used for power plant cooling; this resolution applies only to uses of inland surface waters for cooling water. The SVEP proposes to use recycled water, not inland surface waters. Therefore, this resolution does not apply to the SVEP.

8.15.5.2.6 Title 22 Code of Regulations, Sections 60313 to 60316

The Department of Health Services established water quality standards and treatment criteria for water recycling under Title 22, Chapter 4 of the California Code of Regulations (CCR). Title 22 also specifies the reliability and redundancy for each recycled water treatment and use operation. For recycled wastewater piping, DHS has requirements for preventing backflow of recycled water into the potable water supply system and for avoiding cross-connection between recycled and potable water supply systems.

There will be no cross-connections of the SVEP recycled water and potable water systems. The SVEP will also provide equipment labels, signs, and notice for those pipelines carrying recycled water.

Valle del Sol Energy, LLC (VSE) will prepare an Engineer’s report in accordance with Title 22, Section 60323, which will include the following information:

- A detailed description of the intended use of the recycled water
- Plans and specifications of the recycled water system
- Methods to be used to ensure that the installation and operation of the dual-plumbed system will not result in cross-connections between the recycled water piping system and the potable water piping system. All recycled wastewater lines and valve boxes will be clearly identified to distinguish between recycled wastewater and potable water system.

8.15.5.3 Local Policies

8.15.5.3.1 Eastern Municipal Water District Ordinance No. 68.2

Ordinance 68.2 promotes the conservation and reuse of water resources and ensures maximum public benefit from the use of EMWD’s recycled water supply by regulating its use in accordance with applicable federal, state, and local regulations. This ordinance stipulates the conditions of service for the user, including any required CEQA compliance, service constraints, and operational and metering requirements. In accordance with Ordinance 68.2, the SVEP would be required to obtain a Recycled Water Agreement from

EMWD for the use of recycled water. The proposed use would require the approval of the Department of Health Services.

8.15.5.3.2 Eastern Municipal Water District Ordinance No. 59.5

The Clean Water Act requires that publicly-owned treatment works regulate the discharge of industrial wastes into a sewer system subject to an NPDES permit. Accordingly, the Eastern Municipal Water District has adopted detailed permit requirements for industrial dischargers. The discharge of any wastewater to EMWD's sewer system would be subject to the requirements of Ordinance No. 59.5, which regulates the quantity and quality of discharges to the sewer system. In accordance with Order 59.5, the SVEP would be required to obtain a Waste Discharge Permit (WDP) from EMWD for domestic wastewater disposal. The WDP would specify the detailed project-specific requirements applicable to the SVEP, including pretreatment standards, flow restrictions, and sampling, monitoring, and reporting requirements. The permit would be issued for a fixed time period, not to exceed 5 years.

8.15.5.3.3 Eastern Municipal Water District Ordinance No. 91

Ordinance 91 provides for the regulation of wastewater discharges into the Nonreclaimable Waste Line (NWL) in accordance with the Federal Government's objectives of general pretreatment regulations as stated in Section 403.2 of Title 40 CFR. The ordinance was enacted pursuant to the authorization of the Municipal Water District Law of 1911, California Water Code Section 71000 et seq., California Government Code Section 6500 et seq., the Clean Water Act (33 U.S.C. 1251 et seq.) and the General Pretreatment Regulations (40 CFR 403) (EMWD, 2002). In accordance with Order 59.5, the SVEP would be required to obtain a WDP from EMWD for the disposal of the nonreclaimable water to the NWL. The WDP would specify the detailed project-specific requirements applicable to the SVEP, including pretreatment standards, flow restrictions, and sampling, monitoring, and reporting requirements. The permit would be issued for a fixed time period, not to exceed 5 years.

8.15.5.3.4 County of Riverside, Water Quality Management Plan

The Riverside County Flood Control and Water Conservation District, acting as the main permittee for Order No. R8-2002-0011, has developed a Water Quality Management Plan (WQMP) identifying BMPs, including design standards for source controls and structural BMPs that are to be applied to new development. The WQMP addresses regional and sub-regional source controls and structural BMPs and provides guidelines for site specific, post-construction BMPs to address management of urban runoff quantity and quality. The WQMP addresses management of urban runoff quality for new development projects, including industrial and commercial development where the land area is 100,000 square feet, or more. The WQMP specifies at which point in the land use approval process the provisions of the WQMP should be considered (SARWQCB, 2002a).

8.15.6 Permits Required, Agencies, and Agency Contacts

A summary of required permits and agency contacts is provided in Table 8.15-5.

TABLE 8.15-5
Water Resources Permits Required for SVEP

Permit	Schedule	Agency
NPDES General Permit for Storm Water Discharges Associated with Construction Activities	Submit Notice of Intent 30 days prior to start of construction.	Santa Ana Regional Water Quality Control Board 3737 Main St. Suite 500 Riverside, CA 92501 (951) 782-4130
NPDES General Permit for Storm Water Discharges Associated with Industrial Activities	Submit Notice of Intent 30 days prior to start of operation.	Santa Ana Regional Water Quality Control Board 3737 Main St. Suite 500 Riverside, CA 92501 (951) 782-4130
Waste Discharge Permit for disposal of domestic wastewater	Submit application 60 days prior to the date upon which any discharge will begin or commence	Eastern Municipal Water District 2270 Trumble Road P.O. Box 8300 Perris, CA 92572-8300
Waste Discharge Permit for disposal of nonreclaimable wastewater	Submit application 90 days prior to the date upon which any discharge will begin or commence	Eastern Municipal Water District 2270 Trumble Road P.O. Box 8300 Perris, CA 92572-8300
Compliance with Water Quality Management Plan requirements	Submit application minimum of 30 days prior to start of operation.	Riverside County Flood Control and Water Conservation District 1995 Market Street Riverside, CA 92501
Encroachment Permit for Storm Drain Connection	Submit application minimum of 30 days prior to start of operation.	Riverside County Flood Control and Water Conservation District 1995 Market Street Riverside, CA 92501

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