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Applicant's Supplemental Response #2 to CEC Staff Data Request Set 1A (Nos. 5, 8, 15, 16, 22, 43, 55, and 57) for the APPLICATION FOR CERTIFICATION for the Rio Mesa Solar Electric Generating Facility (Rio Mesa SEGF)

(11-AFC-04)




Submitted to:

CALIFORNIA ENERGY COMMISSION
1516 9th Street, MS15
Sacramento, CA 95814-5504

Submitted by:

RIO MESA SOLAR I, LLC
RIO MESA SOLAR II, LLC
RIO MESA SOLAR III, LLC
1999 Harrison Street, Suite 2150
Oakland, CA 94612

APRIL 16, 2012

URS

April 16, 2012

Pierre Martinez
Project Manager
Systems Assessment & Facility Siting Division
California Energy Commission
1516 Ninth Street, MS-15
Sacramento, CA 95814

Subject: Supplemental Response #2 to CEC Staff Data Request Set 1A (#s 5, 8, 15, 16, 22, 43, 55, and 57) Rio Mesa Solar Electric Generating Facility (11-AFC-04)

Dear Mr. Martinez:

On behalf of Rio Mesa Solar I, LLC, Rio Mesa Solar II, LLC, and Rio Mesa Solar III, LLC, please find enclosed Supplemental Response #2 to CEC Staff Data Request Set 1A (#s 5, 8, 15, 16, 22, 43, 55, and 57) in response to Staff's Data Requests filed on February 7, 2012. Hard copies and/or electronic submittal will be sent to Staff and the Proof of Service list.

Sincerely,

Angela Leiba, Vice President
Senior Project Manager/ Environmental Department Manager

Enclosure

cc: POS List
Project File

Applicant's Supplemental Response #2 to CEC Staff Data Request Set 1A (Nos. 5, 8, 15, 16, 22, 43, 55, and 57)

for the

Application for Certification

for the

Rio Mesa Solar Electric Generating Facility

(11-AFC-04)

Submitted to the
California Energy Commission

Submitted by
Rio Mesa Solar I, LLC,
Rio Mesa Solar II, LLC,
and Rio Mesa Solar III, LLC

April 16, 2012

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Introduction

Attached are supplemental responses (Set 1A) by Rio Mesa Solar I, LLC, Rio Mesa Solar II, LLC, and Rio Mesa Solar III, LLC (collectively, "Applicant") to the California Energy Commission (CEC) Staff's data requests 5, 8, 15, 16, 22, 43, 55, and 57. The submittal of these materials is pursuant to Applicant's February 27, 2012 notice for more time under 20 Cal. Code Reg. Sec. 1716.

AFC figures or tables that have been revised have "R1" following the original number, indicating revision 1. Additional tables, figures, or documents submitted in response to this supplemental data response (supporting data, stand-alone documents such as plans, folding graphics, etc.) are found at the end of this Data Response Set and attached.

Air Quality (Nos. 5, 8, 15, 16, and 22)

Project Description

Background

The Applicant has completed a coordinated design review focused on opportunities to reduce environmental impacts and enhance plant efficiencies. The review identified such an opportunity termed as "Boiler Optimization". The Boiler Optimization modifies the proposed Rio Mesa Solar Electric Generating Facility (Rio Mesa SEGF) by reducing the number of auxiliary boilers to be installed at each power block from five to two. Additionally, a reduction of the number of mirror washing machines (MWM) due to recommendation of a slightly longer period between mirror washing events, and utilization of "on-road" certified engines in the larger MWMs also provides a net positive benefit to air quality.

These modifications produce the following environmental benefits when compared to the configuration in the AFC:

1. Reduced plant water usage
2. Reduced plant air emissions
3. Reduced plant parasitic load

Reduction in the Number of Boilers and Changed Power Block Arrangement

The Boiler Optimization reduces the number of boilers at each power block from five to two. The three, large auxiliary boilers will be eliminated, while the medium-sized and smallest boilers will remain. The operation of the remaining boilers will be modified to support the operation of the solar receiver steam generating system (SRSG) in a more efficient and effective manner.

The solar field and power generation equipment will start each morning after sunrise and will shut down when insolation drops below the level required to keep the turbine online. Each solar plant will include a 249 MMBtu/hr natural-gas-fired auxiliary boiler (the medium-sized boiler, previously called the "startup boiler") that will be used to pre-warm the SRSG to minimize the amount of time required for startup each morning, to assist during shutdown cooling operation, and to augment the solar operation during the evening shoulder period as solar energy diminishes. A small natural gas-fired nighttime preservation boiler will be retained and used to maintain system temperatures and steam seals overnight. The operation concepts are the same as originally proposed.

The removal of the large boilers reduces the facility-wide (combined fuel use for the three plants) annual natural gas use by about 33 percent compared with the original design. The reduced gas use recommended by Boiler Optimization will reduce forecast emissions of greenhouse gas and criteria pollutants for Rio Mesa SEGF under all scenarios. As a result of these changes, the general arrangement

of the power block has been revised. Figures 2-3-R1, 2-5-R1, and 2-8-R1 show the updated plot plan. In addition, Figures 2-9 a through d provide Boiler Optimization elevation drawings.

Minor design changes will be made to the systems described below.

Boiler Feedwater System

The boiler feedwater system transfers feedwater from the deaerator to the SRSG. The system will continue to consist of one turbine-driven (booster & main) pump, one motor-driven backup (booster & main) feedwater pump, and one motor-driven startup pump. However, the backup pump is now sized for 50% turbine load as opposed to 100% in the AFC. Separate boiler feedwater pumps will be provided with the night preservation and auxiliary boilers as before.

Condensate System

No design changes

Demineralized Water System

No design changes

Power Cycle Makeup and Storage

No design changes.

Summary

With implementation of the Boiler Optimization and related facility changes, impacts to Air Quality, Public Health, will continue to be less than significant, and actually result in a net beneficial effect on the environmental impacts when compared to the original plant design. The Boiler Optimization enhancements will have little to no effect on the majority of disciplines, as summarized below.

Air Quality

Reducing the number of boilers and related project changes will have a net positive effect on the environment compared to the impacts described in the AFC. The net reduction in air quality impacts reflect the Boiler Optimization and related changes in project design, as follows

- Reduction in projected support of gas fired supplemental generation allows eliminating the large 500 MMBtu/hr boilers. This does, however, require an increase in operation of the 249 MMBtu/hr auxiliary boiler (previously called the “startup boiler”). The reduction in natural gas usage and associated greenhouse gas emissions is depicted in Tables 1 and 2 below;
- Extending the mirror washing cycle times to three weeks reduces the required number of MWM;
- Using certified on-road engines instead of certified off-road engines in the larger vehicles results in fewer emissions per vehicle as the allowable emissions for on-road certification is less than that for off-road certification. See Tables 3 and 4 below; and

- Slight increase the size of the common area emergency fire pump engine of approximately 20HP will result in a slight increase in emissions from this source. The change was due to the addition of a small water treatment building in the Common Area.

The overall conclusions presented in the AFC have not changed: using the criteria employed by California's Air Districts and by USEPA, the project's emissions will not cause or contribute significantly to a violation of any ambient air quality standards, do not trigger requirements for offsets or BACT, and will have less-than-significant impacts for all pollutants under CEQA. The proposed Boiler Optimization will not subject the project to any new LORS.

Boiler Optimization will reduce maximum annual natural gas fuel use at the facility, as shown in Table 1.

Table 2 shows that annual criteria pollutants and the annual GHG emissions will also be reduced under the Boiler Optimization. The detailed stationary equipment emission calculations are included in Attachment AQ-1, Appendix 5.1B.

Table 1
Maximum Facility Natural Gas Fuel Use, Total, All Plants (Mmbtu)

Averaging Period	Original (AFC) Design	Optimized Design
Per Day	19,854	4,694
Per Year	1,679,220	1,119,532

Table 2
Annual Emissions for Stationary Equipment, Total, All Plants (Tons Per Year)

Pollutant	Original (AFC) Design	Optimized Design
NOx	13.8	12.5
SO_2	1.8	1.2
CO	30.6	19.4
VOC	5.1	4.7
$PM_{10}/PM_{2.5}$	4.5	3.2
CO_2e	99,122	66,753

Emissions of most pollutants from mirror cleaning activities will also be reduced as a result of the Boiler Optimization and related enhancements, as shown in Table 3. The detailed MWM emission calculations are included in Attachment AQ-1, Appendix 5.1B.

Table 3
Annual Emissions for Mirror Cleaning Activities, All Plants (Tons Per Year)

Pollutant	Original (AFC) Design	Optimized Design
NOx	20.5	1.1
SO_2	0.37	0.3
CO	6.0	0.4
VOC	9.8	0.5
PM_{10}	5.6	9.5[a]
$PM_{2.5}$	1.2	0.9
DPM	0.7	0.03
CO_2e	38,509	32,093

[a] The higher PM_{10} emissions are due to an increase in fugitive dust emissions from the MWMs

As shown in Table 4, the maximum modeled criteria pollutant impacts for the Boiler Optimization without MWMs will be equal to or lower than the maximum modeled impacts shown in the AFC, with the exception of NO_2 1-hr (98^{th} ptl) impacts. The increase in NO_2 1-hr (98th ptl) impacts is primarily due to the short-term impacts from the emergency generator engine located in the southernmost power block which, under the Boiler Optimization Design, is located closer to the project boundary. While maximum NO_2 1-hr (98th ptl) impacts have increased, they remain below the national ambient air quality standard of 188 $\mu g/m^3$.

Adding the MWMs to the Boiler Optimization stationary equipment impacts results in no change to the impacts for some pollutants, small increases in annual NO_2 and 24-hr SO_2 impacts, and larger increases in 24-hr/annual $PM_{10}/PM_{2.5}$ impacts. The increases in $PM_{10}/PM_{2.5}$ impacts are due to the fugitive dust emissions from the operation of the MWMs. The higher impacts would not change any of the conclusions presented in the AFC; namely, that Project impacts alone for all modeled pollutants are expected to be below the most stringent state and national standards. With the exception of the 24-hour and annual average PM_{10} standards, Project impacts are not expected to cause an exceedance of state or federal ambient air quality standards. However, the background state 24-hour and annual PM_{10} standards are exceeded in the absence of the emissions for the Project. The emission rates/stack parameters used for the Boiler Optimization modeling analysis are included in Attachment AQ-1, Appendix 5.1D. The modeling input/output files are provided in the enclosed compact disc.

Table 4
Maximum Modeled Impacts

Pollutant	Averaging Period	Project Impact, Original (AFC) Design, without MWMs[a] (µg/m^3)	Project Impact, Optimized Design, without MWMs[b] (µg/m^3)	Project Impact, Optimized Design, with MWMs[c] (µg/m^3)
NOx	1-hr (max)	194	165	165
	1-hr (98th percentile)	149	158	158
	Annual	0.08	0.08	0.09
SO_2	1-hr	10	2	2
	3-hr	4	0.9	0.9
	24-hr	2	0.06	0.07
	Annual	0.01	0.01	0.01
CO	1-hr	237	156	156
	8-hr	45	11	11
PM_{10}	24-hr	0.8	0.2	2.0
	Annual	0.02	0.02	0.59
$PM_{2.5}$	24-hr	0.8	0.2	0.3
	Annual	0.02	0.02	0.07

[a] AFC analysis did not include MWMs and assumed that the emergency engines would not be tested on a day when the 500 MMBtu/hr auxiliary boilers were in operation. Modeling results represent the higher of emergency engine or boiler impacts for short-term (24-hour or less) impacts.
[b] Analysis of Boiler Optimization assumes that emergency engines may operate concurrently with 249 MMBtu/hr auxiliary boilers.
[c] Modeling results represent total impacts from boilers, emergency engines, and MWMs.

Public Health

Boiler Optimization will reduce the public health impacts of the proposed project compared to the impacts described in the AFC. These impacts will continue to be less than significant. No LORS will change as a result of the proposed enhancements. Potential public health impacts associated with the project will remain below significant impact thresholds, as shown in Table 5. The emission rates/stack parameters used for the Boiler Optimization screening level risk assessment are included in Attachment AQ-1, Appendix 5.1D. The modeling input/output files are provided in the enclosed compact disc.

Table 5
Potential Health Risks From the Operation Of The Project

	Original AFC Design[a] without MWMs	**Boiler Optimization without MWMs**	**Boiler Optimization with MWMs**	**Significance Thresholds**	**Significant?**
Maximum Incremental Cancer Risk (MICR) at Point of Maximum Impact (PMI)	1.4 in one million	0.7 in one million	0.8 in one million	10 in one million	No
MICR at Residential Receptor	0.1 in one million	0.1 in one million	0.2 in one million	10 in one million	No
Maximally Exposed Individual Worker (MEIW) at PMI	0.2 in one million	0.1 in one million	0.1 in one million	10 in one million	No
Acute Inhalation Health Hazard Index: 1-hour	0.003	0.0007	0.0007	1.0	No
Acute Inhalation Health Hazard Index: 8-hour	0.002	0.0007	0.0007	1.0	No
Chronic Inhalation Health Hazard Index	0.0007	0.0003	0.0004	1.0	No

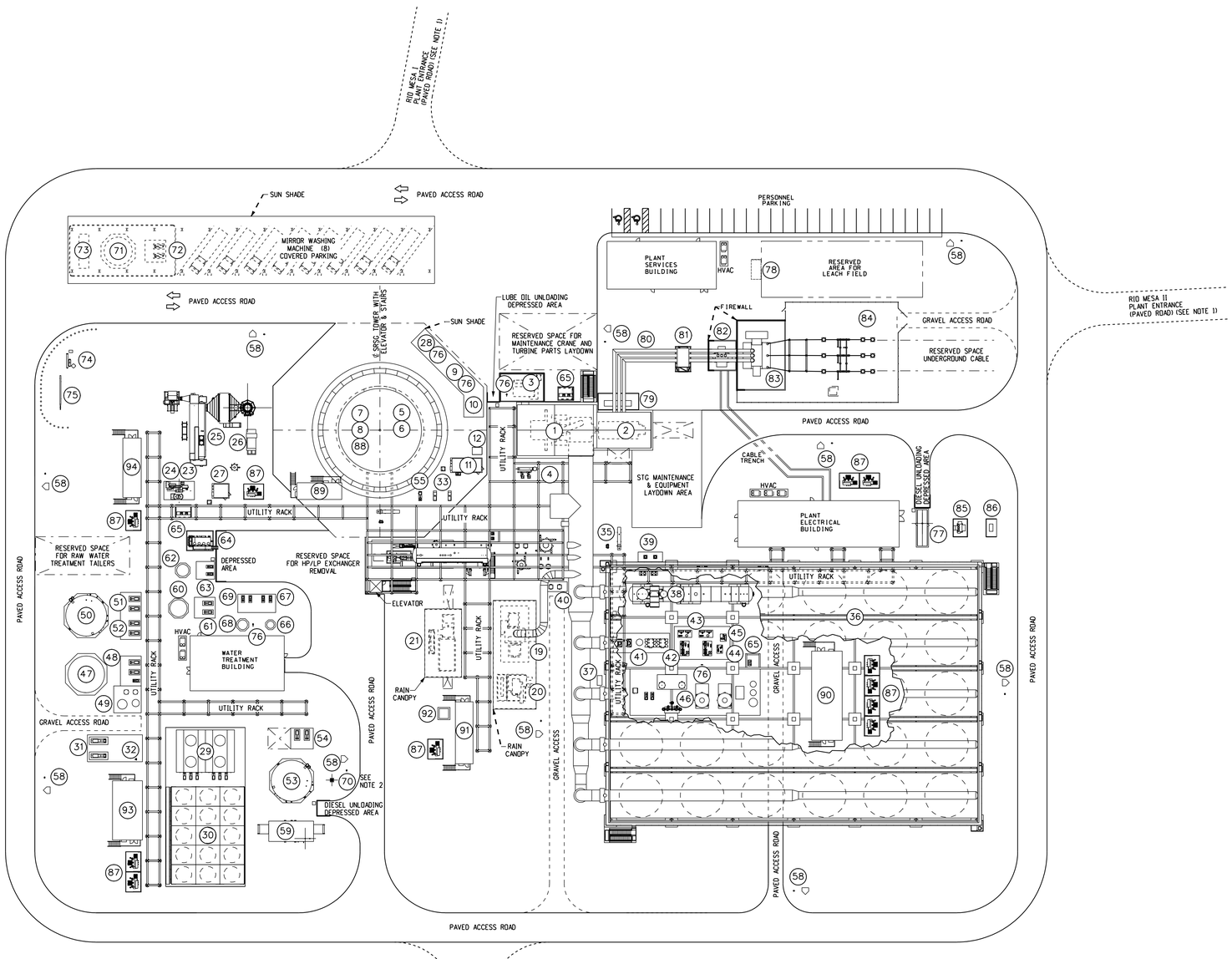
[a] The analysis in the AFC did not include emissions from the MWMs.

Updated Plot Plan
Figures 2-3-R1, 2-5-R1, and 2-8-R1

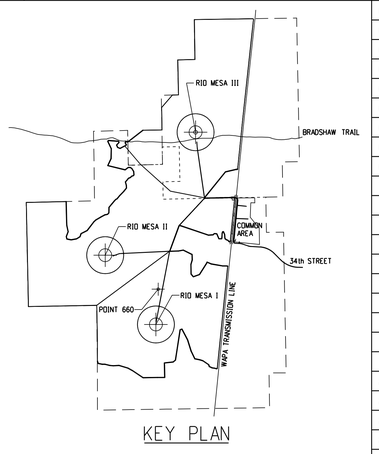
NOTES:

1. POWER BLOCK ARRANGEMENT FOR RIO MESA I, II AND III TO BE IDENTICAL WITH THE EXCEPTION OF PLANT ENTRANCE AND RADIAL DIRT ROAD LOCATIONS. SEE APROPRIATE CIVIL DRAWINGS.

2. WELL LOCATION SHOWN IS FOR RIO MESA I AND RIO MESA II ONLY. FOR RIO MESA III WELL LOCATION SEE APROPRIATE CIVIL DRAWINGS.



ITEM	DESCRIPTION	ITEM	DESCRIPTION
1	STEAM TURBINE	31	CLOSED COOLING WATER (CCW) PUMPS (2)
2	GENERATOR	32	CCW CHEMICAL ADDITION TANK
3	LUBE OIL UNIT	33	CCW BOOSTER PUMPS (2)
4	GLAND STEAM CONDENSER	34	CCW HEAD TANK
5	SOLAR RECEIVER STEAM GENERATOR (SRSG)	35	BLOWDOWN / CONDENSATE HEAT EXCHANGER
6	BOILER CIRCULATION PUMPS (4) (SRSG)	36	AIR COOLED CONDENSER (ACC)
7	SRSG FLASH TANK (TOWER)	37	ACC WASH WATER SYSTEM SKID
8	SRSG BLOWDOWN TANK (TOWER)	38	CONDENSATE COLLECTION TANK
9	SRSG CHEMICAL FEED EQUIPMENT	39	CONDENSATE PUMPS (2)
10	NITROGEN STORAGE	40	STEAM DUCT DRAIN PUMPS (2)
11	STEAM & WATER ANALYSIS SAMPLING SYSTEM (SWAS) - SRSG	41	PLANT AIR EQUIPMENT
12	BYPASS VALVE HYDRAULIC SKID	42	CONDENSER VACUUM PUMPS (2)
13	SRSG BLOWDOWN COOLER	43	CONDENSER VACUUM PUMPS FIN FAN COOLERS (2)
14	INTERNAL DRAIN TANK & PUMPS (2)	44	NIGHT TIME VACUUM PUMP
15	EXTERNAL DRAIN TANK & PUMPS (2)	45	NIGHT TIME VACUUM PUMP FIN FAN COOLER
16	HP FEEDWATER HEATERS (3)	46	CONDENSATE POLISHER EQUIPMENT
17	LP FEEDWATER HEATERS (4)	47	DEMINERALIZED WATER STORAGE TANK
18	DEAERATOR	48	DEMINERALIZED WATER TRANSFER PUMPS (2)
19	MAIN BOILER FEEDWATER PUMP (TURBINE DRIVEN)	49	DEMINERALIZER SPENT & FRESH RESIN STORAGE TANKS (2)
20	MAIN BOILER FEEDWATER PUMP L.O. PACKAGE	50	TREATED WATER STORAGE TANK
21	BACKUP BOILER FEEDWATER PUMP (MOTOR DRIVEN)	51	TREATED WATER TRANSFER PUMPS (2)
22	STARTUP BOILER FEEDWATER PUMP (MOTOR DRIVEN)	52	DEMINERALIZER FEED PUMPS (2)
23	NIGHT PRESERVATION BOILER (NPB)	53	SERVICE / FIRE WATER STORAGE TANK
24	NIGHT PRESERVATION BOILER FEEDWATER PUMPS (2)	54	SERVICE WATER TRANSFER PUMPS (2)
25	AUXILIARY BOILER	55	SERVICE WATER BOOSTER PUMP (1)
26	AUXILIARY BOILER FEEDWATER PUMPS (2)	56	RESERVED
27	STEAM & WATER ANALYSIS SAMPLING SYSTEM (SWAS) - AUX BOILER	57	RESERVED
28	NPB & AUX BOILER CHEMICAL FEED EQUIPMENT	58	FIRE HYDRANT & HOSE HOUSE (10)
29	WET SURFACE AIR COOLER (WSAC)	59	FIRE PUMPS MODULE (ELECTRIC, DIESEL & JOCKEY)
30	DRY FIN-FAN COOLERS	60	WASTEWATER COLLECTION TANK
		61	WASTEWATER FEED PUMPS (2)
		62	WASTEWATER RESIDUE TANK
		63	WASTEWATER RESIDUE PUMPS (2)
		64	OILY WATER SEPARATOR
		65	SUMP PUMPS
		66	POTABLE WATER STORAGE TANK
		67	POTABLE WATER SUPPLY PUMPS (2)
		68	POTABLE WATER TREATMENT SYSTEM FEED TANK
		69	POTABLE WATER FEED PUMPS (2)
		70	WELL PUMP (SEE NOTE 2)
		71	MIRROR WASH WATER STORAGE TANK
		72	MIRROR WASH WATER FILLING PUMPS (2)
		73	DIESEL FUEL STORAGE TANK
		74	FUEL GAS FILTRATION/HEATING EQUIPMENT
		75	FUEL GAS PIG RECEIVER / LAUNCHER (BY SUBCONTRACTOR)
		76	EMERGENCY EYEWASH & SHOWER
		77	EMERGENCY DIESEL GENERATOR
		78	SEWAGE SEPTIC TANK & LEACH FIELD
		79	EXCITATION CONTAINER
		80	ISOPHASE BUS DUCT
		81	GENERATOR CIRCUIT BREAKER
		82	UNIT AUXILIARY TRANSFORMER
		83	GENERATOR STEP-UP TRANSFORMER
		84	220KV PLANT SUB-STATION
		85	STATION SERVICE TRANSFORMER
		86	33kV BREAKER
		87	MCC OIL FILLED TRANSFORMER (11)
		88	ELECTRICAL EQUIPMENT MODULE FOR SRSG (TOWER)
		89	ELECTRICAL EQUIPMENT MODULE FOR SRSG
		90	ELECTRICAL EQUIPMENT MODULE FOR ACC
		91	ELECTRICAL EQUIPMENT MODULE FOR BFP
		92	LIQUID TO AIR REMOTE HEAT EXCHANGER (VFD)
		93	ELECTRICAL EQUIPMENT MODULE FOR FIN FAN/WSAC & WATER TREATMENT AREA
		94	ELECTRICAL EQUIPMENT MODULE FOR AUXILIARY BOILER



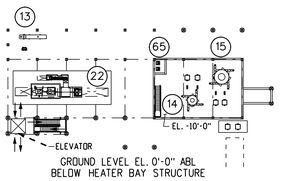
KEY PLAN

SITE LOCATION & ROTATION

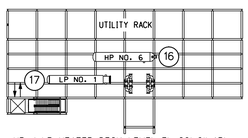
RIO MESA I
TOWER LOCATION: N. 67,289.63 E. 29,824.27
ROTATION: 16.8° CLOCKWISE

RIO MESA II
TOWER LOCATION: N. 72,612.47 E. 25,924.66
ROTATION: 19.0° CLOCKWISE

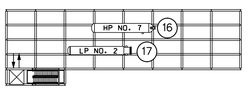
RIO MESA III
TOWER LOCATION: N. 82,063.26 E. 32,873.15
ROTATION: 22.5° CLOCKWISE



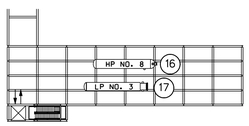
GROUND LEVEL EL. 0'-0" ABL
BELOW HEATER BAY STRUCTURE



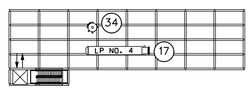
HP / LP HEATER DECK LEVEL EL. 20'-0" ABL
(OPERATING DECK LEVEL)



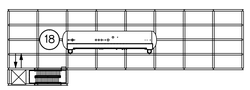
HP / LP HEATER DECK LEVEL EL. 50'-0" ABL



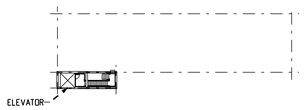
HP / LP HEATER DECK LEVEL EL. 70'-0" ABL



LP HEATER DECK LEVEL EL. 90'-0" ABL



DEAERATOR DECK LEVEL EL. 110'-0" ABL



ELEVATOR MACHINERY DECK LEVEL
EL. 120'-0" ABL

0 60 120 180 240FT

NO.	DATE	REVISIONS	BY	CHK	EGS				PE
A	26MAR12	ISSUED FOR INFORMATION	AKS	RPT	RPT	-	-	-	TWA

SCALE: AS SHOWN DRAWN: AKS DATE: 01FEB12

CBO/AHJ APPROVAL

PE STAMP

BECHTEL POWER CORP.
FREDERICK, MARYLAND
Dedicated to Zero Accident Safety and Quality Excellence

RIO MESA
SOLAR ELECTRIC GENERATING FACILITY

TYPICAL POWER BLOCK PLOT PLAN

JOB NO.	DRAWING NO.	REV.
25755	000-P1K-0010-00001	A

34"X44" E SIZE

N 90,0000 | E 20,0000 | E 30,0000 | E 40,0000

N 90,727.37
E 32,771.26

N 90,839.37
E 40,645.93

N 87,658.36
E 32,814.67

N 87,626.77
E 31,496.46

EX. HIGH VOLTAGE TRANSMISSION LINE

EX. HIGH VOLTAGE TRANSMISSION LINE AND NATURAL GAS LINE

PROJECT BOUNDARY

N 84,942.03
E 31,551.26

N 84,904.70
E 30,241.93

10' DIRT ROAD

CIRCULAR DIRT ROAD (CI)

N 82,245.97
E 30,285.38

N 82,202.98
E 27,655.05

UNIT 3

EX. HIGH VOLTAGE TRANSMISSION LINE

N 82,140.70
E 25,030.81

EX. BRADSHAW TRAIL

12' DIRT ROAD

EX. BRADSHAW TRAIL

ALTERNATE EMERGENCY ENTRANCE

N 80,0000

N 79,467.03
E 25,072.66

20' PAVED ROAD (SS)

U3 - 1

N 79,803.39
E 40,859.23

N 79,779.47
E 39,541.75

N 77,077.35
E 38,273.91

N 76,732.62
E 22,482.35

20'SHARED DIRT ROAD

N 76,793.48
E 25,114.40

N 76,671.69
E 19,850.17

SEE INSET A THIS SHEET

SWITCH YARD

N 77,099.36
E 39,589.93

U2 - 1

N 74,368.37
E 38,321.43

12' DIRT ROAD

SEE INSET B THIS SHEET

24' PAVED SHARED ROAD

COMMON AREA

N 74,383.82
E 39,637.73

CA - 1

CA - 2

CA - 3

CA - 4

N 73,999.80
E 19,906.49

CIRCULAR DIRT ROAD (CI)

UNIT 2

20' PAVED ROAD

12' DIRT ROAD

10' DIRT ROAD

24' PLANT ENTRANCE ROAD

CONNECTS TO EXISTING 34TH AVE.

N 71,667.51
E 39,686.61

N 71,327.86
E 19,963.04

N 70,0000

20' PAVED ROAD

12' DIRT ROAD

20' SHARED DIRT ROAD

PROJECT GRID
N 70,000.000
E 30,000.000

CIRCULAR DIRT ROAD (CI)

UNIT 1

10' DIRT ROAD

12' DIRT ROAD

12' DIRT ROAD

N 68,950.45
E 39,738.28

N 68,655.81
E 20,015.86

N 68,704.15
E 22,642.52

N 68,752.81
E 25,268.57

N 66,233.34
E 39,790.14

N 66,072.50
E 25,315.39

12' DIRT ROAD

U1 - 1

N 63,573.99
E 39,840.08

EX. HIGH VOLTAGE TRANSMISSION LINE AND NATURAL GAS LINE

12' PERIMETER DIRT ROAD OFFSET 5' FROM FENCE (TYP)

N 63,391.63
E 25,325.11

N 63,567.52
E 38,519.93

N 60,747.18
E 27,981.05

N 60,710.91
E 25,334.66

N 60,784.61
E 30,627.36

N 60,858.29
E 35,920.21

RIVERSIDE COUNTY
IMPERIAL COUNTY

RIVERSIDE COUNTY
IMPERIAL COUNTY

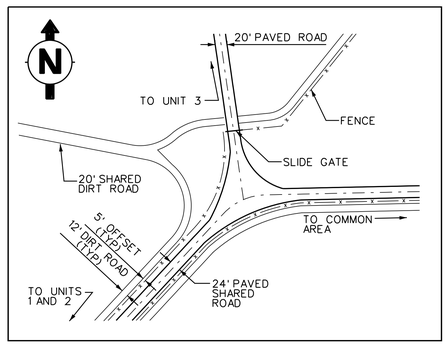
PROJECT BOUNDARY

N 60,0000

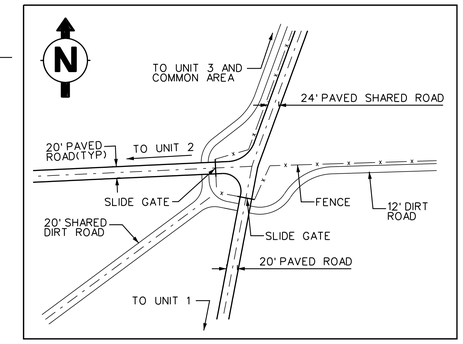
N 60,820.91
E 33,274.09

N 60,895.70
E 38,566.67

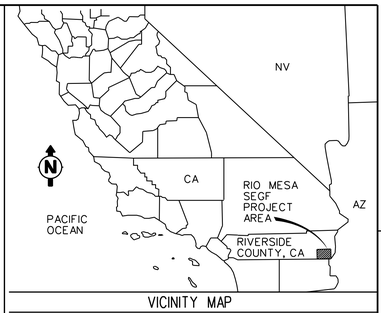
E 20,0000 | E 30,0000 | E 40,0000



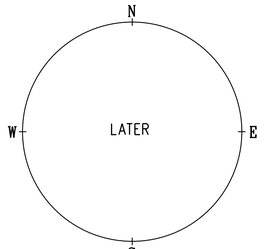
INSET A
NTS



INSET B
NTS



VICINITY MAP



ANNUAL WIND ROSE

NOTES:

1. SOLAR TOWER LOCATIONS:

PROJECT GRID COORDINATES			
UNIT	EASTING	NORTHING	COMMENTS
1	29,824.27	67,289.63	
2	25,924.66	72,612.47	
3	32,873.15	82,063.26	

COORDINATES GIVEN TO CENTERLINE POWER TOWER.

2. TOTAL NUMBER OF HELIOSTATS TO BE BETWEEN 80,000 AND 100,000 EACH UNIT.
3. HELIOSTAT MAINTENANCE PATHS TO BE 10' DIRT ROAD.
4. DISTANCE BETWEEN HELIOSTAT MAINTENACE PATHS TO BE 152.6 FT.
5. HELIOSTAT PYLON DENSITY:
   - NEAR TOWER (UP TO 400-500 METERS): 0.03-0.04 PYLONS PER SQUARE METER.
   - 1,000 METERS FROM TOWER: 0.01-0.02 HELIOSTATS PER SQUARE METER.
   - 2,000 METERS FROM TOWER: 0.005-0.01 HELIOSTATS PER SQUARE METER.

WELL LOCATION TABLE			
POINT NO	EASTING	NORTHING	DESCRIPTION
CA - 1	36242.385	74369.165	COMMON AREA WELL
CA - 2	35990.068	74316.427	COMMON AREA WELL
CA - 3	36110.095	74084.615	COMMON AREA WELL
CA - 4	36093.291	73824.986	CA MONITORING WELL
U1 - 1	29703.975	67027.062	UNIT 1 WELL
U2 - 1	25794.375	72354.714	UNIT 2 WELL
U3 - 1	31520.554	80858.585	UNIT 3 WELL

LEGEND:

PROJECT BOUNDARY

0 1000 2000 3000
1" = 1000'

PRELIMINARY

CBO/AHJ APPROVAL

PE STAMP

NO.	DATE	REVISIONS	BY	CHK	EGS				PE
A	27 MAR 12	ISSUED FOR REVIEW	LAP	VAW	DWF	-	-	-	TWA

SCALE: 1"=1000' DRAWN: 27/03/2012 DATE: LAP

BECHTEL POWER CORP.
FREDERICK, MARYLAND
Dedicated to Zero Accident Safety and Quality Excellence

RIO MESA SOLAR ELECTRIC GENERATING FACILITY

SITE PLAN WITH WELL LOCATIONS

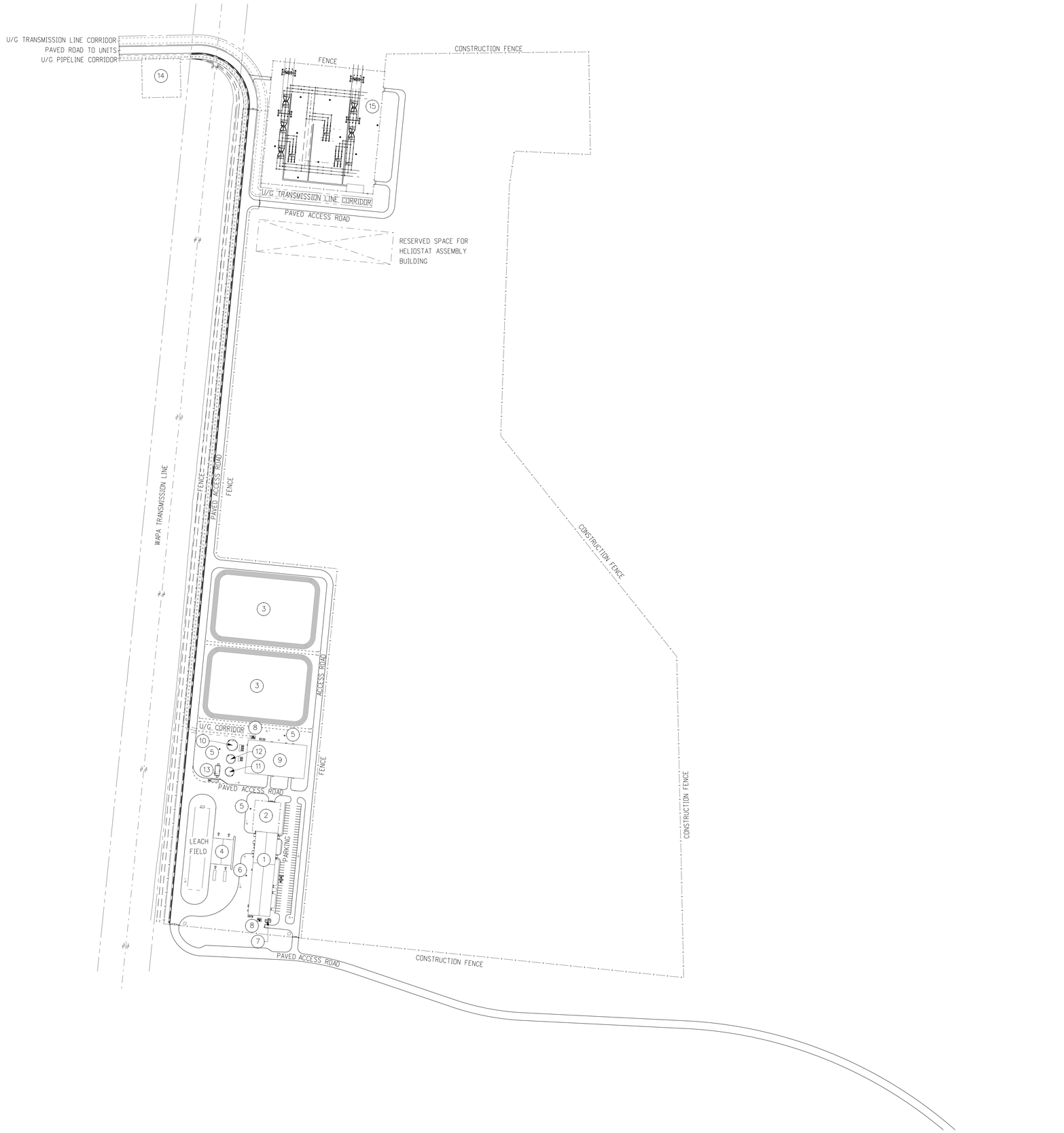
JOB NO.	DRAWING NO.	REV.
25755	000-C2K-0000-00001	A

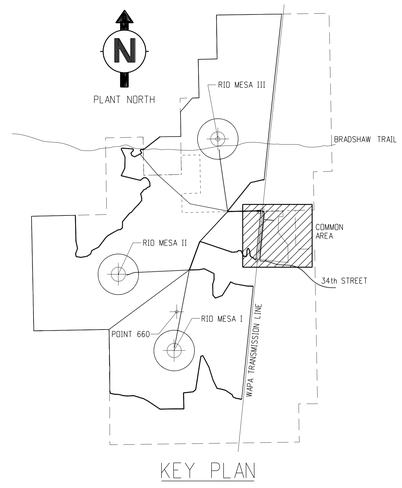
34"X44" E SIZE

8 | 7 | 6 | 5 | 4 | 3 | 2 | 1

H | G | F | E | D | C | B | A

ITEM	DESCRIPTION
1	ADMINISTRATION / CONTROL BUILDING (325' x 85')
2	OUTDOOR STORAGE AREA (120' x 100' FENCED)
3	EVAPORATION POND (2) (2 ACRES EACH)
4	MIRROR WASH MACHINE MAINTENANCE SHED (100' x 80')
5	WATER WELL / WATER SUPPLY (3)
6	PERMANENT MONITORING WELL
7	EMERGENCY DIESEL GENERATOR
8	MCC TRANSFORMER (2)
9	WATER TREATMENT BUILDING (230' x 130')
10	TREATED WATER STORAGE TANK & TRANSFER PUMPS (3)
11	FIRE WATER STORAGE TANK
12	WASTEWATER COLLECTION TANK & FEED PUMPS (2)
13	FIRE PUMP MODULE (ELECTRIC, DIESEL & JOCKEY)
14	FUEL GAS CUSTODY METERING / PIGGING STATION (150 x 150')
15	SWITCHYARD (478' x 436' FENCED)





KEY PLAN

NO.	DATE	REVISIONS	BY	CHK	EGS			PE
A	27MAR12	ISSUED FOR INFORMATION	AKS	RPT	RPT	-	-	TWA

SCALE: AS SHOWN DRAWN: AKS DATE: 06FEB12

BECHTEL POWER CORP.
FREDERICK, MARYLAND
Dedicated to Zero Accident Safety and Quality Excellence

CBO/AHJ APPROVAL

PE STAMP

RIO MESA
SOLAR ELECTRIC GENERATING FACILITY

COMMON AREA
PLOT PLAN

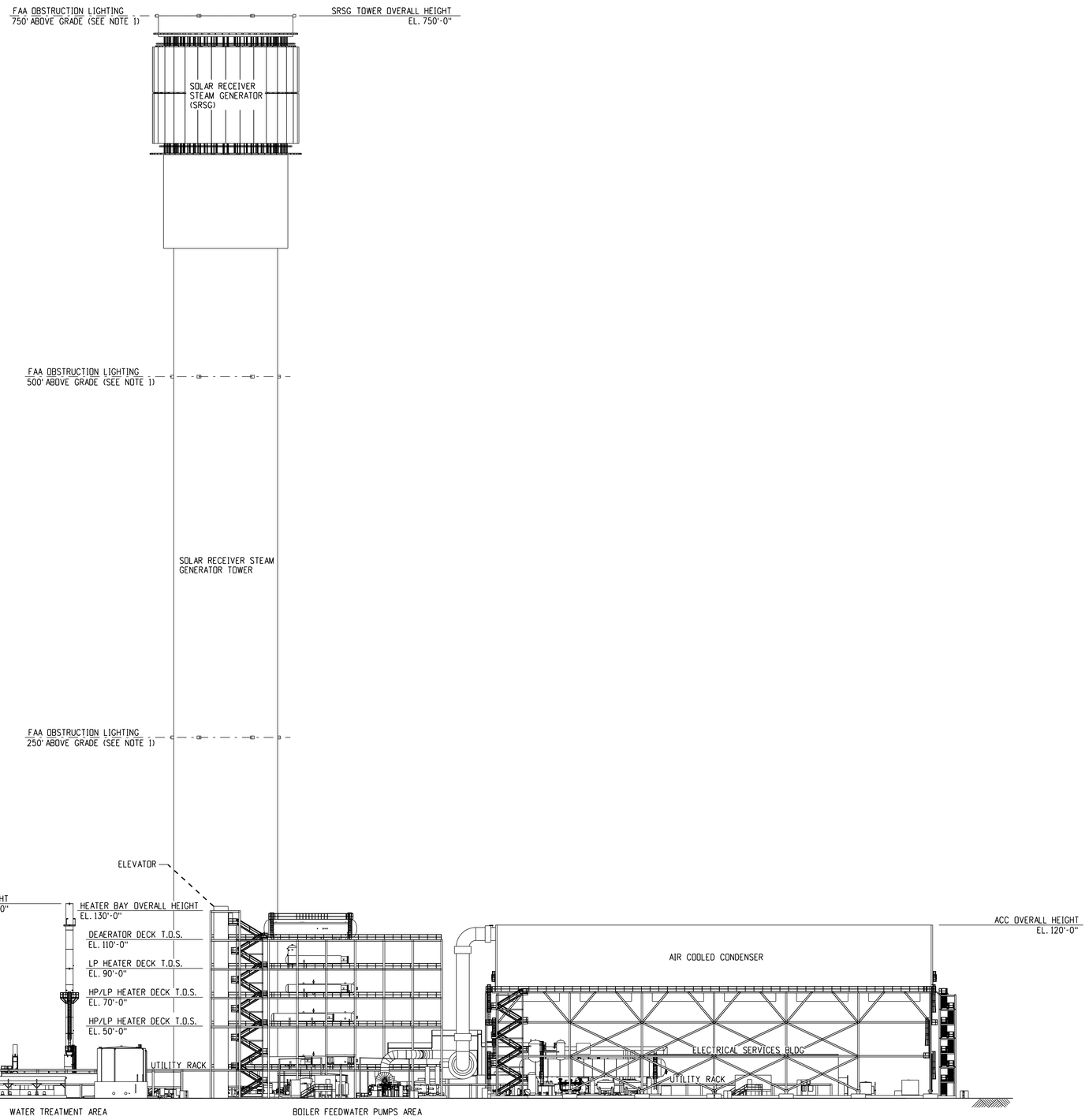
JOB NO.	DRAWING NO.	REV.
25755	009-P1K-0910-00001	A

34"X44" E SIZE

8 7 6 5 4 3 2 1

H G F E D C B A

Figure 2-9 a through d
Boiler Optimization Elevation Drawings



ELEVATION VIEW LOOKING NORTH

NOTES:

1. FAA OBSTRUCTION LIGHTING:
   HIGH INTENSITY FLASHING WHITE OBSTRUCTION LIGHT SYSTEM (HIWOL)
   SIX LIGHT UNITS PER LEVEL (0°, NORTH 60°, 120°, 180°, SOUTH, 240°, 300°)

0 60 120 180 240FT

NO.	DATE	REVISIONS	BY	CHK	DES SUPV.	ENGR.	PROJ ENGR	APPR
B	28 MAR 12	REVISED TO INCLUDE FAA LIGHTING	AKS	RPT	RPT	-	TWA	
A	24 FEB 12	ISSUED FOR INFORMATION	AKS	RPT	RPT	-	TWA	

SCALE AS SHOWN | DATE 23FEB12 | DESIGNED AKS | DRAWN AKS | CHIEF ENGR.

BECHTEL POWER CORP.
DEDICATED TO SAFETY EXCELLENCE - ZERO ACCIDENTS
FREDERICK, MARYLAND

CBO/AHJ APPROVAL

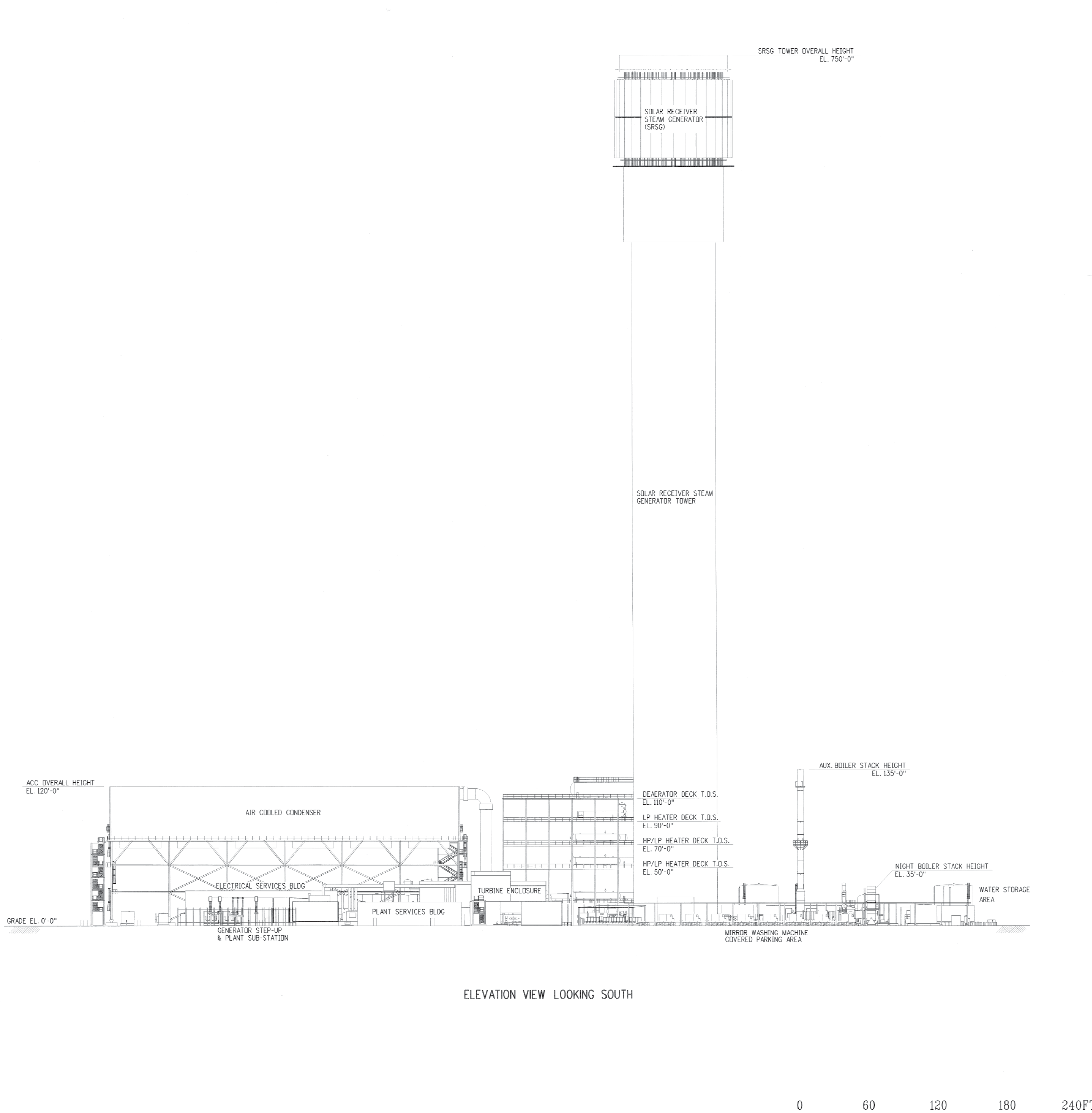
PE STAMP

RIO MESA
SOLAR ELECTRIC GENERATING FACILITY

POWER BLOCK ELEVATION
VIEW LOOKING NORTH

JOB NO.	DRAWING NO.	REV.
25750	000-P1K-0090-00001	B

34"X44" E SIZE



ELEVATION VIEW LOOKING SOUTH

NO.	DATE	REVISIONS	BY	CHK	DES SUPV.	ENGR.	PROJ ENGR	APPR
A	24 FEB 12	ISSUED FOR INFORMATION	AKS					

SCALE AS SHOWN | DATE 23FEB12 | DESIGNED AKS | DRAWN AKS | CHIEF ENGR.

CBO/AHJ APPROVAL

BECHTEL POWER CORP.

DEDICATED TO SAFETY EXCELLENCE - ZERO ACCIDENTS

FREDERICK, MARYLAND

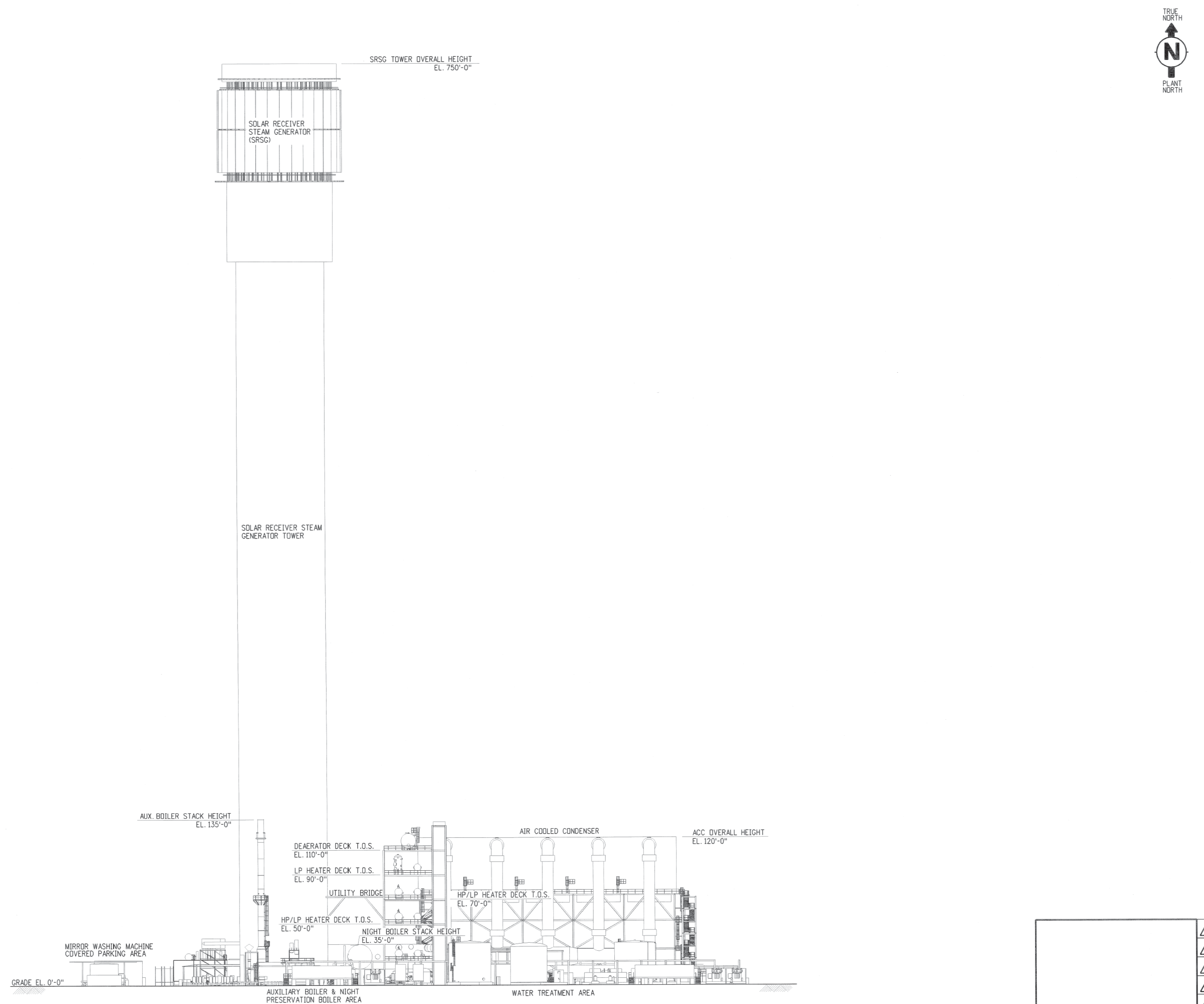
RIO MESA SOLAR ELECTRIC GENERATING FACILITY

POWER BLOCK ELEVATION VIEW LOOKING SOUTH

PE STAMP

JOB NO.	DRAWING NO.	REV.
25750	000-P1K-0090-00002	A

34"X44"E SIZE



ELEVATION VIEW LOOKING EAST

0 60 120 180 240FT

NO.	DATE	REVISIONS	BY	CHK	DES SUPV.	ENGR.	PROJ ENGR	APPR
A	24/FEB/12	ISSUED FOR INFORMATION	AKS			–		

SCALE AS SHOWN | DATE 23FEB12 | DESIGNED AKS | DRAWN AKS | CHIEF ENGR.

BECHTEL POWER CORP.
DEDICATED TO SAFETY EXCELLENCE - ZERO ACCIDENTS
FREDERICK, MARYLAND

CBO/AHJ APPROVAL

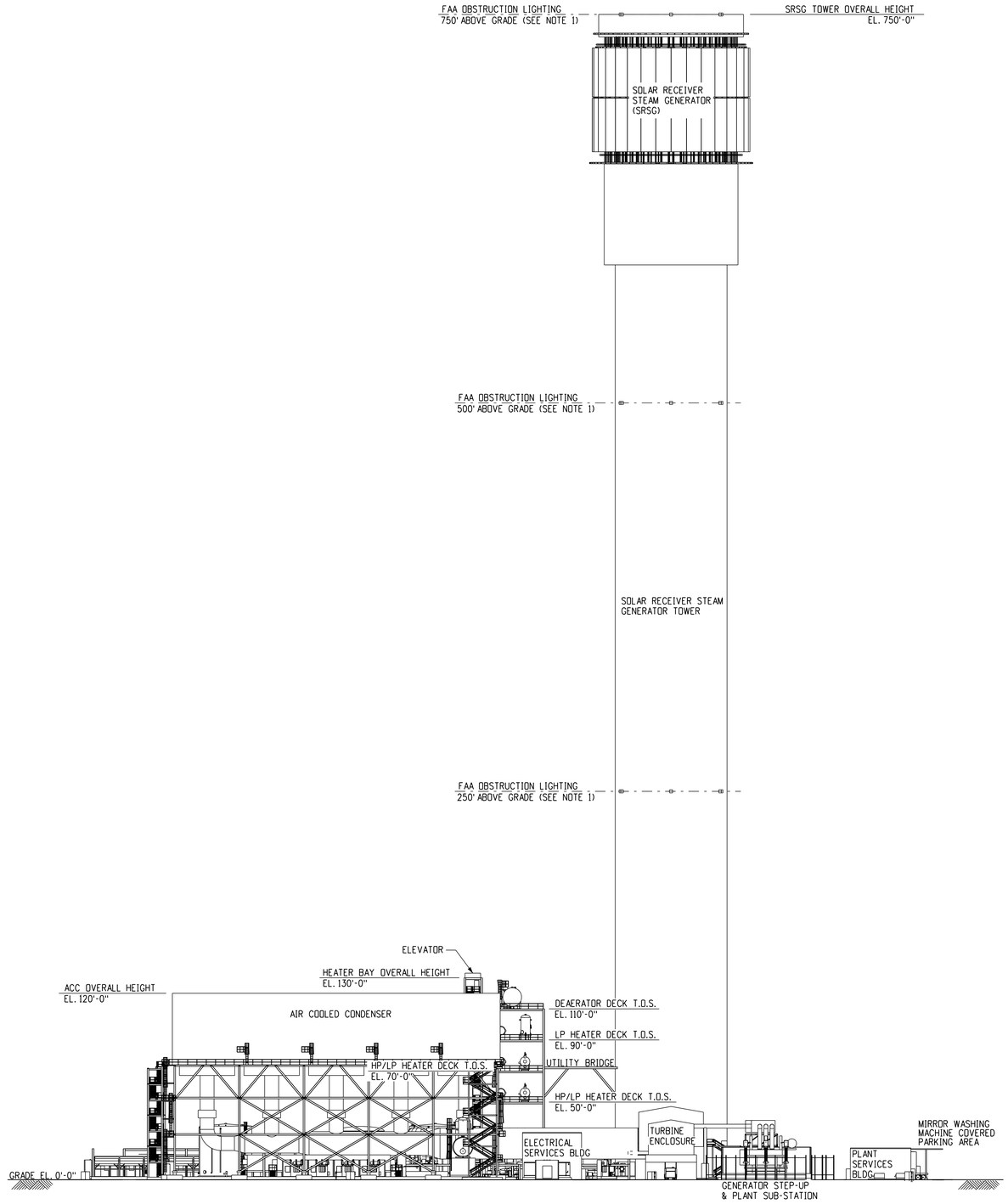
PE STAMP

RIO MESA
SOLAR ELECTRIC GENERATING FACILITY

POWER BLOCK ELEVATION VIEW LOOKING EAST

JOB NO.	DRAWING NO.	REV.
25750	000-P1K-0090-00003	A

34"X44" E SIZE



ELEVATION VIEW LOOKING WEST

NOTES:

1. FAA OBSTRUCTION LIGHTING:
   HIGH INTENSITY FLASHING WHITE OBSTRUCTION LIGHT SYSTEM (HIWOL)
   SIX LIGHT UNITS PER LEVEL (0°, NORTH 60°, 120°, 180°, SOUTH, 240°, 300°)

0 60 120 180 240FT

NO.	DATE	REVISIONS	BY	CHK	DES SUPV.	ENGR.	PROJ ENGR	APPR
	/ /							
	/ /							
	/ /							
B	28/MAR/12	REVISED TO INCLUDE FAA LIGHTING	AKS	RPT	RPT	-	TWA	
A	24/FEB/12	ISSUED FOR INFORMATION	AKS	RPT	RPT	-	TWA	

SCALE AS SHOWN | DATE 23FEB12 | DESIGNED AKS | DRAWN AKS | CHIEF ENGR.

CBO/AHJ APPROVAL

PE STAMP

BECHTEL POWER CORP.
DEDICATED TO SAFETY EXCELLENCE - ZERO ACCIDENTS
FREDERICK, MARYLAND

RIO MESA
SOLAR ELECTRIC GENERATING FACILITY

POWER BLOCK ELEVATION
VIEW LOOKING WEST

JOB NO.	DRAWING NO.	REV.
25750	000-P1K-0090-00004	B

34"X44" E SIZE

Data Request 5

The construction emissions and impacts should be evaluated for the actual Tiered engines to be used during construction. Please identify the Tier levels of all of the off-road equipment and associated emission factors. Please revise the emission calculations and corresponding impact analysis based on reasonable construction vehicle fleet composition to account for the possibility that some of the vehicles may not be available with Tier 3 or 4 engines.

Response:

The construction impacts presented in the AFC assumed that all construction equipment were equipped with Tier 3 or better engines, based on the effective dates of the respective off-road engine standards. This approach was taken to match the construction equipment mitigation requirements developed by the CEC over the past few years for power plant projects. Specific Tier assumptions were shown in the construction emissions calculations attachment to the AFC (Appendix 5.1F, Attachment 5.1F-1); the specific table showing the construction equipment Tier 3/4 emission factors used in the AFC is included here as Table DR5-1-1 of Attachment DR5-1 for convenience.

To account for the possibility that some of the construction equipment may not be available with Tier 3/4 engines, the Applicant reviewed information provided in the Monthly Compliance Reports for the Ivanpah SEGS project. Based on this information, about 18 percent of the construction equipment and 14 percent of the total engine horsepower used for that project is Tier 2-certified; 69 percent of the equipment and 75 percent of the horsepower is Tier 3-certified; and the rest is Tier 4 interim or Tier 4-certified. The Applicant did not account for Tier 0 and Tier 1 vehicles as there were only a few of those and the vehicles did not appear to be onsite for any significant period of time. Based on this assessment, the Applicant has prepared a supplemental construction emissions impact analysis that assumes that 20 percent of the construction equipment horsepower comes from Tier 2 vehicles. For this analysis, the Applicant first calculated emissions assuming that 100 percent of the construction vehicles will be equipped with Tier 2 engines. The Applicant then increased the daily and annual emission rates used for the original project construction impact modeling by 20 percent of the difference between the Tier 3/4 calculated emissions and the Tier 2 calculated emissions. These calculations are shown in Attachment DR5-1. These calculations show that while daily and annual NOx, CO, VOC emissions could be expected to increase if such a fraction of Tier 2 vehicles are used during construction, emissions of SOx would remain unchanged, and $PM_{10}/PM_{2.5}$ emissions would decrease slightly.

The results of the supplemental analysis are summarized in Table DR5-1. Predicted impacts that are different under the 20/80 supplemental scenario from those provided in the AFC are shown underlined. Predicted impacts from the Tier 3/4 scenario, as presented in Table 5.1-36 of the AFC, are shown in strike-out font for comparison.

Table DR5-1
Modeled Maximum Impacts from Onsite Construction Activities, Assuming 20% of Construction Equipment Are Tier 2-Certified

Pollutant	Averaging Period	Maximum Predicted Impact (µg/m^3)	Maximum Background Concentration (µg/m^3)	Total Concentration[a] (µg/m^3)	NAAQS (µg/m^3)	CAAQS (µg/m^3)
NO_2	1-hr (highest)	~~30.5~~ **31.4**	92.4	~~123~~ **124**	--	339
	1-hr (98th percentile)[b]	~~--~~	78.0	109	188	--
	Annual	0.9	17.0	18	100	57
SO_2	1-hr	0.08	136.6	137	196	655
	3-hr	0.05	112.9	113	1300	--
	24-hr	0.02	18.4	18	--	105
	Annual	0.00	2.6	3	80	--
CO	1-hr	~~18.6~~ **18.8**	1,837	1,856	40,000	23,000
	8-hr	~~8.8~~ **9.0**	643	652	10,000	10.000
PM_{10}	24-hr	4.5	140	145	150	50
	Annual	0.5	20.4	21	--	20
$PM_{2.5}$	24-hr[c]	0.9	18	19	35	--
	Annual[d]	0.1	7.8	8	15.0	12

Notes:
[a] Total concentrations shown in this table are the sum of the maximum predicted impact and the maximum measured background concentration. Because the maximum impact will not occur at the same time as the maximum background concentration, the actual maximum combined impact will be lower.
[b] Background concentration shown is the three-year average of the 98th percentile values (2008 to 2010), in accordance with the form of the federal standard. Total concentration shown for 1-hour NO_2 is maximum modeled impact combined with maximum background concentration (Tier 1 analysis in Section 3.6 of modeling protocol).
[c] Background concentration shown is the three-year average of the 98th percentile values, in accordance with the form of the federal standard.
[d] Background value shown is the three-year average of the annual arithmetic mean, in accordance with the form of the standard.

While the maximum modeled NO_2 and CO impacts with 20% Tier 2-certified construction equipment are predicted to be slightly higher than the impacts evaluated in the AFC, the higher impacts would not change any of the conclusions presented in the AFC; namely, that construction impacts alone for all modeled pollutants are expected to be below the most stringent state and national standards. With the exception of the 24-hour and annual average PM_{10} standards, construction activities are not expected to cause or contribute to an exceedance of state or federal ambient air quality standards. However, the background state 24-hour and annual PM_{10} standards are exceeded in the absence of the construction emissions for the project.

Data Request 8

Please include the emissions from mirror washing activities in the total facility emissions and corresponding impact analysis.

Response:

Applicant believes it is not appropriate to include emissions from mirror washing activities in the total project emissions shown in AFC because, as discussed in Applicant's March 8, 2012 response to this data request, emissions from mirror washing activities are not part of emissions from the stationary source. However, Applicant included emissions from the mirror washing activities with emissions from the stationary equipment as part of the Boiler Optimization air quality modeling analysis discussed above in the Boiler Optimization Project Description, Tables 3 and 4.

Criteria Pollutant Emissions

As discussed above in the Project Description, the Boiler Optimization and related project enhancements included reducing the number of MWM, and using certified on-road engines instead of certified off-road engines in the larger vehicles. As shown above in Table 3, these changes results in a reduction in emissions of most pollutants. The detailed hourly, daily, and annual emissions calculations for the Boiler Optimization mirror washing activities are included in Attachment AQ-1, Appendix 5.1B.

The MWMs were modeled as point sources, with a release height of 8 feet (based on the expected height of the trucks that will transport the mirror washing apparatus). Emissions were divided among approximately 87 point sources distributed over the project area. Emissions and stack parameters for the stationary sources are shown in the summary tables included in Attachment AQ-1, Appendix 5.1D.

The results of the modeling analysis are summarized above in the Boiler Optimization Project Description Table 4 and are compared with ambient air quality standards in Table DR8-1. As shown in this table, while the maximum modeled impacts with the MWM's are predicted to be higher for some pollutants than the impacts evaluated in the AFC, the higher impacts would not change any of the conclusions presented in the AFC; namely, that Project impacts alone for all modeled pollutants are expected to be below the most stringent state and national standards. With the exception of the 24-hour and annual average PM_{10} standards, Project impacts are not expected to cause an exceedance of state or federal ambient air quality standards. However, the background state 24-hour and annual PM_{10} standards are exceeded in the absence of the emissions for the Project. The input and output modeling files are provided on the enclosed compact disc.

Table DR8-1
Modeled Maximum Impacts Boiler Optimization Stationary Equipment and Mwms

Pollutant	Averaging Period	Project Impact, Boiler Optimization , with MWMs[a] (µg/m^3)	Maximum Background Concentration (µg/m^3)	Total Concentration[b] (µg/m^3)	NAAQS (µg/m^3)	CAAQS (µg/m^3)
NO_2	1-hr (highest)	~~194~~ **165**	92.4	~~286~~ 257	--	339
	1-hr (98th percentile)	~~149~~ **158**	78.0	~~167~~ 171[c]	188	--
	Annual	~~0.08~~ **0.09**	17.0	17	100	57
SO_2	1-hr	~~10~~ **2**	136.6	~~147~~ 139	196	655
	3-hr	4 **0.9**	112.9	~~117~~ 114	1300	--
	24-hr	~~2~~ **0.07**	18.4	~~20~~ 19	--	105
	Annual	~~0.01~~ **0.01**	2.6	3	80	--
CO	1-hr	~~237~~ **156**	1,837	~~2,074~~ 1,993	40,000	23,000
	8-hr	~~45~~ **11**	643	~~688~~ 654	10,000	10.000
PM_{10}	24-hr	~~0.8~~ **1.99**	140	~~141~~ 142	150	50
	Annual	~~0.02~~ **0.59**	20.4	~~20~~ 21	--	20
$PM_{2.5}$	24-hr[d]	~~0.8~~ **0.27**	18	~~19~~ 18	35	--
	Annual[e]	~~0.02~~ **0.07**	7.8	8	15.0	12

Notes:
[a] Modeling results represent total impacts from boilers, emergency engines, and MWMs.
[b] Total concentrations shown in this table are the sum of the maximum predicted impact and the maximum measured background concentration. Because the maximum impact will not occur at the same time as the maximum background concentration, the actual maximum combined impact will be lower.
[c] Total concentrations shown for 1-hour NO_2 are modeled impacts combined with concurrent hourly NO_2 monitoring data (Tier 4 analysis in Section 3.6 of the modeling protocol). This value represents the five-year average of the annual 1-hr NO_2 98th percentile (modeled impact plus background) for each year (2006 to 2010) as required by June 28, 2010 EPA 1-hr NO_2 NAAQS guidance document.
[d] Background concentration shown is the three-year average of the 98th percentile values, in accordance with the form of the federal standard.
[e] Background value shown is the three-year average of the annual arithmetic mean, in accordance with the form of the standard.

Screening Health Risk Assessment (HRA)

Diesel particulate matter (DPM) emissions from the MWM's were also included in the screening health risk assessment that was performed for the project. The MWM DPM emission rate of 0.03 ton/yr is

shown above in the Boiler Optimization Project Description Table 3 with the detailed emission calculations included in Attachment AQ-1, Appendix 5.1B. Emission rates and source characterizations for the stationary sources are described in detail in Attachment AQ-1, Appendix 5.1D. As shown above in the Boiler Optimization Project Description Table 5, including MWMs in the cancer risk assessment increases the modeled residential cancer risk by 0.1 in one million, from 0.1 to 0.2 in one million. Residential cancer risk remains well below the 10 in one million level considered to be significant.

Data Request 15

Please explain why and how the same auxiliary boilers are used differently in these two projects.

Response:

As discussed above in the Project Description, the Boiler Optimization includes eliminating the 500 MMBtu/hr auxiliary boilers for the Rio Mesa SEGF. This is also the case for the Hidden Hills SEGS. With the Boiler Optimization, the annual operating profiles of the power block boilers are identical for the two projects. As shown above in the Boiler Optimization Project Description Table 2, with the Boiler Optimization the GHG emissions for the Rio Mesa SEGF stationary equipment are well below the PSD review trigger level of 100,000 tons per year.

Data Request 16

Please provide the spreadsheet version, in electronic format, of the GHG emission calculations for the auxiliary boilers.

Response:

The detailed stationary equipment (boilers and engines) GHG emission calculations for the Boiler Optimization are included in Attachment AQ-1, Appendix 5.1B, Table 5.1B-12. The electronic version of these emission calculations will be submitted in a separate confidential filing.

Data Request 22

Please check and correct the inconsistencies between the modeling files and AFC, including but not limited to the above mentioned ones, to make sure they match with each other.

Response:

As part of the Boiler Optimization modeling effort, the Applicant checked and corrected as necessary the inconsistencies between the emission levels summarized in the AFC and used for air quality impact modeling. The detailed emission calculations and emission rates/stack parameters summary tables for the Boiler Optimization modeling are enclosed in Attachment AQ-1, Appendix 5.1D. The results of this modeling effort are discussed above in the Boiler Optimization Project Description Table 4, and the input and output modeling files are provided on the enclosed compact disc.

Data Request No. 43

Data Request 43

Please provide a letter, email, or record of conversation with RCFD that confirms the absence of any expected impacts on the local fire district resulting from construction and operation of the proposed project.

Or, in the absence of such letter or communication, please provide a Fire and Emergency Services Risk Assessment and a Fire Protection and Emergency Services Needs Assessment for the construction and operation of the project that provides an objective estimate of both equipment and staffing shortfalls (if any) and the associated recommended mitigations (if any) that would be required by RCFD to maintain its current level of readiness to respond to the public.

The Fire and Emergency Services Risk Assessment and a Fire Protection and Emergency Services Needs Assessment should be considerate of the guidance provided by NFPA 1710: Standard for the Organization and Deployment of Fire Suppression Operations. Emergency Medical Operations. and Special Operations to the Public by Career Fire Departments and by NFPA 551: Guide for the Evaluation of Fire Risk Assessments. The Fire Protection and Emergency Services Needs Assessment should address emergency fire and medical response and equipment, staffing. and location needs while the Risk Assessment should be used to establish the risk (chances) of significant impacts occurring. The Fire Protection and Emergency Services Needs Assessment and Risk Assessment should evaluate the following: (a) the risk of impact on the local population that could result from potential unmitigated impacts on local fire protection and emergency services (Le. "drawdown" of emergency response resources, extended response times, etc.) and (b) recommend an amount of funding that should be provided and used to mitigate any identified impacts on local fire protection and emergency medical response services.

Response:

Attached are Applicant’s Fire and Emergency Services Risk Assessment and Fire Protection and Emergency Services Needs Assessment.

Data Request Nos. 55 and 57

Data Requests

55. *Please provide data (developed using Pro E, Solid Works or other equivalent 3D modeling package) showing expected energy flux emitted from each tower over a 24-hour period under several different weather (e.g., wind speed) scenarios. Translate this energy flux into expected increases in ambient temperature applied to a body located between the receiver, standby points/ring, and heliostats as well as changes in light and humidity between these locations. Based on 1-hour intervals, state the temperature applied to a body, humidity, and light at the top of the tower, and extending outward at reasonable, regularly occurring heights and distances. Please provide staff both a model and to-scale renderings shown in top down and side view.*

57. From the applicant's presentation at the January 6, 2012 public workshop, please provide the following pertaining to energy flux modeling and computations:

a. raw data used for input to the model;
b. boundary conditions and model parameters;
c. output files of the model runs and detailed computations;
d. an electronic copy of the model or web link to download in order to run the model and verify its findings; and
e. any publications pertinent to the development of the model or conclusions reached using its output.

Data Request 55 and 57 Supplemental Response:

Applicant has objected to these data requests and is providing this information without waving our objection.

The raw model input data and boundary conditions used for this model include: the time (year, month, day, hour, minute, second), geographic data (longitude, latitude, altitude) and LH-2.3 heliostat beam shape. In order to calculate worst-case scenarios, flux densities were modeled using full load demand (maximum flux) assumptions.

The below images were produced by a model using a 1m[meter] (3.28') by 1m (3.28') grid with one point within each grid (1m resolution). BrightSource Industries, Israel (BSII) modeled the cylindrical areas around the SRSG at intervals ranging from 20m to 1000m from the physical center of the tower when evaluated in plan view. Flux was modeled as being projected normal to the surface of the SRSG. The distances at which flux was modeled began at approximately 4m (13') from the SRSG face, and increased in increments of 10m (32') until 100m (320') from the SRSG. From there, flux was modeled at increments of 50m (160') to 200m (640'), and increments of 100m (320') from 200m (640')to 1000m (3,200') away from the SRSG. The height of the cylindrical areas in which flux was modeled range from 10m (33') to 230m (755') from ground level. BrightSource will not disclose the modeling of flux densities closer to the SRSG face due to the proprietary nature of our technology.

Figure 1 provides a 3-D view of the model output.

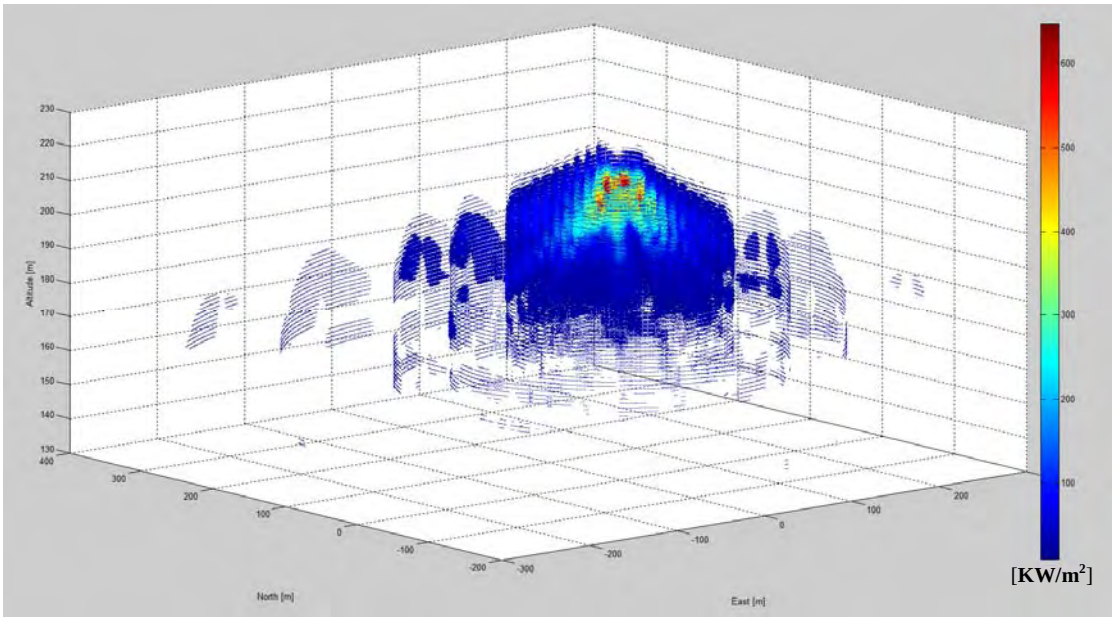


Figure 1. 3-D flux map model on cylindrical sections above the solar field at maximum load (maximum flux requirement); only flux density >10kW/m^2 is shown.

Figure 2Figure 2 illustrates the cylindrical model from above; again, showing only flux above 10kW/m^2.

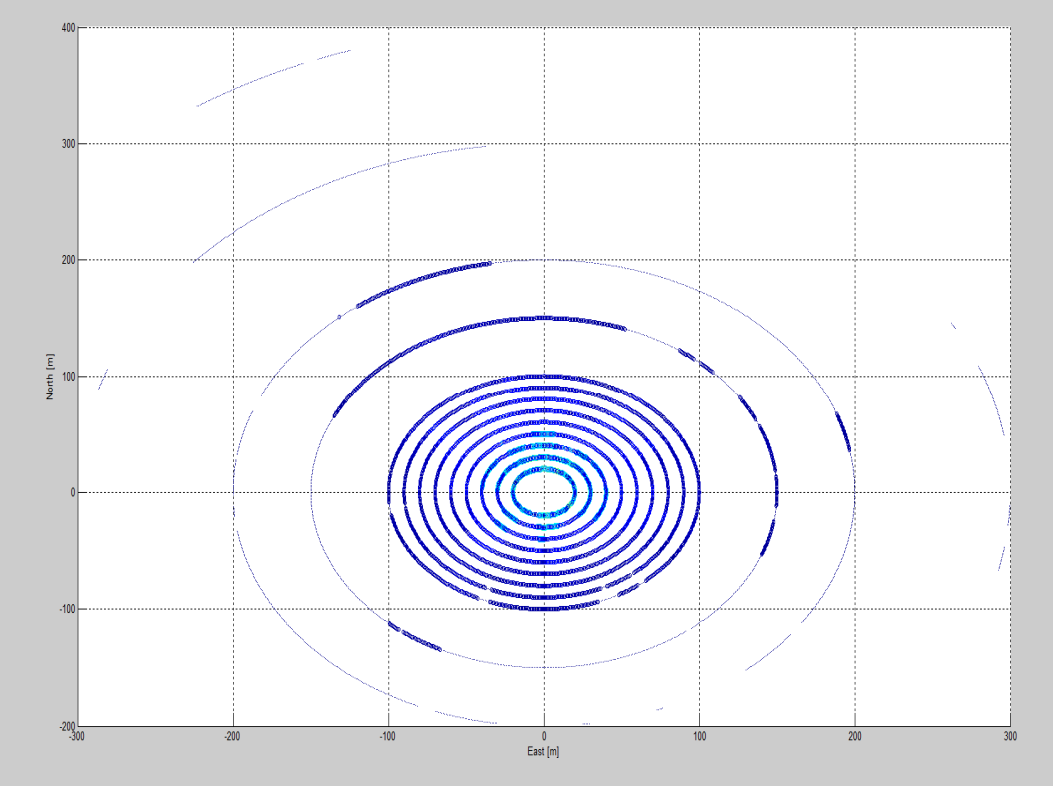


Figure 2. Top view of the cylindrical flux model, flux>10kWm^2.
Flux is only greater than 10kW/m2 at 380m (1,250') from the center and only a small portion of the cylinder on one side.

From a side (elevation) view (**Error! Reference source not found.**, Figure 3 and Figure 4) you can see that the flux is limited to a conical volume around the SRSG, within which the volume of high flux density - is relatively small.

Flux densities greater than 200kW/m^2 is only present at distances less than 35m (115') from the SRSG surface (Figure 5 & Figure 7).

Flux densities greater than 400kW/m^2 are only found within 4m (12') from the SRSG surface and based on the rectangular model to a small portion starting at 15m (49') from the SRSG and with a width of 10m (33'). Since the Rio Mesa SRSG has 32 faces rather than 4, this effect will be minimized if not eliminated.

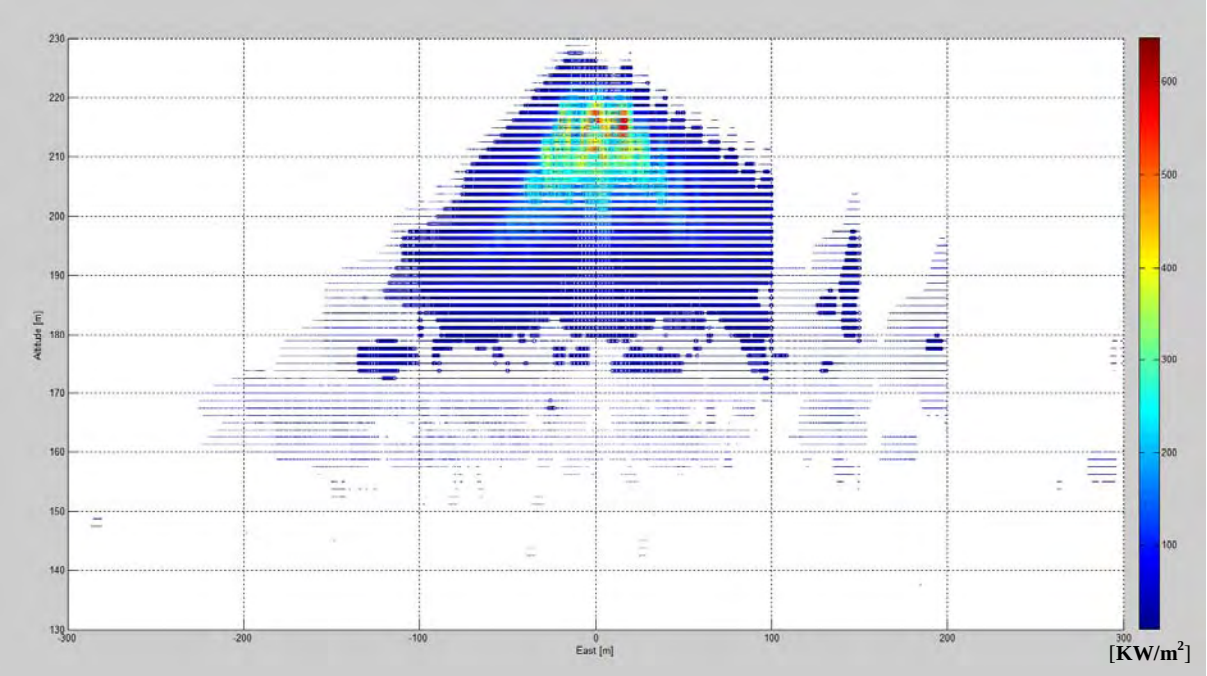


Figure 3. Side view from the North, thick blue is flux over 50kW/m^2.

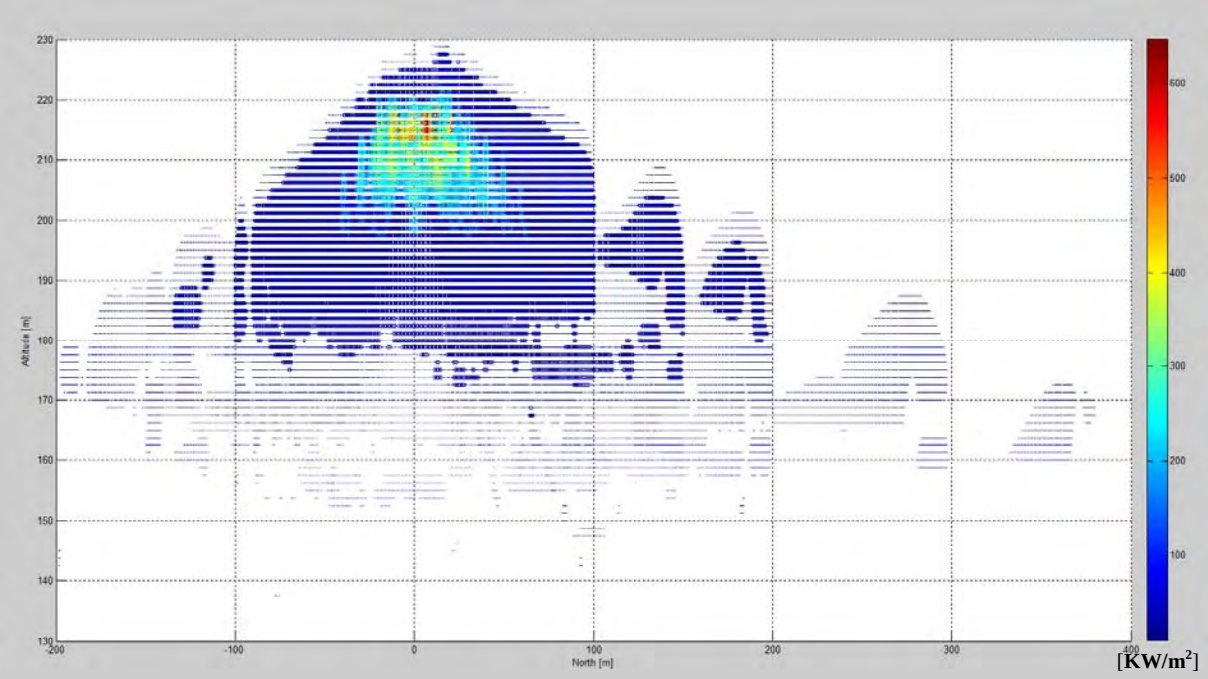


Figure 4. Side view from the East, thick blue is flux over 50kW/m2.

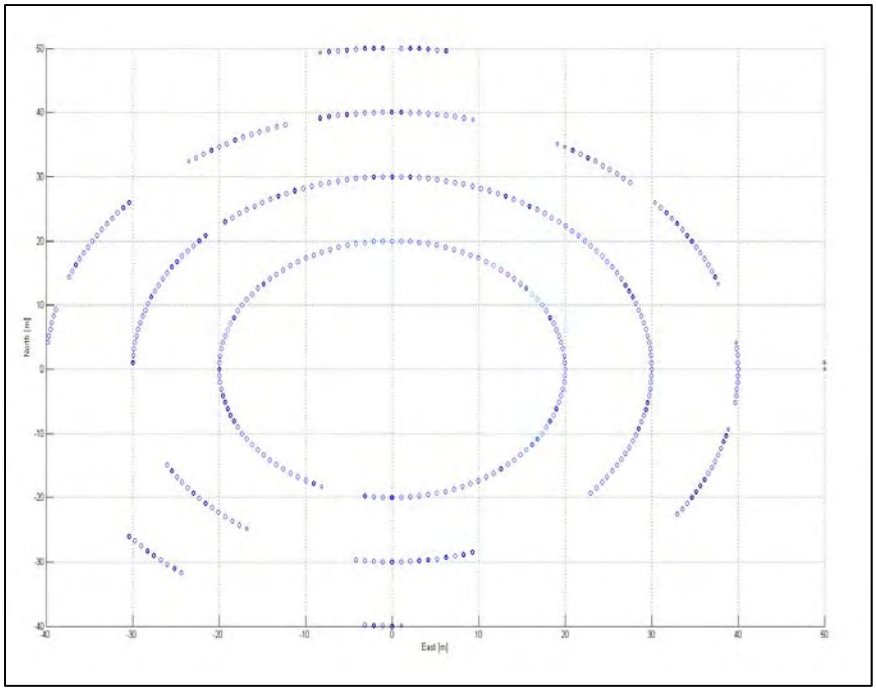


Figure 5. Top view, flux 200kW/m2.

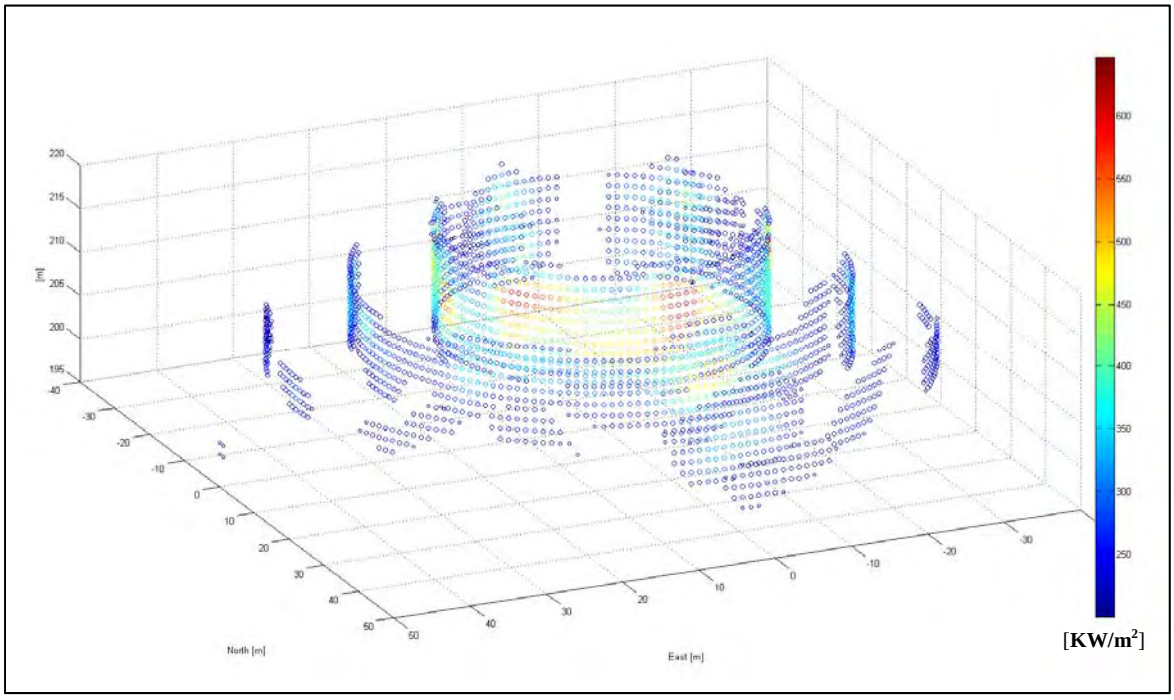


Figure 6. Flux above 200kW/m2.
As shown, the area of flux above 200kW/m2 is limited and the areas of densities 450kW/m2 (yellow) and over 500kW/m2 (orange to red) are very small.

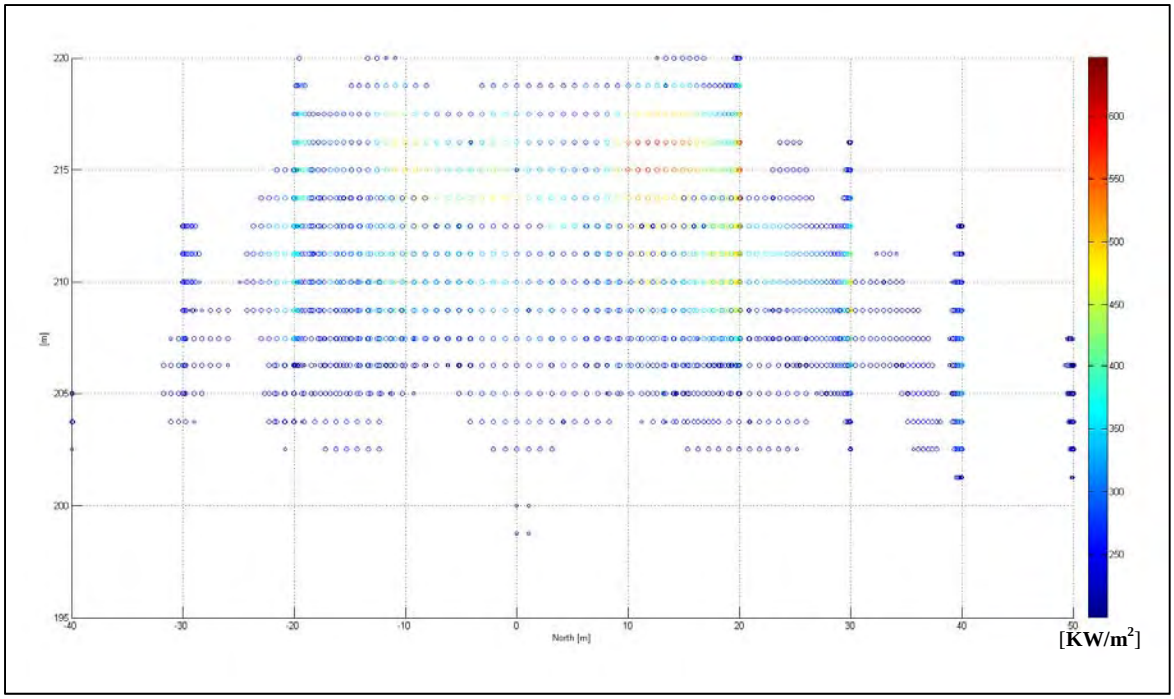


Figure 7. Side view from the East, flux > 200kW/m^2.

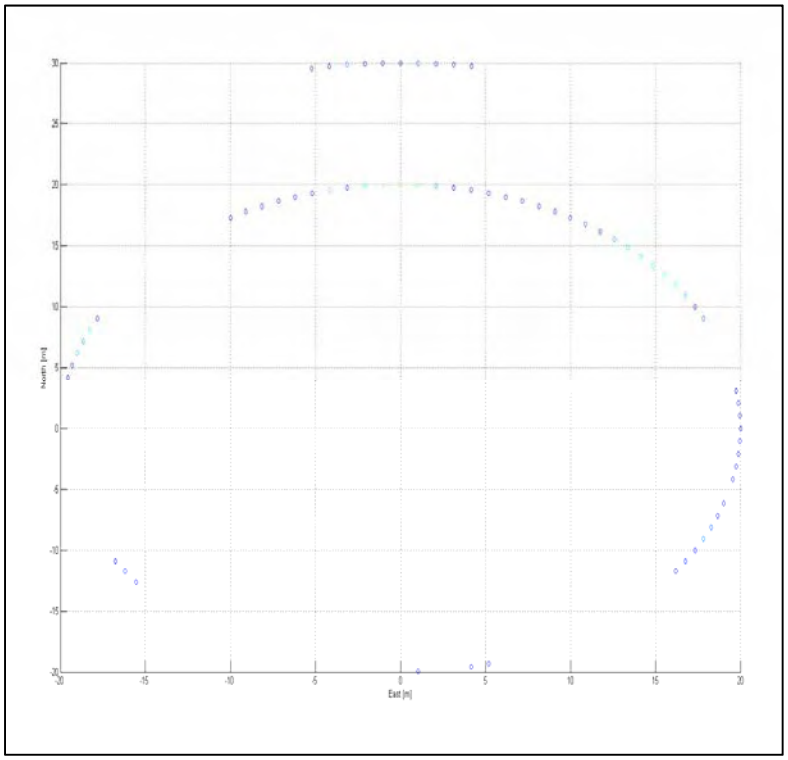


Figure 8. Top view of flux > 400kW/m2.
Concentrated flux is limited to 4m (13') or less from the SRSG (20m (66') from center point).

Attachment AQ-1
Revised Air Quality Appendices

Appendix 5.1: Air Quality (Revised April 2012)

The following briefly describes changes made to Air Quality Appendices 5.1A through 5.1H as a result of the Boiler Optimization.

Appendix 5.1A, Quarterly Wind Roses and Wind Frequency Distributions: no changes

Appendix 5.1B, Emissions and Operating Parameters: completely revised

Appendix 5.1C, Emission Control Technology Assessment: no changes

Appendix 5.1D, Ambient Air Quality Modeling Analysis: completely revised

Appendix 5.1E, Screening Health Risk Assessment: changes in Table 5.1E-1 shown in ~~strikeout~~/underline, completely revised Tables 5.1E-2 to 5.1E-5

Appendix 5.1F, Construction Emissions and Impact Analysis: See Data Response 5, no other changes

Appendix 5.1G, Cumulative Impacts Analysis: changes in Table 5.1G-2 shown in ~~strikeout~~/underline

Appendix 5.1H, Modeling Protocol and Related Correspondence: no changes

Appendix 5.1B (Revised April 2012)
Emissions and Operating Parameters

Table 5.1B-1R1

Emissions and Operating Parameters for the Auxiliary Boilers

Rio Mesa Solar Electric Generating Facility

Eliminated from project design: April 2012

Boiler Emission Characteristics				
		Normal	Hot Standby	Cold Startup
Heat Input, MMBtu/hr (HHV)		500.0		
Boiler Rating, lb/hr		350,000		
NOx, ppmvd @ 3% O2				
CO, ppmvd @ 3% O2				
VOC (as CH4), ppmvd @ 3% O2				
NOx (as NO2), lb/hr				
NOx, lb/MMBtu				
CO, lb/hr				
CO, lb/MMBtu				
VOC (as CH4), lb/hr				
VOC, lb/MMBtu				
PM10, lb/hr				
PM10, lb/MMBtu				
SO2, grains/100 scf				
SO2, lb/hr				
SO2, lb/MMBtu				
Boiler Stack Parameters				
Exhaust temp	deg F			
Exhaust volume	cfm			
Stack diameter	inches			
Exhaust velocity	ft/sec			

Table 5.1B-2R1

Emissions and Operating Parameters for Auxiliary Boilers[1]

Rio Mesa Solar Electric Generating Facility

Revised April 2012

Boiler Emission Characteristics			
		Normal	Startup
Heat Input, MMBtu/hr (HHV)		249.0	31
Boiler Rating, lb/hr		*174,000*	--
NOx, ppmvd @ 3% O2		9	*72*
CO, ppmvd @ 3% O2		25	*200*
VOC (as CH4), ppmvd @ 3% O2		12.6	*101*
NOx (as NO2), lb/hr		*2.74*	*2.74*
NOx, lb/MMBtu		*0.0110*	*0.088*
CO, lb/hr		*4.55*	*4.55*
CO, lb/MMBtu		0.0183	*0.146*
VOC (as CH4), lb/hr		*1.34*	*1.34*
VOC, lb/MMBtu		*0.0054*	*0.043*
PM10, lb/hr		1.25	0.31
PM10, lb/MMBtu		0.005	0.01
SO2, grains/100 scf		0.75	0.75
SO2, lb/hr		0.52	0.07
SO2, lb/MMBtu		0.0021	0.0021
Boiler Stack Parameters			
Exhaust temp	deg F	*300*	*300*
Exhaust volume	cfm	*72,426*	*10,001*
Stack diameter	inches	*66*	*66*
Exhaust velocity	ft/sec	*51*	*7.0*

Note:

1. These 249 MMBtu/hr boilers were called "startup boilers" in the original project design.

Table 5.1B-3R1

Emissions and Operating Parameters for Nighttime Preservation Boilers

Rio Mesa Solar Electric Generating Facility

Revised April 2012

Boiler Emission Characteristics			
		Normal	**Cold Startup**
Heat Input, MMBtu/hr (HHV)		*15*	*1.9*
Boiler Rating, lb/hr		*10,000*	--
NOx, ppmvd @ 3% O2		9	*72*
CO, ppmvd @ 3% O2		50	*400*
VOC (as CH4), ppmvd @ 3% O2		10	*80*
NOx (as NO2), lb/hr		*0.17*	*0.17*
NOx, lb/MMBtu		*0.0113*	*0.091*
CO, lb/hr		*0.55*	*0.55*
CO, lb/MMBtu		0.0366	*0.292*
VOC (as CH4), lb/hr		*0.08*	*0.08*
VOC, lb/MMBtu		*0.0053*	*0.043*
PM10, lb/hr		*0.08*	0.02
PM10, lb/MMBtu		0.005	0.01
SO2, grains/100 scf		0.75	0.75
SO2, lb/hr		0.03	*0.004*
SO2, lb/MMBtu		0.0021	0.0021
Boiler Stack Parameters			
Exhaust temp	deg F	*300*	300
Exhaust volume	cfm	*4,363*	*602*
Stack diameter	inches	*18*	*18*
Exhaust velocity	ft/sec	*41*	*6*

Table 5.1B-4R1
Diesel Emergency Generators, Power Blocks
Rio Mesa Solar Electric Generating Facility
Revised April 2012

Engine				
Engine Mfr		Caterpillar		
Model		*3516C or equivalent*		
Emissions Cert		*Tier 2*		
Useable Horsepower	hp	*3633*		
Generator Power Output	kW	2500		
Fuel		CA Diesel		
Specific Gravity		0.825		
Fuel Sulfur Content	wt %	0.0015%		
Fuel Consumption	gph	175		
	MMBtu/hr	23.8		
	Btu/bhp-hr	*6,551*		
Emissions				
NOx	g/bhp-hr	*4.8*		
CO	g/bhp-hr	*2.6*		
VOC	g/bhp-hr	*0.1669*		
PM10	g/bhp-hr	*0.15*		
NOx	lb/hr	*38.4*	lb/yr	*1922*
CO	lb/hr	*20.8*	lb/yr	*1041*
VOC	lb/hr	*1.3*	lb/yr	*67*
PM10	lb/hr	*1.2*	lb/yr	*60*
SO2	lb/hr	0.04	lb/yr	2
Exhaust Parameters				
Exhaust temp	deg F	*925*		
Stack height	feet	26		
Exhaust volume	cfm	*19,600*		
Stack diameter	inches	*18.0*		
Exhaust velocity	ft/sec	*185*		

Table 5.1B-5R1
Emergency Diesel Generator, Common Area
Rio Mesa Solar Electric Generating Facility
Revised April 2012

Engine				
Engine Mfr		Caterpillar		
Model		C9 ATAAC *or equivalent*		
Emissions Cert		Tier 3		
Useable Horsepower	hp	*398*		
Generator Power Output	kW	250		
Fuel		CA Diesel		
Specific Gravity		0.825		
Fuel Sulfur Content	wt %	0.0015%		
Fuel Consumption	gph	*20*		
	MMbtu/hr	*2.7*		
	Btu/bhp-hr	*6,834*		
Emissions				
NOx	g/bhp-hr	*3.00*		
CO	g/bhp-hr	*2.6*		
VOC	g/bhp-hr	*0.1669*		
PM10	g/bhp-hr	*0.15*		
NOx	lb/hr	*2.6*	lb/yr	*132*
CO	lb/hr	*2.28*	lb/yr	*114*
VOC	lb/hr	*0.15*	lb/yr	*7*
PM10	lb/hr	*0.13*	lb/yr	*7*
SO2	lb/hr	0.004	lb/yr	0
Exhaust Parameters				
Exhaust temp	deg F	*855*		
Stack height	feet	18		
Exhaust volume	cfm	*2,250*		
Stack diameter	inches	*8*		
Exhaust velocity	ft/sec	*107*		

Table 5.1B-6R1
Diesel Fire Pump Engines, Power Blocks
Rio Mesa Solar Electric Generating Facility
Revised April 2012

Engine				
Engine Mfr		*Cummins*		
Model		*CFP7E-F30*		
		or equivalent		
Emissions Cert		Tier 3		
Useable Horsepower	hp	*200*		
Pump Speed	rpm	*2100*		
Fuel		CA Diesel		
Specific Gravity		0.825		
Fuel Sulfur Content	wt %	0.0015%		
Fuel Consumption	gph	*12.0*		
	MMbtu/hr	*1.6*		
	Btu/bhp-hr	*8,160*		
Emissions				
NOx	g/bhp-hr	*3.0*		
CO	g/bhp-hr	*2.6*		
VOC	g/bhp-hr	*0.1836*		
PM10	g/bhp-hr	*0.15*		
NOx	lb/hr	*1.3*	lb/yr	*66*
CO	lb/hr	*1.15*	lb/yr	*57*
VOC	lb/hr	*0.08*	lb/yr	*4*
PM10	lb/hr	*0.07*	lb/yr	*3*
SO2	lb/hr	*0.003*	lb/yr	*0.1*
Exhaust Parameters				
Exhaust temp	deg F	*975*		
Exhaust height	feet	15		
Exhaust volume	cfm	*1,650*		
Stack diameter	inches	4		
Exhaust velocity	ft/sec	*315*		

Table 5.1B-7R1
Diesel Fire Pump Engine, Common Area
Rio Mesa Solar Electric Generating Facility
Revised April 2012

Engine				
Engine Mfr/Model		*Cummins CFP7E-F30 or equivalent*		
Emissions Cert		Tier 3		
Useable Horsepower	hp	*200*		
Pump Speed	rpm	*2100*		
Fuel		CA Diesel		
Specific Gravity		0.825		
Fuel Sulfur Content	wt %	0.0015%		
Fuel Consumption	gph	12.0		
	MMbtu/hr	1.6		
	Btu/bhp-hr	*8,160*		
Emissions				
NOx	g/bhp-hr	*3.0*		
CO	g/bhp-hr	*2.6*		
VOC	g/bhp-hr	*0.1836*		
PM10	g/bhp-hr	*0.15*		
NOx	lb/hr	*1.3*	lb/yr	*66*
CO	lb/hr	*1.15*	lb/yr	*57*
VOC	lb/hr	*0.08*	lb/yr	*4*
PM10	lb/hr	*0.07*	lb/yr	*3*
SO2	lb/hr	*0.003*	lb/yr	*0.1*
Exhaust Parameters				
Exhaust temp	deg F	*975*		
Exhaust height	feet	15		
Exhaust volume	cfm	*1,650*		
Stack diameter	inches	4		
Exhaust velocity	ft/sec	*315*		

Table 5.1B-8R1
Typical Annual Operating Schedule, Each Plant
Rio Mesa Solar Electric Generating Facility
Revised April 2012

Auxiliary boiler operation[1]	**Summer**	**Winter**	
operation , hours/day[2] (average)	5	5	
Equivalent full-load hours/yr[2]			**1,100**
Expected startup hours/yr			**865**

Nighttime boiler operation	**Summer**	**Winter**	
operation , hours/day[2] (average)	12	16	
Equivalent full-load hours/yr[2]			**4,780**
Expected startup hours/yr			**345**

Notes:
1. These 249 MMBtu/hr boilers were called "startup boilers" in the original project design.
2. Hours shown are equivalent full load hours; boilers may operate more hours on some days and/or at lower loads. See text.

Table 5.1B-9R1
Calculation of Wet Surface Air Cooler Emissions
Rio Mesa Solar Electric Generating Facility
Revised April 2012

Typical Worst-Case Design Parameters	
Water Flow Rate, 10E6 lbm/hr	2.00
Water Flow Rate, gal/min	*4,000*
Drift Rate, %	0.0005
Drift, lbm water/hr	10.00
PM10 Emissions based on TDS Level	
TDS level, ppm	*1500*
PM10, lb/hr	*0.015*
PM10, lb/day	*0.18*
PM10, tpy	*0.015*
Exhaust Parameters	
Exhaust Temp, deg F	*80.0*
Volumetric flow rate (total), ft3/min	*590,000.0*
Fan diameter, ft	*9*
No. of fans	*4*

Table 5.1B-10R1
Emissions from Mirror Cleaning Activities
Rio Mesa Solar Electric Generating Facility
Revised April 2012

Pollutant	Emission Factor	Emissions Per Plant (lb/year)	
Larger vehicles:	VMT/yr	18,900	
Far From Tower (FFT) MWMs	gal/yr	899,360	
NOx (g/mi)	2.332	97	
VOC (g/mi)	0.951	40	
SO2 (lb/1000 gal)	0.21	189	
CO (g/mi)	2.027	84	
(g/mi)	0.038	2	
PM10 (road dust) (lb/VMT)	0.30	5,632	
PM2.5 (road dust) (lb/VMT)	0.03	563	
Smaller vehicles:	VMT/yr	4,000	
Near Tower (NT) MWMs	Gal/yr	64,240	
NOx (g/bhp-hr)	0.276	644	
VOC (g/bhp-hr)	0.1314	307	
SO2 (lb/1000 gal)	0.21	13	
CO (g/bhp-hr)	0.087	203	
PM10/PM2.5 (combustion) (g/bhp-hr)	0.0092	21	
PM10 (road dust) (lb/VMT)	0.17	684	
PM2.5 (road dust) (lb/VMT)	0.02	68	

Total, all activities	Per Plant, lb/yr		Total 3 Plants, lb/yr	Total 3 Plants, lb/hr	Total 3 Plants, lb/day	Total 3 Plants, ton/yr
NOx	741		2,224	0.3	6.1	1.1
VOC	346		1,039	0.1	2.8	0.5
SO2	202		607	0.08	1.7	0.30
CO	287		862	0.1	2.4	0.4
PM10/PM2.5 (combustion)	23		69	0.0	0.2	0.03
PM10 (road dust)	6,316		18,949	2.6	51.9	9.5
PM2.5 (road dust)	632		1,895	0.3	5.2	0.9
DPM	23		69	0.01	0.2	0.03
Greenhouse Gas Emissions (GHG)			lb/yr			ton/yr
FFT (Onroad) vehicles			59,906,368			29,953
NT (Offroad) vehicles			4,279,026			2,140

Notes:

1. Emission factors for nonroad vehicles from EPA Nonroad Model documentation, Tier 4 engines: 100 to 175 bhp for NT vehicles (available at http://www.epa.gov/otaq/models/nonrdmdl/nonrdmdl2010/420r10018.pdf).
2. Assume all combustion PM10 is <2.5 um in size.
3. Assume all engines are diesel fueled so all combustion PM is DPM.
4. GHG emission factors from 40 CFR 98, Table C-1 and GWP from 40 CFR 98, Table A-1.; distillate fuel.
5. Unpaved road dust factors from construction emissions calculations; 90% control.

CO2 EF, kg/MMBtu	CH4 EF, kg/MMBtu	N2O EF, kg/MMBtu	GWP for CO2	GWP for CH4	GWP for N2O	Weighted CO2e, kg/MMBtu	Weighted CO2e, lb/MMBtu	Diesel HHV, MMBtu/gal	Weighted CO2e, lb/1000 gal
73.96	0.003	0.0006	1	21	310	74.209	163.3	0.136	22203.33

Table 5.1B-11R1
Calculations for Maximum Hourly, Daily and Annual Criteria Pollutant Emissions
Rio Mesa Solar Electric Generating Facility
Revised April 2012

Equipment	Hourly Emission Rates, Each Unit					Heat Input, MMBtu/hr
	NOx	SOx	CO	VOC	PM10/PM2.5	
Auxiliary Boilers						
Normal operation	2.74	0.52	4.55	1.34	1.25	*249*
Cold startup	*2.74*	0.07	*4.55*	*1.34*	0.31	*31*
Nighttime Preservation Boilers						
Normal operation	0.17	0.03	0.55	0.08	0.08	*15.00*
Cold startup	*0.17*	0.004	*0.55*	*0.08*	0.02	*1.9*
Power Block Emergency Generators	38.44	0.04	20.82	1.34	1.20	*23.8*
Common Area Emergency Generator	2.63	0.004	2.28	0.15	0.13	*2.7*
Power Block Fire Pump Engines	*1.32*	*0.003*	*1.15*	*0.08*	*0.07*	*1.6*
Common Area Fire Pump Engine	*1.32*	*0.003*	*1.15*	*0.08*	*0.07*	*1.6*
WSAC	0	0	0	0	*0.015*	*0*

Maximum Hourly Emissions, Normal Boiler Operation

Equipment	Total Number of Units (1)	Max Hour	Heat Input, MMBtu/hr	Emissions, pounds/hr					
				NOx	SO2	CO	VOC	PM10	PM2.5
Auxiliary Boilers	3	1	747.0	8.2	1.6	13.7	4.0	3.7	3.7
Nighttime Preservation Boilers	3	1	45.0	0.5	0.1	1.6	0.2	0.2	0.2
Power Block Emergency Generators	3	0.5	35.7	57.7	0.1	31.2	2.0	1.8	1.8
Common Area Emergency Generator	1	0.5	1.4	1.3	0.0	1.1	0.1	0.1	0.1
Power Block Fire Pump Engines	3	0.5	2.4	2.0	0.0	1.7	0.1	0.1	0.1
Common Area Fire Pump Engine	1	0.5	0.8	0.7	0.0	0.6	0.0	0.0	0.0
WSAC	3	1	0	0.0	0.0	0.0	0.0	4.5E-02	4.5E-02
Total Emissions, lb/hr			**832.3**	**70.4**	**1.7**	**50.0**	**6.5**	**6.0**	**6.0**

Table 5.1B-11R1 (cont.)
Calculations for Maximum Hourly, Daily and Annual Criteria Pollutant Emissions
Rio Mesa Solar Electric Generating Facility
Revised April 2012

Maximum Daily Emissions, Normal Operating Day

Equipment	Total Number of Units (1)	Operating Hours/Day	Heat Input, MMBtu/day	Emissions, pounds/day (Each Unit)						Emissions, pounds/day (Combined Total for Three Plants)					
				NOx	SO2	CO	VOC	PM10	PM2.5	NOx	SO2	CO	VOC	PM10	PM2.5
Auxiliary Boilers-- normal operations	3	5	3,735	13.7	2.6	22.8	6.7	6.2	6.2	41.1	7.8	68.3	20.1	18.7	18.7
Auxiliary Boilers-- startup	3	2.5	233	6.9	0.2	11.4	3.4	0.8	0.8	20.6	0.6	34.1	10.1	2.3	2.3
Nighttime Preservation Boilers	3	16	720	2.7	0.5	8.8	1.3	1.2	1.2	8.2	1.5	26.3	3.8	3.6	3.6
Nighttime Pres. Boilers-- startup	3	1	6	0.2	0.0	0.5	0.1	0.0	0.0	0.5	0.0	1.6	0.2	0.1	0.1
Power Block Emergency Generators	3	0.5	36	19.2	0.0	10.4	0.7	0.6	0.6	57.7	0.1	31.2	2.0	1.8	1.8
Common Area Emergency Generator	1	0.5	1.4	1.3	0.0	1.1	0.1	0.1	0.1	1.3	0.0	1.1	0.1	0.1	0.1
Power Block Fire Pump Engines	3	0.5	2.4	0.7	0.0	0.6	0.0	0.0	0.0	2.0	0.0	1.7	0.1	0.1	0.1
Common Area Fire Pump Engine	1	0.5	0.8	0.7	0.0	0.6	0.0	0.0	0.0	0.7	0.0	0.6	0.0	0.0	0.0
WSAC	3	12	0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.54	0.54
Total, Boilers			4,694.2							70.3	9.9	130.4	34.2	24.7	24.7
Total, Engines			40.3							61.6	0.1	34.7	2.2	2.0	2.0
Total Emissions, lb/day			**4,734.5**							**131.9**	**10.0**	**165.1**	**36.5**	**27.2**	**27.2**

Maximum Daily Emissions, Auxiliary Boiler Cold Startup Day

Equipment	Total Number of Units (1)	Operating Hours/Day	Heat Input, MMBtu/day	Emissions, pounds/day (Each Unit)						Emissions, pounds/day (Combined Total for Three Plants)					
				NOx	SO2	CO	VOC	PM10	PM2.5	NOx	SO2	CO	VOC	PM10	PM2.5
Auxiliary Boilers-- normal operations	3	2	1,494	5.48	1.0	9.1	2.7	2.5	2.5	16.4	3.1	27.3	8.0	7.5	7.5
Auxiliary Boilers-- startup	3	5	467	13.7	0.4	22.8	6.7	1.6	1.6	41.1	1.1	68.3	20.1	4.7	4.7
Nighttime Preservation Boilers	3	16	720	2.7	0.5	8.8	1.3	1.2	1.2	8.2	1.5	26.3	3.8	3.6	3.6
Nighttime Pres. Boilers-- startup	3	1	6	0.2	0.0	0.5	0.1	0.0	0.0	0.5	0.0	1.6	0.2	0.1	0.1
Power Block Emergency Generators	3	0.5	36	19.2	0.0	10.4	0.7	0.6	0.6	57.7	0.1	31.2	2.0	1.8	1.8
Common Area Emergency Generator	1	0.5	1.4	1.3	0.0	1.1	0.1	0.1	0.1	1.3	0.002	1.1	0.1	0.07	0.1
Power Block Fire Pump Engines	3	0.5	2.4	0.7	0.0	0.6	0.0	0.0	0.0	2.0	0.004	1.7	0.1	0.1	0.1
Common Area Fire Pump Engine	1	0.5	0.8	0.7	0.0	0.6	0.0	0.0	0.0	0.7	0.0	0.6	0.0	0.0	0.03
WSAC	3	12	0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.54	0.54
Total, Boilers			2,687							66.2	5.8	123.6	32.2	15.8	15.8
Total, Engines			40.3							61.6	0.1	34.7	2.2	2.0	2.0
Total Emissions, lb/day			**2,726.9**							**127.8**	**5.8**	**158.2**	**34.5**	**18.3**	**18.3**

Maximum Annual Emissions

Equipment	Total Number of Units (1)	Operating Hours/Yr	Startup Hours/Yr	Emissions, tons/yr					
				NOx	SO2	CO	VOC	PM10	PM2.5
Auxiliary Boilers	3	1100	865	8.1	1.0	13.4	3.9	2.5	2.5
Nighttime Preservation Boilers	3	4780	345	1.3	0.2	4.2	0.6	0.5	0.5
Power Block Emergency Generators	3	50	0	2.9	0.003	1.6	0.10	0.09	0.09
Common Area Emergency Generator	1	50	0	0.1	1.1E-04	0.06	0.004	0.003	0.003
Power Block Fire Pump Engines	3	50	0	0.099	1.9E-04	0.09	0.006	0.005	0.005
Common Area Fire Pump Engine	1	50	0	0.03	6.3E-05	0.03	0.002	0.002	0.002
WSAC	3	2000	0	0.0	0.0	0.0	0.0	0.04	0.04
Total Emissions, tons/yr				**12.5**	**1.2**	**19.4**	**4.7**	**3.2**	**3.2**

Note:
1. Total, 3x250 MW plants.

Table 5.1B-12R1
Greenhouse Gas Emissions Calculations
Rio Mesa Solar Electric Generating Facility
Revised April 2012

Unit	Total Number of Units (1)	Rated Heat Input, MMBtu/hr	Rated Capacity, MW (Note 1)	Operating Hours per year	Startup Hours per year	Fuel Use, MMBtu/yr (1)	Estimated Gross MWh	Maximum Emissions, metric tonnes/yr				Max. Emissions, tons/yr CO2e	CO2 lb/MWh
								CO2	CH4	N2O	SF6		
Auxiliary Boilers	3	249	n/a	1100	865	902,485	n/a	47,850	0.90	0.09	--		
Nighttime Preservation Boilers	3	15.0	n/a	4780	345	217,047	n/a	11,508	0.22	0.02	--		
Power Block Emergency Generators	3	23.8	n/a	200	n/a	14,280	n/a	1,056	0.04	0.01	--		
Common Area Emergency Generator	1	2.72	n/a	200	n/a	544	n/a	40	1.6E-03	3.3E-04	--		
Power Block Fire Pump Engines	3	1.63	n/a	200	n/a	979	n/a	72	2.9E-03	5.9E-04	--		
Common Area Fire Pump Engine	1	1.63	n/a	200	n/a	326	n/a	24	9.8E-04	2.0E-04	--		
WSACs	3	--	n/a	2000	n/a	0	n/a	0	0.00	0.00	--		
Circuit breakers	9	--	n/a	8760	n/a	0	n/a	--	--	--	3.0E-03		
Total			--	--		1,135,662	2,100,000	60,551	1.17	0.12	3.0E-03		
CO2-Equivalent								60,551	24.53	37.71	71.73	66,753	64

Natural Gas GHG Emission Rates (2)

Fuel	Emission Factors, kg/MMBtu			Emission Factor
	CO2 (3)	CH4 (4)	N2O (4)	SF6 (5)
Natural Gas	*53.020*	*1.00E-03*	1.00E-04	n/a
Diesel Fuel	*73.960*	3.00E-03	6.00E-04	n/a
Global Warming Potential (4)	1	21	310	23,900

Notes:

1. Rated capacity and heat input from heat balance at annual average conditions, annual fuel use and gross generation based on 100% capacity factor.
2. Calculation methods and emission factors from ARB, "Regulation for the Mandatory Reporting of Greenhouse Gas Emissions," December 5, 2007 (Staff's Suggested Modifications to the Originally Proposed Regulation Order Released October 19, 2007). http://www.arb.ca.gov/cc/ccei/reporting/GHGReportRegUpdate12_05_07.pdf
3. 40 CFR 98, Table C-1
4. 40 CFR 98, Table A-1.
5. Sulfur hexafluoride (SF6) will be used as an insulating medium in six 230 kV breakers (five in use, one in storage) in the common area and in one generator circuit breaker (GCB) at each power block. Estimates of the SF6 contained in a 230 kV breaker range from 161 to 208 lbs, depending on the manufacturer. The GCBs will each contain 24.2 lb of SF6. The IEC standard for SF6 leakage is less than 0.5%; the NEMA leakage standard for new circuit breakers is 0.1%. A maximum leakage rate of 0.5% per year is assumed.

Table 5.1B-13R1
Calculation of Noncriteria Pollutant Emissions from Auxiliary Boilers
Rio Mesa Solar Electric Generating Facility
Large auxiliary boilers eliminated from project design: April 2012

Compound	Emission Factor, lb/MMcf (1)	Maximum Hourly Emissions, lb/hr per boiler(2)	Annual Emissions (3)	
			tpy per boiler	tpy, all boilers
Propylene	1.55E-02			
Hazardous Air Pollutants				
Acetaldehyde	9.0E-04			
Acrolein	8.0E-04			
Benzene	1.7E-03			
Ethylbenzene	2.0E-03			
Formaldehyde	3.6E-03			
Hexane	1.3E-03			
Naphthalene	3.0E-04			
PAHs (except naphthalene) (4)	1.0E-04			
Toluene	7.8E-03			
Xylene	5.8E-03			
Total HAPs				

Notes:

(1) All factors from Ventura County APCD, "AB2588 Combustion Emission Factors," Natural Gas Fired External Combustion Equipment >100 MMBtu/hr. Available at http://www.vcapcd.org/pubs/Engineering/AirToxics/combem.pdf

(2) Based on maximum hourly boiler heat input of - MMscf/hr

(3) Based on total annual heat input of 0.0 MMscf/yr

(4) Total PAHs, excluding naphthalene. See speciation below.

(5) Emission factors for individual PAHs obtained from AP-42, Table 1.4-3, then adjusted proportionally so that total of "Adjusted EF" equals Total PAH EF of 1.0 E-04 lb/MMscf per Ventura County factors.

Speciated PAHs (except naphthalene)

	Mean EF (Note 1)	Adjusted EF (Note 5)	Emissions per boiler	
			lb/hr	tpy
Benzo(a)anthracene	1.80E-06	1.58E-05	0.00E+00	0.00E+00
Benzo(a)pyrene	1.20E-06	1.05E-05	0.00E+00	0.00E+00
Benzo(b)fluoranthrene	1.80E-06	1.58E-05	0.00E+00	0.00E+00
Benzo(k)fluoranthrene	1.80E-06	1.58E-05	0.00E+00	0.00E+00
Chrysene	1.80E-06	1.58E-05	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	1.20E-06	1.05E-05	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	1.80E-06	1.58E-05	0.00E+00	0.00E+00
Total	1.14E-05	1.00E-04	0.00E+00	0.00E+00

Table 5.1B-14R1
Calculation of Noncriteria Pollutant Emissions from Auxiliary Boilers
Rio Mesa Solar Electric Generating Facility
Revised April 2012

Compound	Emission Factor, lb/MMcf (1)	Maximum Hourly Emissions, lb/hr per boiler(2)	Annual Emissions (3)	
			tpy per boiler	tpy, all boilers
Propylene	1.55E-02	3.79E-03	*2.29E-03*	*6.87E-03*
Hazardous Air Pollutants				
Acetaldehyde	9.00E-04	2.20E-04	*1.33E-04*	*3.98E-04*
Acrolein	8.00E-04	1.95E-04	*1.18E-04*	*3.54E-04*
Benzene	1.70E-03	4.15E-04	*2.51E-04*	*7.52E-04*
Ethylbenzene	2.00E-03	4.88E-04	*2.95E-04*	*8.85E-04*
Formaldehyde	3.60E-03	8.79E-04	*5.31E-04*	*1.59E-03*
Hexane	1.30E-03	3.17E-04	*1.92E-04*	*5.75E-04*
Naphthalene	3.00E-04	7.32E-05	*4.42E-05*	*1.33E-04*
PAHs (except naphthalene) (4)	1.00E-04	2.44E-05	*1.47E-05*	*4.42E-05*
Toluene	7.80E-03	1.90E-03	*1.15E-03*	*3.45E-03*
Xylene	5.80E-03	1.42E-03	*8.55E-04*	*2.57E-03*
Total HAPs		5.93E-03	*3.58E-03*	*1.08E-02*

Notes:

(1) All factors from Ventura County APCD, "AB2588 Combustion Emission Factors," Natural Gas Fired External Combustion Equipment >100 MMBtu/hr. Available at http://www.vcapcd.org/pubs/Engineering/AirToxics/combem.pdf

(2) Based on maximum hourly boiler heat input of 0.2441 MMscf/hr

(3) Based on total annual heat input of *295.0* MMscf/yr

(4) Total PAHs, excluding naphthalene. See speciation below.

(5) Emission factors for individual PAHs obtained from AP-42, Table 1.4-3, then adjusted proportionally so that total of "Adjusted EF" equals Total PAH EF of 1.0 E-04 lb/MMscf per Ventura County factors.

Speciated PAHs (except naphthalene)

	Mean EF (Note 1)	Adjusted EF (Note 5)	Emissions	
			lb/hr	tpy
Benzo(a)anthracene	1.80E-06	1.58E-05	3.85E-06	2.33E-06
Benzo(a)pyrene	1.20E-06	1.05E-05	2.57E-06	1.55E-06
Benzo(b)fluoranthrene	1.80E-06	1.58E-05	3.85E-06	2.33E-06
Benzo(k)fluoranthrene	1.80E-06	1.58E-05	3.85E-06	2.33E-06
Chrysene	1.80E-06	1.58E-05	3.85E-06	2.33E-06
Dibenz(a,h)anthracene	1.20E-06	1.05E-05	2.57E-06	1.55E-06
Indeno(1,2,3-cd)pyrene	1.80E-06	1.58E-05	3.85E-06	2.33E-06
Total	1.14E-05	1.00E-04	2.44E-05	1.47E-05

Table 5.1B-15R1
Calculation of Noncriteria Pollutant Emissions from Nighttime Preservation Boilers
Rio Mesa Solar Electric Generating Facility
Revised April 2012

Compound	Emission Factor, lb/MMscf (1)	Maximum Hourly Emissions, lb/hr per boiler(2)	Annual Emissions (3)	
			tpy per boiler	tpy, all boilers
Propylene	5.30E-01	*7.79E-03*	*1.88E-02*	*5.64E-02*
Hazardous Air Pollutants				
Acetaldehyde	3.10E-03	*4.56E-05*	*1.10E-04*	*3.30E-04*
Acrolein	2.70E-03	*3.97E-05*	*9.58E-05*	*2.87E-04*
Benzene	5.80E-03	*8.53E-05*	*2.06E-04*	*6.17E-04*
Ethylbenzene	6.90E-03	*1.01E-04*	*2.45E-04*	*7.34E-04*
Formaldehyde	1.23E-02	*1.81E-04*	*4.36E-04*	*1.31E-03*
Hexane	4.60E-03	*6.76E-05*	*1.63E-04*	*4.89E-04*
Naphthalene	3.00E-04	*4.41E-06*	*1.06E-05*	*3.19E-05*
PAHs (4)	1.00E-04	*1.47E-06*	*3.55E-06*	*1.06E-05*
Toluene	2.65E-02	*3.90E-04*	*9.40E-04*	*2.82E-03*
Xylene	1.97E-02	*2.90E-04*	*6.99E-04*	*2.10E-03*
Total HAPs		*1.21E-03*	*2.91E-03*	*8.72E-03*

Notes:

(1) All factors from Ventura County APCD, "AB2588 Combustion Emission Factors," Natural Gas Fired External Combustion Equipment 10-100 MMBtu/hr. Available at http://www.vcapcd.org/pubs/Engineering/AirToxics/combem.pdf

(2) Based on maximum hourly heat input of *0.015* MMscf/hr

(3) Based on total annual fuel use of *70.9* MMscf/yr

(4) Total PAHs, excluding naphthalene. See speciation below.

(5) Emission factors for individual PAHs obtained from AP-42, Table 1.4-3, then adjusted proportionally so that total of "Adjusted EF" equals Total PAH EF of 1.0 E-04 lb/MMscf per Ventura County factors.

Speciated PAHs (except naphthalene)

	Mean EF (Note 1)	Adjusted EF (Note 5)	Emissions	
			lb/hr	tpy
Benzo(a)anthracene	1.80E-06	1.58E-05	2.32E-07	5.60E-07
Benzo(a)pyrene	1.20E-06	1.05E-05	1.55E-07	3.73E-07
Benzo(b)fluoranthrene	1.80E-06	1.58E-05	2.32E-07	5.60E-07
Benzo(k)fluoranthrene	1.80E-06	1.58E-05	2.32E-07	5.60E-07
Chrysene	1.80E-06	1.58E-05	2.32E-07	5.60E-07
Dibenz(a,h)anthracene	1.20E-06	1.05E-05	1.55E-07	3.73E-07
Indeno(1,2,3-cd)pyrene	1.80E-06	1.58E-05	2.32E-07	5.60E-07
Total	1.14E-05	1.00E-04	1.47E-06	3.55E-06

Table 5.1B-16R1
Calculation of Noncriteria Pollutant Emissions from WSACs
Rio Mesa Solar Electric Generating Facility
Revised April 2012

Constituent	Concentration in Cooling Tower Return Water (2)	Emissions (1)		
		Emissions, lb/hr	Emissions, ton/yr	Emissions, lbs/year
Ammonia	0 ppm	0.0E+00	0.0E+00	0.0
Copper	0.01 ppm	*1.0E-07*	*1.0E-07*	0.0
Silver	0 ppm	0.0E+00	0.0E+00	0.0
Zinc	0 ppm	0.0E+00	0.0E+00	0.0
Hazardous Air Pollutants				
Arsenic	0 ppm	0.0E+00	0.0E+00	0.0
Beryllium	0.0025 ppm	*2.5E-08*	*2.5E-08*	0.0
Cadmium	0 ppm	0.0E+00	0.0E+00	0.0
Chromium (III)	0 ppm	0.0E+00	0.0E+00	0.0
Lead	0 ppm	0.0E+00	0.0E+00	0.0
Mercury	0 ppm	0.0E+00	0.0E+00	0.0
Nickel	0 ppm	0.0E+00	0.0E+00	0.0
Dioxins/furans	-- ppm	--	--	--
PAHs	--	--	--	--
Total HAPs			*2.5E-08*	*5.0E-05*

Notes:
1. Emissions calculated from maximum drift rate *10.00* lb/hr and 2,000 hrs/yr of operation.
2. Based on assumed 20 cycles of concentration

Table 5.1B-17R1
Detailed Emission Calculations for Boiler Commissioning
Rio Mesa Solar Electric Generating Facility
Revised April 2012

Units	Activity	Days	Daily Operation (hrs/day)	Heat Input Rate (MMBtu/hr)	Pollutant	Emission Factor (lbs/MMBtu)	Hourly Emissions (lbs/hr)	Daily Emissions (lbs/day)	Total Emissions During Test (lbs)	Notes
Auxiliary Boilers	Cold start/tuning	3	4	31.1	NOx	0.09	2.74	11.0	32.9	1 day per boiler. Use cold start emission rates
					CO	0.15	4.55	18.2	54.6	
					VOC	0.043	1.34	5.4	16.1	
					SOx	0.0021	0.07	0.3	0.8	
					PM10	0.01	0.31	1.2	3.7	
Auxiliary Boilers	Warm start/tuning	3	4	31.1	NOx	0.09	2.74	11.0	32.9	1 day per boiler. Assume same as cold start emission rates
					CO	0.15	4.55	18.2	54.6	
					VOC	0.04	1.34	5.4	16.1	
					SOx	0.0021	0.07	0.3	0.8	
					PM10	0.01	0.31	1.2	3.7	
Auxiliary Boilers	Part Load Operation	12	6	93	NOx	0.0110	1.03	6.2	74.0	4 days per boiler. Assume fully controlled levels based on 25% minimum compliant load
					CO	0.018	1.71	10.2	122.9	
					VOC	0.0054	0.50	3.0	36.2	
					SOx	0.0021	0.20	1.2	14.1	
					PM10	0.005	0.47	2.8	33.6	
Auxiliary Boilers	Full Load Operation	6	4	249	NOx	0.0110	2.74	11.0	65.8	2 days per boiler.
					CO	0.0183	4.55	18.2	109.3	
					VOC	0.0054	1.34	5.4	32.2	
					SOx	0.0021	0.52	2.1	12.6	
					PM10	0.01	1.25	5.0	29.9	
Nighttime Pres. Boilers	Cold Start Operation	3	4	1.9	NOx	0.0227	0.04	0.2	0.5	1 day per boiler. Assume cold start emissions are 2x normal emissions
					CO	0.0731	0.14	0.5	1.6	
					VOC	0.0107	0.02	0.1	0.2	
					SOx	0.0021	0.00	0.0	0.0	
					PM10	0.01	0.02	0.1	0.2	
Nighttime Pres. Boilers	Part Load Operation	3 3	6 4	5.6	NOx	0.011	0.06	0.4	1.9	2 days per boiler. Assume fully controlled levels based on 25% minimum compliant load
					CO	0.037	0.21	1.2	6.2	
					VOC	0.005	0.03	0.2	0.9	
					SOx	0.0021	0.01	0.1	0.4	
					PM10	0.005	0.03	0.2	0.8	
Nighttime Pres. Boilers	Full Load Operation	3	6	15	NOx	0.0113	0.17	1.0	3.1	1 day per boiler
					CO	0.0366	0.55	3.3	9.9	
					VOC	0.0053	0.08	0.5	1.4	
					SOx	0.0021	0.03	0.2	0.6	
					PM10	0.005	0.08	0.5	1.4	
Maximum/Total for the Commissioning Period		36	180		NOx		2.74	10.96	211.0	Maximum hourly, maximum daily and total commissioning period emissions
					CO		4.55	18.21	359.1	
					VOC		1.34	5.36	103.1	
					SOx		0.52	2.09	29.2	
					PM10		1.25	4.98	73.4	

Appendix 5.1D (Revised April 2012)
Ambient Air Quality Modeling Analysis

Table 5.1D-2R1
Emission Rates and Stack Parameters for Refined Modeling
Rio Mesa Solar Electric Generating Facility
Revised Apri 2012

	Stack Diam, m	Release Height m	Temp, deg K	Exhaust Flow, m3/s	Exhaust Velocity, m/s	Emission Rates, g/s			
						NOx	SO2	CO	PM10
Averaging Period: One hour									
Auxiliary Boilers	1.676	41.148	421.89	34.181	15.486	0.3452	6.591E-02	0.5736	n/a
Nighttime Preservation Boilers	0.457	9.144	421.89	2.059	12.543	2.142E-02	3.971E-03	6.911E-02	n/a
PB emergency generators (each)	0.457	8.000	769.11	9.250	56.344	2.422	2.316E-03	1.3119	n/a
PB fire pump engines (each)	0.102	4.572	796.89	0.779	96.051	8.333E-02	1.588E-04	7.222E-02	n/a
Common Area em generator	0.203	5.486	730.22	1.062	32.745	1.658E-01	2.646E-04	1.437E-01	n/a
Common Area fire pump engine	0.102	4.572	796.89	0.779	96.051	8.333E-02	1.588E-04	7.222E-02	n/a
Averaging Period: Three hours									
Auxiliary Boilers	1.676	41.148	421.89	34.181	15.486	n/a	6.591E-02	n/a	n/a
Nighttime Preservation Boilers	0.457	9.144	421.89	2.059	12.543	n/a	3.971E-03	n/a	n/a
PB emergency generators (each)	0.457	8.000	769.11	9.250	56.344	n/a	7.719E-04	n/a	n/a
PB fire pump engines (each)	0.102	4.572	796.89	0.779	96.051	n/a	5.293E-05	n/a	n/a
Common Area em generator	0.203	5.486	730.22	1.062	32.745	n/a	8.821E-05	n/a	n/a
Common Area fire pump engine	0.102	4.572	796.89	0.779	96.051	n/a	5.293E-05	n/a	n/a
Averaging Period: Eight hours									
Auxiliary Boilers	1.676	41.148	421.89	34.181	15.486	n/a	n/a	5.736E-01	n/a
Nighttime Preservation Boilers	0.457	9.144	421.89	2.059	12.543	n/a	n/a	6.911E-02	n/a
PB emergency generators (each)	0.457	8.000	769.11	9.250	56.344	n/a	n/a	1.640E-01	n/a
PB fire pump engines (each)	0.102	4.572	796.89	0.779	96.051	n/a	n/a	9.028E-03	n/a
Common Area em generator	0.203	5.486	730.22	1.062	32.745	n/a	n/a	1.797E-02	n/a
Common Area fire pump engine	0.102	4.572	796.89	0.779	96.051	n/a	n/a	9.028E-03	n/a
Averaging Period: 24 hours									
Auxiliary Boilers	1.676	41.148	421.89	34.181	15.486	n/a	7.426E-03	n/a	2.124E-02
Nighttime Preservation Boilers	0.457	9.144	421.89	2.059	12.543	n/a	2.668E-03	n/a	6.399E-03
PB emergency generators (each)	0.457	8.000	769.11	9.250	56.344	n/a	9.648E-05	n/a	3.154E-03
PB fire pump engines (each)	0.102	4.572	796.89	0.779	96.051	n/a	6.616E-06	n/a	1.736E-04
Common Area em generator	0.203	5.486	730.22	1.062	32.745	n/a	1.103E-05	n/a	3.455E-04
Common Area fire pump engine	0.102	4.572	796.89	0.779	96.051	n/a	6.616E-06	n/a	1.736E-04
WSACs (8 cells, per cell)	2.743	3.658	299.67	69.612	11.778	n/a	n/a	n/a	2.362E-04
Averaging Period: Annual									
Auxiliary Boilers	1.676	41.148	421.89	34.181	15.486	7.744E-02	9.193E-03	n/a	2.357E-02
Nighttime Preservation Boilers	0.457	9.144	421.89	2.059	12.543	1.253E-02	2.186E-03	n/a	5.250E-03
PB emergency generators (each)	0.457	8.000	769.11	9.250	56.344	2.765E-02	2.643E-05	n/a	8.640E-04
PB fire pump engines (each)	0.102	4.572	796.89	0.779	96.051	9.513E-04	1.813E-06	n/a	4.756E-05
Common Area em generator	0.203	5.486	730.22	1.062	32.745	1.893E-03	3.021E-06	n/a	9.465E-05
Common Area fire pump engine	0.102	4.572	796.89	0.779	96.051	9.513E-04	1.813E-06	n/a	4.756E-05
WSACs (8 cells, per cell)	2.743	3.658	299.67	69.612	11.778	n/a	n/a	n/a	1.078E-04

Table 5.1D-3R1

Rio Mesa Solar Electric Generating Facility

Emission Rates and Stack Parameters for Boilers in Startup

Revised April 2012

	Stack Diam, m	Release Height m	Temp, deg K	Exhaust Flow, m3/s	Exhaust Velocity, m/s	Emission Rates, g/s NOx	SO2	CO	PM10
Auxiliary Boilers in startup; Nighttime Preservation Boilers in operation									
Averaging Period: One hour									
Auxiliary Boiler	1.676	41.148	421.89	4.720	2.138	0.3452	9.281E-03	0.574	n/a
Nighttime Pres. Boiler	0.457	9.144	421.89	2.059	12.543	0.0214	3.971E-03	0.069	n/a
Averaging Period: Three hours									
Auxiliary Boiler	1.676	41.148	421.89	4.720	2.138	n/a	9.281E-03	n/a	n/a
Nighttime Pres. Boiler	0.457	9.144	421.89	2.059	12.543	n/a	3.971E-03	n/a	n/a
Averaging Period: Eight hours									
Auxiliary Boiler	1.676	41.148	421.89	4.720	2.138	n/a	n/a	0.574	n/a
Nighttime Pres. Boiler	0.457	9.144	421.89	2.059	12.543	n/a	n/a	0.069	n/a
Nighttime Pres. Boilers in startup; Auxiliary Boilers in operation									
Averaging Period: One hour									
Auxiliary Boiler	1.676	41.148	421.89	34.181	15.486	0.3452	6.591E-02	0.574	n/a
Nighttime Pres. Boiler	0.457	9.144	421.89	0.284	1.732	0.0214	4.963E-04	0.069	n/a
Averaging Period: Three hours									
Auxiliary Boiler	1.676	41.148	421.89	34.181	15.486	n/a	6.591E-02	n/a	n/a
Nighttime Pres. Boiler	0.457	9.144	421.89	0.284	1.732	n/a	4.963E-04	n/a	n/a
Averaging Period: Eight hours									
Auxiliary Boiler	1.676	41.148	421.89	34.181	15.486	n/a	n/a	0.574	n/a
Nighttime Pres. Boiler	0.457	9.144	421.89	0.284	1.732	n/a	n/a	0.069	n/a

Table 5.1D-4R1

Emission Rates and Stack Parameters for Aux Boilers on Hot Standby

Rio Mesa Solar Electric Generating Facility

Large auxiliary boilers eliminated from project design: April 2012

	Stack Diam, m	Release Height m	Temp, deg K	Exhaust Flow, m3/s	Exhaust Velocity, m/s	Emission Rates, g/s NOx	SO2	CO	PM10
Averaging Period: One hour, all aux boilers on hot standby									
~~Aux Boilers~~	~~2.083~~	~~36.576~~	~~455.22~~	~~8.319~~	~~2.442~~	~~0.3784~~	~~6.624E-03~~	~~0.576~~	~~n/a~~
Averaging Period: Three hours, all aux boilers on hot standby									
~~Aux Boilers~~	~~2.083~~	~~36.576~~	~~455.22~~	~~8.319~~	~~2.442~~	~~n/a~~	~~6.624E-03~~	~~n/a~~	~~n/a~~
Averaging Period: Eight hours, all aux boilers on hot standby									
Aux Boilers	~~2.083~~	~~36.576~~	~~455.22~~	~~8.319~~	~~2.442~~	~~n/a~~	~~n/a~~	~~0.576~~	~~n/a~~

Table 5.1D-5R1
Calculation of Inversion Fumigation Impacts
Rio Mesa Solar Electric Generating Facility
Revised April 2012

Boiler Emission Rates, g/s

Unit	NOx	SO2	CO	PM10	# of Units
Auxiliary Boilers	0.345	6.591E-02	0.574	2.124E-02	3
Nighttime Preservation Boilers	2.142E-02	3.971E-03	6.911E-02	6.399E-03	3

Flat Terrain Modeling Results from SCREEN3

Unit	**Unit Impact, ug/m3 per g/s**	**Distance to Maximum (m)**
Auxiliary Boilers	5.84	779
Nighttime Preservation Boilers	107	176

Inversion Breakup Modeling Results from SCREEN3

	Unit Impact, ug/m3 per g/s	**Distance to Maximum (m)**
Auxiliary Boilers	4.95	5785
Nighttime Preservation Boilers	0	n/a

Adjust 1-hour impacts for longer averaging periods to account for 90-minute duration of fumigation

	1-hr unit	**3-hr unit**	**8-hr unit**	**24-hr unit**
Auxiliary Boilers	5.84	5.26	4.09	2.34
Nighttime Preservation Boilers	107.00	96.30	74.90	42.80

Calculation of Fumigation Impacts

Case/Avg Period	**NOx**	**SO2**	**CO**	**PM10**
One-Hour				
Auxiliary Boilers	6.05	1.15	10.05	-
Nighttime Preservation Boilers[a]	6.88	1.27	22.19	-
Total	12.9	2.4	32.2	-
3 Hours				
Auxiliary Boilers	-	1.04	-	-
Nighttime Preservation Boilers[a]	-	1.15	-	-
Total	-	2.2	-	-
8 Hours				
Auxiliary Boilers	-	-	7.03	-
Nighttime Preservation Boilers[a]	-	-	15.53	-
Total	-	-	22.6	-
24 Hours				
Auxiliary Boilers	-	0.46	-	0.15
Nighttime Preservation Boilers[a]	-	0.51	-	0.82
Total	-	1.0	-	1.0

a Although inversion breakup fumigation impacts from the nighttime preservation boilers is zero, flat terrain impacts were included to ensure that the evaluation is conservative.

Table 5.1D-6

Rio Mesa Solar Electric Generating Facility

Emission Rates for Modeling Mirror Washing Activities

New Table as of April 2012

	Em Rates, g/s				
	NOx	**SO2**	**CO**	**PM10**	**PM2.5**
Averaging Period: One hour					
MWMs-- combustion	3.84E-02	1.05E-02	1.49E-02	--	--
Averaging Period: Three hours					
MWMs-- combustion	--	1.05E-02	--	--	--
Averaging Period: Eight hours					
MWMs-- combustion	--	--	1.49E-02	--	--
Averaging Period: 24 hours					
MWMs-- combustion	--	8.73E-03	--	9.95E-04	9.95E-04
MWMs-- fugitive dust	--	--	--	2.73E-01	2.73E-02
Averaging Period: Annual					
MWMs-- combustion	3.20E-02	8.73E-03	--	9.95E-04	9.95E-04
MWMs-- fugitive dust	--	--	--	2.73E-01	2.73E-02

Appendix 5.1E (Revised April 2012)
Screening Level Risk Assessment

TABLE 5.1E-1R1 (REVISED APRIL 2012)
Screening Level Risk Assessment Results

Risk Methodology	Project Impacts with MWMs
Modeled Residential Cancer Risk (in one million)	
Residential: Derived (OEHHA) Method at PMI	~~1.38~~ xxx
Residential: Derived (OEHHA) Method at maximally impacted residential receptor	~~0.10~~ xxx
Modeled Worker Cancer Risk (in one million)	
Worker Exposure: Derived (OEHHA) Method at PMI	~~0.21~~ xxx
Modeled Acute and Chronic Impacts	
Acute HHI—1-hour RELs	~~0.003~~ xxx
Acute HHI—8-hour RELs	~~0.002~~ xxx
Chronic HHI	~~0.0007~~ xxx

Table 5.1E-2R1
Risk Assessment Modeling Inputs for Boilers
Rio Mesa Solar Electric Generating Facility
Revised April 2012

Compound	Auxiliary Boilers (each) Emission Rates lb/hr	Auxiliary Boilers (each) Emission Rates lb/yr	Emission Rates Auxiliary Boilers (each) lb/hr	Emission Rates Auxiliary Boilers (each) lb/yr	Emission Rates Nighttime Boilers (each) lb/hr	Emission Rates Nighttime Boilers (each) lb/yr
Acetaldehyde	0.0	0.0	2.197E-04	2.655E-01	4.559E-05	2.199E-01
Acrolein	0.0	0.0	1.953E-04	2.360E-01	3.971E-05	1.915E-01
Benzene	0.0	0.0	4.150E-04	5.014E-01	8.530E-05	4.114E-01
Ethylbenzene	0.0	0.0	4.882E-04	5.899E-01	1.015E-04	4.894E-01
Formaldehyde	0.0	0.0	8.788E-04	1.062E+00	1.809E-04	8.725E-01
Hexane	0.0	0.0	3.174E-04	3.834E-01	6.765E-05	3.263E-01
Naphthalene	0.0	0.0	7.324E-05	8.849E-02	4.412E-06	2.128E-02
PAHs						
Benzo(a)anthracene	0.0	0.0	3.855E-06	4.657E-03	2.322E-07	1.120E-03
Benzo(a)pyrene	0.0	0.0	2.570E-06	3.105E-03	1.548E-07	7.466E-04
Benzo(b)fluoranthrene	0.0	0.0	3.855E-06	4.657E-03	2.322E-07	1.120E-03
Benzo(k)fluoranthrene	0.0	0.0	3.855E-06	4.657E-03	2.322E-07	1.120E-03
Chrysene	0.0	0.0	3.855E-06	4.657E-03	2.322E-07	1.120E-03
Dibenz(a,h)anthracene	0.0	0.0	2.570E-06	3.105E-03	1.548E-07	7.466E-04
Indeno(1,2,3-cd)pyrene	0.0	0.0	3.855E-06	4.657E-03	2.322E-07	1.120E-03
Propylene	0.0	0.0	3.791E-03	4.58	7.794E-03	37.59
Toluene	0.0	0.0	1.904E-03	2.30	3.897E-04	1.88
Xylene	0.0	0.0	1.416E-03	1.71	2.897E-04	1.40

Table 5.1E-3R1
Risk Assessment Modeling Inputs for Emergency Engines
Rio Mesa Solar Electric Generating Facility
Revised April 2012

Unit	DPM Emission Rate lb/hr	lb/yr
Power Block Emergency Generators (each)	0.6007	60.069
Common Area Emergency Generator	6.581E-02	6.581
Power Block Fire Pump Engines (each)	3.307E-02	3.307
Common Area Fire Pump Engine	3.307E-02	3.307

Table 5.1E-4R1
Calculation of Screening HRA Inputs for 8-Hour Exposure Periods
Rio Mesa Solar Electric Generating Facility
Revised April 2012

		Auxiliary Boilers (each)		Nighttime Preservation Boilers (each)	
Chemical	8-hour REL (ug/m3)	One-hour Emission Rate, g/s	Weighted Contribution to Acute HHI (g/s per ug/m3)	One-hour Emission Rate, g/s	Weighted Contribution to Acute HHI (g/s per ug/m3)
Acetaldehyde	300	2.77E-05	9.23E-08	5.74E-06	1.91E-08
Acrolein	0.7	2.46E-05	3.52E-05	5.00E-06	7.15E-06
Formaldehyde	9	1.11E-04	1.23E-05	2.28E-05	2.53E-06
	Acute Risk Factor		4.75E-05		9.70E-06

Table 5.1E-5R1
Stack Parameters for Screening HRA
Rio Mesa Solar Electric Generating Facility
Revised April 2012

Stack Parameters				
	Stack Diam (m)	Stack Ht (m)	Exhaust Temp (deg K)	Exhaust Velocity (m/s)
Auxiliary Boilers	1.676	41.148	421.889	15.486
Nighttime Preservation Boilers	0.457	9.144	421.889	12.543
Power Block Emergency Generators (each)	0.457	8.000	769.111	56.344
Power Block Fire Pump Engines (each)	0.102	4.572	796.889	96.051
Common Area Emergency Generator	0.203	5.486	730.222	32.745
Common Area Fire Pump Engine	0.102	4.572	796.889	96.051

Appendix 5.1G (Revised April 2012)
Cumulative Impacts Analysis

Table 5.1G-2R1 (Revised April 2012)
Summary of Combined 1-hr NO_2 Results (Modeled Maximum Impacts plus Background)

Pollutant	Averaging Time	Combined Impact Three Projects ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Concentration (Modeled Impact plus Background) ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	CAAQS ($\mu g/m^3$)
NO_2	1-hr (max)	~~194~~[a] xxx	92.4	~~286~~ xxx	--	339
	1-hr (98th percentile)	~~149~~[a] xxx	78.0[c]	~~167~~ xxx[b]	188	--

Note:

[a] ~~Highest 1-hour average NO_2 impacts occur during emergency engine testing at the Proposed Project~~.

[b] Total concentrations shown for 1-hour NO_2 are modeled project impacts combined with concurrent hourly NO_2 monitoring data (Tier 4 analysis in Section 3.6 of the modeling protocol). This value represents the five-year average of the annual 1-hr NO_2 98^{th} percentile (modeled impact plus background) for each year (2006 to 2010) as required by June 28, 2010 EPA 1-hr NO_2 NAAQS guidance document.

[c] Background concentration shown is the three-year average of the 98th percentile values (2008 to 2010), in accordance with the form of the federal standard.

Attachment DR5-1
Tier 2 Construction Analysis

Attachment DR5-1

20/80 TIER 2 CONSTRUCTION ANALYSIS

Table DR5-1-1 summarizes the calculated emissions from construction equipment as presented in the AFC in Tables 5.1F-1 and 5.1F-2 (pounds per day and tons per year, respectively). Table DR5-1-2 summarizes the calculated emissions from construction equipment assuming all offroad equipment is Tier 2 certified; emission factors for each piece of equipment are shown in the attached table. Table DR5-1-3 summarizes the daily and annual emissions used for the supplemental construction impacts analysis, assuming that 20% of the offroad construction equipment is Tier 2 certified while the remainder is Tier 3 or Tier 4 certified. Fugitive dust and concrete batch plant emission rates are unchanged from the values used in the original analysis.

Table DR5-1-1
Onsite Construction Equipment Emissions, Tier 3/4 Construction Equipment

	NOx	CO	VOC	SOx	$PM_{2.5}$	PM_{10}
Daily Emissions During Peak Month (lbs/day)						
Construction Equipment	220.0	120.9	22.0	0.5	11.2	11.2
Annual Construction Emissions During Peak 12-Month Period (tons/year)						
Construction Equipment	25.7	14.2	2.6	0.1	1.30	1.30

Table DR5-1-2
Onsite Construction Equipment Emissions, Tier 2 Construction Equipment

	NOx	CO	VOC	SOx	$PM_{2.5}$	PM_{10}
Daily Emissions During Peak Month (lbs/day)						
Construction Equipment	253.3	128.6	25.1	0.5	10.5	10.5
Annual Construction Emissions During Peak 12-Month Period (tons/year)						
Construction Equipment	29.8	15.1	3.0	0.1	1.25	1.25

Table DR5-1-3
Onsite Construction Equipment Emissions, 20% Tier 2 and 80% Tier 3/4 Construction Equipment

	NOx	CO	VOC	SOx	$PM_{2.5}$	PM_{10}
Daily Emissions During Peak Month (lbs/day)						
Construction Equipment	226.7	122.4	22.6	0.5	11.0	11.0
Annual Construction Emissions During Peak 12-Month Period (tons/year)						
Construction Equipment	26.5	14.4	2.7	0.1	1.29	1.29

As shown in Table DR5-1-3, since daily and annual SOx and $PM_{10}/PM_{2.5}$ emissions under the 20/80 supplemental scenario are lower[1] than or unchanged from the original construction equipment emissions assumptions, only NOx and CO emissions were included in the supplemental construction ambient air quality impact analysis. The results of the supplemental analysis are summarized in Table DR5-1-4. Predicted impacts that are different under the 20/80 supplemental scenario from those provided in the AFC are shown underlined. Predicted impacts from the Tier 3/4 scenario, as presented in Table 5.1-36 of the AFC, are shown in strike-out font for comparison.

Table DR5-1-4
Modeled Maximum Impacts from Onsite Construction Activities, Assuming 20% of Construction Equipment Are Tier 2 Certified

Pollutant	Averaging Period	Maximum Predicted Impact (µg/m^3)	Maximum Background Concentration (µg/m^3)	Total Concentration[a] (µg/m^3)	NAAQS (µg/m^3)	CAAQS (µg/m^3)
NO_2	1-hr (highest)	~~30.5~~ 31.4	92.4	~~123~~ 124	--	339
	1-hr (98th percentile)[b]	--	78.0	109	188	--
	Annual	0.9	17.0	18	100	57
SO_2	1-hr	0.08	136.6	137	196	655
	3-hr	0.05	112.9	113	1300	--
	24-hr	0.02	18.4	18	--	105
	Annual	0.00	2.6	3	80	--
CO	1-hr	~~18.6~~ 18.8	1,837	1,856	40,000	23,000
	8-hr	~~8.8~~ 9.0	643	652	10,000	10.000
PM_{10}	24-hr	4.5	140	145	150	50
	Annual	0.5	20.4	21	--	20
$PM_{2.5}$	24-hr[c]	0.9	18	19	35	--
	Annual[d]	0.1	7.8	8	15.0	12

Notes:
[a] Total concentrations shown in this table are the sum of the maximum predicted impact and the maximum measured background concentration. Because the maximum impact will not occur at the same time as the maximum background concentration, the actual maximum combined impact will be lower.
[b] Background concentration shown is the three-year average of the 98th percentile values (2008 to 2010), in accordance with the form of the federal standard. Total concentration shown for 1-hour NO_2 is maximum modeled impact combined with maximum background concentration (Tier 1 analysis in Section 3.6 of modeling protocol).
[c] Background concentration shown is the three-year average of the 98th percentile values, in accordance with the form of the federal standard.
[d] Background value shown is the three-year average of the annual arithmetic mean, in accordance with the form of the standard.

[1] $PM_{10}/PM_{2.5}$ emissions decrease when switching from Tier 3/4 to Tier 2 because of the differences in the zero-hour emissions factors (see attached page from EPA's NONROAD model documentation, "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling – Compression Ignition,", NR-009D, EPA-420-R-10-018, dated July 2010, available at http://www.epa.gov/otaq/models/nonrdmdl/nonrdmdI2010/420r10018.pdf).

While the maximum modeled NO_2 and CO impacts with 20% Tier 2 certified construction equipment are predicted to be slightly higher than the impacts evaluated in the AFC, the higher impacts would not change any of the conclusions presented in the AFC; namely, that construction impacts alone for all modeled pollutants are expected to be below the most stringent state and national standards. With the exception of the 24- hour and annual average PM_{10} standards, construction activities are not expected to cause an exceedance of state or federal ambient air quality standards. However, the background state 24-hour and annual PM_{10} standards are exceeded in the absence of the construction emissions for the project

Rio Mesa Construction Equipment Emission Factors (Tier 2 Factors)

Power Plant

		Tier (Nonroad) Avg mph (Onroad)	Base Emission Factors g/bhp (1)						Transient Adjustment Factor (2)							Adjustment (3)	Adjusted Emission Factors (g/bhp - Nonroad, lb/vmt Onroad)					
Equipment	HP		BSFC lb/hp-hr	NOx	CO	VOC	SOx	PM10	Adj. Type	BSFC	NOx	CO	VOC	SOx	PM10	PM10 Fuel S	BSFC	NOx	CO	VOC	SOx	PM10
CLASS 01 AUTOMOTIVE																						
SEDAN LIGHT G	175	10.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.31E-04	9.83E-03	8.82E-04	0.00E+00	8.53E-05
CLASS 02 TRUCKS - LIGHT DUTY																						
PICKUP 1/2 TON 4X4 CREW CAB G	302	10.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.31E-04	9.83E-03	8.82E-04	0.00E+00	8.53E-05
CLASS 03 TRUCKS - HEAVY DUTY																						
TRUCK DUMP TANDEM AXLE 13-15 CY D	325	10.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.49E-02	1.44E-02	2.91E-03	3.95E-05	1.23E-03
TRUCK WATER 3600-4000G F-R SPR BAR / MONITOR 2AX	375	10.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.49E-02	9.17E-03	2.21E-03	3.95E-05	1.19E-03
TRUCK YARD DOG 4X2 D	200	10.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.31E-04	9.83E-03	8.82E-04	0.00E+00	8.53E-05
CLASS 06 PERSONNEL CARRIERS																						
ROUGH TERRAIN UTILITY VEHICLE D	25	2	0.408	4.440	2.161	0.438	0.006	0.267	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.440	2.161	0.438	0.006	0.171
CLASS 07 EMERGENCY VEHICLES																						
AMBULANCE TYPE II VAN D	302	10.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.49E-02	9.17E-03	2.21E-03	3.95E-05	1.19E-03
CLASS 08 LIQUID STORAGE																						
TANK FUEL STRG 10,000G DBLWALLW/PUMP	0	No Engine	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.000	0.000	0.000	0.000	0.000	0.000
CLASS 11 EARTHMOVING																						
ATT HOERAM 5,000LB 270-480 BPM CAT330	0	No Engine	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.000	0.000	0.000	0.000	0.000	0.000
DOZER CRAWLER 101 - 160HP D	143	2	0.367	4.100	0.867	0.338	0.005	0.180	HI LF	1.01	0.95	1.53	1.05	1.01	1.23	-0.0867	0.371	3.895	1.326	0.355	0.005	0.135
EXCAVATOR CRAWLER	266	2	0.367	4.000	0.748	0.309	0.005	0.132	HI LF	1.01	0.95	1.53	1.05	1.01	1.23	-0.0867	0.371	3.800	1.144	0.324	0.005	0.075
GRADER 29860LB 12' 165HP W/RPR-SCAR D	165	2	0.367	4.100	0.867	0.338	0.005	0.180	HI LF	1.01	0.95	1.53	1.05	1.01	1.23	-0.0867	0.371	3.895	1.326	0.355	0.005	0.135
LOADER BACKHOE	93	2	0.408	4.700	2.366	0.367	0.006	0.240	HI LF	1.01	0.95	1.53	1.05	1.01	1.23	-0.0984	0.412	4.465	3.619	0.388	0.006	0.199
TRACTOR INDUSTRIAL 60-79 PTO HP D	65	2	0.408	4.700	2.366	0.367	0.006	0.240	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.700	2.366	0.367	0.006	0.145
CLASS 12 PIPELAYING / TRENCHING EQUIPMENT																						
TRENCHER WHEEL CHAIN 60HP 0-60" D	55	2	0.408	4.700	2.366	0.367	0.006	0.240	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.700	2.366	0.367	0.006	0.145
CLASS 13 COMPACTION																						
COMPACTOR VIB SMOOTH 66" 7.7T 75HP D	110	2	0.367	4.100	0.867	0.338	0.005	0.180	None	1.00	1.00	1.00	1.00	1.00	1.00	N/A	N/A	2.49E-02	9.17E-03	2.21E-03	3.95E-05	1.19E-03
CLASS 14 CRANES																						
CRANE CRAWLER 220T M14000 D	360	3	0.367	2.500	0.943	0.167	0.005	0.150	HI LF	1.01	1.04	1.53	1.05	1.01	1.47	-0.0967	0.371	2.600	1.209	0.175	0.005	0.134
CRANE RT 70T 210HP D	210	3	0.367	2.500	0.748	0.184	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0959	0.367	2.500	0.748	0.184	0.005	0.064
TOWER CRANE LUFF M1280D 110T 250 X 271 D	700	3	0.367	2.500	1.327	0.167	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0959	0.367	2.500	1.327	0.167	0.005	0.064
CLASS 15 FORKLIFT																						
FORKLIFT W/HI 500LB GAS/PG	48	2	0.408	4.728	1.532	0.279	0.006	0.339	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.728	1.532	0.279	0.006	0.243
CLASS 17 AIR COMPRESSORS																						
AIR COMPR 750CFM 275HP D	275	2	0.367	4.000	0.748	0.309	0.005	0.132	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.49E-02	9.17E-03	2.21E-03	3.95E-05	1.19E-03
CLASS 52 WELDING EQUIPMENT																						
WELDER MULTIPROCESS	40	2	0.408	4.728	0.153	0.279	0.006	0.339	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.728	0.153	0.279	0.006	0.243
WELDER FUSION 4"- 12"G	20	2	0.408	4.440	2.161	0.438	0.006	0.267	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.440	2.161	0.438	0.006	0.171
WACHS PIPE END PREP MACHINE 2-6 AIR	0	No Engine	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.000	0.000	0.000	0.000	0.000	0.000
CONCRETE TRUCKS																						
TRANSMIXER	400	10.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.49E-02	9.17E-03	2.21E-03	3.95E-05	1.19E-03
CLASS 54 MANLIFTS / SCISSORLIFTS																						
ELEVATOR PERS/MAT 7000LB 350 FT 2-CAR E	0	No Engine	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.000	0.000	0.000	0.000	0.000	0.000
MANLIFT ARTICULATING 60-86FT 66HP D	65	2	0.408	4.700	2.366	0.367	0.006	0.240	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.700	2.366	0.367	0.006	0.145
AWP PERSONNEL LIFT 20-26FT E	0	No Engine	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.000	0.000	0.000	0.000	0.000	0.000
SCISSORLIFT 26-32FT E	0	No Engine	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.000	0.000	0.000	0.000	0.000	0.000
Generators	260	2	0.367	4.000	0.748	0.309	0.005	0.132	HI LF	1.01	0.95	1.53	1.05	1.01	1.23	-0.0867	0.371	3.800	1.144	0.324	0.005	0.075

Rio Mesa Construction Equipment Emission Factors (Tier 2 Factors)

Power Plant

		Tier (Nonroad) Avg mph (Onroad)	Base Emission Factors g/bhp (1)						Transient Adjustment Factor (2)							Adjustment (3)	Adjusted Emission Factors (g/bhp - Nonroad, lb/vmt Onroad)					
Equipment	HP		BSFC lb/hp-hr	NOx	CO	VOC	SOx	PM10	Adj. Type	BSFC	NOx	CO	VOC	SOx	PM10	PM10 Fuel S	BSFC	NOx	CO	VOC	SOx	PM10
CLASS 01 AUTOMOTIVE																						
SEDAN LIGHT G	175	10.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.31E-04	9.63E-03	8.82E-04	0.00E+00	8.53E-05
CLASS 02 TRUCKS - LIGHT DUTY																						
PICKUP 1/2 TON 4X4 CREW CAB G	302	10.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.31E-04	9.63E-03	8.82E-04	0.00E+00	8.53E-05
CLASS 03 TRUCKS - HEAVY DUTY																						
TRUCK DUMP TANDEM AXLE 13-15 CY D	325	10.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.49E-02	1.44E-02	2.91E-03	3.95E-05	1.23E-03
TRUCK WATER 3600-4000G F-R SPR BAR / MONITOR 2AX	375	10.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.49E-02	9.17E-03	2.21E-03	3.95E-05	1.19E-03
TRUCK YARD DOG 4X2 D	200	10.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.31E-04	9.63E-03	8.82E-04	0.00E+00	8.53E-05
CLASS 06 PERSONNEL CARRIERS																						
ROUGH TERRAIN UTILITY VEHICLE D	25	2	0.408	4.440	2.161	0.438	0.006	0.267	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.440	2.161	0.438	0.006	0.171
CLASS 07 EMERGENCY VEHICLES																						
AMBULANCE TYPE II VAN D	302	10.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.49E-02	9.17E-03	2.21E-03	3.95E-05	1.19E-03
CLASS 08 LIQUID STORAGE																						
TANK FUEL STRG 10,000G DBLWALLW/PUMP	0	No Engine	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.000	0.000	0.000	0.000	0.000	0.000
CLASS 11 EARTHMOVING																						
ATT HOERAM 5,000LB 270-400 BFM CAT330	0	No Engine	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.000	0.000	0.000	0.000	0.000	0.000
DOZER CRAWLER 131 - 160HP D	143	2	0.367	4.100	0.867	0.338	0.005	0.180	HI LF	1.01	0.95	1.53	1.05	1.01	1.23	-0.0867	0.371	3.895	1.326	0.355	0.005	0.135
EXCAVATOR CRAWLER	266	2	0.367	4.000	0.748	0.309	0.005	0.132	HI LF	1.01	0.95	1.53	1.05	1.01	1.23	-0.0867	0.371	3.800	1.144	0.324	0.005	0.075
GRADER 29960LB 12'165HP W/RPR-SCAR D	165	2	0.367	4.100	0.867	0.338	0.005	0.180	HI LF	1.01	0.95	1.53	1.05	1.01	1.23	-0.0867	0.371	3.895	1.326	0.355	0.005	0.135
LOADER BACKHOE	93	2	0.408	4.700	2.366	0.367	0.006	0.240	HI LF	1.01	0.95	1.53	1.05	1.01	1.23	-0.0964	0.412	4.465	3.619	0.386	0.006	0.199
TRACTOR INDUSTRIAL 60-79 PTO HP D	65	2	0.408	4.700	2.366	0.367	0.006	0.240	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.700	2.366	0.367	0.006	0.145
CLASS 12 PIPELAYING / TRENCHING EQUIPMENT																						
TRENCHER WHEEL CHAIN 80HP 0-60' D	65	2	0.408	4.700	2.366	0.367	0.006	0.240	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.700	2.366	0.367	0.006	0.145
CLASS 13 COMPACTION																						
COMPACTOR VIB SMOOTH 66" 7.7T 75HP D	110	2	0.367	4.100	0.867	0.338	0.005	0.180	None	1.00	1.00	1.00	1.00	1.00	1.00	N/A	N/A	2.49E-02	9.17E-03	2.21E-03	3.95E-05	1.19E-03
CLASS 14 CRANES																						
CRANE CRAWLER 220T M14000 D	360	3	0.367	2.500	0.843	0.167	0.005	0.150	HI LF	1.01	1.04	1.53	1.05	1.01	1.47	-0.0867	0.371	2.600	1.289	0.175	0.005	0.134
CRANE RT 70T 210HP D	210	3	0.367	2.500	0.748	0.184	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0959	0.367	2.500	0.748	0.184	0.005	0.064
TOWER CRANE LUFF M1200D 110T 250 X 271 D	700	3	0.367	2.500	1.327	0.167	0.005	0.150	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0959	0.367	2.500	1.327	0.167	0.005	0.064
CLASS 15 FORKLIFT																						
FORKLIFT WHS 5000LB GILPG	48	2	0.408	4.728	1.532	0.279	0.006	0.339	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.728	1.532	0.279	0.006	0.243
CLASS 17 AIR COMPRESSORS																						
AIR COMPR 750CFM 275HP D	275	2	0.367	4.000	0.748	0.309	0.005	0.132	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.49E-02	9.17E-03	2.21E-03	3.95E-05	1.19E-03
CLASS 32 WELDING EQUIPMENT																						
WELDER MULTIPROCESS	40	2	0.408	4.728	0.153	0.279	0.006	0.339	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.728	0.153	0.279	0.006	0.243
WELDER FUSION 4"- 12" G	20	2	0.408	4.440	2.161	0.438	0.006	0.267	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.440	2.161	0.438	0.006	0.171
WACHS PIPE END PREP MACHINE 2-8 AIR	0	No Engine	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.000	0.000	0.000	0.000	0.000	0.000
CONCRETE TRUCKS																						
TRANSMIXER	400	10.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.49E-02	9.17E-03	2.21E-03	3.95E-05	1.19E-03
CLASS 54 MANLIFTS / SCISSORLIFTS																						
ELEVATOR PERS/MAT 7000LB 350 FT 2-CAR E	0	No Engine	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.000	0.000	0.000	0.000	0.000	0.000
MANLIFT ARTICULATING 60-86FT 65HP D	65	2	0.408	4.700	2.366	0.367	0.006	0.240	None	1.00	1.00	1.00	1.00	1.00	1.00	-0.0954	0.408	4.700	2.366	0.367	0.006	0.145
AWP PERSONNEL LIFT 20-26FT E	0	No Engine	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.000	0.000	0.000	0.000	0.000	0.000
SCISSORLIFT 26-32FT E	0	No Engine	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.000	0.000	0.000	0.000	0.000	0.000
Generators	260	2	0.367	4.000	0.748	0.309	0.005	0.132	HI LF	1.01	0.95	1.53	1.05	1.01	1.23	-0.0867	0.371	3.800	1.144	0.324	0.005	0.075

Table 7. Summary of the Basis for the PM_{10} Zero-Hour Steady-State CI Emission Factors in NONROAD2008a

HP	PM_{10} g/hp-hr									
	Tier 0[a]	T0 Basis	Tier 1	T1 Basis	Tier 2	T2 Basis[b]	Tier 3	T3 Basis[b]	Tier 4[e]	T4 Basis
>0 to 11	1	OFFROAD	0.4474	cert	0.50	(1) The NOx T1 EF exceeds the T2 std. To meet NOx T2, changes are likely to increase PM. The T2 PM EF is therefore expected to be greater than 0.44 (T1 EF) and less than 0.60 (T2 std); 0.50 chosen as a reasonable value.	na		0.28	8% margin from 0.3 std
>11 to 16	0.9	OFFROAD	0.2665	cert	0.2665	(3) Same as T1 (since T1 EF still below T2 std)	na		0.28	8% margin from 0.3 std
>16 to 25	0.9	OFFROAD	0.2665	cert	0.2665	(3) Same as T1 (since T1 EF still below T2 std)	na		0.28	8% margin from 0.3 std
>25 to 50	0.8	OFFROAD	0.3389	cert	0.3389	(3) Same as T1 (since T1 EF still below T2 std)	na		0.0184[c]	8% margin from 0.02 std
>50 to 75	0.722	EF data	0.4730		0.24	(4) 20% highway-based margin from std (since T1 EF exceeds T2 std, cannot be used)	0.30	(1) T3 std	0.0184[c]	8% margin from 0.02 std
>75 to 100	0.722	EF data	0.4730		0.24	(4) 20% highway-based margin from std (since T1 EF exceeds T2 std, cannot be used)	0.30	(1) T3 std	0.0092	8% margin from 0.01 std
>100 to 175	0.402	EF data	0.2799		0.18	(4) 20% highway-based margin from std (since T1 EF exceeds T2 std, cannot be used)	0.22	(1) T3 std	0.0092	8% margin from 0.01 std
>175 to 300	0.402	EF data	0.2521	cert	0.1316	(2) T2 EF for >300 to 600hp category applied to these hp categories. Rationale: All four hp categories meet same PM std. Also, T2 EF of 0.1316 based on actual certification data.	0.15	(1) T3 std	0.0092	8% margin from 0.01 std
>300 to 600	0.402	EF data	0.2008	cert	0.1316		0.15	(1) T3 std	0.0092	8% margin from 0.01 std
>600 to 750	0.402	EF data	0.2201	cert	0.1316		0.15	(1) T3 std	0.0092	8% margin from 0.01 std
>750 except gen sets	0.402	EF data	0.1934	cert	0.1316		na		0.0276[d]	8% margin from 0.03 std
Gen sets >750 to 1200	0.402	EF data	0.1934	cert	0.1316		na		0.0184[d]	8% margin from 0.02 std
Gen sets >1200	0.402	EF data	0.1934	cert	0.1316		na		0.0184[d]	8% margin from 0.02 std

[a] Tier 0 represents 1988+ MY engines for MYs prior to Tier 1. Separate EFs are also provided for Base (pre-1988 MY) engines. For ≤50hp engines, Base EF = Tier 0 EF. For >50hp engines, the Base EFs vary by application, so are not provided in this table.

[b] Numbers in brackets correspond to the option selected, which is briefly described here. For more details regarding the options, consult the text. The derivation of the highway-based compliance margins are discussed in Appendix E.

[c] For >25 to 75 hp engines, there is also a transitional Tier 4 PM standard of 0.22 g/hp-hr in 2008-2012. The corresponding PM EF in NONROAD is 0.20 g/hp-hr.

[d] For all engines >750 hp, there is also a transitional Tier 4 PM standard of 0.075 g/hp-hr in 2011-2014. The corresponding PM EF in NONROAD is 0.069 g/hp-hr.

[e] Tier 4 emission factors are considered to be transient, rather than steady-state.

Attachment DR 43-1
Fire and Emergency Services
Risk Assessment

DRAFT

RIO MESA SOLAR ELECTRIC GENERATING FACILITY

FIRE AND EMERGENCY SERVICES RISK ASSESSMENT

Prepared by:
Pacific Development Solutions Group

Contact:
Wesley Alston
(800) 385-4643

April 13, 2012

TABLE OF CONTENTS

1.0 SCOPE OF STUDY

This Fire and Emergency Services Risk Assessment has been prepared for the Applicant by Pacific Development Solutions Group (hereinafter "Consultant") in response to CEC Staff Data Requests, Set 1A, Data Request No. 43.

The following provides a summary of the scope of work accomplished in order to prepare this document:

1. Review and understand the location, setting, and design as well as the construction activities and ongoing operation of the Rio Mesa Solar Electric Generating Facility (RMSEGF).

2. Define the applicable standards related to worker safety and health, fire protection, and emergency medical services.

3. Describe the fire protection systems for the RMSEGF and the safety and health programs defined by the applicant in the Application for Certification (AFC). This includes programs related to hazardous materials, worker safety and health, fire protection, and emergency medical services to address hazards that could occur during construction and operation.

4. Review the potential for hazards to occur as a result of the construction and operation of the RMSEGF. This includes the potential for hazards related to the transport, use, and storage of hazardous materials, accidental release hazards, fire and explosion hazards, and other worker safety hazards.

5. Review the potential for hazards to occur in the area surrounding the RMSEGF site. This includes the potential effects that could occur on adjacent properties and vehicle-related accidents on the off-site roadways that would provide access during construction and operation.

6. Based on the identified potential hazards, compliance with the applicable standards, and the implementation of the fire protection systems and safety and health programs, define the risks related to the construction and operation of the RMSEGF that would require fire protection and emergency medical services.

2.0 PROJECT DESCRIPTION AND SETTING

2.1 LOCATION AND SETTING

The Rio Mesa Solar Energy Generating Facility (RMSEGF) project site is located on approximately 5,750 acres in the southeastern portion of unincorporated Riverside County, California, approximately 13 miles to the southeast of City of Blythe. The project site is located partially on privately owned land and partially on public land administered by the U.S. Bureau of Land Management (BLM). Appendix A of this document provides the regional location of the project site.

The project site is located in on the Palo Verde Valley in the general area known as the Palo Verde Valley. The area around the project is comprised of open space and agricultural land. There is some very low density residential land use in the vicinity of the project site. The nearest community to the project site is Palo Verde located within Imperial County approximately 2.3 miles east of the southeast corner of the project site boundary on the border of Riverside County and Imperial County. The community of Ripley is located approximately 6.8 miles from the project site.

The project site is generally bounded by the existing Imperial Irrigation District Transmission line to the northwest, the Western Area Power Administration (WAPA) transmission line to the east, and the TransCanada Gas Transmission Company (TCGT) North Baja Transmission Line on the east. Bradshaw Trail intersects the project site at an east-west orientation. Approximately five to eight miles to the east, the Colorado River forms the border between eastern Riverside County and La Paz County, Arizona.

The project area is primarily served by State Route (SR) 78 (Neighbours Boulevard) and local streets, including: 28th Avenue, 30th Avenue, 34th Avenue, South Lovekin Boulevard, and Bradshaw Trail. Access to the RMSEGF project site would be provided via 34th Avenue (primary) and Bradshaw Trail off of SR 78 (to the east). The access road would travel adjacent to agricultural land before reaching the project site.

The project site is within a "Non-High Fire Hazard Severity Zone" according to the *Approved Very High Fire Hazard Severity Zones and Local Responsibility Areas* map, dated December 24, 2009, prepared by the State of California Department of Forestry and Fire Protection (CAL FIRE) and adopted by the County of Riverside.

2.2 PROJECT CHARACTERISTICS

The RMSEGF consists of three 250-megawatt (MW) (nominal) solar concentration thermal power plants, a shared common area, and four additional features consisting of linear corridors used for site access and electrical service lines. The first plant, known as Rio Mesa I, would be constructed at the south end of the project site. The second plant,

known as Rio Mesa II, would be located in the central portion of the project site. The third plant, Known as Rio Mesa III, would be constructed in the northern portion of the project site. Appendix A to this document provides the site plans for the RMSEGF.

The following provides a description of the key project elements of the RMSEGF.

2.2.1 Solar Plants

Each solar plant would use heliostats, which are elevated mirrors guided by a tracking system mounted on a pylon, to focus the sun's rays on a solar receiving steam generator (SRSG) on top of a 750-foot tall solar power tower with a 10-foot tall lightening rod near the center of each solar field. The heliostat fields will focus solar energy on the SRSG on top of the power towers to produce steam. Each heliostat array will be comprised of four to eight sections with distinct focal lengths for the mirrors. In each plant, one Rankine-cycle non-reheat steam turbine would receive live steam from the SRSG, which would be located in the power block at the top of its own tower. The solar field and power generation equipment would start each morning after sunrise and would shut down (unless augmented by the auxiliary boilers) when insolation drops below the level required to keep the turbine online.

Each solar plant would include auxiliary steam boilers that may be required during transient cloudy conditions in order to maintain the turbine on-line. After the clouds pass, production would resume from solar thermal input. After the solar thermal input resumes, the turbine would be returned to full solar production and the auxiliary boilers would be shut down. The daily volume of energy generated by the plant may be extended using the auxiliary boilers. In addition to the boilers, each plant would use an air-cooled condenser or dry cooling to minimize water usage.

2.2.2 Common Area

A 120-acre shared common area would be provided on the eastern border of the project site to accommodate: a combined administration, control, warehouse, maintenance, and warehouse building; evaporation ponds; groundwater wells; water treatment plant; construction laydown and parking areas; mobile equipment maintenance facilities; and a natural gas tap and meter station. A common switchyard would be installed onsite where all three plant's substation and underground transmission lines would terminate.

2.2.3 Access Roads and Drive Zones

Access to the RMSEGF project site would be provided via 34th Avenue (primary) and Bradshaw Trail off of SR 78 (to the east). The access road would travel adjacent to agricultural land before reaching the project site.

The internal roadway and utility corridors for each heliostat field and its power block would contain a paved or hardscape access road from the entrance of the solar plant site to the power block, and then around the power block. In addition to the paved or hardscaped access road to the power block of each solar plant, unpaved roads would

radiate out from the power block to provide access through the solar field to the internal perimeter access road. Within the heliostat fields, "drive zones" would be located concentrically around the power block to provide access to the heliostat mirrors for maintenance and cleaning.

2.2.4 Power Transmission

Power would be generated at the solar plants by the steam turbine generators (STGs) and then stepped up by transformers for transmission to the grid. The solar plants would connect to the utility at 220 kilovolts (kV). Surge arresters would be provided at the high-voltage bushings of the step-up transformers to protect the transformers from surges on the system caused by lightning strikes or other system disturbances. The transformers would be set on concrete pads within containments designed to contain the transformer oil in the event of a leak or spill. Fire protection systems would be provided for the transformers. The high-voltage side of the step-up transformers would be connected to the switchyard at each solar plant. From the plant switchyards, power would be transmitted via a 220 kV transmission line to a common area switchyard. The common area switchyard then would be connected to the SCE Colorado River Substation (CRS).

2.2.5 Natural Gas Fuel System

The natural gas supply for the RMSEGF would connect to the TransCanada Gas Transmission Company (TCGT) north Baja pipeline, which runs adjacent to the eastern edge of the proposed solar fields. A gas metering station would be required at the TCGT tap point to measure and record gas volumes for custody transfer. In addition, facilities would be installed either at the tap station or the power block to regulate gas pressure and to remove any liquids or solid particles.

2.2.6 Electricity

Stand-by power and back-up power would be provided for all auxiliary components for which failures would cause an electrical or steam production shut down at the project site. The backup power components would be installed and kept in a ready status, in case of failure, and would be available for immediate service. One station service transformer would be required at each solar plant for backup power purposes.

Project construction and emergency backup power to the proposed project would be provided from one of two alternatives. The proposed project would receive 33 kilovolt (kV) of power from Southern California Edison (SCE), sourced at an existing substation in the Blythe area and routed over SCE's existing electric distribution system to a point east of the project site on Bradshaw Trail (30^{th} Avenue) where new power poles and distribution cable would be installed to serve the construction loads, common facility loads, and subsequently the emergency backup needs of the completed RMSEGF.

2.4.7 Water Supply

The solar plants would use air-cooled condensers to save water. Raw water would be drawn daily from onsite wells located in the common area. Groundwater would be treated in an onsite treatment system in the common area for use as potable water, fire water, boiler make-up water, auxiliary cooling water, and to wash the heliostats.

A treated water tank sized to accommodate a two-day reserve of process water that would include makeup for the demineralizer would be located in the common area. A separate mirror wash water tank would be provided in the power block area. In addition, a combined service water/firewater storage tank that has sufficient capacity for service water and a dedicated 2-hour reserve volume for fire water would be provided in the power block area.

The RMSEGF would operate an average of 8 to 16 hours a day, 7 days a week throughout the year, with the exception of a scheduled shutdown in winter for maintenance (at a time negotiated with the transmission system operator). The water treatment plant is planned to be operated continuously during the night in order to minimize cost while using off-peak energy.

2.4.8 Waste Management

Waste Water Collection, Treatment, and Disposal

The primary wastewater collection system would collect and process wastewater from all of the solar plant equipment, including the boilers and WSAC blowdowns. To the extent practical, process wastewater would be recycled and reused. Each solar plant has an onsite wastewater treatment (WWT) system consisting of either a thermal distillation system with mechanical vapor compression or RO with ion exchange. Distillate/permeate collected from the WWT plant would be recycled to the treated water storage tank for reuse within the plant. Concentrate from the WWT system would be disposed in two evaporation ponds in the common area and allowed to evaporate. Each pond would be lined with a high-density polyethylene (HDPE) liner to prevent infiltration of process water into the soil below. When needed, pond sludge would be removed from the project site by an outside contractor.

The following describes the wastewater collection, treatment, and disposal for the RMSEGF.

Plant Drains and Oil/Water Separator

General plant drains would collect containment area washdown, sample drains, and drainage from facility equipment drains. Water from these areas would 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 would first be routed through an oil/water separator.

Raw Water Treatment System Waste

Reject waste produced from the reverse osmosis process in the raw water treatment system would be captured in the wastewater collection tank and treated in the wastewater treatment system.

Power Cycle Makeup Water Treatment Wastes

Demineralized water from the mixed-bed system would be used as the feed water from the power-cycle makeup treatment system. The mixed-bed unit would be a self-contained skid-mounted unit that would be regenerated offsite. There would be no liquid waste from the power cycle makeup water treatment equipment.

Boiler Blowdown

Boiler blowdown consists of water discharged from each SRSG to maintain the water chemistry within acceptable ranges. Boiler blowdown from the SRSG would be routed to the SRSG flash tank. Flash steam from the flash tank would be recovered back into the steam cycle via the deaerator. Condensate from the flash tank would be further flashed to the atmosphere, then cooled and recovered in the treated water storage tank. As an alternative, blowdown may be discharged to the wastewater collection tank for treatment.

Blowdown from the nighttime preservation, start-up and auxiliary boilers would be collected in blowdown tanks and recovered in the treated water storage tank. As an alternative, blowdown may be discharged to the wastewater collection tank for treatment.

Solid Wastes

The RMSEGF would produce maintenance and plant wastes typical of power generation operations. Generation plant wastes may 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. Solid wastes would be trucked offsite for recycling or disposal.

Hazardous Wastes

Several methods would be used to properly manage and dispose of hazardous wastes generated by the RMSEGF. Waste lubricating oil would be recovered and recycled by a waste oil recycling contractor. Spent lubrication oil filters would be disposed in a Class I landfill. Workers would be trained to handle hazardous wastes generated at the project site.

Chemical cleaning wastes would consist of alkaline and acid cleaning solutions used during pre-operational chemical cleaning of the boilers and acid cleaning solutions used for chemical cleaning of the boilers after the units are put into service. These wastes, which are subject to high metal concentrations, would be temporarily stored onsite in

portable tanks or sumps and disposed offsite by the chemical cleaning contractor in accordance with applicable regulatory requirements.

2.2.9 Management of Hazardous Materials

A variety of chemicals would be stored and used onsite during construction and operation. The storage, handling, and use of all chemicals would be conducted in accordance with applicable laws, ordinances, regulations, and standards (LORS) as defined in Section 3.0. Section 6.0 provides a description of the types, locations and quantities of hazardous material storage onsite. Chemicals would be stored in appropriate chemical storage facilities. Bulk chemicals would be stored in tanks and most other chemicals will be stored in returnable delivery containers. Chemical storage and chemical feed areas would be designed to contain leaks, spills, and stormwater. Concrete containment pits and drain piping design would allow a full-tank capacity spill without overflowing the containment. For multiple tanks located within the same containment area, the capacity of the largest single tank will determine the volume of the containment area and drain piping. Drain piping for reactive chemicals will be trapped and isolated from other drains to eliminate noxious or toxic vapors.

Safety showers and eyewashes would be provided adjacent to, or in the vicinity of, chemical storage and use areas. Plant personnel would use approved personal protective equipment during chemical spill containment and cleanup activities. Personnel would 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 absorbant material would be stored onsite for spill cleanup.

2.2.10 Emission Control and Monitoring

Air emissions from the combustion of natural gas in the auxiliary-boilers and start-up boilers at each plant would be controlled using appropriate air emission control devices as required by the Mojave Desert Air Quality Management District. To ensure that the systems perform correctly, a parametric or predictive emissions monitoring system (PEMS) that monitors emissions through detailed algorithms based on specific operating parameters will be installed on the auxiliary boiler.

2.2.11 Fire Protection System

The fire protection system would be designed to protect personnel and limit property loss and plant downtime in the event of a fire. The system would be designed to limit the spread of any fire generated at the plant site to adjacent land to avoid igniting a wildland fire. The primary source of fire protection water would be a service/firewater storage tank in each plant and a fire water storage tank in the common area.

An electric jockey pump and electric-motor-driven main fire pump would be provided to maintain the water pressure in each plant and the common fire main to the level required to serve all fire fighting systems. In addition, a back-up, diesel-engine-driven fire pump would be provided in each plant and the common area to pressurize the fire loop if the

power supply to the electric-motor-driven main fire pump fails. A fire pump controller would be provided for each fire pump.

The fire pumps would discharge to a dedicated underground firewater loop piping system. Normally, the jockey pump would maintain pressure in the firewater loop. Both the fire hydrants and the fixed suppression systems will be supplied from the firewater loop. Fixed fire suppression systems will be installed at determined fire risk areas such as the transformers and turbine lube oil equipment. Sprinkler systems will also be installed in the Administration, Control, Warehouse, Maintenance Building, Heliostat Assembly Building, and fire pump enclosure as required by National Fire Protection Association (NFPA) and local code requirements. Handheld fire extinguishers of the appropriate size and rating will be located in accordance with NFPA 850 throughout the facility. Generator step-up transformers and other oil-filled transformers will be contained and provided with a deluge system.

A more detailed discussion of the fire protection systems is provided in Section 4.0.

2.3 SCHEDULE

2.3.1 Construction Schedule

The construction of the RMSEGF, from site preparation and grading to commercial operation, is expected to take place from the fourth quarter of 2013 to the first quarter of 2016. Major milestones are listed below. However, the construction order may change. Construction of the common area facilities would occur concurrently with the construction of the first plant.

Project Schedule Major Milestones

Activity	Date
Solar Plant 1 (Rio Mesa I)	
Begin construction	Fourth Quarter 2013
Start-up and test	Third Quarter 2015
Commercial operation	Fourth Quarter 2015
Solar Plant 2 (Rio Mesa II)	
Begin construction	First Quarter 2014
Start-up and test	Fourth Quarter 2015
Commercial operation	First Quarter 2016
Solar Plant 3 (Rio Mesa III)	
Begin construction	Second Quarter 2014
Start-up and test	First Quarter 2016
Commercial operation	Second Quarter 2016

Based on an approximate 36-month construction period, there will be an average and peak workforce of approximately 1,040 and 2,500, respectively, of construction craft people, supervisory, support, and construction management personnel during construction. The peak construction site workforce level is expected to occur in month

21. During some construction periods and during the start-up phase of the project, some activities would occur 24 hours per day, 7 days per week.

The construction laydown and parking area would be located in and around the common facilities, as well as those areas of each solar plant that are either outside the edges of the heliostat fields, or not previously under construction in and around the power block area. The construction access would be generally from 34th Avenue (workers and heavy hall loads) and Bradshaw Trail (workers and light deliveries) to the plant entrance road. Materials and equipment would be delivered by truck.

2.3.2 Generating Facility Operation

Management, engineering, administration staff, skilled workers, and operators would serve all three plants. The RMSEGF is expected to employ up to 150 full-time employees: 30 at Rio Mesa I; 30 at Rio Mesa II; 30 at Rio Mesa III; and 60 at the common area. The facility will operate 7 days a week, typically up to 16 hours per day.

Detailed long-term maintenance schedules are currently unavailable, but will include periodic maintenance and overhauls in accordance with manufacturer recommendations. To maintain heliostat performance, nighttime labor demand includes an average 12 hours of mirror washing per day, covering the entire solar field every 2 weeks.

The RMSEGF is expected to have an annual plant availability of 92 to 98 percent. It will be possible for plant availability to exceed 98 percent for a given 12-month period.

The facility may be operated in one of the following modes:

- The facility would be operated at its maximum continuous output for as many hours per year as solar input allows; or
- A full shutdown will occur if forced by equipment malfunction, transmission or gas line disconnect, or scheduled maintenance.

3.0 APPLICABLE STANDARDS

The following provides a discussion of the laws, ordinances, regulations, and standards related to worker safety and health, fire protection, and emergency medical services that are applicable to the RMSEGF.

3.1 FEDERAL AND STATE LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following federal and state laws, ordinances, regulations, and standards (LORS) related to worker health and safety, fire protection services, and emergency medical services are applicable to the construction and ongoing operation of the RMSEGF:

Laws, Ordinances, Regulations, and Standards Applicable for Worker Safety and Health

LORS	Applicability
Federal	
Title 29 Code of Federal Regulations (CFR) Part 1910	Contains the minimum occupational safety and health standards for general industry in the United States
Title 29 CFR Part 1926	Contains the minimum occupational safety and health standards for the construction industry in the United States
State	
California Occupational Safety and Health Act, 1970	Establishes minimum safety and health standards for construction and general industry operations in California
8 California Code of Regulations (CCR) 339	Requires list of hazardous chemicals relating to the Hazardous Substance Information and Training Act
8 CCR 450	Addresses hazards associated with pressurized vessels
8 CCR 750	Addresses hazards associated with high-pressure steam
8 CCR 1509	Addresses requirements for construction, accident, and prevention plans
8 CCR 1509, et seq., and 1684, et seq.	Addresses construction hazards, including head, hand, and foot injuries and noise and electrical shock
8 CCR 1528, et seq., and 3380, et seq.	Requirements for personal protective equipment (PPE)
8 CCR 1597, et seq., and 1590, et seq.	Requirements for addressing the hazards associated with traffic accidents and earth-moving
8 CCR 1604, et seq.	Requirements for construction hoist equipment
8 CCR 1620, et seq., and 1723, et seq.	Addresses miscellaneous hazards

LORS	Applicability
8 CCR 1709, et seq.	Requirements for steel reinforcing, concrete pouring and structural steel erection operations
8 CCR 1920, et seq.	Requirements for fire protection systems
8 CCR 2300, et seq., and 2320, et seq.	Requirements for addressing low-voltage electrical hazards
8 CCR 2395, et seq.	Addresses electrical installation requirements
8 CCR 2700, et seq.	Addresses high-voltage electrical hazards
8 CCR 3200, et seq. and 5139, et seq.	Requirements for control of hazardous substances
8 CCR 3203, et seq.	Requirements for operational accident prevention programs
8 CCR 3270, et seq., and 3209, et seq.	Requirements for evacuation plans and procedures
8 CCR 3301, et seq.	Requirements for addressing miscellaneous hazards, including hot pipes, hot surfaces, compressed air systems, relief valves, enclosed areas containing flammable or hazardous materials, rotation equipment, pipelines and vehicle-loading dock operations
8 CCR 3360, et seq.	Addresses requirements for sanitary conditions
8 CCR 3511, et seq., and 3555, et seq.	Requirements for addressing hazards associated with stationary engines, compressors, and portable, pneumatic, and electrically powered tools
8 CCR 3649, et seq., and 3700, et seq.	Requirements for addressing hazards associated with field vehicles
8 CCR 3940, et seq.	Requirements for addressing hazards associated with power transmission, compressed air, and gas equipment
8 CCR 5109, et seq.	Requirements for addressing construction accident and prevention programs
8 CCR 5110, et seq.	Requirements for the implementation of an ergonomics program
8 CCR 5139, et seq.	Requirements for addressing hazards associated with welding, sandblasting, grinding, and spray-coating
8 CCR 5150, et seq.	Requirements for confined space entry
8 CCR 5160, et seq.	Requirements for addressing hot, flammable, poisonous, corrosive, and irritant substances
8 CCR 5192, et seq.	Requirements for conduction emergency response operations
8 CCR 5194, et seq.	Requirements for employee exposure to dusts, fumes, mists, vapors, and gases

LORS	Applicability
8 CCR 5405, et seq.; 5426, et seq.; 5465, et seq.; 5500, et seq.; 5521, et seq.; 5545, et seq.; 5554, et seq.; 5565, et seq.; 5583, et seq.; and 5606, et seq.	Requirements for flammable liquids, gases, and vapors
8 CCR 5583, et seq.	Requirements for design, construction, and installation of venting, diking, valving, and supports
8 CCR 6150, et seq.; 6151, et seq.; 6165, et seq.; 6170, et seq.; and 6175, et seq.	Provides fire protection requirements
24 CCR 3, et seq.	Incorporates current edition of Uniform Building Code
8 CCR, Part 6	Provides health and safety requirements for working with tanks and boilers
California Health and Safety Code Section 25500, et seq.	Requires that every new or modified facility that handles, treats, stores or disposes of more than the threshold quantity of any of the listed acutely hazardous materials prepare and maintain a Risk Management Plan (RMP)
California Health and Safety Code Section 25500 through 25541	Requires the preparation of a Hazardous Material Business Plan (HMBP) that details emergency response plans for a hazardous materials emergency at the facility

Laws, Ordinances, Regulations, and Standards Applicable to Hazardous Materials Handling

LORS	Applicability
Federal	
Title 29 Code of Federal Regulations (CFR) Part 1910, et seq. and Part 1926, et seq.	Requirements for equipment used to store and handle hazardous materials
Risk Management Plan (Title 40 CFR 68)	Requires facilities storing or handling significant amounts of acutely hazardous materials to prepare and submit Risk Management Plans
Title 49 CFR Parts 172, 173, and 179	Provides standards for labeling and packaging of hazardous materials during transportation
Section 302, EPCRA (Pub. L. 99-499, 42 USC 11022) Hazardous Chemical Reporting: Community Right-To-Know (40 CFR 370)	Requires one time notification if extremely hazardous substances are stored in excess of Threshold Planning Quantities (TPQs)
Section 304, EPCRA (Pub. L. 99-499, 42 USC 11002) Emergency Planning and Notification (40 CFR 355)	Requires notification when there is a release of hazardous material in excess of its Reportable Quantity (RQ)
Section 311, EPCRA (Pub. L. 99-499, 42 USC 11021) Hazardous Chemical Reporting: Community Right-To-Know (40 CFR 370)	Requires that either Material Safety Data Sheets (MSDSs) for all hazardous materials or a list of all hazardous materials be submitted to the State Emergency Response Commission (SERC), Local

LORS	Applicability
	Emergency Planning Committee (LEPC), and Inyo County Department of Environmental Services
Section 313, EPCRA (Pub. L. 99-499, 42 USC 11023) Toxic Chemical Release Reporting: Community Right-To-Know (40 CFR 372)	Requires annual reporting of releases of hazardous materials
Section 311, Clean Water Act (Pub. L. 92-500, 33 USC 1251, et seq.) Oil Pollution Prevention (40 CFR 112)	Requires preparation of a Spill Prevention Control and Countermeasure (SPCC) plan if oil is stored in a single aboveground storage tank with a capacity greater than 660 gallons or if the total petroleum storage (including ASTs, oil-filled equipment, and drums) is greater than 1,320 gallons The facility will have petroleum in excess of the aggregate volume of 1,320 gallons
Pipeline Safety Laws (49 USC 60101, et seq.) Hazardous Materials Transportation Laws (49 USC 5101, et seq.) Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards (49 CFR 192)	Specifies natural gas pipeline construction, safety, and transportation requirements
State	
Health and Safety Code, Section 25500, et seq. (HMBP)	Requires preparation of an Hazardous Material Business Plan (HMBP) if hazardous materials are handled or stored in excess of threshold quantities
Health and Safety Code, Section 25270 through 25270.13 (Aboveground Petroleum Storage Act)	Requires preparation of an SPCC plan if oil is stored in a single aboveground storage tank with a capacity greater than 660 gallons or if the total petroleum storage (including ASTs, oil-filled equipment, and drums) is greater than 1,320 gallons The facility will have petroleum in excess of the aggregate volume of 1,320 gallons
Health and Safety Code, Section 25249.5 through 25249.13 (Safe Drinking Water and Toxics Enforcement Act) (Proposition 65)	Requires warning to persons exposed to a list of carcinogenic and reproductive toxins and protection of drinking water from the same toxins
Health and Safety Code, Article 2, Chapter 6.95, Sections 25531 to 25541; California Code of Regulations (CCR) Title 19 (Public Safety), Division 2 (Office of Emergency Services), Chapter 4.5 (California Accidental Release Prevention Program)	Requires facilities storing or handling significant amounts of acutely hazardous materials to prepare and submit Risk Management Plans
California Public Utilities Commission (CPUC) General Oder Nos. 112-E and 58-A	Specify standards for gas service and construction of gas gathering, transmission, and distribution piping systems

3.2 NATIONAL CONSENSUS STANDARDS

The following national consensus standards related to worker health and safety, fire protection services, and emergency medical services are applicable to the construction and ongoing operation of the RMSEGF:

Applicable National Consensus Standards

LORS	Applicability
Uniform Fire Code, Article 80	Addresses the prevention, control, and mitigation of dangerous conditions related to storage, dispensing, use and handling of hazardous materials and information need by emergency response personnel
National Fire Protection Association (NFPA) 10, Standard for Portable Fire Extinguishers	Requirements for selection, placement, inspection, maintenance, and employee training for portable fire extinguishers
NFPA 11, Standard for Low-Expansion Foam and Combined Agent Systems	Requirements for installation, and use of low-expansion foam and combined –agent systems
NFPA 11A, Standard for Medium- and High-Expansion Foam Systems	Requirements for installation and use of medium- and high-expansion foam systems
NFPA 12, Standard on Carbon Dioxide Extinguishing Systems	Requirements for installation and use of carbon dioxide extinguishing systems
NFPA 13, Standard for Installation of Sprinkler Systems	Guidelines for selection and installation of fire sprinkler systems
NFPA 14, Standard for the Installation of Standpipe and Hose Systems	Guidelines for selection and installation of standpipe and hose systems
NFPA 15, Standard for Water Spray Fixed Systems	Guidelines for selection and installation of water fixed spray systems
NFPA 17, Standard for Dry Chemical Extinguishing Systems	Guidance for selection and use of dry chemical extinguishing systems
NFPA 20, Standard for the Installation of Centrifugal Fire Protection	Guidance for selection and installation of centrifugal fire pumps
NFPA 22, Standard for Water Tanks for Private Fire Protection	Requirements for water tanks for private fire prevention
NFPA 24, Standard for the Installation of Private Fire Service Mains and Their Appurtenances	Requirements for private fire services mains and their appurtenances
NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems	Requirements for the periodic inspection, testing, and maintenance of water-based fire protection systems, including land-based and marine applications
NFPA 30, Flammable and Combustible Liquid Code	Requirements for storage and use of flammable and combustible liquids
NFPA 37, Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines	Fire protection requirements for installation and use of combustion engines and gas turbines

LORS	Applicability
NFPA 50A, Standard for Gaseous Hydrogen Systems at Consumer Sites	Fire protection requirements for hydrogen systems
NFPA 54, National Fuel Gas Code	Fire protection requirements for use of fuel gases
NFPA 59A, Standard for the Storage and Handling of Liquefied Petroleum Gases	Requirements for storage and handling of liquefied petroleum gases
NFPA 68, Guide for Explosion Venting	Guidance in design of facilities for explosion venting
NFPA 70, National Electric Code	Guidance on safe selection and design, installation, maintenance, and construction of electrical systems
NFPA 70B, Recommended Practice for Electrical Equipment Maintenance	Guidance on electrical equipment maintenance
NFPA 70E, Standard for Electrical Safety Requirements for Employee Workplaces	Employee safety requirements for working with electrical equipment
NFPA 72, Standard for the Installation, Maintenance and Use of Local Protective Signaling Systems for Guard's Tour, Fire Alarm and Supervisory Service	Requirements for installation, maintenance, and use of local protective signaling systems
NFPA 75, Standard for the Protection of Electronic Computer/Data Processing Equipment	Requirements for fire protection systems used to protect computer systems
NFPA 80, Standard for Fire Doors and Windows	Requirements for fire doors and windows
NFPA 85, Boiler and Combustion Systems and Hazard Code	Requirements for boiler design, installation, operation, maintenance, and training
NFPA 90A, Standard for the Installation of Air Conditioning and Ventilation Systems	Requirements for installation of air conditioning and ventilating systems
NFPA 101, Code for Safety to Life from Fire in Buildings and Structures	Requirements for design of means of exiting the facility
NFPA 291, Recommended Practice for Fire Flow Testing and Marking of Hydrants	Guidelines for testing and marking of fire hydrants
NFPA 850, Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations	Requirements for fire protection in electric generating plants and alternative fuel electric generating plants
NFPA 1961, Standard for Fire Hose	Specifications for fire hose
NFPA 1962, Standard for the Care, Maintenance, and Use of Fire Hose Including Connections and Nozzles	Requirements for care, maintenance, and use of fire hose
NFPA 1963, Standard for Screw Threads and Gaskets for Fire Hose Connections	Specifications for fire hose connections
American National Standards Institute/American Society for Mechanical Engineers (ANSI/ASME), Boiler and Pressure Vessel Code	Specifications and requirements for pressure vessels
ANSI, B31.2, Fuel Gas Piping	Specifications and requirements for fuel gas piping

3.3 LOCAL LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following local ordinances, regulations, and standards related to worker safety and fire protection services are applicable to the construction and ongoing operation of the RMSEGF:

- *Riverside County Ordinance 457.* Adopts specific building, mechanical, plumbing, and electrical codes from sources such as the California Building Standards Commission with county-specific modifications.

- *Riverside County Ordinance 787.* Adopts the 2007 edition of the California Fire Code and portions of the 2007 edition of the California Building Code with county-specific modifications.

- *Riverside County Ordinance 615.* Establishes requirements for the use, generation, storage and disposal of hazardous materials within the County.

- *Riverside County Department of Environmental Health, Hazardous Materials Releases.* Adopts State requirements and guidelines to govern hazardous materials release response plans and inventories.

- *Chapter 22 of the 2007 California Fire Code.* This section of the California Fire Code addresses requirements for Motor Fuel-Dispensing Facilities and Repair Garages and has been adopted by Riverside County.

- *Riverside County Fire Department Strategic Plan 2009-2029.* The Riverside County Board of Supervisors read and filed the Riverside County Fire Department Strategic Plan in February 2010. The Strategic Plan contains the organizational mission, vision, and values; six goals; strategies for each goal; an implementation action plan; and supporting analysis of an organization and performance audit.

- *Riverside County Fire Protection and Emergency Medical Master Plan.* The Riverside County Fire Department (RCFD) adopted the Master Plan in 1987. The Master Plan serves as the general guiding document for the provision of fire protection and emergency medical services in the cities and unincorporated areas of the County protected by the RCFD. The Master Plan established response criteria based on Insurance Services Office (ISO) and NFPA standards for four different land use categories defined for the County. The four land use categories are Category I - Heavy Urban, Category II - Urban, Category III - Rural, and Category IV – Outlying. For each of these land use categories, the Master Plan defines goals and objectives related to: fire station location; suppression initiated; full assignment in operation; and initial attack fire control. There are minute values assigned to each land use designation. Although these values have been adopted, there have been

internal adjustments based on new information, operational needs, and advances in technology.

4.0 FIRE PROTECTION SYSTEM

The fire protection system will be designed to protect personnel and limit property loss and plant downtime in the event of a fire. The system will be designed to limit the spread of any fire generated at the plant site to adjacent land to avoid igniting a wildland fire. The primary source of fire protection water will be a service/firewater storage tank in each plant and a fire water storage tank in the common area.

An electric jockey pump and electric-motor-driven main fire pump will be provided to maintain the water pressure in each plant and the common fire main to the level required to serve all fire fighting systems. In addition, a back-up, diesel-engine-driven fire pump will be provided in each plant and the common area to pressurize the fire loop if the power supply to the electric-motor-driven main fire pump fails. A fire pump controller will be provided for each fire pump.

The fire pumps will discharge to a dedicated underground firewater loop piping system. Normally, the jockey pump will maintain pressure in the firewater loop. Both the fire hydrants and the fixed suppression systems will be supplied from the firewater loop. Fixed fire suppression systems will be installed at determined fire risk areas such as the transformers and turbine lube oil equipment. Sprinkler systems will also be installed in the Administration, Control, Warehouse, Maintenance Building, Heliostat Assembly Building, and fire pump enclosure as required by National Fire Protection Association (NFPA) and local code requirements. Handheld fire extinguishers of the appropriate size and rating will be located in accordance with NFPA 10 throughout the facility. Generator step-up transformers and other oil-filled transformers will be contained and provided with a fire protection system per NFPA 850.

Refer to Appendix B for the *RMSEGF Fire Protection Design Basis*.

5.0 SAFETY AND HEALTH PROGRAMS

5.1 CONSTRUCTION SAFETY AND HEALTH PROGRAMS

During the construction phase, the RMSEGF would include the implementation of the Safety and Health Programs listed below. Prior to the start of construction, detailed programs and plans would be provided to the CEC, the RCFD, and other agencies as required by the Conditions of Certification. They are as follows:

- Injury and Illness Prevention Program for Project Construction
  - A written Code of Safe Practices that relates to construction activities.
  - Identification of the person or persons responsible for implementing the program.
  - Posting of the Code of Safe Practices at a conspicuous location at each job site office or providing it to each supervisor who shall have it readily available.
  - A system for identifying workplace hazards that includes inspections.
  - A system of verifying employee and subcontractor compliance.
  - "Toolbox" or "tailgate" meetings that supervisors conduct with employees to discuss job hazards and mitigation measures.
  - Methods of communicating with employees that encourage employees to expose unsafe activities.
  - Procedures for correcting unsafe conditions.
- Accident/incident reporting procedures
- Blood-Borne Pathogens Exposure Control Program
- Procedures for use of compressed gas and air-handling systems
- Confined-space entry procedures
- Contractor Safety Program
- Electrical safety procedures
- Emergency Action Plan/Emergency Response Plan
- Emergency response procedures
- Excavation, Trenching, and Shoring Program
- Fall Protection Program
- Fire Protection and Prevention Plan

- First-Aid/Cardiopulmonary Resuscitation/Automated External Defibrillator Program
- Hand tools and equipment guarding safety procedures
- Hazard Communication Plan (including Proposition 65 requirements)
- Hazardous materials handling procedures
- Hazardous waste awareness training
- Hearing Conservation Program
- Heat Stress Protection Plan
- Heavy equipment procedures
- Hoist/chain/wire rope/webs/rope slings/crane procedures
- Hot Work Program (welding, cutting, and brazing)
- Industrial Hygiene Program
- Industrial truck (forklift) safety
- Ladders, scaffolds, and work platforms
- Lockout/Tag-out Program
- Motor vehicle safety
- Personal Protective Equipment Program
- Portable electric and pneumatic tools
- Preventing slips, trips, and falls
- Repetitive stress injuries/ergonomics/lifting hazards
- Respiratory Protection Program
- Safety and Housekeeping Inspection Program
- Safety Committee and toolbox tailgate safety meetings
- Security Program
- Signs, tags, and barricades
- Tools (power- and hand-operated)
- UXO Identification, Training and Reporting Plan

5.2 OPERATIONS SAFETY AND HEALTH PROGRAMS

After the completion of the construction phase and the commencement of the operation of the RMSEGF, the construction Safety and Health Programs would transition into an operation-oriented program reflecting the hazards and controls necessary. Detailed programs and plans would be submitted to the CEC, the RCFD, and other agencies as required by the Conditions of Certification. They are as follows:

- Injury and Illness Prevention Program for Project Operation
  - A list of the person(s) with authority and responsibility for implementing the program.
  - A system for verifying that employees comply with safe and healthful work practices.
  - A system for communicating with employees in a readily understandable form.
  - Procedures for identifying and evaluating workplace hazards, including inspections, to identify hazards and unsafe conditions.
  - Methods for correcting unhealthy/unsafe conditions in a timely manner—when the hazard is discovered and/or when there is an imminent danger.
  - A training program for:
    establishing the program initially;
    new, transferred, or promoted employees;
    new processes and equipment; and
    supervisors.
  - Methods of documenting inspections and training and maintaining records for three years.
- Accident/incident reporting procedures
- Blood-Borne Pathogens Exposure Control Program
- Best Management Practices (BMPs) for herbicide storage and application
- Chemical Hygiene Plan
- Code of Safe Practices for Equipment and Operation
- Procedures for use of compressed gas and air-handling systems
- Confined-space entry procedures
- Electrical safety procedures
- Emergency Action Plan
- Emergency response procedures
- Fall Protection Program

- Fire Protection and Prevention Plan
- First-Aid/Cardiopulmonary Resuscitation/Automated External Defibrillator Program
- Hand tools and equipment guarding safety procedures
- Hazard Communication Plan (including Proposition 65 requirements)
- Hazardous materials handling procedures
- Hazardous waste awareness training
- Hearing Conservation Program
- Heat Stress Protection Plan
- Heavy equipment procedures
- Hoist/chain/wire rope/webs/rope slings/crane procedures
- Hot Work Program (welding, cutting, and brazing)
- Industrial Hygiene Program
- Industrial truck (forklift) safety
- Ladders, scaffolds, and work platforms
- Lockout/Tag-out Program
- Motor vehicle safety
- PPE Program
- Portable electric and pneumatic tools
- Preventing slips, trips, and falls
- Repetitive stress injuries/ergonomics/lifting hazards
- Respiratory Protection Program
- Safety and Housekeeping Inspection Program
- Safety Committee and toolbox tailgate safety meetings
- Security Program
- Stop work authority
- Signs, tags, and barricades
- Tools (power- and hand-operated)

5.3 TRAINING PROGRAMS

5.3.1 Construction Training Program

Training will be delivered to the construction employees in various ways depending on the requirements of the California Occupational Safety and Health Administration (Cal-OSHA) standards, the complexity of the topic addressed, the characteristics of the workforce, and the degree of risk associated with each of the potential hazards. As a minimum, employees and workers will receive a full Safety Orientation which includes (among other topics), PPE, fall protection, and welding safety, which is conducted by the EPC contractor that is required of all and Worker Environmental Awareness Program (WEAP) training that will be provided by a qualified individual.

5.3.2 Operations Training Program

The following summarizes the operations training program that will be implemented to ensure that employees recognize and understand how to protect themselves from potential hazards. The training will be delivered to the employees in various ways depending on the requirements of the Cal-OSHA standards, the complexity of the topic addressed, the characteristics of the workforce, and the degree of risk associated with each of the potential hazards.

- New employees will receive safety training orientation.
- Weekly safety meetings will be held with employees.
- Toolbox/tailgate safety meetings will be conducted periodically for each crew. General safety topics and specific hazards that may be encountered will be discussed. Comments and suggestions from all employees will be encouraged.
- Regularly scheduled safety meetings will be held for supervisors.
- Hazard communication training, including California Proposition 65 warnings and discharge prohibitions, will be conducted as new hazardous materials are introduced into the workplace.
- Material Safety Data Sheets (MSDSs) will be provided for all appropriate chemicals. A bulletin board with required postings and other information will be maintained at the plant site.
- Warning signs will be posted in hazardous areas.

Safety training will be provided to each new employee as indicated below.

- Safe work rules for the Rio Mesa SEGF will be explained to each new employee.
- A copy of the applicable Safe Work Practices will be given to each new employee. The provisions will be incorporated into training for the qualifications programs so that employees may fully understand what the protective provisions mean.

- The Hazard Communication Program and other applicable training and requirements for personal protection of the types of hazards that may be encountered at the Rio Mesa SEGF will be explained to employees. This training will be documented.
- Unusual hazards that are found on site will be explained in detail to each new employee, including any specific requirements for personal protection.
- Safety requirements for the new employee's specific job assignment will be explained by the foreman upon initial assignment and upon any reassignment.

6.0 HAZARDS OF THE PROJECT

The following provides a discussion of the potential hazards during construction and operation of the RMSEGF.

6.1 USE AND STORAGE OF HAZARDOUS MATERIALS

6.1.1 Construction Phase

The construction activities on the project site would use the hazardous materials listed on Tables 6-1 and 6-2. Tables 6-1 and 6-2 provide a summary of the hazardous materials to be used and stored during construction on the RMSEGF project site based on the Title 22 CCR characteristics criteria and based on the properties of the substances themselves.

The use, storage, and handling of these materials would occur consistent with the applicable LORS defined in Section 3.0, Applicable Standards, and the worker safety programs defined in Section 5.0, Safety and Health Programs, above. Refer to those sections of this document for the plans, programs, and guidelines to be implemented for the construction activities on the RMSEGF project site. The storage of hazardous materials would be contained in designated hazardous materials storage areas and their use would be carefully prescribed in terms of the defined hazardous materials handling plans. The construction contractor would be responsible for verifying that the use, storage, and handling of the hazardous materials on the RMSEGF project site are in compliance with the applicable LORS, including licensing, personnel training, accumulation limits, disposal, reporting requirements, and record keeping.

The most likely potential hazardous incident that could occur during construction would involve fuels, oils, or grease dripping from construction equipment. Construction personnel would be trained to handle the materials properly and the small quantities of fuel, oil, and grease that might drip from construction equipment would have relatively low toxicity. In addition, construction activities may result in small oil spills during onsite refueling of construction equipment. These potential spills from fueling operations would be limited to small areas of contaminated soil. If a large spill occurs, the spill area would be bermed or controlled as quickly as practical to minimize the footprint of the area affected. The potentially contaminated soil and materials would be placed into drums for offsite disposal as hazardous waste. If a spill or leak into the environment involves hazardous materials equal to or greater than the specific reportable quantity, the federal, state, and local reporting requirements will be adhered to during the cleanup activities. This would include the notification of the Riverside County Department of Environmental Health. The construction contractor will be responsible for implementing Best Management Practices (BMPs) on the RMSEGF project site consistent with the hazardous materials storage, handling, emergency spill response, and reporting specified in the Hazardous Materials Business Plan (HMBP). Therefore, the expected potential

TABLE 6-1
HAZARDOUS MATERIALS USAGE AND STORAGE DURING CONSTRUCTION BASED ON TITLE 22 HAZARD CHARACTERIZATION

Material	Hazard Characteristics[1]	Purpose	Storage Location	Maximum Stored[2]	Storage Type
Acetylene	Ignitability	Welding	Hazardous Material Storage Area	25,000 ft^3	Cylinder
Diesel Fuel	Ignitability	Emergency Generator	Hazardous Material Storage Area	9,500 gal	Tank
Oxygen-Gaseous	Ignitability	Welding Operation	Hazardous Material Storage Area	80,000 ft^3	Cylinder
Paint, solvents, adhesives, cleaners, sealants, lubricants	Toxicity	Construction Maintenance, Painting	Hazardous Material Storage Area	500 gal	Can/Small Containers
Sodium Hydroxide	Corrosive	Spill Neutralization	Hazardous Material Storage Area	150 gal	Carboy

Source: Rio Mesa Solar Electric Generating Facility, Application for Certification, filed October 10, 2011.

Notes:
[1]Hazardous characteristic identified per Title 22 California Code of Regulations Section 66261.20 et seq. for hazardous wastes.
[2]All numbers are approximate.
gal = gallon(s); ft^3 = cubic feet

TABLE 6-2
HAZARDOUS MATERIALS USAGE AND STORAGE DURING CONSTRUCTION BASED ON MATERIAL PROPERTIES

Material	Hazard Characteristics[1]	Purpose	Storage Location	Maximum Stored[2]	Storage Type
Hydraulic Oil	Mildly Toxic	Miscellaneous Equipment Control Oil	Within Equipment	1,000 gal	Construction Equipment
Lubricating Oil	Mildly Toxic	Lubricating Equipment Parts	Hazardous Material Storage Area	22,000 gal	Drums and Equipment

Source: Rio Mesa Solar Electric Generating Facility, Application for Certification, filed October 10, 2011.

Notes:
[1]Hazardous characteristics based on material properties and potential health hazards provided by those properties.
[2]All numbers are approximate.
gal = gallon(s); ft^3 = cubic feet

hazard from fuel, oil, and grease from construction equipment to employees or the environment would be minimal and, therefore, less than significant.

The potential for hazards related to accidental releases, fires, or explosions to occur during construction of the RMSEGF due to hazardous materials is discussed below.

6.1.2 Operation Phase

The operation of the RMSEGF would require the use of the hazardous materials listed on Tables 6-3 and 6-4. Tables 6-3 and 6-4 provide a summary of the hazardous materials to be used and stored during operation of the RMSEGF based on the Title 22 CCR characteristics criteria and based on the properties of the substances themselves. The hazardous materials used at the project site are not considered "Regulated Substances" subject to the requirements of the California Accidental Release Program (CalARP Program) and process safety management.

The transport, use, and storage of these materials would occur consistent with the applicable LORS defined in Section 3.0, Applicable Standards, and worker safety programs defined in Section 5.0, Safety and Health Programs, above. Refer to those sections of this document for the plans, programs, and guidelines to be implemented for the ongoing operations on the RMSEGF project site.

During the ongoing operation, most of the hazardous substances that would be use are required for facility maintenance and lubrication of equipment or would be contained in transformers and electrical switches. Their storage would be contained in designated hazardous materials storage areas and their use would be carefully prescribed in terms of the defined hazardous materials handling plans, the Safety and Health Programs, and the HMBP. If a spill or release of hazardous materials should occur, the spill area would be bermed or controlled as quickly as practical to minimize the footprint of the area affected. The potentially contaminated soil and materials would be placed into drums for offsite disposal as hazardous waste. If a spill or leak into the environment involves hazardous materials equal to or greater than the specific reportable quantity, the federal, state, and local reporting requirements will be adhered to during the cleanup activities. This would include the notification of the Riverside County Department of Environmental Health. The Owner would be responsible for verifying that the use, storage, and handling of hazardous materials during operations are in compliance with the applicable LORS. This would include the implementation of BMPs consistent with hazardous materials handling, emergency spill response, and reports as specified in the HMBP. Therefore, the expected potential hazard to employees or the environment during operation would be very low and, therefore, less than significant.

The potential for hazards related to accidental releases, fires, or explosions to occur during ongoing operation of the HHSEGS due to hazardous materials is discussed below.

TABLE 6-3
HAZARDOUS MATERIALS USAGE AND STORAGE DURING OPERATION BASED ON TITLE 22 HAZARD CHARACTERIZATION

Material	Hazard Characteristics[1]	Purpose	Storage Location	Maximum Stored[2]	Storage Type
Nalco Elimin-OX (Oxygen scavenger)	Ignitability	Oxygen scavenger for boiler chemistry control	Power Block: Containers near power tower	1,800 gal	300 gallon totes
Aqueous Ammonia (19% concentration)	Reactivity, toxicity	pH control for boiler chemistry	Power Block: Containers near power tower	1,800 gal	300 gallon totes
Sulfuric Acid 93% (66° Baumé)	Corrosivity, reactivity, toxicity	pH control	Power Block: Containers in water treatment building	2,700 gal	300 gallon totes
Sulfuric Acid (Batteries)	Corrosivity, reactivity, toxicity	Electrical power	Power Block: Contained within the main electrical room and the power tower; Common Area: Contained within main electrical room	14,000 gal	Batteries
Sodium Hydroxide (50% concentration)	Corrosivity, reactivity, toxicity	pH control	Power Block: Containers near WSAC and WWTS; Common Area: Containers in Water Treatment Building	2,400 gal	300 gallon totes
Diesel Fuel (No. 2)	Ignitability	Emergency generator	Power Block: Near fire pump, beneath emergency diesel generator, and adjacent to the mirror wash machines water filling station; Common Area: beneath emergency diesel generator and near fire pump	46,000 gal	Aboveground storage tanks and in equipment
Paint, solvents, adhesives, cleaners, sealants, lubricants	Toxicity	Equipment maintenance	Power Block: Maintenance Shop	500 gal	1-gal and 5-gal containers

Source: Rio Mesa Solar Electric Generating Facility, Application for Certification, filed October 10, 2011.

Notes:
[1]Hazardous characteristic identified per Title 22 California Code of Regulations Section 66261.20 et seq. for hazardous wastes.
[2]All numbers are approximate.
gal = gallon(s); WSAC = Wet-Surface Air Cooler; WWTS = Wastewater Treatment System

TABLE 6-4
HAZARDOUS MATERIALS USAGE AND STORAGE DURING OPERATION BASED ON MATERIAL PROPERTIES

Material	Hazard Characteristics[1]	Purpose	Storage Location	Maximum Stored[2]	Storage Type
Cleaning Chemicals and Detergents	Toxicity, irritant	Periodic cleaning of steam turbine	Power Block: Maintenance shop	3,000 gal	Miscellaneous manufacturer's containers
Nalco 5200M (Anti-scalant)	Irritant, mildly toxic	Wastewater treatment anti-scalant	Power Block: Containers near WWTS; Common Area: Containers in water treatment building	1,500 gal	300 gallon totes
Nalco 3DT-187 (Corrosion inhibitor)	Irritant, mildly toxic	WSAC corrosion inhibitor	Power Block: Containers near WSAC; Common Area: Containers in water treatment building (storage)	2,100 gal	300 gallon totes
Nalco 73801WR (Dispersant)	Irritant, mildly toxic	WSAC dispersant	Power Block: Containers near WSAC; Common Area: Containers in water treatment building (storage)	2,100 gal	300 gallon totes
Nalco TRAC107 (Corrosion inhibitor)	Irritant, mildly toxic	Closed cooling water (CCW) corrosion inhibitor	Power Block: Contained within CCW system; Common Area: Containers in water treatment building (storage)	500 gal	55 gallon drums
Avista Vitec (Scale inhibitor)	Irritant, mildly toxic	Reverse osmosis scale inhibitor	Common Area: Containers in water treatment building	900 gal	300 gallon totes
Sodium Bisulfite	Irritant, mildly toxic	Dechlorination	Common Area: Containers in water treatment building	900 gal	300 gallon totes
Nalco 7468 (anti-foaming agent)	Irritant, mildly toxic	Wastewater treatment system anti-foaming agent	Power Block: Containers near WWTS; Common Area: Containers in water treatment building	1,500 gal	300 gallon totes
Lubricating Oil	Mildly toxic	Miscellaneous equipment lubrication	Power Block: Contained within equipment, drums during replacement; Common Area: Contained within equipment, spare capacity stored in maintenance shop	30,000 gal	Contained within equipment, misc. drums during replacement

TABLE 6-4 (CONTINUED)
HAZARDOUS MATERIALS USAGE AND STORAGE DURING OPERATION BASED ON MATERIAL PROPERTIES

Material	Hazard Characteristics[1]	Purpose	Storage Location	Maximum Stored[2]	Storage Type
Mineral Transformer Insulating Oil	Mildly toxic	Provides overheating and insulation protection for transformers	Power Block: Contained within transformers; Common Area: Contained within transformers	112,000 gal	Transformers
Hydraulic Oil	Mildly toxic	Miscellaneous equipment control oil	Power Block: Contained within equipment, drums during replacement; Common Area: Contained within equipment, spare capacity stored in warehouse	6,000 gal	Contained within equipment; misc. drums during replacement
Sodium Hypochlorite 12% (trade) solution	Irritant, corrosivity, reactivity	Biocide	Power Block: Containers in water treatment building; Common Area: Potable water treatment area	2,400 gal	300 gallon totes

Source: Rio Mesa Solar Electric Generating Facility, Application for Certification, filed October 10, 2011.

Notes:
[1]Hazardous characteristics based on material properties and potential health hazards provided by those properties.
[2]All numbers are approximate.
gal = gallon(s); WSAC = Wet-Surface Air Cooler; WWTS = Wastewater Treatment System

6.2 ACCIDENTIAL RELEASE HAZARDS

The California Fire Code, Articles 79 and 80, includes specific requirements for the safe storage and handling of hazardous materials that would reduce the potential for a release or for the mixing of incompatible materials. The design of the RMSEGF provides for chemical storage and handling facilities in compliance with the current California Fire Code and other applicable LORS. Upon compliance with these requirements, hazards related to accidental release of hazardous materials would be less than significant.

6.3 FIRE AND EXPLOSION HAZARDS

The California Fire Code, Article 80, requires that all hazardous materials storage areas to be equipped with a fire extinguishing system and requires ventilation for all enclosed hazardous material storage areas. Some flammable substances would be used and stored on the project site: natural gas, diesel fuel, transformer oil and lubricating oil. These substances are discussed below.

Natural gas would be used as a fuel for the natural gas-fired auxiliary boilers to extend the available power used to provide supplemental steam to the turbine generator. The natural gas would be continuously delivered to the project site through a pressurized natural gas line and, therefore, no onsite storage would be required. With design features and safety management practices in compliance with the applicable LORS during the construction, operation, and maintenance of the gas line, hazards related to fire and explosion as a result of natural gas would be less than significant.

Diesel fuel would be used as fuel for emergency and fire generators and fire pumps. The diesel fuel would be stored in 8,000-gallon above ground storage tanks located in the refueling area of each solar plant. The tank would be located away from electrical lines and other potential ignition sources. The tanks would be installed so that the entire exterior surface can be viewed and monitored. In addition, the tanks would be protected from vehicles and other equipment by bollards placed around the tanks. With proper storage and handling in compliance with the California Fire Code and the HMBP, hazards related to fire and explosion as a result of diesel fuel would be less than significant.

Transformer oil would only be stored within the transformers of the project site. The generator step-up transformers and other oil-filed transformers would be contained and provided with a deluge system. The only risk of fire or explosion would be during the unlikely event of a catastrophic transformer failure, resulting in the need for response by the RCFD Hazardous Materials Team. However, due to the small amounts of transformer oil used on the project site and, with proper handling in compliance with the applicable LORS, hazards related to fire and explosion as a result of transformer oil would be less than significant.

Lubrication oil would be used inside rotating plant equipment. Only small amounts of lubrication oil would be used on the project site. In accordance with the California Fire Code, Article 80, the storage area for the lubrication oil would be equipped with a fire extinguishing system and the lubrication oil would be handled in accordance with the HMBP. With proper storage and handling in compliance with the California Fire Code and the HMBP, hazards related to fire and explosion as a result of lubrication oil would be less than significant.

6.4 OTHER WORKER SAFETY HAZARDS

During construction activities, ongoing daily operations and maintenance, and annual maintenance of the solar power tower, the power generation equipment, and other components of the RMSEGF, there would be the potential for other hazards to worker safety, including the potential for technical rescue conditions. The solar power tower structure, including the receiving steam generator (SRSG), would be a height of approximately 750 feet. The tower would have stairs, an elevator, and hoist system that could be used in an emergency event. Table 6-5 provides the potential hazards to workers during construction activities on the RMSEGF project site. Table 6-6 provides the potential hazards to workers during operation and maintenance activities on the RMSEGF project site.

All construction, operation, and maintenance on the RMSEGF project site would occur in compliance with the California Department of Safety and Health (CAL/OSHA) Standards Part 1910, Occupational Safety and Health Administration Safety and Health Regulations. Due to the height of the tower and the confined space in the interior, the construction contractor and the daily operations and maintenance personnel for the solar power tower and other project components with potential technical rescue conditions would have training based on federal and state standards and equipment manufacturer's requirements. Major maintenance activity for the solar power tower, including the exterior of the tower and the SRSG as well as other project components with potential technical rescue conditions, would occur on an annual basis by a contractor with personnel that would have training based on federal and state standards and equipment manufacturer's requirements. Upon compliance with CAL/OSHA Standards Part 1910 and the use of contractors and/or employees with the appropriate training, other hazards related to worker safety during construction, operation, and maintenance would be less than significant.

6.5 OFF-SITE VEHICLE ACCIDENTS

During construction activities and ongoing operation of the RMSEGF, there would be the potential for vehicle hazards with injuries to occur on the roadways in the vicinity of the RMSEGF project site. The following provides a description of the roadways that would serve the project area and access to the RMSEGF project site.

TABLE 6-5
POTENTIAL WORKER HAZARDS DURING PROJECT CONSTRUCTION

Activity	Potential Hazard
Elevated work	Slips/trips/falls
Hot work (welding/cutting)	Flash burns, explosion, thermal burns, toxic welding fumes
Excavations	Excavation/trench wall collapse, spoil movement, oxygen deficiency, buildup of toxic gases, fumes, vapors, dusts or mists, wet exposures, crushing hazards, confined spaces, potentially contaminated soil/waste
Solar power tower construction work	Slips/trips/falls, protruding objects, punctures, and lacerations
Equipment operation – motor vehicle and heavy equipment use	Noise exposure, vehicle accidents, load hazards, induced current
Transmission lines/transformer station (working on electrical equipment and systems)	Slips/trips/falls, contact with live electricity and energized equipment, electrocution, flash burns
Painting	Paint solvents, paint vapors, chemical burns, fire/explosion, and slips/trips/falls
Abrasive blasting	Dust, flying particles, pressure vessels, noise
Powered hand tools	Noise, dust, flying particles, cuts, amputation, crushing
Fueling and working with flammable and combustible liquids	Fire, explosion, spills, environmental contamination
Construction and testing of high-pressure steam and air systems	Injury from failure of pressurized system components or unexpected pressure release
General construction activities	Heat and cold stress, biological hazards (e.g., Valley Fever, snakes, scorpions, spiders, badgers), noise exposure, dust exposure, injury to head, eyes, face, body, foot, and skin, ergonomic injuries, exposure to hazardous materials or UXO/MEC

Source: California Department of Industrial Relations, 2011.

TABLE 6-6
POTENTIAL WORKER HAZARDS DURING PROJECT OPERATION AND MAINTENANCE

Activity	Potential Hazard
Generation enclosure	High voltage
Operations building	High voltage, repetitive trauma
Transformer	Electrocution, flash burns
Compressor	Fire, noise, temperature, rotating equipment, pressure
Chemical storage	Chemical splashes, burns, reactions, gases, vapors, fumes, injury due to ingestion, inhalation, or dermal contact
Machinery, general	Noise, temperature extremes, rotating equipment, electrocution
Elevated work	Slips/trips/falls
Hot work (welding/cutting)	Flash burns, explosion, thermal burns, toxic welding fumes
Equipment operation (motor vehicle and heavy equipment use)	Noise exposure, vehicle accidents, load hazards, induced current
Fueling and working with flammable and combustible liquids	Fire, explosion, spills, environmental contamination
Transmission lines/transformer station (working on electrical equipment and systems)	Slips/trips/falls, contact with live electricity and energized equipment, electrocution, flash burns
Maintenance of high-pressure steam and air systems	Injury from failure of pressurized system components or unexpected pressure release
General project operation activities	Heat and cold stress, biological hazards, noise exposure, dust exposure, injury to head, eyes/face, body, foot, and skin, ergonomic injuries, exposure to hazardous materials

Source: California Department of Industrial Relations, 2011.

As point of reference and in context to the regional roadway system, the RMSEGF project site is generally located on the southwest quadrant of I-10 and State Route (SR) 78 in unincorporated eastern Riverside County. The primary regional transportation corridors within the project area include Interstate 110 (I-10) and SR 78. The project area is primarily served by SR 78 and local streets, including: 28th Avenue, 30th Avenue, 34th Avenue, Lovekin Boulevard, and Bradshaw Trail. Access to the RMSEGF project site would be provided via 34th Avenue (primary) and Bradshaw Trail off of SR 78 (to the east).

Interstate 10 (I-10) is a four-lane, east-west interstate freeway located approximately 12 miles north of the project site and is under the operational jurisdiction of the California Department of Transportation (Caltrans). I-10 originates in Santa Monica and runs through Los Angeles, San Bernardino County, Riverside County, and beyond through transcontinental U.S. to the east. In the vicinity of the project site, access to I-10 is provided via freeway ramp connections at South Neighbors Boulevard/SR 78. The posted speed limit is 70 miles per hour (mph) and trucks comprise 39 percent of traffic on the freeway.

State Route 78 is a north-south state highway, located east of the project site, which provides regional access to the project area. State Route 78 is a two-lane highway with a posted speed limit of 55 mph except through Ripley, where the speed limit is 45 mph. SR 78 has two 12-foot lanes and paved shoulders. In the vicinity of the project site, SR 78 is accessed via 30th Avenue/Bradshaw Trail and 34th Avenue. SR 78 is also referred to by local street names as South Neighbors Boulevard, 28th Avenue and Rannells Boulevard. The east and west SR 78 ramps at I-10 are stop sign controlled. The land uses adjacent to SR 78 are predominantly agricultural, although SR 78 goes through the communities of Ripley, California northeast of the Project and Palo Verde, California southeast of the project site.

34th Avenue is the preferred access route to the RMSEGF project site. It runs east-west from SR 78 and connects to the project site 1.5 miles north of the community of Palo Verde at the Riverside/Imperial County line. From SR 78, this access route runs west between agricultural lands on a 60-foot wide County right-of-way (ROW) before reaching the project site. West of SR 78, 34th Avenue is a dirt road.

30th Avenue is a two-lane, east-west paved road for 1 mile west of Rannells Avenue (or SR 78). The paved portion is 24 feet wide with dirt shoulders. Beyond the paved segment it becomes a graded dirt road that varies in width from 15 to 30 feet as it leads into the RMSEGF project site.

Bradshaw Trail bisects the RMSEGF project site. The current routing of Bradshaw Trail through the agricultural lands and the project site was formerly known as the Butterfield Trail, although it may not represent the actual routing of the historic trail. Bradshaw Trail runs through the northern portion of the project site and is a 65-mile dirt road that is periodically graded by the Riverside County Transportation Department and managed by

the U.S. Bureau of Land Management (BLM). Bradshaw Trail provides access to the northern portion of the project site. The portion that runs through the project site is primarily used as an off highway vehicle (OHV) access route.

In addition and in combination with SR 78, Lovekin Boulevard provides a secondary regional access route to the RMSEGF project site from I-10. This route is proposed to be used in tandem with SR 78, thereby splitting the traffic demand at the two interchanges along I-10. This route runs south along Lovekin Boulevard from I-10 for approximately 7.5 miles and then continues west along 28th Avenue for 6 miles. The route then turns south and extends for 2 miles south to 32nd Avenue and then west for 1 mile to SR 78 for 1.3 miles to the project access at 34th Avenue. All of these roads are existing. Lovekin Boulevard is a paved road with a 55 mph speed limit. All other roads are also paved with the exception of the project access segment of 34th Avenue. Lovekin Boulevard is a designated Class II Bike Lane between 10th Avenue and 14th Avenue and a Class I Bike Path between 14th Avenue towards 18th Avenue.

To provide an evaluation of the potential hazard for off-site vehicle accidents, the accident rates on SR 78 and Lovekin Boulevard were determined based on historical data obtained from the California Department of Transportation (Caltrans) and the Statewide Integrated Traffic Records System that compiles incidents reported by the California Highway Patrol. Table 6-7 provides the number of accidents (injury and non-injury) and the corresponding accident rates for the years 2009, 2010, and 2011 that occurred on the Riverside County roadways in the vicinity of the project site.

Utilizing the estimated accident rates and the additional traffic that would be added to these roadways as a result of the RMSEGF, the potential accidents that could occur during the construction and ongoing operation of the RMSEGF were estimated. Table 6-7 provides an estimate of the accidents (injury and non-injury) that could occur on the Riverside County roadways in the vicinity of the project site. Table 6-8 provides an estimate of the injury accidents (ones which may require emergency response by the RCFD) that could occur on the Riverside County roadways in the vicinity of the project site.

As indicated in Table 6-8, with the additional average daily trips generated by construction worker traffic during the construction phase of the RMSEGF and accident rate data, there is the potential for four additional vehicle accident with injuries to occur per year on the surrounding roadways in Riverside County. An accident with injuries may require a response from the RCFD. In addition, during the ongoing operation of the RMSEGF, there is a minimal anticipated increase in vehicle accidents on the surrounding roadways in Riverside County. Therefore, hazards to worker safety due to off-site vehicle accidents on the roadways in the project vicinity would be less than significant.

TABLE 6-7
ACCIDENTS (INJURY AND NON-INJURY) ON ROADWAYS IN RIVERSIDE COUNTY WITHIN VICINITY OF THE RMSEGF PROJECT SITE

Roadway Link	Existing ADT[1]	No. of Reported Accidents[2]			Highest No. of Accidents Over Period	Accident Rate[3]
		2008	2009	2010		
SR 78 south of I-15	2,100	3	3	1	4	0.0019
SR 78 north of 22nd Avenue	1,600	0	2	1	3	0.0018
SR 78 north of 30th Avenue	1,300	0	1	3	3	0.0023
SR 78 south of 34th Avenue	1,100	2	3	2	3	0.0027
Lovekin Blvd south of I-10	6751	1	4	1	4	0.0005
28th Avenue west of Lovkin Blvd	713	0	0	0	0	0.0000

Source: Rio Mesa Solar Electric Generating Facility, Application for Certification, filed October 10 2011 and Statewide Integrated Traffic Records System, Data Run Date March 28, 2012

[1]Gross number of accidents per ADT per year for each roadway link, based on the highest number of accidents during 2008-2010 divided by the existing ADT.

TABLE 6-8
POTENTIAL ADDITIONAL ACCIDENTS (INJURY AND NON-INJURY) ON ROADWAYS IN RIVERSIDE COUNTY WITHIN VICINITY OF THE RMSEGF PROJECT SITE

Roadway Link	Existing ADT[1]	Additional ADT Due to Project[2]		Accident Rate[3]	Potential Additional Accidents	
		During Construction	During Operation		During Construction	During Operation
SR 78 south of I-15	2,100	1795	510	0.0019	3.5	1
SR 78 north of 22nd Avenue	1,600	1755	460	0.0018	3	1
SR 78 north of 30th Avenue	1,300	1731	430	0.0023	4	0.77
SR 78 south of 34th Avenue	1,100	226	110	0.0027	0.61	0.29
Lovekin Blvd south of I-10	6751	550	685	0.0005	0.29	0.34
28th Avenue west of Lovkin Blvd	713	65	79	0.0000	0.0	0.0

Source: Rio Mesa Solar Electric Generating Facility, Application for Certification, filed October 10, 2011 and Statewide Integrated Traffic Records System, Data Run Date March 28, 2012

[1]Gross number of accidents per ADT per year for each roadway.

7.0 CONCLUSIONS RELATED TO RISKS OF THE PROJECT

Based on the identified potential hazards, compliance with the applicable standards, and the implementation of the fire protection systems and safety and health programs, the risks as a result of the construction activities and operation of the RMSEGF that would require a response by fire protection and emergency medical service personnel have been summarized in Table 7-1.

TABLE 7-1
POTENTIAL RISKS

Hazard	Probability of Risk
Use and storage of hazardous materials during construction	Extremely low probability
Use and storage of hazardous materials during operation and maintenance	Extremely low probability
Accidental release of hazardous materials	Extremely low probability
Fire or explosion from hazardous materials	Extremely low probability
Fire or explosion from use of natural gas, diesel fuel, transformer oil and lubrication oil	Extremely low probability
Worker safety during typical construction, operation, and maintenance	Extremely low probability
Worker safety related to height of tower during construction, operation, and maintenance	Extremely low probability
Worker safety related to work in confined spaces during construction, operation, and maintenance	Extremely low probability
Worker safety related to height of tower during construction, operation and maintenance	Extremely low probability
Offsite vehicle accidents	Extremely low probability

Source: Pacific Development Solutions Group, April 8, 2012.

The ranges of probability for this table are: high probability, moderate probability, low probability, extremely low probability, remote probability, and extremely remote probability.

Appendix A

MAPS AND SITE PLAN

OVERVIEW MAP

22nd Ave
Rannells Blvd
28th Ave
Bradshaw Trail
32nd Ave
34th Ave
Riverside County
Imperial County

Project Features

- Project Site - approx. 7,529 ac.; (approx. acres: 5,604 MWD, 1,615 BLM, 310 Private)
- Draft Fenceline Boundary of Solar Field (approx. 5,526 acres)
- Draft Usable Boundary of Common Areas (approx. 119 acres)
- Draft Solar Field and Common Layout

Improved Access Roads Corridor

- Proposed Bradshaw Trail Re-route (5.2 miles)

Access Road Corridors to be Improved

- 34th Ave Access Road Corridor to be Improved (1.02 mile, 200ft. corridor, 100ft. from c/l, 25 ac.)
- Bradshaw Trail Access Road Corridor to be Improved 2.96 miles, 200ft. corridor, 100ft. from c/l, 71 ac.)
- City/Town
- County Boundary

Land Ownership

- US Bureau of Land Management (2,598 ac.within project)
- Unclassified (5,749 ac. within project)
- Parcel Boundary
- PLSS Section Line

SOURCES: Draft Solar Field Layout & Fenceline (Bechtel, 8-03-2011). Project Site (VTN, 3-15-2011). Aerial Imagery (NAIP, 5-25-2009). County, State Boundaries, Roads (ESRI, 2007). Parcels (BLM, 2006). Land Ownership (BLM, 3-03-2011).PLSS Sections (BLM, 12-11-2007). Bradshaw Trail Re-route (URS, 6-2011).

FIRE PLAN
RIO MESA SOLAR
ELECTRIC GENERATING FACILITY

URS

1750 0 1750 3500 Feet

SCALE: 1" = 3500' (1:42,000)

SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: DS	DATE: 3/27/2012	FIG. NO: 1
PM: AL	PROJ. NO: 27652105.00510	

Path: G:\gis\projects\N1577\27651002\map_docs\mxd\Exchange\Fire_Map.mxd, diana_smith, 3/27/2012, 7:17:54 PM

NA_FORMATS.CEL AC-ESTD_NA 07/17/08

N 90,0000 — N 80,0000 — N 70,0000 — N 60,0000

E 20,0000 — E 30,0000 — E 40,0000

N 90,727.37
E 32,771.26

N 90,839.37
E 40,645.93

N 87,658.36
E 32,814.67

N 87,626.77
E 31,496.46

N 84,942.03
E 31,551.26

N 84,904.70
E 30,241.93

N 82,245.97
E 30,285.38

N 82,202.98
E 27,655.05

N 82,140.70
E 25,030.81

N 79,467.03
E 25,072.66

N 79,803.39
E 40,859.23

N 79,779.47
E 39,541.75

N 77,077.35
E 38,273.91

N 77,099.36
E 39,589.93

N 76,732.62
E 22,482.35

N 76,793.48
E 25,114.40

N 76,671.69
E 19,850.17

N 74,368.37
E 38,321.43

N 74,383.82
E 39,637.73

N 73,999.80
E 19,906.49

N 71,667.51
E 39,686.61

N 71,327.86
E 19,963.04

N 68,950.45
E 39,738.28

N 68,752.81
E 25,268.57

N 68,704.15
E 22,642.52

N 68,655.81
E 20,015.86

N 66,233.34
E 39,790.14

N 66,072.50
E 25,315.39

N 63,573.99
E 39,840.08

N 63,567.52
E 38,519.93

N 63,391.63
E 25,325.11

N 60,747.18
E 27,981.05

N 60,710.91
E 25,334.66

N 60,784.61
E 30,627.36

N 60,858.29
E 35,920.21

N 60,820.91
E 33,274.09

N 60,895.70
E 38,566.67

EX. HIGH VOLTAGE TRANSMISSION LINE

EX. HIGH VOLTAGE TRANSMISSION LINE AND NATURAL GAS LINE

EX. BRADSHAW TRAIL

PROJECT BOUNDARY

UNIT 3

UNIT 2

UNIT 1

CIRCULAR DIRT ROAD (CI)

12' DIRT ROAD

10' DIRT ROAD

20' PAVED ROAD (SS1)

24' PAVED SHARED ROAD

ALTERNATE EMERGENCY ENTRANCE

COMMON AREA

24' PLANT ENTRANCE ROAD

CONNECTS TO EXISTING 34TH AVE.

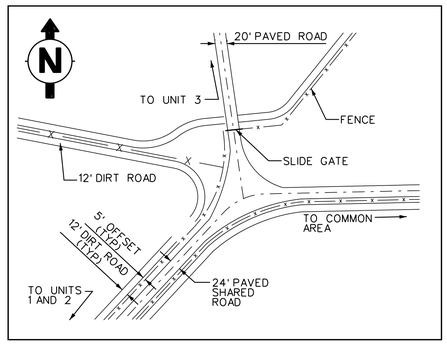
SEE INSET A THIS SHEET

SEE INSET B THIS SHEET

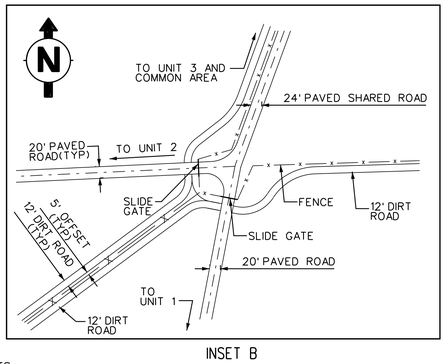
PROJECT GRID
N 70,000,000
E 30,000,000

12' PERIMETER DIRT ROAD OFFSET 5' FROM FENCE (TYP)

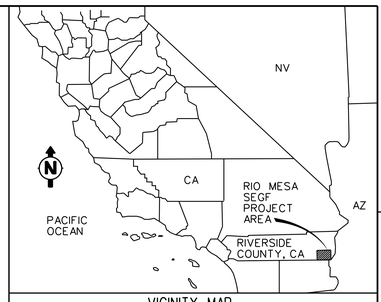
RIVERSIDE COUNTY
IMPERIAL COUNTY



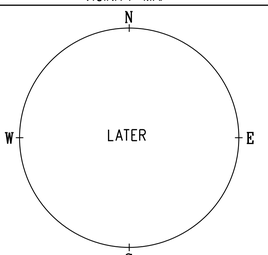
INSET A
NTS



INSET B
NTS



VICINITY MAP



ANNUAL WIND ROSE

NOTES:

1. SOLAR TOWER LOCATIONS:

PROJECT GRID COORDINATES			
UNIT	EASTING	NORTHING	COMMENTS
1	29,824.27	67,289.63	
2	25,924.66	72,612.47	
3	32,873.15	82,063.26	

COORDINATES GIVEN TO CENTERLINE POWER TOWER.

2. TOTAL NUMBER OF HELIOSTATS TO BE BETWEEN 80,000 AND 100,000 EACH UNIT.
3. HELIOSTAT MAINTENANCE PATHS TO BE 10' DIRT ROAD.
4. DISTANCE BETWEEN HELIOSTAT MAINTENACE PATHS TO BE 152.6 FT.
5. HELIOSTAT PYLON DENSITY:
   - NEAR TOWER (UP TO 400-500 METERS): 0.03-0.04 PYLONS PER SQUARE METER.
   - 1,000 METERS FROM TOWER: 0.01-0.02 HELIOSTATS PER SQUARE METER.
   - 2,000 METERS FROM TOWER: 0.005-0.01 HELIOSTATS PER SQUARE METER.

LEGEND:

PROJECT BOUNDARY

0 1000 2000 3000
1" = 1000'

NO.	DATE	REVISIONS	BY	CHK	DES. SUPV.	ENGR.	PROJ ENGR.	APPR
D	29 SEPT, 11	ADDED HELIOSTAT PATHS WITHIN CIRCULAR ROAD.	LAP	DWF	-	DWF	TWA	
C	27 SEPT, 11	ADDED NOTES AND HELIOSTAT PATHS.	LAP	DWF	-	DWF	TWA	
B	8/5/11	ROTATED UNITS 1,2 AND 3, ADJUSTED UNIT ACCESS ROADS AND ISSUED FOR AFC	LAP	DWF	-	DWF	TWA	
A	7/15/11	ISSUED FOR REVIEW	LAP	DWF	-	DWF	TWA	

SCALE 1"=1000' | DATE 7/13/11 | DESIGNED LAP | DRAWN 7/13/11 | CHIEF ENGR.

BrightSource

BECHTEL POWER CORP.
DEDICATED TO SAFETY EXCELLENCE - ZERO ACCIDENTS
FREDERICK, MARYLAND

PRELIMINARY

RIO MESA SOLAR ELECTRIC GENERATING FACILITY

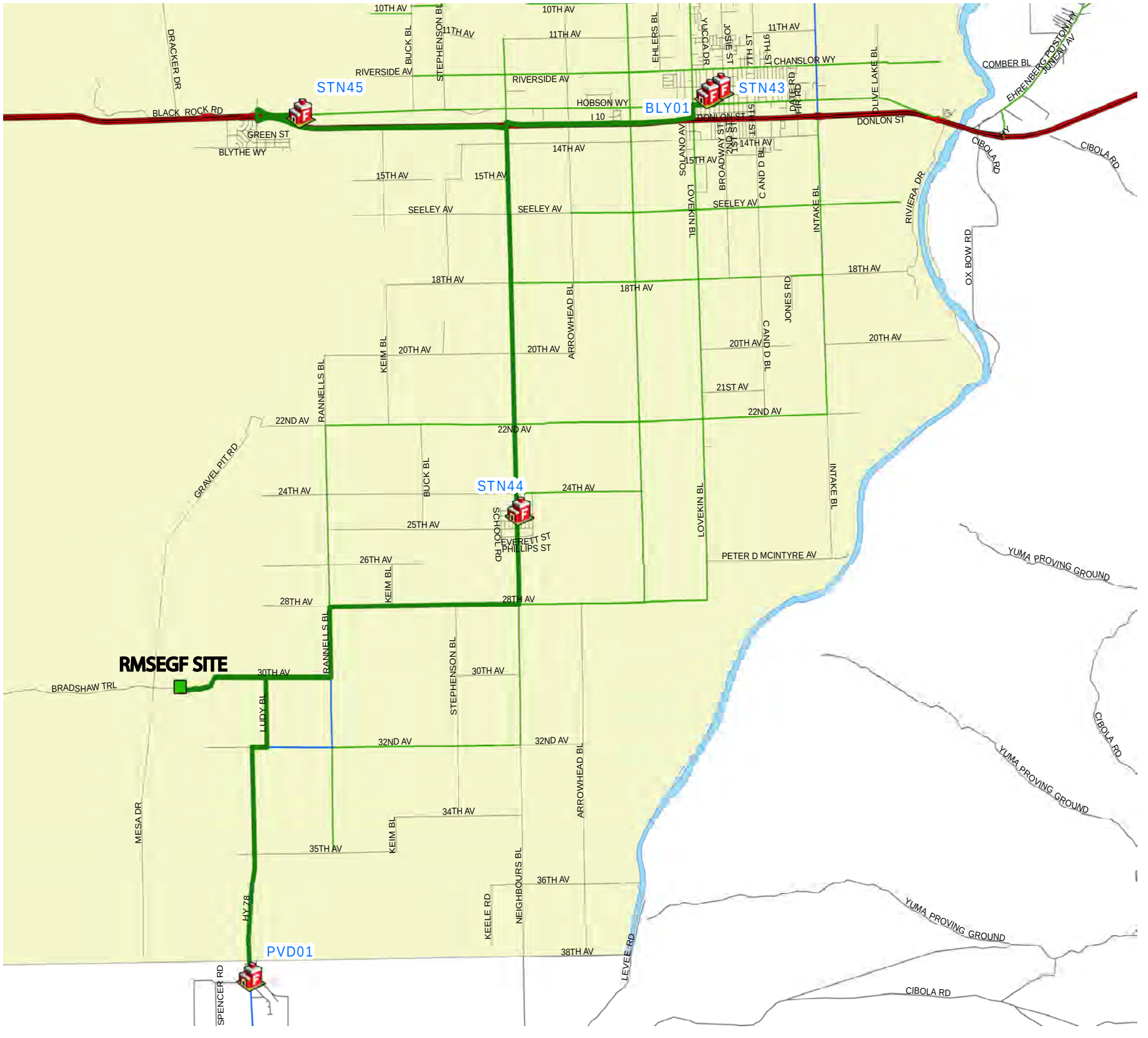
SITE PLAN

BSII (Ltd.) | FIG. NO: 2-5 | OWNER DRAWING NO.: TBD

BECHTEL | JOB NO.: 25670 | DRAWING NO.: 000-C2-0000-00001 | REV.: D

34"X44" E SIZE
PSC-

Fire Stations Serving RMSEGF Site



Source RCFD GIS Manager 03/19/2012

Appendix B

RIO MESA SOLAR ENERGY GENERATING FACILITY
FIRE PROTECTION DESIGN BASIS

Rio Mesa Solar Electric Generating Facility (RMSEGF)

Fire Protection Design Basis

The RMSEGF consists of three 250 MW (nominal) Power Plants and one Common Area. Each Power Plant and Common Area will have a fire water storage tank and fire pumps to supply the fire water loop that supplies the yard hydrants, hose stations, water spray, and sprinkler systems. The system will be designed to supply the design water demand for automatic suppression systems plus flow for fire hydrants and hose stations in accordance with California Building Code (CBC 2010)/NFPA requirements.

1.0 WATER SUPPLY

Each service/fire water storage tank (Power Plant) and fire water storage tank (Common Area) will include a 2-hour dedicated fire water capacity. The suction piping for service water demand will be taken from above the 2-hour storage volume reserved for fire protection water at the bottom of the tank. Two main, one-hundred percent capacity, fire water pumps (one electric-motor driven and one diesel-engine driven) and a jockey pump to maintain system pressure will be provided at each Power Plant and Common Area. The fire pumps will take suction from the service/fire water storage tank. Automatic start for the fire pumps will be initiated by a pressure switch in accordance with CBC (2010)/NFPA practice. Once started, the fire pump(s) will continue to run until manually stopped at the associated local pump controller. Fire pumps will be sized to provide the design water demand to the automatic fire suppression system plus 500 gpm for a fire hydrant or hose station.

The underground fire main headers will be high-density polyethylene (HDPE) pipe and will loop around their respective Power Plant and Common Area, with service main branch lines to auxiliary structures and facilities as necessary. The main headers will serve yard hydrants and hose stations. Fire hydrants will be spaced at approximately 250-foot intervals around the fire loop. Fire hydrants will be located in accordance with NFPA 24 and local fire codes. The hydrants will be dry barrel type and include threaded outlet connections to match local fire department hose threads. Applicable hydrants, valving, and other appurtenances required by state and local codes will be included. Fire hose houses and hoses will be provided. Each hose house shall be equipped with 200-feet of 1 ½ inch hose and accessories per CBC (2010)/NFPA 24.

The fire water distribution system will incorporate sectionalizing valves so that a single failure in the respective yard loop piping (other than the supply piping) will not affect service to both suppression systems and yard hydrants serving the same area. The fire water distribution system will incorporate isolation valves so that the automatic suppression system can be taken out of service without affecting standpipes/hose stations serving the same area. Valves requiring periodic testing will be accessible. Valves will be arranged and installed in accordance with NFPA 24 and NFPA 13 requirements, as applicable. The valves will be administratively supervised/inspected in accordance with NFPA 25. Fire protection system piping will be hydrostatically tested in accordance with NFPA requirements.

2.0 FIRE PUMP HOUSE

The fire pumps will be skid mounted in a structural steel metal enclosure complete with all furnished equipment, piping, valves, controllers, panels, lights (interior, exterior and emergency), receptacles, etc. on a single enclosed, prewired and fabricated skid complete with heating, ventilation (with dust louvers on intake) and lighting etc designed to permit a single lift during transit and installation on the foundation. The enclosure will have a rated fire wall separating the diesel and electric fire pumps.

3.0 CODES AND STANDARDS

The fire protection shall be in accordance with generally accepted fire protection engineering practices and consistent with previously approved approaches to fire protection for other power plants throughout the US. This design approach will require local and/or state review and approval and may require code clarifications or design variances where general code requirements exceed typical industry design practice for power generating facilities.

The fire protection system will be provided in accordance with code requirements to mitigate fire hazards, reduce potential property loss and protect personnel, as approved by the authority having jurisdiction (AHJ). The fire protection system design generally will conform to NFPA 850 provisions and recommendations, except for the following:

- ♦ Section 4.5, Fire Protection Design Basis Document - A fire risk evaluation will be performed as part of the design development. A formal fire risk evaluation document will not be issued (unless required by Chief Building Official (CBO)).
- ♦ Section 5.1.1, Fire Area Determination - Detailed drawings showing plant fire areas and fire boundaries will not be issued (unless required by CBO).
- ♦ Section 5.1.1.4, Fire Barriers - In general, spatial separation will be provided for fire hazards. Fire-rated barriers will be provided only in a limited number of locations where physical separation cannot be achieved (e.g., transformer fire walls or walls separating office areas from fire hazards, fire pump house).
- ♦ Section 5.1.5, Indoor Transformers - All indoor transformers will be the dry type and less than 35 kV rating. Therefore, rated fire barriers or suppression systems will be not required for this equipment.
- ♦ Section 5.4.1.2.2, Heat Vents - The boiler does not require smoke/heat venting. The turbine enclosure roof will have fusible-link-operated smoke/heat vents only if provided by the STG Supplier.
- ♦ Section 5.4.1.3, Smoke Vents - Dedicated smoke venting systems are not required in plant control rooms or switchgear rooms due to their small size.
- ♦ Section 5.5.2, Drainage and Curbing - Oil-filled equipment, containers, and tanks will be curbed. A floor trench will be installed on the lowest level of such containment. The trench will be sized to accommodate the entire volume of oil contained in such equipment, containers, or tanks and sprinkler discharge.
- ♦ Section 7.7.2, Hydraulic Control System - The steam turbine will use a fire-resistant hydraulic fluid. Therefore, automatic fire suppression system coverage is not required for this equipment.

♦ Section 7.7.3.1, Turbine Lubricating Oil Systems - Listed fire-resistant lubricating oils are not available for steam turbines in this size range. Since the lubricating oil is flammable, an automatic suppression system will be provided to cover the areas below the turbine operating floor that are subject to oil flow for all areas containing oil piping and for 20 feet beyond the piping.

♦ Section 7.7.3.4, Turbine Lubricating Oil Curbing - See clarification for Section 5.5.2.

♦ Section 7.7.3.8, Lubricating Oil Pumps - The lube oil pump skid will be covered by an automatic suppression system. It is not feasible to separate or protect electrical cabling for the ac and dc oil pumps since they will be located on the same pump skid.

♦ Section 7.8.2, Cable Tunnels - Cable tunnels will not be used. There may be some cable pits beneath electrical equipment rooms. Cable within these areas will have fire-retardant insulation.

♦ Section 7.8.3.3, Electrical Cables - It is not practical to provide automatic suppression systems or fire-retardant coatings for electrical cable trays. Cable trays will be routed to avoid ignition sources or flammable liquids where possible. Medium and low voltage cable entering buildings will have flame-retardant insulation meeting the requirements of the IEEE-383 vertical flame test.

Sprinkler and fixed spray systems will be designed and installed in accordance with NFPA 13 and NFPA 15, respectively.

NFPA codes and standards listed in the CBC (2010) will be used (NFPA 10,13,14,15,16,20,22,24,30,37,72, 80, 85 and 2001), plus the following:

NFPA 45	Standard on Fire Protection for Laboratories Using Chemicals
NFPA 55	Compressed Gases and Cryogenic Fluids Code
NFPA 69	Standard on Explosion Prevention Systems
NFPA 75	Standard for the Protection of Information Technology Equipment
NFPA 496	Standard for Purged and Pressurized Enclosures for Electrical Equipment
NFPA 497	Recommended Practice For the Classification of Flammable Liquids, Gases, or Vapors, and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas
NFPA 780	Standard for the Installation of Lightning Protection Systems
NFPA 850	Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations
NFPA 1961	Standard on Fire Hose
NFPA 1963	Standard for Fire Hose Connections
NFPA 1964	Standard for Spray Nozzles

4.0 FIRE PROTECTION

Automatic and manual fire protection systems will be provided as necessary for protection in the event of a fire. The fire protection system will incorporate a fire alarm system with means to automatically or manually detect and suppress fires until they can be extinguished by qualified onsite or offsite personnel.

4.1 SUPPRESSION AND DETECTION SYSTEMS

Sprinkler and fixed spray systems will be designed and installed in accordance with CBC (2010)/NFPA. Fire protection systems for the Power Plant will be provided as stated in the table below.

Fire Protection Systems for Each Power Plant

	Automatic Suppression					**Manual**				**Alarm System**
Area Receiving Fire Protection	**Wet Pipe**	**Water Deluge**	**Gaseous System**	**Foam Deluge**	**Foam Preaction**	**Portable Extinguisher**	**Standpipe**	**Yard Hydrant**	**Pull Station**	**Fire Detection**
STG bearings					X					X
STG enclosure				X		X		X	X	X
STG lube oil reservoir				X				X		X
Boiler Feedwater Pump Turbine (BFPT) lube oil reservoir				X				X		X
Control room and control equipment room in Plant Services building *(Note)*			X			X		X	X	X
Plant electrical building			X			X		X	X	X
Electrical equipment module (PDC)						X		X	X	X
Main and auxiliary transformers		X						X	X	X
Station service transformer								X		X
ACC/MCC transformers								X		X
Solar tower and SRSG						X				X
Fire pump house	X							X		X
Water treatment building	X					X		X	X	X

Note: Clean Agent Fire Suppression Systems will be provided for control equipment and control rooms in the Plant Services building and the electrical rooms of the plant electrical building and the water treatment building. The systems should consist of, but not limited to, the agent, agent storage containers, agent release valves, fire detectors, fire detection system (wiring control panel, actuation signaling), agent delivery piping and agent dispersion nozzles.

Fire protection systems for the Common Area will be provided as stated in the table below.

Common Area Fire Protection Systems

	Automatic Suppression					Manual				Alarm System
Area Receiving Fire Protection	**Wet Pipe**	**Water Deluge**	**Gaseous System**	**Foam Deluge**	**Foam Preaction**	**Portable Extinguisher**	**Standpipe**	**Yard Hydrant**	**Pull Station**	**Fire Detection**
Admin/control building -maintenance/ warehouse areas	X					X		X	X	X
Admin/control building -central control room, control equipment room, battery room, and electrical room *(Note)*			X			X		X	X	X
Admin/control building -other offices only	X					X		X	X	X
MCC transformers								X		X
Fire pump house	X							X		X
Water treatment building (except for electrical room)	X					X		X	X	X
Water treatment building electrical room (*Note)*			X			X		X	X	X
Heliostat assembly building	X					X		X	X	X
Mirror Wash Machine (MWM) maintenance shed						X		X		
Switchyard control Electrical Equipment Module (EEM)						X		X	X	X

Note: Clean Agent Fire Suppression Systems will be provided for control equipment and control rooms in the Admin/Control building, and the electrical rooms of the water treatment building. The systems should consist of, but not limited to, the agent, agent storage containers, agent release valves, fire detectors, fire detection system (wiring control panel, actuation signaling), agent delivery piping and agent dispersion nozzles.

Augmenting the fixed fire protection system, portable fire extinguishers will be located throughout the Power Plant and Common Area. These extinguishers will be sized, rated, and spaced in accordance with CBC (2010)/NFPA. A 100-pound wheeled handcart CO_2 extinguisher will be provided in the turbine area.

A proprietary, addressable, smoke and fire detection system will be provided for the project, with local structure fire alarms, automatic fire detectors, and fire signaling panels as required by design codes and in accordance with CBC (2010)/NFPA. The main fire panel will be located in the Common Area central control room (CCR) and will be connected to the Power Plant local control room (LCR) panels. The LCR fire panel will have non-redundant communication with the distributed control system (DCS) and, if applicable, hardwired shutdown signals to the Emergency Shutdown (ESD) System. A DCS gateway will be provided to interface with the Fire Alarm Panel, with the main electrical distribution systems and process systems located at the common area and packaged equipment of the common area.

4.2 FIRE BARRIERS, FIRE PROOFING AND FIRE SEALS

The CBC occupancy use group of the Services Building and Electrical Building in each Plant and the Admin/Control Building in the Common Area are considered to be Factory Industrial (F-1). The structure will consist of Type II, nonrated, unprotected construction. Other than the walls surrounding the LCR, the CCR, the control equipment rooms, IT/ media room, oil storage rooms (if any), cable pits, battery room, solar tower stair enclosure, and electrical room, no other fire walls or structural steel fireproofing will be included.

Wherever possible, through-barrier penetrations in fire barriers will have commercially available rated closure systems or seals. Barrier penetrations having design characteristics exceeding the limits of commercially available qualified closure systems or seals will have closure systems or seals that use materials similar to qualified configurations. Alternatively, the barrier and penetration design will be evaluated and qualified by engineering judgment.

Concrete transformer firewalls will be provided between oil-filled transformers and adjacent structures and equipment as required by NFPA 850. Firewall partitions will be provided between adjacent transformers and where required to protect structures within 50 feet of the generator step-up (GSU) transformer.

Fire separation walls and floors will be provided in accordance with code requirements. Fire doors and frames will conform to CBC (2010)/NFPA for the class of door furnished.

Appendix C

RESUMES OF PREPARERS

WESLEY A. ALSTON

Community Planning / Entitlement / Environmental Analysis
Fire Compliance Analysis / Fire Protection Services

CLIENTS SERVED

As Principal of Pacific Development Solutions Group (**PDSG),** Wes Alston has been an active participant in the endeavors of many California builders and developers. **PDSG** has provided services to relatively small entrepreneur developers, mid-size development firms, and major landowners including:

Alliance Residential	Lowes
Andland Properties, LLC	Nevis Development Company
Beazer Homes Southern California	Pacific Century Homes
Braddock and Logan Associates	Pulte Homes
Bren/Osgood Company	Rael Development Corporation
Canaday & Company	R.C. Hobbs Company
Centex Homes	SolarReserve
Cobra Plantas Industriales	Starbucks
Empire Companies	Stoneridge Commercial
Highpoint Communities	Suncal
K. Hovnanian Homes	Target
KB Homes	Taylor Woodrow Homes
Kohl's	Trumark Companies
Lincoln Properties	William Lyon Companies

PROFESSIONAL EXPERIENCE

Principal, Pacific Development Solutions Group **February 2003 – Current**

Serves as a key expert in the entitlement processing of commercial, industrial, and residential development projects throughout California. Manages the preparation of community planning and environmental analysis documentation with a special expertise in fire compliance analysis, fire needs assessments, and regulatory compliance documentation. Coordinates the plan submittal process at the regional and local level, obtains permits from responsible and trustee agencies, and manages the implementation of conditions of project approval.

Deputy Fire Chief, Riverside County Fire Department **July 1999 – February 2003**

The Riverside County Fire Department provides all risk emergency management to the County of Riverside and 18 contract Cities. Responsible for a $143 million dollar budget and the supervision and overall management of the Fire Department.

Fire Chief, City of Moreno Valley **February 2000 – December 2002**

Accountable for administering a $6 million budget and maintaining effective cost controls. Managed staff of 150 firefighters and administrative personnel. Coordinated resource exchanges with other California Department of Forestry (CDF) facilities and fire departments. Responsibilities included:

- *Fire Stations:* Sponsored program to facilitate reducing response time by 5 minutes.
- *Equipment Acquisition and Fire Stations:* Responsible for submitting RFP's, preparing and reviewing specifications, negotiating contracts, and awarding bids.
- *Financial Management:* Maintained the lowest per capita cost of cities in California with a population between 100,000 and 200,000.

Battalion Chief/Fire Marshal, City of Moreno Valley **November 1997 – February 2000**

Supervised clerical and engineering staff in preparation of files, records, drafts, and maps pertaining to Fire Protection Planning for the City of Moreno Valley Fire Prevention office. Provided technical assistance to Fire Protection staff, Building and Safety staff, Code Enforcement, Planning staff, and others within the City that require technical fire protection and planning information. Assisted in development of the Fire Department budget and monitor expenditures within the general Fire Department fund, development fees, and fire mitigation fees. Developed the Fire Department section of the City of Moreno Valley's new General Plan, presented to the City's Planning Commission and received approval. Attended all meetings throughout the City and County requiring the Fire Department representation. Provided a leadership role in all meetings.

Fire Captain Specialist **July 1984 – November 1997**

Managed the operation of the Fire Protection Planning and Engineering Division. Activities included:

- Participation in committees developing local and state ordinances.
- Serving as representative of the County Fire Department on planning matters before the Riverside County Board of Supervisors and Planning Commission.
- Negotiation of deal terms and purchase agreement conditions with property owners and brokers for new fire stations within the county.
- Preparation of economic and market feasibility analyses for specific plans within the county.

Responsibilities included:

- Management of current planning functions including subdivision, boundary adjustment, annexation, covenant modification, variance, and condition change.
- Preparation and presentation of staff reports and recommendations to Design Review Board and Board of Directors.
- Research and preparation of information on application processing, land use, governing documents, and regulatory code questions for staff, decision-makers, the membership, realtors and land-use professionals.
- Special projects in support or furtherance of Association policies and goals.
- Review and analyze regional plans and projects that have local impacts and generally tracking development in adjacent jurisdictions.
- Representing the Association at meetings of other jurisdictional entities.

EDUCATION

Bachelor of Science in Engineering, 1976
San Diego State

Associate of Arts in Fire Science, 1977
San Diego City College

PROFESSIONAL TRAINING AND CERTIFICATIONS

POST Basic
POST Intermediate
POST Supervision
SFM Fire Investigator 1
NFPA Fire Sprinklers
NFPA Fire Alarms

CURRENT COMMUNITY INVOLVEMENT / PROFESSIONAL AFFILIATIONS

Board Member Riverside Area Rape Crisis Center
Board Member United Way of Inland Valleys
Moreno Valley Community Hospital Foundation
Riverside Community College Foundation
RCC Community Partnership
Silver Eagles
Moreno Valley Chamber of Commerce
Building Committee, St. Patrick Church
National Fire Protection Association
International Conference of Building Officials
California Fire Chiefs Association
California League of Cities
California Conference of Arson Investigators
California Contractor (B2) License No. 81515

LAUREN JUE

Community Planning / Entitlement / Environmental Analysis
Public Services Analysis

EXPERTISE

Lauren Jue is an urban planner with over 28 years of experience managing and preparing a variety of urban design, land planning, and environmental studies throughout California. She has significant expertise in and working knowledge of the California Environmental Quality Act (CEQA), the National Environmental Policy Act (NEPA), the State of California General Plan Guidelines, and the entitlement process. Ms. Jue has been project manager for and primary contributor to environmental analyses, fire needs assessments, planning studies, land use programs, design implementation programs, Specific Plans, General Plans, and zoning documentation. She has been involved in public and private sector projects ranging from infrastructure and roadway projects, hospitals, industrial and office developments, master planned communities, resorts, recreational projects, and educational institutions including schools and university campuses.

PROFESSIONAL EXPERIENCE

- Planning Consultant – 2001 to 2011
- Associate Principal, PCR Services Corporation – 1998 to 2001
- Senior Associate, EDAW, Inc., Irvine – 1993 to 1996
- Director, STA, Inc., Newport Beach – 1989 to 1993
- Assistant Manager of Community Planning/Senior Planner, University of California, Irvine – 1986 to 1989
- Project Manager/Project Planner, Tierra Planning and Design, San Juan Capistrano – 1983 to 1986
- Management Analyst/Staff Analyst, County Administrative Office and County Fire Department, Orange County – 1982 to 1983

PROJECT EXPERIENCE

Ms. Jue has managed the preparation of planning and environmental documentation throughout California. She has recently completed or is currently working on projects in Kern, Riverside, San Bernardino, Orange, and San Diego Counties. The key issues addressed for these projects include land use compatibility, circulation and access, biological resources, cultural resources, aesthetics, geology and soils, hydrology and water quality, air quality, noise, public services and utilities, and global climate change. The settings of these projects range from undeveloped rural areas to urban infill sites. Her project experience includes the following:

- **Rice Solar Energy Project Fire Needs Assessment, Riverside County.** The project consisted of a 150-megawatt concentrating solar thermal power project located on a 2,560-acre project site in the northeastern portion of unincorporated Riverside County. The Fire

Needs Assessment was prepared to assess the impact of the project on worker safety and the resulting demand on fire protection and emergency response services. The Fire Needs Assessment defined the relevant worker safety and fire protection standards, reviewed the potential project hazards and risks, analyzed the effectiveness of the fire protection systems and safety and health programs to be provided by the project applicant and the conditions of certification recommended by the California Energy Commission, and evaluated fire department resources available to respond to emergency situations at the project. As a result of the analysis, the Fire Needs Assessment determined the level of significance of the potential project-specific and cumulative impacts related to fire protection and other emergency response services and provided recommendations to address potential hazards and minimize the risks to public health and safety.

- **Rice Solar Energy Project Construction Safety and Health Program, Riverside County.** The project consisted of a 150-megawatt concentrating solar thermal power project located on a 2,560-acre project site in the northeastern portion of unincorporated Riverside County. The Construction Safety and Health Program was prepared in accordance with the requirements of the Final Commission Decision issued by the California Energy Commission to address the potential effects of the project on worker safety and reduce the demand on fire protection and emergency response services to insignificant levels. The Construction Safety and Health Program consisted of the following programs and plans: Construction Personal Protective Equipment Program; Construction Exposure Monitoring Program; Construction Injury and Illness Prevention Program; Construction Heat Stress Program; Construction Emergency Action Plan; and Construction Fire Prevention Plan. The Construction Emergency Action Plan and Construction Fire Prevention Plan were reviewed by the Riverside County Fire Department. All of the programs and plans were reviewed and approved by the California Energy Commission staff.

- **Rice Solar Energy Project Construction Security Plan, Riverside County.** The project consisted of a 150-megawatt concentrating solar thermal power project located on a 2,560-acre project site in the northeastern portion of unincorporated Riverside County. The Construction Security Plan was prepared in accordance with the requirements of the Final Commission Decision issued by the California Energy Commission to address site security and access in order to protect employees, project resources and equipment, and reduce the need for emergency response. The plan was reviewed and approved by the California Energy Commission staff.

- **Tehachapi Hospital Project Environmental Analysis, Tehachapi Valley Healthcare District, City of Tehachapi, Kern County.** The proposed project consists of the construction of a new critical care hospital in the City of Tehachapi and the remodel of the existing hospital to provide an outpatient clinic for the community. The development of the new hospital includes: the construction of hospital buildings; a medical administration building; on-site improvements consisting of a helipad, parking, pedestrian and vehicular circulation system, stormwater facilities, utilities, a water tank for the fire protection systems and fire flow, landscaping and hardscape; and off-site improvements consisting of the extension of access roadways, utilities, and signage. The major project issues include transportation and access, noise, air quality, greenhouse gas emissions, biological resources, and public services and utilities.

- **Kern River Valley Specific Plan Environmental Impact Report, Kern County.** The proposed project consists of the implementation of the Kern River Valley Specific Plan which addresses approximately 110,510 acres in the northeastern portion of Kern County. Currently, the land use development in the Specific Plan Area is guided by the Kern County General Plan (General Plan) and two existing specific plans, the South Lake Specific Plan and the Kelso Valley Specific Plan. The proposed project will implement the General Plan and replace the existing specific plans with a single comprehensive planning document that integrates the policies and programs of the General Plan and the two currently adopted specific plans to provide a clear and unified vision and direction to guide future land use development within the Kern River Valley. The major project issues include aesthetics, air quality and global climate change, biological resources, cultural resources, fire hazards, geologic hazards, hydrology and water quality, population and housing, and utilities and service systems.

- **Children's Hospital of Orange County (CHOC) Master Plan Environmental Impact Report, City of Orange, Orange County.** The project consisted of the multi-phased upgrade of the CHOC Hospital campus that would allow for the continued use of the existing Hospital and supporting facilities during the implementation of the proposed Master Plan through the year 2020. The development program for the project would occur in three phases and result in demolition activities, new construction, and the remodeling of buildings on the project site. At build out, the project would result in the addition of approximately 600,524 gross square feet of new hospital building area that includes 202 pediatric in-patient beds, supporting diagnostic and emergency services, operating rooms, patient and visitor amenities, increased pedestrian and vehicular access, and 485 parking spaces. The major project issues included transportation/circulation, parking, aesthetics, land use compatibility, air quality, global climate change, noise, biological resources, cultural resources, geology and soils, population and housing, public services and utilities, and hazards and hazardous materials.

- **Children's Hospital of Orange County (CHOC) Parking Structure and Pedestrian Bridge Project Initial Study and Mitigated Negative Declaration, City of Orange, Orange County.** The project consisted of the construction of a nine-level parking structure and pedestrian bridge that provided access across a major arterial roadway to CHOC Hospital. The parking structure provided approximately 1,500 parking spaces for hospital staff and visitors. The major issues addressed included circulation and traffic, parking, aesthetics, air quality, noise, geology and soils, public services, and hazards and hazardous materials.

- **St. Joseph Hospital Master Plan Initial Study and Mitigated Negative Declaration, City of Orange, Orange County.** The project consisted of the multi-phased seismic upgrade of the existing St. Joseph Hospital and supporting facilities in compliance with State Senate Bill 1953 while allowing for the continued use of the existing facilities. In addition, the build out of the project by the year 2020 would allow for the development of a 404,000 square foot patient care center with a total of 240 in-patient beds, power generation facilities, pedestrian and vehicular circulation improvements, and additional parking spaces. The major issues addressed included circulation and traffic, parking, aesthetics, air quality, noise, public services and utilities, and hazards and hazardous materials.

- **Gateway Business Park Entitlement Processing and Environmental Analysis, City of Moreno Valley, Riverside County.** The project included the subdivision of the project site into six parcels for industrial and warehouse uses. The business park development consists of 253,740 square feet provided in 16 buildings with office, industrial, and warehouse space and associated parking areas organized along an the internal circulation system. The project has been design as a "gateway" to the City with extensive landscaping, decorative walls, fences, and signage. Due to the location of the project site within the Accident Potential Zone I for the March Air Reserve Base, the project was designed for occupancy by businesses at an intensity that is consistent with the land uses defined in the March Air Reserve Land Use Compatibility Plan. The actions taken by the City included the approval of a General Plan Amendment, Zone Change, Master Plot Plan, and Tentative Parcel Map. The environmental evaluation of the project included extensive technical documentation. Issues addressed included traffic and parking, noise, air quality, land use compatibility, hydrology and water quality, hazards and hazardous materials, and biological resources, including jurisdictional features.

- **California City General Plan, Kern County**. The project consisted of the preparation of a comprehensive update of the California City General Plan. The General Plan planning area is comprised of a total of 168,570 (263 square miles) located to the north of Edwards Air Force Base in the Mojave Desert. The General Plan addresses a planning horizon timeframe through the year 2030 and includes the following state-mandatory elements: Land Use, Circulation, Conservation and Open Space, Noise, and Safety. The key issues addressed included: the balance of land uses (residential with job-producing uses); regional circulation (upgrade of existing facilities, freeway access, alternative transportation); provision of adequate parks and recreational facilities; preservation of open space and natural resources; overflight hazards from Edwards Air Force Base and other military installations in the region; geotechnical hazards; flood hazards; adequacy of water supply and groundwater quality; and provision of public facilities. The scope of services included visioning workshops, community meetings for the purpose of reviewing the conceptual land use plan and alternative concepts, and joint Planning Commission/City Council meeting to review the various elements of the General Plan.

- **Archstone Gateway Project Environmental Impact Report, Cities of Anaheim and Orange, Orange County**. The project consisted of the development of an 884-unit multi-family residential community with on-site circulation, recreational amenities, and services. The development program for the project provided for two four-story on-grade residential buildings surrounding integrated four-story parking structures; and one three- to four-story residential building with the first floor serving as a screened parking garage. The 21-acre project site for the Archstone Gateway Project is located within the Cities of Anaheim and Orange, in north-central Orange County. The environmental evaluation of the proposed project included detailed analysis of traffic and parking, noise, air quality, land use compatibility, hydrology and water quality, hazards and hazardous materials, biological resources (trees), public services, and utilities and service systems.

- **Winchester 1800 Specific Plan Amendments No. 1, 2, and 3 Entitlement Processing and Environmental Analysis, Riverside County**. The project consisted of the preparation of amendments to the Winchester 1800 Specific Plan to allow for residential development, including park and school facilities, and the realignment of major transportation corridors. In addition, the project required the preparation of extensive documentation related to biological resources, cultural resources, jurisdictional waters, and soils and geology.

- **San Elijo Ridge Environmental Impact Report, City of San Marcos, San Diego County.** The Environmental Impact Report analyzed the potential impacts of the development of a 61.63-acre project site with 129 single-family residential units and three neighborhood mini-parks and the preservation of 33.54 acres as natural open space. The project was defined based on input from the community and the resource agencies. The major issues included land use compatibility, consistency with land use plans, biological resources, hydrology and water quality, aesthetics, air quality, cultural resources, hazards, noise, traffic, public services, and utilities and service systems.

- **Quail Ridge Specific Plan Environmental Impact Report, San Diego County.** The Environmental Impact Report analyzed the potential impacts of the development of a 234-acre project site with a large lot planned community consisting of 69 custom residential units and 62 acres preserved as natural open space for the purpose of protecting biological resources, cultural resources, and steep slopes. The major issues included land use compatibility, consistency with land use plans, biological resources, drainages, hydrology and water quality, aesthetics and light/glare, air quality, cultural resources, hazards, noise, traffic, public services, and utilities and service systems.

- **Rosedale Ranch Environmental Impact Report, Kern County.** This project consisted of the preparation of an Environmental Impact Report for the Rosedale Ranch project area. The project encompassed an approximately 6,550-acre area to the west of the City of Bakersfield. The goal of the project was to provide for the comprehensive planning of the project area with multiple property ownership to address the provision of adequate transportation facilities, utility infrastructure, water supply, and public services. Major project issues included land use, transportation/circulation, air quality, noise, biological resources, hydrology, water quality, population/housing, public services and utilities, and human health/risk of upset.

- **Western Rosedale Specific Plan Environmental Impact Report, Kern County**. This project consisted of the preparation of an Environmental Impact Report for the Western Rosedale Specific Plan area. The project encompassed an approximately 36,500-acre area to the west of the City of Bakersfield. The overall goal of the project was to ensure that future growth and development occurs in a comprehensive and well planned manner. Major project issues included land use, transportation/circulation, air quality, noise, biological resources, cultural resources, population/housing, public services and utilities, and human health/risk of upset.

- **Dana Point Headlands Specific Plan Environmental Impact Report, City of Dana Point, Orange County**. The Environmental Impact Report analyzed the potential impacts of the development of a 121.3-acre mixed use site within the City of Dana Point. The proposed project included a mix of residential uses varying in density from 3.5 to 14.0 dwelling units per acre for a maximum of 522 dwelling units on 53.5 acres of the project site, 12.8 acres of visitor/recreation commercial uses, and 55 acres of open space. Major project issues included land use, air quality, noise, traffic and circulation, aesthetics, geology, hydrology, biology, socioeconomics, and cultural resources. Site constraints included development within the coastal zone on bluffs which overlook the Pacific Ocean.

- **Smithcliffs Residential Development Project Environmental Impact Report, Orange County**. This project involved the preparation of an Environmental Impact Report for a

private, gate-guarded community of 26 single-family estate lots north of the City of Laguna Beach in the County of Orange. Major project issues included land use, earth resources, biological resources, cultural/scientific resources, air quality, water quality, aesthetics, transportation/circulation, noise, light and glare, public services and utilities, and public health and safety. Additional work efforts and documentation included an urban runoff management plan, Monarch butterfly surveys, extensive archaeological and paleontological assessments, a historical structure survey, and a detailed noise analysis.

- **State Route 134/San Fernando Road Access and Safety Program Initial Study/Environmental Assessment, City of Glendale and Caltrans, Los Angeles County**. The project consisted of improvements to the State Route 134 (SR 134)/San Fernando Road Interchange for the purpose of providing grade separation of Fairmont Avenue across San Fernando Road and the Southern California Regional Rail Authority (SCRRA) railroad right-of-way resulting in safety benefits by separating traffic accessing the SR-134 from the at-grade crossings along San Fernando Road. This resulted in an increase in vehicular and pedestrian access and safety and reduced the effects of noise and light and glare on adjacent residential and commercial development. The Initial Study/Environmental Assessment addressed environmental issues related to circulation and traffic, land use, right-of-way acquisition, aesthetics, light and glare, noise, air quality, biological resources, cultural and historical resources, and hazards and hazardous materials. The project required close coordination with the City, Caltrans, and the Federal Highway Administration (FHWA) and the preparation of the supporting technical documentation consistent with the requirements of Caltrans and FHWA.

- **Avenida Vista Hermosa and I-5 Interchange Initial Study/Environmental Assessment, City of San Clemente and Caltrans, Orange County**. This Initial Study/Environmental Assessment was prepared for the construction of a new freeway interchange at the proposed intersection of Avenida Vista Hermosa at Interstate 5 (I-5) in the City of San Clemente. Major project issues included circulation, land use, right of way acquisition, noise, relationship to existing interchanges, and aesthetics. The project required close coordination with the City, Caltrans, and the Federal Highway Administration.

EDUCATION

Bachelor of Science in City and Regional Planning, School of Architecture, 1982
California State Polytechnical University, San Luis Obispo

Attachment DR 43-2
Fire Protection and Emergency Services Needs Assessment

DRAFT

RIO MESA SOLAR ELECTRIC GENERATING FACILITY

FIRE PROTECTION AND EMERGENCY SERVICES NEEDS ASSESSMENT

Prepared by:
Pacific Development Solutions Group

Contact:
Wesley Alston
(800) 385-4643

April 13, 2012

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1.0 SCOPE OF STUDY

This Fire Protection and Emergency Services Needs Assessment has been prepared for the Applicant by Pacific Development Solutions Group (hereinafter "Consultant") in response to CEC Staff Data Requests, Set 1A, Data Request No. 43.

The following provides a summary of the scope of work accomplished in order to prepare this document:

1. Review and understand the location, setting, and design as well as the construction activities and ongoing operation of the Rio Mesa Solar Electric Generating Facility (RMSEGF).

2. Define the applicable standards related to worker safety and health, fire protection, and emergency medical services.

3. Describe the fire protection systems for the RMSEGF and the safety and health programs defined by the applicant in the Application for Certification (AFC). This includes programs related to hazardous materials, worker safety and health, fire protection, and emergency medical services to address hazards that could occur during construction and operation.

4. Identify the existing fire department resources and emergency medical services resources. Evaluate the fire department and emergency medical services resources available to respond to emergency situations taking into account their existing staffing, equipment, response times, and workload.

5. Based on the potential hazards identified in the RMSEGF Fire and Emergency Services Risk Assessment (including compliance with the applicable standards, and the implementation of the fire protection systems and safety and health programs), analyze the impact to fire protection and emergency medical services resources during the construction activities and ongoing operation of the RMSEGF.

6. Provide recommendations that address identified impacts to fire protection and emergency medical services resources during the construction activities and ongoing operation of the RMSEGF.

2.0 PROJECT DESCRIPTION AND SETTING

2.1 LOCATION AND SETTING

The Rio Mesa Solar Energy Generating Facility (RMSEGF) project site is located on approximately 5,750 acres in the southeastern portion of unincorporated Riverside County, California, approximately 13 miles to the southeast of City of Blythe. The project site is located partially on privately owned land and partially on public land administered by the U.S. Bureau of Land Management (BLM). Appendix A of this document provides the regional location of the project site.

The project site is located on the Palo Verde Valley in the general area known as the Palo Verde Valley. The area around the project site is comprised of open space and agricultural land. There is some very low density residential land use in the vicinity of the project site. The nearest community to the project site is Palo Verde located within Imperial County approximately 2.3 miles east of the southeast corner of the project site boundary on the border of Riverside County and Imperial County. The community of Ripley is located approximately 6.8 miles from the project site.

The project site is generally bounded by the existing Imperial Irrigation District Transmission line to the northwest, the Western Area Power Administration (WAPA) transmission line to the east, and the TransCanada Gas Transmission Company (TCGT) North Baja Transmission Line on the east. Bradshaw Trail intersects the project site at an east-west orientation. Approximately five to eight miles to the east, the Colorado River forms the border between eastern Riverside County and La Paz County, Arizona.

The project area is primarily served by State Route (SR) 78 (Neighbours Boulevard) and local streets, including: 28th Avenue, 30th Avenue, 34th Avenue, South Lovekin Boulevard, and Bradshaw Trail. Access to the RMSEGF project site would be provided via 34th Avenue (primary) and Bradshaw Trail off of SR 78 (to the east). The access road would travel adjacent to agricultural land before reaching the project site.

The project site is within a "Non-High Fire Hazard Severity Zone" according to the *Approved Very High Fire Hazard Severity Zones and Local Responsibility Areas* map, dated December 24, 2009, prepared by the State of California Department of Forestry and Fire Protection (CAL FIRE) and adopted by the County of Riverside.

2.2 PROJECT CHARACTERISTICS

The RMSEGF consists of three 250-megawatt (MW) (nominal) solar concentration thermal power plants, a shared common area, and four additional features consisting of linear corridors used for site access and electrical service lines. The first plant, known as Rio Mesa I, would be constructed at the south end of the project site. The second plant,

known as Rio Mesa II, would be located in the central portion of the project site. The third plant, Known as Rio Mesa III, would be constructed in the northern portion of the project site. Appendix A to this document provides the site plans for the RMSEGF.

The following provides a description of the key project elements of the RMSEGF.

2.2.1 Solar Plants

Each solar plant would use heliostats, which are elevated mirrors guided by a tracking system mounted on a pylon, to focus the sun's rays on a solar receiving steam generator (SRSG) on top of a 750-foot tall solar power tower with a 10-foot tall lightening rod near the center of each solar field. The heliostat fields will focus solar energy on the SRSG on top of the power towers to produce steam. Each heliostat array will be comprised of four to eight sections with distinct focal lengths for the mirrors. In each plant, one Rankine-cycle non-reheat steam turbine would receive live steam from the SRSG, which would be located in the power block at the top of its own tower. The solar field and power generation equipment would start each morning after sunrise and would shut down (unless augmented by the auxiliary boilers) when insolation drops below the level required to keep the turbine online.

Each solar plant would include auxiliary steam boilers that may be required during transient cloudy conditions in order to maintain the turbine on-line. After the clouds pass, production would resume from solar thermal input. After the solar thermal input resumes, the turbine would be returned to full solar production and the auxiliary boilers would be shut down. The daily volume of energy generated by the plant may be extended using the auxiliary boilers. In addition to the boilers, each plant would use an air-cooled condenser or dry cooling to minimize water usage.

2.2.2 Common Area

A 120-acre shared common area would be provided on the eastern border of the project site to accommodate: a combined administration, control, warehouse, maintenance, and warehouse building; evaporation ponds; groundwater wells; water treatment plant; construction laydown and parking areas; mobile equipment maintenance facilities; and a natural gas tap and meter station. A common switchyard would be installed onsite where all three plant's substation and underground transmission lines would terminate.

2.2.3 Access Roads and Drive Zones

Access to the RMSEGF project site would be provided via 34th Avenue (primary) and Bradshaw Trail off of SR 78 (to the east). The access road would travel adjacent to agricultural land before reaching the project site.

The internal roadway and utility corridors for each heliostat field and its power block would contain a paved or hardscape access road from the entrance of the solar plant site to the power block, and then around the power block. In addition to the paved or hardscaped access road to the power block of each solar plant, unpaved roads would

radiate out from the power block to provide access through the solar field to the internal perimeter access road. Within the heliostat fields, unpaved "drive zones" would be located concentrically around the power block to provide access to the heliostat mirrors for maintenance and cleaning.

2.2.4 Power Transmission

Power would be generated at the solar plants by the steam turbine generators (STGs) and then stepped up by transformers for transmission to the grid. The solar plants would connect to the utility at 220 kilovolts (kV). Surge arresters would be provided at the high-voltage bushings of the step-up transformers to protect the transformers from surges on the system caused by lightning strikes or other system disturbances. The transformers would be set on concrete pads within containments designed to contain the transformer oil in the event of a leak or spill. Fire protection systems would be provided for the transformers. The high-voltage side of the step-up transformers would be connected to the switchyard at each solar plant. From the plant switchyards, power would be transmitted via a 220 kV transmission line to a common area switchyard. The common area switchyard then would be connected to the SCE Colorado River Substation (CRS).

2.2.5 Natural Gas Fuel System

The natural gas supply for the RMSEGF would connect to the TransCanada Gas Transmission Company (TCGT) north Baja pipeline, which runs adjacent to the eastern edge of the proposed solar fields. A gas metering station would be required at the TCGT tap point to measure and record gas volumes for custody transfer. In addition, facilities would be installed either at the tap station or the power block to regulate gas pressure and to remove any liquids or solid particles.

2.2.6 Electricity

Stand-by power and back-up power would be provided for all auxiliary components for which failures would cause an electrical or steam production shut down at the project site. The backup power components would be installed and kept in a ready status, in case of failure, and would be available for immediate service. One station service transformer would be required at each solar plant for backup power purposes.

Project construction and emergency backup power to the proposed project would be provided from one of two alternatives. The proposed project would receive 33 kilovolt (kV) of power from Southern California Edison (SCE), sourced at an existing substation in the Blythe area and routed over SCE's existing electric distribution system to a point east of the project site on Bradshaw Trail (30^{th} Avenue) where new power poles and distribution cable would be installed to serve the construction loads, common facility loads, and subsequently the emergency backup needs of the completed RMSEGF.

2.4.7 Water Supply

The solar plants would use air-cooled condensers to save water. Raw water would be drawn daily from onsite wells located in the common area. Groundwater would be treated in an onsite treatment system in the common area for use as potable water, fire water, boiler make-up water, auxiliary cooling water, and to wash the heliostats.

A treated water tank sized to accommodate a two-day reserve of process water that would include makeup for the demineralizer would be located in the common area. A separate mirror wash water tank would be provided in the power block area. In addition, a combined service water/firewater storage tank that has sufficient capacity for service water and a dedicated 2-hour reserve volume for fire water would be provided in the power block area.

The RMSEGF would operate an average of 8 to 16 hours a day, 7 days a week throughout the year, with the exception of a scheduled shutdown in winter for maintenance (at a time negotiated with the transmission system operator). The water treatment plant is planned to be operated continuously during the night in order to minimize cost while using off-peak energy.

2.4.8 Waste Management

Waste Water Collection, Treatment, and Disposal

The primary wastewater collection system would collect and process wastewater from all of the solar plant equipment, including the boilers and WSAC blowdowns. To the extent practical, process wastewater would be recycled and reused. Each solar plant has an onsite wastewater treatment (WWT) system consisting of either a thermal distillation system with mechanical vapor compression or RO with ion exchange. Distillate/permeate collected from the WWT plant would be recycled to the treated water storage tank for reuse within the plant. Concentrate from the WWT system would be disposed in two evaporation ponds in the common area and allowed to evaporate. Each pond would be lined with a high-density polyethylene (HDPE) liner to prevent infiltration of process water into the soil below. When needed, pond sludge would be removed from the project site by an outside contractor.

The following describes the wastewater collection, treatment, and disposal for the RMSEGF.

Plant Drains and Oil/Water Separator

General plant drains would collect containment area washdown, sample drains, and drainage from facility equipment drains. Water from these areas would 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 would first be routed through an oil/water separator.

Raw Water Treatment System Waste

Reject waste produced from the reverse osmosis process in the raw water treatment system would be captured in the wastewater collection tank and treated in the wastewater treatment system.

Power Cycle Makeup Water Treatment Wastes

Demineralized water from the mixed-bed system would be used as the feed water from the power-cycle makeup treatment system. The mixed-bed unit would be a self-contained skid-mounted unit that would be regenerated offsite. There would be no liquid waste from the power cycle makeup water treatment equipment.

Boiler Blowdown

Boiler blowdown consists of water discharged from each SRSG to maintain the water chemistry within acceptable ranges. Boiler blowdown from the SRSG would be routed to the SRSG flash tank. Flash steam from the flash tank would be recovered back into the steam cycle via the deaerator. Condensate from the flash tank would be further flashed to the atmosphere, then cooled and recovered in the treated water storage tank. As an alternative, blowdown may be discharged to the wastewater collection tank for treatment.

Blowdown from the nighttime preservation, start-up and auxiliary boilers would be collected in blowdown tanks and recovered in the treated water storage tank. As an alternative, blowdown may be discharged to the wastewater collection tank for treatment.

Solid Wastes

The RMSEGF would produce maintenance and plant wastes typical of power generation operations. Generation plant wastes may 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. Solid wastes would be trucked offsite for recycling or disposal.

Hazardous Wastes

Several methods would be used to properly manage and dispose of hazardous wastes generated by the RMSEGF. Waste lubricating oil would be recovered and recycled by a waste oil recycling contractor. Spent lubrication oil filters would be disposed in a Class I landfill. Workers would be trained to handle hazardous wastes generated at the project site.

Chemical cleaning wastes would consist of alkaline and acid cleaning solutions used during pre-operational chemical cleaning of the boilers and acid cleaning solutions used for chemical cleaning of the boilers after the units are put into service. These wastes, which are subject to high metal concentrations, would be temporarily stored onsite in portable tanks or sumps and disposed offsite by the chemical cleaning contractor in accordance with applicable regulatory requirements.

2.2.9 Management of Hazardous Materials

A variety of chemicals would be stored and used onsite during construction and operation. The storage, handling, and use of all chemicals would be conducted in accordance with applicable laws, ordinances, regulations, and standards (LORS) as defined in Section 3.0. Section 6.0 provides a description of the types, locations and quantities of hazardous material storage onsite. Chemicals would be stored in appropriate chemical storage facilities. Bulk chemicals would be stored in tanks and most other chemicals will be stored in returnable delivery containers. Chemical storage and chemical feed areas would be designed to contain leaks, spills, and stormwater. Concrete containment pits and drain piping design would allow a full-tank capacity spill without overflowing the containment. For multiple tanks located within the same containment area, the capacity of the largest single tank will determine the volume of the containment area and drain piping. Drain piping for reactive chemicals will be trapped and isolated from other drains to eliminate noxious or toxic vapors.

Safety showers and eyewashes would be provided adjacent to, or in the vicinity of, chemical storage and use areas. Plant personnel would use approved personal protective equipment during chemical spill containment and cleanup activities. Personnel would 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 absorbant material would be stored onsite for spill cleanup.

2.2.10 Emission Control and Monitoring

Air emissions from the combustion of natural gas in the auxiliary-boilers and start-up boilers at each plant would be controlled using appropriate air emission control devices as required by the Mojave Desert Air Quality Management District. To ensure that the systems perform correctly, a parametric or predictive emissions monitoring system (PEMS) that monitors emissions through detailed algorithms based on specific operating parameters will be installed on the auxiliary boiler.

2.2.11 Fire Protection System

The fire protection system would be designed to protect personnel and limit property loss and plant downtime in the event of a fire. The system would be designed to limit the spread of any fire generated at the plant site to adjacent land to avoid igniting a wildland fire. The primary source of fire protection water would be a service/firewater storage tank in each plant and a fire water storage tank in the common area.

An electric jockey pump and electric-motor-driven main fire pump would be provided to maintain the water pressure in each plant and the common fire main to the level required to serve all fire fighting systems. In addition, a back-up, diesel-engine-driven fire pump would be provided in each plant and the common area to pressurize the fire loop if the power supply to the electric-motor-driven main fire pump fails. A fire pump controller would be provided for each fire pump.

The fire pumps would discharge to a dedicated underground firewater loop piping system. Normally, the jockey pump would maintain pressure in the firewater loop. Both the fire hydrants and the fixed suppression systems will be supplied from the firewater loop. Fixed fire suppression systems will be installed at determined fire risk areas such as the transformers and turbine lube oil equipment. Sprinkler systems will also be installed in the Administration, Control, Warehouse, Maintenance Building, Heliostat Assembly Building, and fire pump enclosure as required by National Fire Protection Association (NFPA) and local code requirements. Handheld fire extinguishers of the appropriate size and rating will be located in accordance with NFPA 850 throughout the facility. Generator step-up transformers and other oil-filled transformers will be contained and provided with a deluge system.

A more detailed discussion of the fire protection systems is provided in Section 4.0.

2.3 SCHEDULE

2.3.1 Construction Schedule

The construction of the RMSEGF, from site preparation and grading to commercial operation, is expected to take place from the fourth quarter of 2013 to the first quarter of 2016. Major milestones are listed below. However, the construction order may change. Construction of the common area facilities would occur concurrently with the construction of the first plant.

Project Schedule Major Milestones

Activity	Date
Solar Plant 1 (Rio Mesa I)	
Begin construction	Fourth Quarter 2013
Start-up and test	Third Quarter 2015
Commercial operation	Fourth Quarter 2015
Solar Plant 2 (Rio Mesa II)	
Begin construction	First Quarter 2014
Start-up and test	Fourth Quarter 2015
Commercial operation	First Quarter 2016
Solar Plant 3 (Rio Mesa III)	
Begin construction	Second Quarter 2014
Start-up and test	First Quarter 2016
Commercial operation	Second Quarter 2016

Based on an approximate 36-month construction period, there will be an average and peak workforce of approximately 1,040 and 2,500, respectively, of construction craft people, supervisory, support, and construction management personnel during construction. The peak construction site workforce level is expected to occur in month 21. During some construction periods and during the start-up phase of the project, some activities would occur 24 hours per day, 7 days per week.

The construction laydown and parking area would be located in and around the common facilities, as well as those areas of each solar plant that are either outside the edges of the heliostat fields, or not previously under construction in and around the power block area. The construction access would be generally from 34th Avenue (workers and heavy hall loads) and Bradshaw Trail (workers and light deliveries) to the plant entrance road. Materials and equipment would be delivered by truck.

2.3.2 Generating Facility Operation

Management, engineering, administration staff, skilled workers, and operators would serve all three plants. The RMSEGF is expected to employ up to 150 full-time employees: 30 at Rio Mesa I; 30 at Rio Mesa II; 30 at Rio Mesa III; and 60 at the common area. The facility will operate 7 days a week, typically up to 16 hours per day.

Detailed long-term maintenance schedules are currently unavailable, but will include periodic maintenance and overhauls in accordance with manufacturer recommendations. To maintain heliostat performance, nighttime labor demand includes an average 12 hours of mirror washing per day, covering the entire solar field every 2 weeks.

The RMSEGF is expected to have an annual plant availability of 92 to 98 percent. It will be possible for plant availability to exceed 98 percent for a given 12-month period.

The facility may be operated in one of the following modes:

- The facility would be operated at its maximum continuous output for as many hours per year as solar input allows; or
- A full shutdown will occur if forced by equipment malfunction, transmission or gas line disconnect, or scheduled maintenance.

3.0 APPLICABLE STANDARDS

The following provides a discussion of the laws, ordinances, regulations, and standards related to worker safety and health, fire protection, and emergency medical services that are applicable to the RMSEGF.

3.1 FEDERAL AND STATE LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following federal and state laws, ordinances, regulations, and standards (LORS) related to worker health and safety, fire protection services, and emergency medical services are applicable to the construction and ongoing operation of the RMSEGF:

Laws, Ordinances, Regulations, and Standards Applicable for Worker Safety and Health

LORS	Applicability
Federal	
Title 29 Code of Federal Regulations (CFR) Part 1910	Contains the minimum occupational safety and health standards for general industry in the United States
Title 29 CFR Part 1926	Contains the minimum occupational safety and health standards for the construction industry in the United States
State	
California Occupational Safety and Health Act, 1970	Establishes minimum safety and health standards for construction and general industry operations in California
8 California Code of Regulations (CCR) 339	Requires list of hazardous chemicals relating to the Hazardous Substance Information and Training Act
8 CCR 450	Addresses hazards associated with pressurized vessels
8 CCR 750	Addresses hazards associated with high-pressure steam
8 CCR 1509	Addresses requirements for construction, accident, and prevention plans
8 CCR 1509, et seq., and 1684, et seq.	Addresses construction hazards, including head, hand, and foot injuries and noise and electrical shock
8 CCR 1528, et seq., and 3380, et seq.	Requirements for personal protective equipment (PPE)
8 CCR 1597, et seq., and 1590, et seq.	Requirements for addressing the hazards associated with traffic accidents and earth-moving
8 CCR 1604, et seq.	Requirements for construction hoist equipment
8 CCR 1620, et seq., and 1723, et seq.	Addresses miscellaneous hazards

LORS	Applicability
8 CCR 1709, et seq.	Requirements for steel reinforcing, concrete pouring and structural steel erection operations
8 CCR 1920, et seq.	Requirements for fire protection systems
8 CCR 2300, et seq., and 2320, et seq.	Requirements for addressing low-voltage electrical hazards
8 CCR 2395, et seq.	Addresses electrical installation requirements
8 CCR 2700, et seq.	Addresses high-voltage electrical hazards
8 CCR 3200, et seq. and 5139, et seq.	Requirements for control of hazardous substances
8 CCR 3203, et seq.	Requirements for operational accident prevention programs
8 CCR 3270, et seq., and 3209, et seq.	Requirements for evacuation plans and procedures
8 CCR 3301, et seq.	Requirements for addressing miscellaneous hazards, including hot pipes, hot surfaces, compressed air systems, relief valves, enclosed areas containing flammable or hazardous materials, rotation equipment, pipelines and vehicle-loading dock operations
8 CCR 3360, et seq.	Addresses requirements for sanitary conditions
8 CCR 3511, et seq., and 3555, et seq.	Requirements for addressing hazards associated with stationary engines, compressors, and portable, pneumatic, and electrically powered tools
8 CCR 3649, et seq., and 3700, et seq.	Requirements for addressing hazards associated with field vehicles
8 CCR 3940, et seq.	Requirements for addressing hazards associated with power transmission, compressed air, and gas equipment
8 CCR 5109, et seq.	Requirements for addressing construction accident and prevention programs
8 CCR 5110, et seq.	Requirements for the implementation of an ergonomics program
8 CCR 5139, et seq.	Requirements for addressing hazards associated with welding, sandblasting, grinding, and spray-coating
8 CCR 5150, et seq.	Requirements for confined space entry
8 CCR 5160, et seq.	Requirements for addressing hot, flammable, poisonous, corrosive, and irritant substances
8 CCR 5192, et seq.	Requirements for conduction emergency response operations
8 CCR 5194, et seq.	Requirements for employee exposure to dusts, fumes, mists, vapors, and gases

LORS	Applicability
8 CCR 5405, et seq.; 5426, et seq.; 5465, et seq.; 5500, et seq.; 5521, et seq.; 5545, et seq.; 5554, et seq.; 5565, et seq.; 5583, et seq.; and 5606, et seq.	Requirements for flammable liquids, gases, and vapors
8 CCR 5583, et seq.	Requirements for design, construction, and installation of venting, diking, valving, and supports
8 CCR 6150, et seq.; 6151, et seq.; 6165, et seq.; 6170, et seq.; and 6175, et seq.	Provides fire protection requirements
24 CCR 3, et seq.	Incorporates current edition of Uniform Building Code
8 CCR, Part 6	Provides health and safety requirements for working with tanks and boilers
California Health and Safety Code Section 25500, et seq.	Requires that every new or modified facility that handles, treats, stores or disposes of more than the threshold quantity of any of the listed acutely hazardous materials prepare and maintain a Risk Management Plan (RMP)
California Health and Safety Code Section 25500 through 25541	Requires the preparation of a Hazardous Material Business Plan (HMBP) that details emergency response plans for a hazardous materials emergency at the facility

Laws, Ordinances, Regulations, and Standards Applicable to Hazardous Materials Handling

LORS	Applicability
Federal	
Title 29 Code of Federal Regulations (CFR) Part 1910, et seq. and Part 1926, et seq.	Requirements for equipment used to store and handle hazardous materials
Risk Management Plan (Title 40 CFR 68)	Requires facilities storing or handling significant amounts of acutely hazardous materials to prepare and submit Risk Management Plans
Title 49 CFR Parts 172, 173, and 179	Provides standards for labeling and packaging of hazardous materials during transportation
Section 302, EPCRA (Pub. L. 99-499, 42 USC 11022) Hazardous Chemical Reporting: Community Right-To-Know (40 CFR 370)	Requires one time notification if extremely hazardous substances are stored in excess of Threshold Planning Quantities (TPQs)
Section 304, EPCRA (Pub. L. 99-499, 42 USC 11002) Emergency Planning and Notification (40 CFR 355)	Requires notification when there is a release of hazardous material in excess of its Reportable Quantity (RQ)
Section 311, EPCRA (Pub. L. 99-499, 42 USC 11021) Hazardous Chemical Reporting: Community Right-To-Know (40 CFR 370)	Requires that either Material Safety Data Sheets (MSDSs) for all hazardous materials or a list of all hazardous materials be submitted to the State Emergency Response Commission (SERC), Local

LORS	Applicability
	Emergency Planning Committee (LEPC), and Inyo County Department of Environmental Services
Section 313, EPCRA (Pub. L. 99-499, 42 USC 11023) Toxic Chemical Release Reporting: Community Right-To-Know (40 CFR 372)	Requires annual reporting of releases of hazardous materials
Section 311, Clean Water Act (Pub. L. 92-500, 33 USC 1251, et seq.) Oil Pollution Prevention (40 CFR 112)	Requires preparation of a Spill Prevention Control and Countermeasure (SPCC) plan if oil is stored in a single aboveground storage tank with a capacity greater than 660 gallons or if the total petroleum storage (including ASTs, oil-filled equipment, and drums) is greater than 1,320 gallons The facility will have petroleum in excess of the aggregate volume of 1,320 gallons
Pipeline Safety Laws (49 USC 60101, et seq.) Hazardous Materials Transportation Laws (49 USC 5101, et seq.) Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards (49 CFR 192)	Specifies natural gas pipeline construction, safety, and transportation requirements
State	
Health and Safety Code, Section 25500, et seq. (HMBP)	Requires preparation of an Hazardous Material Business Plan (HMBP) if hazardous materials are handled or stored in excess of threshold quantities
Health and Safety Code, Section 25270 through 25270.13 (Aboveground Petroleum Storage Act)	Requires preparation of an SPCC plan if oil is stored in a single aboveground storage tank with a capacity greater than 660 gallons or if the total petroleum storage (including ASTs, oil-filled equipment, and drums) is greater than 1,320 gallons The facility will have petroleum in excess of the aggregate volume of 1,320 gallons
Health and Safety Code, Section 25249.5 through 25249.13 (Safe Drinking Water and Toxics Enforcement Act) (Proposition 65)	Requires warning to persons exposed to a list of carcinogenic and reproductive toxins and protection of drinking water from the same toxins
Health and Safety Code, Article 2, Chapter 6.95, Sections 25531 to 25541; California Code of Regulations (CCR) Title 19 (Public Safety), Division 2 (Office of Emergency Services), Chapter 4.5 (California Accidental Release Prevention Program)	Requires facilities storing or handling significant amounts of acutely hazardous materials to prepare and submit Risk Management Plans
California Public Utilities Commission (CPUC) General Oder Nos. 112-E and 58-A	Specify standards for gas service and construction of gas gathering, transmission, and distribution piping systems

3.2 NATIONAL CONSENSUS STANDARDS

The following national consensus standards related to worker health and safety, fire protection services, and emergency medical services are applicable to the construction and ongoing operation of the RMSEGF:

Applicable National Consensus Standards

LORS	Applicability
Uniform Fire Code, Article 80	Addresses the prevention, control, and mitigation of dangerous conditions related to storage, dispensing, use and handling of hazardous materials and information need by emergency response personnel
National Fire Protection Association (NFPA) 10, Standard for Portable Fire Extinguishers	Requirements for selection, placement, inspection, maintenance, and employee training for portable fire extinguishers
NFPA 11, Standard for Low-Expansion Foam and Combined Agent Systems	Requirements for installation, and use of low-expansion foam and combined –agent systems
NFPA 11A, Standard for Medium- and High-Expansion Foam Systems	Requirements for installation and use of medium- and high-expansion foam systems
NFPA 12, Standard on Carbon Dioxide Extinguishing Systems	Requirements for installation and use of carbon dioxide extinguishing systems
NFPA 13, Standard for Installation of Sprinkler Systems	Guidelines for selection and installation of fire sprinkler systems
NFPA 14, Standard for the Installation of Standpipe and Hose Systems	Guidelines for selection and installation of standpipe and hose systems
NFPA 15, Standard for Water Spray Fixed Systems	Guidelines for selection and installation of water fixed spray systems
NFPA 17, Standard for Dry Chemical Extinguishing Systems	Guidance for selection and use of dry chemical extinguishing systems
NFPA 20, Standard for the Installation of Centrifugal Fire Protection	Guidance for selection and installation of centrifugal fire pumps
NFPA 22, Standard for Water Tanks for Private Fire Protection	Requirements for water tanks for private fire prevention
NFPA 24, Standard for the Installation of Private Fire Service Mains and Their Appurtenances	Requirements for private fire services mains and their appurtenances
NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems	Requirements for the periodic inspection, testing, and maintenance of water-based fire protection systems, including land-based and marine applications
NFPA 30, Flammable and Combustible Liquid Code	Requirements for storage and use of flammable and combustible liquids
NFPA 37, Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines	Fire protection requirements for installation and use of combustion engines and gas turbines

LORS	Applicability
NFPA 50A, Standard for Gaseous Hydrogen Systems at Consumer Sites	Fire protection requirements for hydrogen systems
NFPA 54, National Fuel Gas Code	Fire protection requirements for use of fuel gases
NFPA 59A, Standard for the Storage and Handling of Liquefied Petroleum Gases	Requirements for storage and handling of liquefied petroleum gases
NFPA 68, Guide for Explosion Venting	Guidance in design of facilities for explosion venting
NFPA 70, National Electric Code	Guidance on safe selection and design, installation, maintenance, and construction of electrical systems
NFPA 70B, Recommended Practice for Electrical Equipment Maintenance	Guidance on electrical equipment maintenance
NFPA 70E, Standard for Electrical Safety Requirements for Employee Workplaces	Employee safety requirements for working with electrical equipment
NFPA 72, Standard for the Installation, Maintenance and Use of Local Protective Signaling Systems for Guard's Tour, Fire Alarm and Supervisory Service	Requirements for installation, maintenance, and use of local protective signaling systems
NFPA 75, Standard for the Protection of Electronic Computer/Data Processing Equipment	Requirements for fire protection systems used to protect computer systems
NFPA 80, Standard for Fire Doors and Windows	Requirements for fire doors and windows
NFPA 85, Boiler and Combustion Systems and Hazard Code	Requirements for boiler design, installation, operation, maintenance, and training
NFPA 90A, Standard for the Installation of Air Conditioning and Ventilation Systems	Requirements for installation of air conditioning and ventilating systems
NFPA 101, Code for Safety to Life from Fire in Buildings and Structures	Requirements for design of means of exiting the facility
NFPA 291, Recommended Practice for Fire Flow Testing and Marking of Hydrants	Guidelines for testing and marking of fire hydrants
NFPA 850, Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations	Requirements for fire protection in electric generating plants and alternative fuel electric generating plants
NFPA 1961, Standard for Fire Hose	Specifications for fire hose
NFPA 1962, Standard for the Care, Maintenance, and Use of Fire Hose Including Connections and Nozzles	Requirements for care, maintenance, and use of fire hose
NFPA 1963, Standard for Screw Threads and Gaskets for Fire Hose Connections	Specifications for fire hose connections
American National Standards Institute/American Society for Mechanical Engineers (ANSI/ASME), Boiler and Pressure Vessel Code	Specifications and requirements for pressure vessels
ANSI, B31.2, Fuel Gas Piping	Specifications and requirements for fuel gas piping

3.3 LOCAL LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following local ordinances, regulations, and standards related to worker safety and fire protection services are applicable to the construction and ongoing operation of the RMSEGF:

- *Riverside County Ordinance 457.* Adopts specific building, mechanical, plumbing, and electrical codes from sources such as the California Building Standards Commission with county-specific modifications.

- *Riverside County Ordinance 787.* Adopts the 2007 edition of the California Fire Code and portions of the 2007 edition of the California Building Code with county-specific modifications.

- *Riverside County Ordinance 615.* Establishes requirements for the use, generation, storage and disposal of hazardous materials within the County.

- *Riverside County Department of Environmental Health, Hazardous Materials Releases.* Adopts State requirements and guidelines to govern hazardous materials release response plans and inventories.

- *Chapter 22 of the 2007 California Fire Code.* This section of the California Fire Code addresses requirements for Motor Fuel-Dispensing Facilities and Repair Garages and has been adopted by Riverside County.

- *Riverside County Fire Department Strategic Plan 2009-2029.* The Riverside County Board of Supervisors read and filed the Riverside County Fire Department Strategic Plan in February 2010. The Strategic Plan contains the organizational mission, vision, and values; six goals; strategies for each goal; an implementation action plan; and supporting analysis of an organization and performance audit.

- *Riverside County Fire Protection and Emergency Medical Master Plan.* The Riverside County Fire Department (RCFD) adopted the Master Plan in 1987. The Master Plan serves as the general guiding document for the provision of fire protection and emergency medical services in the cities and unincorporated areas of the County protected by the RCFD. The Master Plan established response criteria based on Insurance Services Office (ISO) and NFPA standards for four different land use categories defined for the County. The four land use categories are Category I - Heavy Urban, Category II - Urban, Category III - Rural, and Category IV – Outlying. For each of these land use categories, the Master Plan defines goals and objectives related to: fire station location; suppression initiated; full assignment in operation; and initial attack fire control. There are minute values assigned to each land use designation. Although these values have been adopted, there have been

internal adjustments based on new information, operational needs, and advances in technology.

4.0 FIRE PROTECTION SYSTEM

The fire protection system will be designed to protect personnel and limit property loss and plant downtime in the event of a fire. The system will be designed to limit the spread of any fire generated at the plant site to adjacent land to avoid igniting a wildland fire. The primary source of fire protection water will be a service/firewater storage tank in each plant and a fire water storage tank in the common area.

An electric jockey pump and electric-motor-driven main fire pump will be provided to maintain the water pressure in each plant and the common fire main to the level required to serve all fire fighting systems. In addition, a back-up, diesel-engine-driven fire pump will be provided in each plant and the common area to pressurize the fire loop if the power supply to the electric-motor-driven main fire pump fails. A fire pump controller will be provided for each fire pump.

The fire pumps will discharge to a dedicated underground firewater loop piping system. Normally, the jockey pump will maintain pressure in the firewater loop. Both the fire hydrants and the fixed suppression systems will be supplied from the firewater loop. Fixed fire suppression systems will be installed at determined fire risk areas such as the transformers and turbine lube oil equipment. Sprinkler systems will also be installed in the Administration, Control, Warehouse, Maintenance Building, Heliostat Assembly Building, and fire pump enclosure as required by National Fire Protection Association (NFPA) and local code requirements. Handheld fire extinguishers of the appropriate size and rating will be located in accordance with NFPA 10 throughout the facility. Generator step-up transformers and other oil-filled transformers will be contained and provided with a fire protection system per NFPA 850.

Refer to Appendix B for the *RMSEGF Fire Protection Design Basis*.

5.0 SAFETY AND HEALTH PROGRAMS

5.1 CONSTRUCTION SAFETY AND HEALTH PROGRAMS

During the construction phase, the RMSEGF would include the implementation of the Safety and Health Programs listed below. Prior to the start of construction, detailed programs and plans would be provided to the CEC, the RCFD, and other agencies as required by the Conditions of Certification. They are as follows:

- Injury and Illness Prevention Program for Project Construction
  - A written Code of Safe Practices that relates to construction activities.
  - Identification of the person or persons responsible for implementing the program.
  - Posting of the Code of Safe Practices at a conspicuous location at each job site office or providing it to each supervisor who shall have it readily available.
  - A system for identifying workplace hazards that includes inspections.
  - A system of verifying employee and subcontractor compliance.
  - "Toolbox" or "tailgate" meetings that supervisors conduct with employees to discuss job hazards and mitigation measures.
  - Methods of communicating with employees that encourage employees to expose unsafe activities.
  - Procedures for correcting unsafe conditions.
- Accident/incident reporting procedures
- Blood-Borne Pathogens Exposure Control Program
- Procedures for use of compressed gas and air-handling systems
- Confined-space entry procedures
- Contractor Safety Program
- Electrical safety procedures
- Emergency Action Plan/Emergency Response Plan
- Emergency response procedures
- Excavation, Trenching, and Shoring Program
- Fall Protection Program
- Fire Protection and Prevention Plan

- First-Aid/Cardiopulmonary Resuscitation/Automated External Defibrillator Program
- Hand tools and equipment guarding safety procedures
- Hazard Communication Plan (including Proposition 65 requirements)
- Hazardous materials handling procedures
- Hazardous waste awareness training
- Hearing Conservation Program
- Heat Stress Protection Plan
- Heavy equipment procedures
- Hoist/chain/wire rope/webs/rope slings/crane procedures
- Hot Work Program (welding, cutting, and brazing)
- Industrial Hygiene Program
- Industrial truck (forklift) safety
- Ladders, scaffolds, and work platforms
- Lockout/Tag-out Program
- Motor vehicle safety
- Personal Protective Equipment Program
- Portable electric and pneumatic tools
- Preventing slips, trips, and falls
- Repetitive stress injuries/ergonomics/lifting hazards
- Respiratory Protection Program
- Safety and Housekeeping Inspection Program
- Safety Committee and toolbox tailgate safety meetings
- Security Program
- Signs, tags, and barricades
- Tools (power- and hand-operated)
- UXO Identification, Training and Reporting Plan

5.2 OPERATIONS SAFETY AND HEALTH PROGRAMS

After the completion of the construction phase and the commencement of the operation of the RMSEGF, the construction Safety and Health Programs would transition into an operation-oriented program reflecting the hazards and controls necessary. Detailed programs and plans would be submitted to the CEC, the RCFD, and other agencies as required by the Conditions of Certification. They are as follows:

- Injury and Illness Prevention Program for Project Operation
  - A list of the person(s) with authority and responsibility for implementing the program.
  - A system for verifying that employees comply with safe and healthful work practices.
  - A system for communicating with employees in a readily understandable form.
  - Procedures for identifying and evaluating workplace hazards, including inspections, to identify hazards and unsafe conditions.
  - Methods for correcting unhealthy/unsafe conditions in a timely manner—when the hazard is discovered and/or when there is an imminent danger.
  - A training program for:
    establishing the program initially;
    new, transferred, or promoted employees;
    new processes and equipment; and
    supervisors.
  - Methods of documenting inspections and training and maintaining records for three years.
- Accident/incident reporting procedures
- Blood-Borne Pathogens Exposure Control Program
- Best Management Practices (BMPs) for herbicide storage and application
- Chemical Hygiene Plan
- Code of Safe Practices for Equipment and Operation
- Procedures for use of compressed gas and air-handling systems
- Confined-space entry procedures
- Electrical safety procedures
- Emergency Action Plan
- Emergency response procedures
- Fall Protection Program

- Fire Protection and Prevention Plan
- First-Aid/Cardiopulmonary Resuscitation/Automated External Defibrillator Program
- Hand tools and equipment guarding safety procedures
- Hazard Communication Plan (including Proposition 65 requirements)
- Hazardous materials handling procedures
- Hazardous waste awareness training
- Hearing Conservation Program
- Heat Stress Protection Plan
- Heavy equipment procedures
- Hoist/chain/wire rope/webs/rope slings/crane procedures
- Hot Work Program (welding, cutting, and brazing)
- Industrial Hygiene Program
- Industrial truck (forklift) safety
- Ladders, scaffolds, and work platforms
- Lockout/Tag-out Program
- Motor vehicle safety
- PPE Program
- Portable electric and pneumatic tools
- Preventing slips, trips, and falls
- Repetitive stress injuries/ergonomics/lifting hazards
- Respiratory Protection Program
- Safety and Housekeeping Inspection Program
- Safety Committee and toolbox tailgate safety meetings
- Security Program
- Stop work authority
- Signs, tags, and barricades
- Tools (power- and hand-operated)

5.3 TRAINING PROGRAMS

5.3.1 Construction Training Program

Training will be delivered to the construction employees in various ways depending on the requirements of the California Occupational Safety and Health Administration (Cal-OSHA) standards, the complexity of the topic addressed, the characteristics of the workforce, and the degree of risk associated with each of the potential hazards. As a minimum, employees and workers will receive a full Safety Orientation which includes (among other topics), PPE, fall protection, and welding safety, which is conducted by the EPC contractor that is required of all and Worker Environmental Awareness Program (WEAP) training that will be provided by a qualified individual.

5.3.2 Operations Training Program

The following summarizes the operations training program that will be implemented to ensure that employees recognize and understand how to protect themselves from potential hazards. The training will be delivered to the employees in various ways depending on the requirements of the Cal-OSHA standards, the complexity of the topic addressed, the characteristics of the workforce, and the degree of risk associated with each of the potential hazards.

- New employees will receive safety training orientation.
- Weekly safety meetings will be held with employees.
- Toolbox/tailgate safety meetings will be conducted periodically for each crew. General safety topics and specific hazards that may be encountered will be discussed. Comments and suggestions from all employees will be encouraged.
- Regularly scheduled safety meetings will be held for supervisors.
- Hazard communication training, including California Proposition 65 warnings and discharge prohibitions, will be conducted as new hazardous materials are introduced into the workplace.
- Material Safety Data Sheets (MSDSs) will be provided for all appropriate chemicals. A bulletin board with required postings and other information will be maintained at the plant site.
- Warning signs will be posted in hazardous areas.

Safety training will be provided to each new employee as indicated below.

- Safe work rules for the Rio Mesa SEGF will be explained to each new employee.
- A copy of the applicable Safe Work Practices will be given to each new employee. The provisions will be incorporated into training for the qualifications programs so that employees may fully understand what the protective provisions mean.

- The Hazard Communication Program and other applicable training and requirements for personal protection of the types of hazards that may be encountered at the Rio Mesa SEGF will be explained to employees. This training will be documented.
- Unusual hazards that are found on site will be explained in detail to each new employee, including any specific requirements for personal protection.
- Safety requirements for the new employee's specific job assignment will be explained by the foreman upon initial assignment and upon any reassignment.

6.0 SUMMARY OF THE RISKS OF THE PROJECT

Based on the potential hazards identified in the RMSEGF Fire and Emergency Services Risk Assessment (including compliance with the applicable standards, and the implementation of the fire protection systems and safety and health programs), the probability of a risk as a result of the construction activities and operation of the RMSEGF that would require a response by fire protection and emergency medical service personnel have been summarized in Table 6-1.

TABLE 6-1
POTENTIAL RISKS

Hazard	Probability of Risk
Use and storage of hazardous materials during construction	Extremely low probability
Use and storage of hazardous materials during operation and maintenance	Extremely low probability
Accidental release of hazardous materials	Extremely low probability
Fire or explosion from hazardous materials	Extremely low probability
Fire or explosion from use of natural gas, diesel fuel, transformer oil and lubrication oil	Extremely low probability
Worker safety during typical construction, operation, and maintenance	Extremely low probability
Worker safety related to height of tower during construction, operation, and maintenance	Extremely low probability
Worker safety related to work in confined spaces during construction, operation, and maintenance	Extremely low probability
Worker safety related to height of tower during construction, operation and maintenance	Extremely low probability
Offsite vehicle accidents	Extremely low probability

Source: Pacific Development Solutions Group, April 8, 2012

The ranges of probability for this table are: high probability, moderate probability, low probability, extremely low probability, remote probability, and extremely remote probability.

7.0 EXISTING RESOURCES

7.1 FIRE DEPARTMENT RESOURCES

7.1.1 Department Overview

The Riverside County Fire Department (RCFD) is one of the largest regional fire service organizations in California. According to the *Riverside County Fire Department Strategic Plan 2009-2029*, the County supplements its fire staff of 175 by contracting with the State of California Department of Forestry and Fire Protection (CAL FIRE) for an additional 1,077 employees to provide fire protections services, resulting in a total of 1,252 personnel. Through their partnership with CAL FIRE, the RCFD serves 19 partner agencies and has approximately 700 volunteers. They serve an area of 7,004 square miles with approximately 1.3 million residents.

The RCFD responds to both urban and wildfire emergencies. According to the *Riverside County Fire Department/CAL FIRE 2010 Yearly Emergency Incident Statistics* report, in 2010, the RCFD responded to 117,859 total incidents with a daily average of 322 calls for service.

The RCFD operates 92 fire stations in six divisions. These divisions are comprised of 17 line battalions providing fire suppression, emergency medical, technical rescue, fire prevention, and related services. The RMSEGF project site is located within the East Desert Division which encompasses the lower Coachella Valley and extends east out to the Arizona State line. There are two battalions (Battalions 6 and 8), nine permanent staffed fire stations, and one all-volunteer fire station within the East Desert Division. The RMSEGF project site is located within Battalion 8.

7.1.2 Stations Serving the Project Site

Table 7-1 provides the fire stations that are the closest to the RMSEGF project site and their respective distances and response times to the site. These stations are staffed full-time, 24 hours seven days per week, with a minimum three person crew including Paramedics operating a "Type-1" structural fire fighting apparatus.

Table 7-2 provides the annual emergency incident statistics for the year 2010 for the three RCFD stations closest to the RMSEGF site. As indicated in Table 7-2, these three stations responded to a total of 945 calls in the year 2010; none of which were to a fire at a commercial land use. In addition, these three fire stations responded to a total of 590 emergency medical calls and 102 traffic collisions (typically requiring emergency medical aid) in the year 2010 and, therefore, 73 percent of the total calls received by the three stations were for emergency medical aid and not fire-related.

TABLE 7-1
CLOSEST FIRE STATIONS TO THE RMSEGF PROJECT SITE

Station No.	Station Address	Distance From Project Site (Miles)	Est. Response Time (Minutes After Dispatch)
RCFD Station No. 44 (Ripley)	13987 Main St. Ripley, CA 92272	10	12
RCFD Station No. 43 (Blythe)	140 West Barnard Street, Blythe, CA 92225	18	23
RCFD Station No. 45 (Blythe Air Base)	17280 W. Hobson Way, Blythe, CA 92225	21	24

Source: Riverside County Fire Department GIS Manager March 19, 2012.

TABLE 7-2
CLOSEST FIRE STATIONS TO THE RMSEGF PROJECT SITE
ANNUAL EMERGENCY INCIDENT STATISTICS FOR 2010

Station No.	Commercial Fire	False Alarm	Hazardous Material	Medical	Multi-Family Dwelling Fire	Other Fire	Other Miscellaneous	Public Service Assistance	Residential Fire	Rescue	Standby	Traffic Collision	Vehicle Fire	Wildland Fire	TOTAL
RCFD Station No. 43 (Blythe)	0	38	2	382	0	55	3	10	1	2	10	52	6	18	579
RCFD Station No. 44 (Ripley Air Base)	0	4	0	106	0	5	0	2	2	0	8	17	3	5	152
RCFD Station No. 45 (Blythe Air Base)	0	20	2	102	0	9	5	14	1	0	3	33	5	2	196
TOTAL	**0**	**62**	**4**	**590**	**0**	**69**	**8**	**26**	**4**	**2**	**21**	**102**	**14**	**25**	**927**

Source: Riverside County Fire Department/CAL FIRE 2010 Yearly Emergency Incident Statistics.

Based on a "reasonable standard" for an engine company workload of 6.5 calls per day (or 2,190 calls on an annual basis) as defined in the *Riverside County Fire Department Strategic Plan 2009-2029*, the three fire stations closest to the RMSEGF site have the capability of responding to a total of 6,570 calls per year. The total of 927 annual calls in the year 2010 represents 14 percent of the maximum workload capacity for these three stations.

Therefore, based on workload capacity, the addition of the RMSEGF facility to their service area would not justify the addition of an engine company, a fire station, or any additional staff.

The closest fire station to the RMSEGF site is Imperial County Fire Department (ICFD) fire Station No. 5 located 7 miles to the south of the project. This station consists of one-paid staff and volunteers that provide Advanced Life Support/Emergency Medical Technician-A (ASL/EMT-A) services. According to the RCFD, although ICFD Station No. 5 is located closer to the RMSEGF project site and the ICFD works under a mutual agreement, this would not guarantee that Station No. 5 would have equipment available to respond or that these agreements require ICFD to release the resources to respond. Furthermore, RCFD has indicated that, if ICFD Station No. 5 is dispatched and the request is honored, RCFD Station No. 44 would also respond since the RCFD is the Authority Having Jurisdiction (AHJ). RCFD uses a computer aided dispatch system. This dispatch system can be modified to include ICFD Station No. 5 in a response to RMSEGF.

7.1.3 Fire Protection and Emergency Medical Master Plan

The RCFD adopted the *Riverside County Fire Protection and Emergency Medical Master Plan* (Master Plan) in 1987. The Master Plan serves as the general guiding document for the provision of fire protection and emergency medical services in the cities and unincorporated areas of the County protected by the RCFD. The Master Plan established response criteria based on Insurance Services Office (ISO) and NFPA standards for four different land use categories defined for the County. The four land use categories are Category I - Heavy Urban, Category II - Urban, Category III - Rural, and Category IV – Outlying. For each of these land use categories, the Master Plan defines goals and objectives related to: fire station location; suppression initiated; full assignment in operation; and initial attack fire control. There are minute values assigned to each land use designation. Although these values have been adopted, there have been internal adjustments based on new information, operational needs, and advances in technology.

The RMSEGF site falls within land use category "Category IV – Outlying" in the Master Plan. The Master Plan provides the objective to "Apply extinguishing agent to structure and vegetation fires within 20 minutes of dispatch, full assignment within 30 minutes (Fire Station located within 8 miles)" and "Initiate suppression within 15 minutes of receipt of alarm for 90% of all fires." Furthermore, the Master Plan provides the objective to "Control 80% of all outlying fires with initial attack assignment." The intent of these objectives is to address the portions of Riverside County that are remotely

located away from urban development and do not generate the same level of demand for fire protection services as an area of the County with more intensified development. As indicated in the Master Plan, the provision of "an equitable level [of service] is not necessarily an identical level of service." RMSEGF is within the Category IV- Outlying response criteria and while not within 8 miles of Station 44 would meet the response requirements and would not need additional stations and equipment to meet the service level for Category IV.

In addition, the Master Plan provides the standard that one new fire station and/or engine company is recommended for every 3.5 million square feet of industrial building area. Based on this, the RMSEGF would not require a new fire station.

7.1.4 Riverside County Fire Severity Map

The RMSEGF site is within a "Non-High Fire Hazard Severity Zone" according to the *Approved Very High Fire Hazard Severity Zones and Local Responsibility Areas* map, dated December 24, 2009, prepared by CAL FIRE and adopted by the County of Riverside.

7.2 EMERGENCY MEDICAL SERVICES RESOURCES

Riverside County Fire Emergency Medical Services (EMS) Bureau is part of the Special Operation Division and is responsible for ensuring that the emergency medical services provided by the RCFD meets and exceeds the standard of care and the applicable laws and protocols. The primary objective of the Bureau is to "promote the highest quality of patient care by providing EMS personnel the support and resources necessary for optimal field performance. The duties of EMS include: provide medical quality control and improvement; provide EMS continuing education and training; address equipment supply and maintenance; serve as a liaison to County EMS and the health agencies; and provide community awareness and education.

Emergency Medical Services to the RMSEGF project site are provided by the three RCFD stations discussed above. Refer to Table 7-1 for the estimated response time from the three stations closest to the project site. As discussed above, the staffing at each of these stations includes a Paramedic. When responding to a call, a Paramedic would provide advanced life support until the injured or ill person can be transported to the hospital.

Since the Paramedic is part of the minimum three person crew at the three RCFD stations that serve the project area, the workload capacity discussion provided above would be applicable to the provision of emergency medical services.

8.0 FIRE PROTECTION AND EMERGENCY MEDICAL SERVICES IMPACT ANALYSIS

8.1 PROJECT EFFECTS

The construction and operation of the RMSEGF would result in the addition of three solar thermal power plants within the service area for the RCFD. Refer to Section 3.0 of this document for an overview of the proposed project including the facility technology, project characteristics, and the number of employees on the project site during the construction activities and the ongoing operation of the RMSEGF.

The area around the project site is comprised of open space and agricultural land. The RMSEGF project site and the adjacent area is within a "Non-High Fire Hazard Severity Zone" according to the *Approved Very High Fire Hazard Severity Zones and Local Responsibility Areas* map, dated December 24, 2009, prepared by CAL FIRE and adopted by the County of Riverside.

As discussed in Section 4.0 of this document, extensive fire protection systems are incorporated into the design of the RMSEGF. The fire protection systems would be designed and maintained in accordance with the relevant NFPA guidelines and local code requirements as described in the Rio Mesa Fire Protection Plan provided as Appendix B to this document.

The Safety and Health Programs discussed in Section 5.0 of this document would be implemented during construction activities and the ongoing operation of the RMSEGF. In addition, to the Safety and Health Programs defined by the applicant, the CEC will require typical Conditions of Certification that address worker safety issues and fire protection.

8.1.1 Fire Protection

As discussed in Section 6.0 of this document, based on the potential hazards identified in the RMSEGF Fire and Emergency Services Risk Assessment (including compliance with the applicable standards, and the implementation of the fire protection systems and safety and health programs), the probability of risks as a result of the construction activities and operation of the RMSEGF that would require fire protection and emergency medical services would be extremely low. Therefore, the potential increase in the demand for fire protection services would be considered less than significant. Refer to Section 6.0 for the list of the potential hazards addressed.

The RMSEGF project site is located within RCFD Battalion 8. Table 7-1 in Section 7.0 of this document, provides information regarding the distance and response times for the RCFD stations closest to the project site. These stations are staffed full-time, 24 hours a

day, seven days per week, with a minimum three person crew including Paramedics operating a "Type-1" structural fire fighting apparatus. In addition, ICFD Station No. 5 is located 7 miles to the south of the project site. As discussed in Section 7.0, according to the RCFD, although ICFD Station No. 5 is located closer to the RMSEGF project site and the ICFD works under a mutual aid agreement, this would not guarantee that Station No. 5 would have equipment available to respond or that these agreements require ICFD to release the resources to respond. Furthermore, RCFD has indicated that, if ICFD Station No. 5 is dispatched and the request is honored, RCFD Station No. 44 would also respond since the RCFD is the Authority Having Jurisdiction (AHJ).

Table 7-2 in Section 7.0 of this document provides the annual emergency incident statistics for the year 2010 for the three RCFD stations closest to the RMSEGF project site. As indicated in Table 7-2, these three stations responded to a total of 947 calls in the year 2010; none of which were to a fire at a commercial land use. In addition, these three fire stations responded to a total of 590 emergency medical calls and 102 traffic collisions (typically requiring emergency medical aid) in the year 2010 and, therefore, 77 percent of the total calls received by the three stations were for emergency medical aid and not fire-related. Based on a "reasonable standard" for an engine company workload of 6.5 calls per day (or 2,190 calls on an annual basis) as defined in the *Riverside County Fire Department Strategic Plan 2009-2029*, the three fire stations closest to the RSEP site have the capability of responding to a total of 6,570 calls per year. The 947 total calls in the year 2010 represents 14 percent of the maximum workload capacity for these three fire stations. In addition, the Ivanpah Solar Energy System under construction in San Bernardino County has only resulted in five calls since construction commenced in October 2010 and its construction activities and workforce are very similar to that of the RMSEGF. Since the RMSEGF would have a very limited need for fire protection services and the existing workload is well below the estimated maximum capacity for the three responding stations, the RMSEGF would not interfere with the ability of Station No. 44 (Ripley), Station No. 43 (Blythe), and Station No. 45 (Blythe Air Base) to respond to other calls unrelated to the RMSEGF that occur in their service area. Therefore, based on existing workload capacity, the addition of the RMSEGF to the RCFD service area would not justify the addition of an engine company, a fire station, or any additional staff.

Section 6.0 of the RMSEGF Fire and Emergency Services Risk Assessment provides an analysis of the potential for hazards as a result of off-site vehicle Accidents. Table 6-8 provides the potential additional accidents on the roadways in Riverside County within the vicinity of the project site with construction and operation of the RMSEGF. As a result of the additional average daily trips generated by construction worker traffic during the construction phase (36 months) of the RMSEGF and accident rate data, there is the potential for 11 additional vehicle accidents to occur per year on the surrounding roadways in Riverside County. An accident with injuries may require a response from the RCFD. In addition, during the ongoing operation of the RMSEGF, there is the potential for 3 additional vehicle accidents on the surrounding roadways in Riverside County. Therefore, the addition of the RMSEGF to the RCFD service area would result

in an insignificant increase in responses from the RCFD due to vehicle accidents on the roadways in the project vicinity.

8.1.2 Technical Rescue

The probability of risks as a result of the construction activities and operation of the RMSEGF that would generate a demand for responses to technical rescue incidents, including high angle rescue, low angle rescue, and confined space rescue, would be extremely low. Therefore, the potential increase in the demand for fire protection services would be considered less than significant. In order to ensure that the demand on the RCFD for high angle rescue, low angle rescue, and confined space rescue on the RMSEGF project site would be less than significant, the incorporation of the consultant recommendations provided in Section 9.0 of this document shall be implemented. Therefore, the addition of the RMSEGF to the RCFD service area would not require responses to technical rescue incidents by the RCFD.

8.1.3 Emergency Medical Services

The probability of risks as a result of the construction activities and operation of the RMSEGF that would generate demand for response to emergency medical incident(s) would be extremely low. The demand for emergency medical services by the RMSEGF during construction would be would be eliminated through the use of an onsite Nurse (provided by the Owner). The onsite Nurse would assess any incident and triage affected personnel to determine if secondary response personnel are needed. If required, the Nurse shall direct other personnel to contact the RCFD via 911. With the request being made per Riverside County EMS policies, a ground or air ambulance would be dispatched. If ground transportation is used, the injured/ill employee would be transported to the local hospital or to another offsite emergency medical facility. If the injured/ill employee is transported by air ambulance, the employee would be taken to the appropriate medical facility as deemed necessary by the attending medical personnel. Therefore, the addition of the RMSEGF to the RCFD service area would not require additional emergency medical responses from the RCFD.

8.1.4 Fire Protection and Emergency Medical Services Master Plan

The RMSEGF project site falls within land use category "Category IV – Outlying" in the Riverside County Fire Protection and Emergency Medical Master Plan (Master Plan). The Master Plan provides the objectives to "Apply extinguishing agent to structure and vegetation fires within 20 minutes of dispatch, full assignment within 30 minutes (Fire Station located within 8 miles)" and "Initiate suppression within 15 minutes of receipt of alarm for 90% of all fires." Furthermore, the Master Plan provides the objective to "Control 80% of all outlying fires with initial attack assignment." However, to qualify these objectives in order to address the portions of Riverside County that are remotely located away from urban development and do not generate the same level of demand for fire protection services as an area of the County with more intensified development, the

Master Plan states that "In a Jurisdiction as large and complex as that served by the RCFD, it is not practical to meet these response time/distance requirements for all land use categories. Therefore, the corresponding goals and objectives represent a compromise between "ideal" requirements and community needs and the availability of resources."

As discussed above, with the design of the RMSEGF fire protection systems and implementation of the Safety and Health Programs and the consultant recommendations during construction and the ongoing operation of the proposed project, there would be a very limited need for fire protection services from the RCFD. While the RMSEGF project site is more than 8 miles from Station 44, it falls within the Master Plan objectives for "Category IV – Outlying." Therefore, no impact related to the Master Plan would occur.

8.2 CUMULATIVE EFFECTS

As indicated in the Master Plan, the provision of "an equitable level [of service] is not necessarily an identical level of service." This logic can be applied to the determination of the RMSEGF's potential contribution to the cumulative effect on fire protection services provided by the RCFD. As demonstrated in the analysis provided in this document, the design of the RMSEGF fire protection systems and the implementation of the Safety and Health Programs and the consultant recommendations during construction and the ongoing operation of the proposed project, would result in a very limited need for fire protection services and eliminate the need for emergency medical services. Moreover, past, present, and reasonably foreseeable future projects, including the RSPP, BSPP, PSPP, DSSF, and GSEP, also are subject to LORS addressing fire protection and emergency medical services. Therefore, implementation of consultant recommendations and compliance with existing LORS will ensure that the incremental effects of the Project on worker safety, when considered together with the effects of past, present, and reasonably foreseeable projects, will not be cumulatively considerable.

Therefore, the construction and operation of the RMSEGF would not contribute to a significant cumulative impact to fire protection and emergency medical services provided by the RCFD.

9.0 RECOMMENDATIONS

The consultant team for the preparation of this document provides the following recommended requirements to be incorporated into the design of the RMSEGF and the construction and ongoing operation of the facility:

- During construction activities that require the type of situations addressed by California Department of Safety and Health (Cal/OSHA) Standards Part 1910, Occupational Safety and Health Administration Safety and Health Regulations, the contractor shall be required to provide evidence that their personnel with training based on federal and state standards and the equipment manufacturer's requirements will be available on-site for the extent of the construction activity.

- During operation, the daily on-site operational and maintenance personnel for the Central Receiver Tower shall be required to have training based on federal and state standards and equipment manufacturer's requirements.

- During operation, the contractor to perform the annual maintenance for the Central Receiver Tower and other areas that require work in confined space shall be required to provide evidence that their on-site personnel have training based on federal and state standards and the equipment manufacturer's requirements.

Appendix A

MAPS AND SITE PLAN

OVERVIEW MAP

22nd Ave
Rannells Blvd
28th Ave
Bradshaw Trail
32nd Ave
34th Ave
Riverside County
Imperial County

Project Features

- Project Site - approx. 7,529 ac.; (approx. acres: 5,604 MWD, 1,615 BLM, 310 Private)
- Draft Fenceline Boundary of Solar Field (approx. 5,526 acres)
- Draft Usable Boundary of Common Areas (approx. 119 acres)
- Draft Solar Field and Common Layout

Improved Access Roads Corridor

- Proposed Bradshaw Trail Re-route (5.2 miles)

Access Road Corridors to be Improved

- 34th Ave Access Road Corridor to be Improved (1.02 mile, 200ft. corridor, 100ft. from c/l, 25 ac.)
- Bradshaw Trail Access Road Corridor to be Improved 2.96 miles, 200ft. corridor, 100ft. from c/l, 71 ac.)
- City/Town
- County Boundary

Land Ownership

- US Bureau of Land Management (2,598 ac.within project)
- Unclassified (5,749 ac. within project)
- Parcel Boundary
- PLSS Section Line

SOURCES: Draft Solar Field Layout & Fenceline (Bechtel, 8-03-2011). Project Site (VTN, 3-15-2011). Aerial Imagery (NAIP, 5-25-2009). County, State Boundaries, Roads (ESRI, 2007). Parcels (BLM, 2006). Land Ownership (BLM, 3-03-2011).PLSS Sections (BLM, 12-11-2007). Bradshaw Trail Re-route (URS, 6-2011).

FIRE PLAN
RIO MESA SOLAR
ELECTRIC GENERATING FACILITY

URS

1750 0 1750 3500 Feet

SCALE: 1" = 3500' (1:42,000)

SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: DS	DATE: 3/27/2012	FIG. NO: 1
PM: AL	PROJ. NO: 27652105.00510	

Path: G:\gis\projects\N1577\27651002\map_docs\mxd\Exchange\Fire_Map.mxd, diana_smith, 3/27/2012, 7:17:54 PM

NA_FORMATS.CEL AC-ESTD_NA 07/17/08

N 90,0000 — N 80,0000 — N 70,0000 — N 60,0000

E 20,0000 — E 30,0000 — E 40,0000

N 90,727.37
E 32,771.26

N 90,839.37
E 40,645.93

N 87,658.36
E 32,814.67

N 87,626.77
E 31,496.46

N 84,942.03
E 31,551.26

N 84,904.70
E 30,241.93

N 82,245.97
E 30,285.38

N 82,202.98
E 27,655.05

N 82,140.70
E 25,030.81

N 79,467.03
E 25,072.66

N 79,803.39
E 40,859.23

N 79,779.47
E 39,541.75

N 77,077.35
E 38,273.91

N 77,099.36
E 39,589.93

N 76,732.62
E 22,482.35

N 76,793.48
E 25,114.40

N 76,671.69
E 19,850.17

N 74,368.37
E 38,321.43

N 74,383.82
E 39,637.73

N 73,999.80
E 19,906.49

N 71,667.51
E 39,686.61

N 71,327.86
E 19,963.04

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E 39,738.28

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E 25,268.57

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E 22,642.52

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E 39,790.14

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E 39,840.08

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E 25,325.11

N 60,747.18
E 27,981.05

N 60,710.91
E 25,334.66

N 60,784.61
E 30,627.36

N 60,858.29
E 35,920.21

N 60,820.91
E 33,274.09

N 60,895.70
E 38,566.67

EX. HIGH VOLTAGE TRANSMISSION LINE

EX. HIGH VOLTAGE TRANSMISSION LINE AND NATURAL GAS LINE

EX. BRADSHAW TRAIL

PROJECT BOUNDARY

UNIT 3

UNIT 2

UNIT 1

CIRCULAR DIRT ROAD (CI)

12' DIRT ROAD

10' DIRT ROAD

20' PAVED ROAD (SS1)

24' PAVED SHARED ROAD

ALTERNATE EMERGENCY ENTRANCE

COMMON AREA

24' PLANT ENTRANCE ROAD

CONNECTS TO EXISTING 34TH AVE.

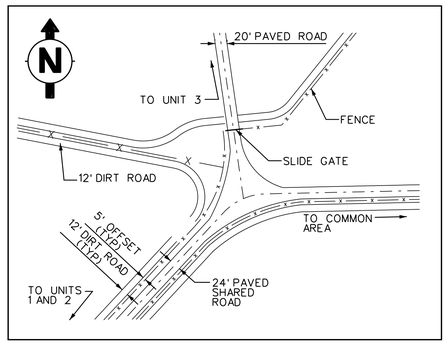
SEE INSET A THIS SHEET

SEE INSET B THIS SHEET

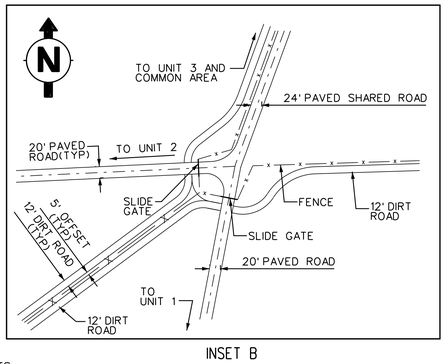
PROJECT GRID
N 70,000,000
E 30,000,000

12' PERIMETER DIRT ROAD OFFSET 5' FROM FENCE (TYP)

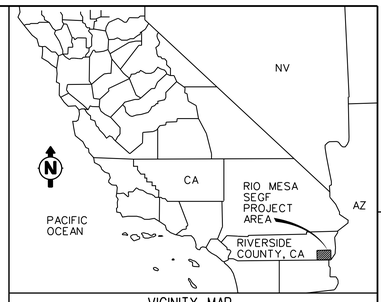
RIVERSIDE COUNTY
IMPERIAL COUNTY



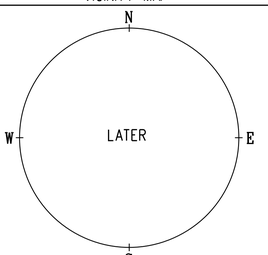
INSET A
NTS



INSET B
NTS



VICINITY MAP



ANNUAL WIND ROSE

NOTES:

1. SOLAR TOWER LOCATIONS:

PROJECT GRID COORDINATES			
UNIT	EASTING	NORTHING	COMMENTS
1	29,824.27	67,289.63	
2	25,924.66	72,612.47	
3	32,873.15	82,063.26	

COORDINATES GIVEN TO CENTERLINE POWER TOWER.

2. TOTAL NUMBER OF HELIOSTATS TO BE BETWEEN 80,000 AND 100,000 EACH UNIT.
3. HELIOSTAT MAINTENANCE PATHS TO BE 10' DIRT ROAD.
4. DISTANCE BETWEEN HELIOSTAT MAINTENACE PATHS TO BE 152.6 FT.
5. HELIOSTAT PYLON DENSITY:
   - NEAR TOWER (UP TO 400-500 METERS): 0.03-0.04 PYLONS PER SQUARE METER.
   - 1,000 METERS FROM TOWER: 0.01-0.02 HELIOSTATS PER SQUARE METER.
   - 2,000 METERS FROM TOWER: 0.005-0.01 HELIOSTATS PER SQUARE METER.

LEGEND:

PROJECT BOUNDARY

0 1000 2000 3000
1" = 1000'

NO.	DATE	REVISIONS	BY	CHK	DES. SUPV.	ENGR.	PROJ ENGR.	APPR
D	29 SEPT, 11	ADDED HELIOSTAT PATHS WITHIN CIRCULAR ROAD.	LAP	DWF	-	DWF	TWA	
C	27 SEPT, 11	ADDED NOTES AND HELIOSTAT PATHS.	LAP	DWF	-	DWF	TWA	
B	8/5/11	ROTATED UNITS 1,2 AND 3, ADJUSTED UNIT ACCESS ROADS AND ISSUED FOR AFC	LAP	DWF	-	DWF	TWA	
A	7/15/11	ISSUED FOR REVIEW	LAP	DWF	-	DWF	TWA	

SCALE 1"=1000' | DATE 7/13/11 | DESIGNED LAP | DRAWN 7/13/11 | CHIEF ENGR.

BrightSource

BECHTEL POWER CORP.
DEDICATED TO SAFETY EXCELLENCE - ZERO ACCIDENTS
FREDERICK, MARYLAND

PRELIMINARY

RIO MESA SOLAR ELECTRIC GENERATING FACILITY

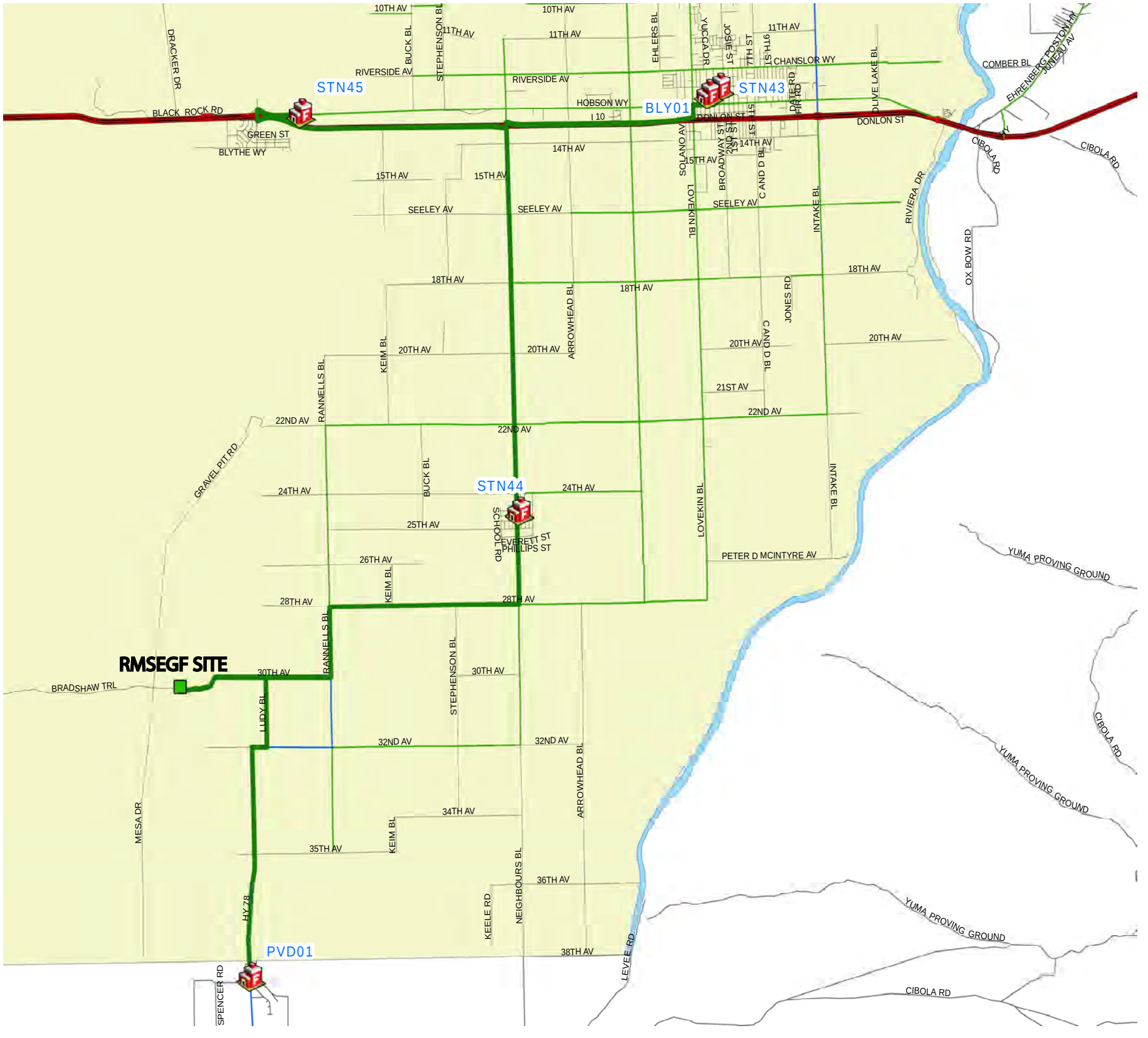
SITE PLAN

BSII (Ltd.) | FIG. NO: 2-5 | OWNER DRAWING NO.: TBD

BECHTEL | JOB NO.: 25670 | DRAWING NO.: 000-C2-0000-00001 | REV.: D

34"X44" E SIZE
PSC-

Fire Stations Serving RMSEGF Site



Source RCFD GIS Manager 03/19/2012

Appendix B

RIO MESA SOLAR ENERGY GENERATING FACILITY
FIRE PROTECTION DESIGN BASIS

Rio Mesa Solar Electric Generating Facility (RMSEGF)

Fire Protection Design Basis

The RMSEGF consists of three 250 MW (nominal) Power Plants and one Common Area. Each Power Plant and Common Area will have a fire water storage tank and fire pumps to supply the fire water loop that supplies the yard hydrants, hose stations, water spray, and sprinkler systems. The system will be designed to supply the design water demand for automatic suppression systems plus flow for fire hydrants and hose stations in accordance with California Building Code (CBC 2010)/NFPA requirements.

1.0 WATER SUPPLY

Each service/fire water storage tank (Power Plant) and fire water storage tank (Common Area) will include a 2-hour dedicated fire water capacity. The suction piping for service water demand will be taken from above the 2-hour storage volume reserved for fire protection water at the bottom of the tank. Two main, one-hundred percent capacity, fire water pumps (one electric-motor driven and one diesel-engine driven) and a jockey pump to maintain system pressure will be provided at each Power Plant and Common Area. The fire pumps will take suction from the service/fire water storage tank. Automatic start for the fire pumps will be initiated by a pressure switch in accordance with CBC (2010)/NFPA practice. Once started, the fire pump(s) will continue to run until manually stopped at the associated local pump controller. Fire pumps will be sized to provide the design water demand to the automatic fire suppression system plus 500 gpm for a fire hydrant or hose station.

The underground fire main headers will be high-density polyethylene (HDPE) pipe and will loop around their respective Power Plant and Common Area, with service main branch lines to auxiliary structures and facilities as necessary. The main headers will serve yard hydrants and hose stations. Fire hydrants will be spaced at approximately 250-foot intervals around the fire loop. Fire hydrants will be located in accordance with NFPA 24 and local fire codes. The hydrants will be dry barrel type and include threaded outlet connections to match local fire department hose threads. Applicable hydrants, valving, and other appurtenances required by state and local codes will be included. Fire hose houses and hoses will be provided. Each hose house shall be equipped with 200-feet of 1 ½ inch hose and accessories per CBC (2010)/NFPA 24.

The fire water distribution system will incorporate sectionalizing valves so that a single failure in the respective yard loop piping (other than the supply piping) will not affect service to both suppression systems and yard hydrants serving the same area. The fire water distribution system will incorporate isolation valves so that the automatic suppression system can be taken out of service without affecting standpipes/hose stations serving the same area. Valves requiring periodic testing will be accessible. Valves will be arranged and installed in accordance with NFPA 24 and NFPA 13 requirements, as applicable. The valves will be administratively supervised/inspected in accordance with NFPA 25. Fire protection system piping will be hydrostatically tested in accordance with NFPA requirements.

2.0 FIRE PUMP HOUSE

The fire pumps will be skid mounted in a structural steel metal enclosure complete with all furnished equipment, piping, valves, controllers, panels, lights (interior, exterior and emergency), receptacles, etc. on a single enclosed, prewired and fabricated skid complete with heating, ventilation (with dust louvers on intake) and lighting etc designed to permit a single lift during transit and installation on the foundation. The enclosure will have a rated fire wall separating the diesel and electric fire pumps.

3.0 CODES AND STANDARDS

The fire protection shall be in accordance with generally accepted fire protection engineering practices and consistent with previously approved approaches to fire protection for other power plants throughout the US. This design approach will require local and/or state review and approval and may require code clarifications or design variances where general code requirements exceed typical industry design practice for power generating facilities.

The fire protection system will be provided in accordance with code requirements to mitigate fire hazards, reduce potential property loss and protect personnel, as approved by the authority having jurisdiction (AHJ). The fire protection system design generally will conform to NFPA 850 provisions and recommendations, except for the following:

- ♦ Section 4.5, Fire Protection Design Basis Document - A fire risk evaluation will be performed as part of the design development. A formal fire risk evaluation document will not be issued (unless required by Chief Building Official (CBO)).
- ♦ Section 5.1.1, Fire Area Determination - Detailed drawings showing plant fire areas and fire boundaries will not be issued (unless required by CBO).
- ♦ Section 5.1.1.4, Fire Barriers - In general, spatial separation will be provided for fire hazards. Fire-rated barriers will be provided only in a limited number of locations where physical separation cannot be achieved (e.g., transformer fire walls or walls separating office areas from fire hazards, fire pump house).
- ♦ Section 5.1.5, Indoor Transformers - All indoor transformers will be the dry type and less than 35 kV rating. Therefore, rated fire barriers or suppression systems will be not required for this equipment.
- ♦ Section 5.4.1.2.2, Heat Vents - The boiler does not require smoke/heat venting. The turbine enclosure roof will have fusible-link-operated smoke/heat vents only if provided by the STG Supplier.
- ♦ Section 5.4.1.3, Smoke Vents - Dedicated smoke venting systems are not required in plant control rooms or switchgear rooms due to their small size.
- ♦ Section 5.5.2, Drainage and Curbing - Oil-filled equipment, containers, and tanks will be curbed. A floor trench will be installed on the lowest level of such containment. The trench will be sized to accommodate the entire volume of oil contained in such equipment, containers, or tanks and sprinkler discharge.
- ♦ Section 7.7.2, Hydraulic Control System - The steam turbine will use a fire-resistant hydraulic fluid. Therefore, automatic fire suppression system coverage is not required for this equipment.

♦ Section 7.7.3.1, Turbine Lubricating Oil Systems - Listed fire-resistant lubricating oils are not available for steam turbines in this size range. Since the lubricating oil is flammable, an automatic suppression system will be provided to cover the areas below the turbine operating floor that are subject to oil flow for all areas containing oil piping and for 20 feet beyond the piping.

♦ Section 7.7.3.4, Turbine Lubricating Oil Curbing - See clarification for Section 5.5.2.

♦ Section 7.7.3.8, Lubricating Oil Pumps - The lube oil pump skid will be covered by an automatic suppression system. It is not feasible to separate or protect electrical cabling for the ac and dc oil pumps since they will be located on the same pump skid.

♦ Section 7.8.2, Cable Tunnels - Cable tunnels will not be used. There may be some cable pits beneath electrical equipment rooms. Cable within these areas will have fire-retardant insulation.

♦ Section 7.8.3.3, Electrical Cables - It is not practical to provide automatic suppression systems or fire-retardant coatings for electrical cable trays. Cable trays will be routed to avoid ignition sources or flammable liquids where possible. Medium and low voltage cable entering buildings will have flame-retardant insulation meeting the requirements of the IEEE-383 vertical flame test.

Sprinkler and fixed spray systems will be designed and installed in accordance with NFPA 13 and NFPA 15, respectively.

NFPA codes and standards listed in the CBC (2010) will be used (NFPA 10,13,14,15,16,20,22,24,30,37,72, 80, 85 and 2001), plus the following:

NFPA 45	Standard on Fire Protection for Laboratories Using Chemicals
NFPA 55	Compressed Gases and Cryogenic Fluids Code
NFPA 69	Standard on Explosion Prevention Systems
NFPA 75	Standard for the Protection of Information Technology Equipment
NFPA 496	Standard for Purged and Pressurized Enclosures for Electrical Equipment
NFPA 497	Recommended Practice For the Classification of Flammable Liquids, Gases, or Vapors, and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas
NFPA 780	Standard for the Installation of Lightning Protection Systems
NFPA 850	Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations
NFPA 1961	Standard on Fire Hose
NFPA 1963	Standard for Fire Hose Connections
NFPA 1964	Standard for Spray Nozzles

4.0 FIRE PROTECTION

Automatic and manual fire protection systems will be provided as necessary for protection in the event of a fire. The fire protection system will incorporate a fire alarm system with means to automatically or manually detect and suppress fires until they can be extinguished by qualified onsite or offsite personnel.

4.1 SUPPRESSION AND DETECTION SYSTEMS

Sprinkler and fixed spray systems will be designed and installed in accordance with CBC (2010)/NFPA. Fire protection systems for the Power Plant will be provided as stated in the table below.

Fire Protection Systems for Each Power Plant

	Automatic Suppression					**Manual**				**Alarm System**
Area Receiving Fire Protection	**Wet Pipe**	**Water Deluge**	**Gaseous System**	**Foam Deluge**	**Foam Preaction**	**Portable Extinguisher**	**Standpipe**	**Yard Hydrant**	**Pull Station**	**Fire Detection**
STG bearings					X					X
STG enclosure				X		X		X	X	X
STG lube oil reservoir				X				X		X
Boiler Feedwater Pump Turbine (BFPT) lube oil reservoir				X				X		X
Control room and control equipment room in Plant Services building *(Note)*			X			X		X	X	X
Plant electrical building			X			X		X	X	X
Electrical equipment module (PDC)						X		X	X	X
Main and auxiliary transformers		X						X	X	X
Station service transformer								X		X
ACC/MCC transformers								X		X
Solar tower and SRSG						X				X
Fire pump house	X							X		X
Water treatment building	X					X		X	X	X

Note: Clean Agent Fire Suppression Systems will be provided for control equipment and control rooms in the Plant Services building and the electrical rooms of the plant electrical building and the water treatment building. The systems should consist of, but not limited to, the agent, agent storage containers, agent release valves, fire detectors, fire detection system (wiring control panel, actuation signaling), agent delivery piping and agent dispersion nozzles.

Fire protection systems for the Common Area will be provided as stated in the table below.

Common Area Fire Protection Systems

	Automatic Suppression					Manual				Alarm System
Area Receiving Fire Protection	**Wet Pipe**	**Water Deluge**	**Gaseous System**	**Foam Deluge**	**Foam Preaction**	**Portable Extinguisher**	**Standpipe**	**Yard Hydrant**	**Pull Station**	**Fire Detection**
Admin/control building -maintenance/ warehouse areas	X					X		X	X	X
Admin/control building -central control room, control equipment room, battery room, and electrical room *(Note)*			X			X		X	X	X
Admin/control building -other offices only	X					X		X	X	X
MCC transformers								X		X
Fire pump house	X							X		X
Water treatment building (except for electrical room)	X					X		X	X	X
Water treatment building electrical room (*Note)*			X			X		X	X	X
Heliostat assembly building	X					X		X	X	X
Mirror Wash Machine (MWM) maintenance shed						X		X		
Switchyard control Electrical Equipment Module (EEM)						X		X	X	X

Note: Clean Agent Fire Suppression Systems will be provided for control equipment and control rooms in the Admin/Control building, and the electrical rooms of the water treatment building. The systems should consist of, but not limited to, the agent, agent storage containers, agent release valves, fire detectors, fire detection system (wiring control panel, actuation signaling), agent delivery piping and agent dispersion nozzles.

Augmenting the fixed fire protection system, portable fire extinguishers will be located throughout the Power Plant and Common Area. These extinguishers will be sized, rated, and spaced in accordance with CBC (2010)/NFPA. A 100-pound wheeled handcart CO_2 extinguisher will be provided in the turbine area.

A proprietary, addressable, smoke and fire detection system will be provided for the project, with local structure fire alarms, automatic fire detectors, and fire signaling panels as required by design codes and in accordance with CBC (2010)/NFPA. The main fire panel will be located in the Common Area central control room (CCR) and will be connected to the Power Plant local control room (LCR) panels. The LCR fire panel will have non-redundant communication with the distributed control system (DCS) and, if applicable, hardwired shutdown signals to the Emergency Shutdown (ESD) System. A DCS gateway will be provided to interface with the Fire Alarm Panel, with the main electrical distribution systems and process systems located at the common area and packaged equipment of the common area.

4.2 FIRE BARRIERS, FIRE PROOFING AND FIRE SEALS

The CBC occupancy use group of the Services Building and Electrical Building in each Plant and the Admin/Control Building in the Common Area are considered to be Factory Industrial (F-1). The structure will consist of Type II, nonrated, unprotected construction. Other than the walls surrounding the LCR, the CCR, the control equipment rooms, IT/ media room, oil storage rooms (if any), cable pits, battery room, solar tower stair enclosure, and electrical room, no other fire walls or structural steel fireproofing will be included.

Wherever possible, through-barrier penetrations in fire barriers will have commercially available rated closure systems or seals. Barrier penetrations having design characteristics exceeding the limits of commercially available qualified closure systems or seals will have closure systems or seals that use materials similar to qualified configurations. Alternatively, the barrier and penetration design will be evaluated and qualified by engineering judgment.

Concrete transformer firewalls will be provided between oil-filled transformers and adjacent structures and equipment as required by NFPA 850. Firewall partitions will be provided between adjacent transformers and where required to protect structures within 50 feet of the generator step-up (GSU) transformer.

Fire separation walls and floors will be provided in accordance with code requirements. Fire doors and frames will conform to CBC (2010)/NFPA for the class of door furnished.

Appendix C

RESUMES OF PREPARERS

WESLEY A. ALSTON

Community Planning / Entitlement / Environmental Analysis
Fire Compliance Analysis / Fire Protection Services

CLIENTS SERVED

As Principal of Pacific Development Solutions Group (**PDSG),** Wes Alston has been an active participant in the endeavors of many California builders and developers. **PDSG** has provided services to relatively small entrepreneur developers, mid-size development firms, and major landowners including:

Alliance Residential	Lowes
Andland Properties, LLC	Nevis Development Company
Beazer Homes Southern California	Pacific Century Homes
Braddock and Logan Associates	Pulte Homes
Bren/Osgood Company	Rael Development Corporation
Canaday & Company	R.C. Hobbs Company
Centex Homes	SolarReserve
Cobra Plantas Industriales	Starbucks
Empire Companies	Stoneridge Commercial
Highpoint Communities	Suncal
K. Hovnanian Homes	Target
KB Homes	Taylor Woodrow Homes
Kohl's	Trumark Companies
Lincoln Properties	William Lyon Companies

PROFESSIONAL EXPERIENCE

Principal, Pacific Development Solutions Group **February 2003 – Current**

Serves as a key expert in the entitlement processing of commercial, industrial, and residential development projects throughout California. Manages the preparation of community planning and environmental analysis documentation with a special expertise in fire compliance analysis, fire needs assessments, and regulatory compliance documentation. Coordinates the plan submittal process at the regional and local level, obtains permits from responsible and trustee agencies, and manages the implementation of conditions of project approval.

Deputy Fire Chief, Riverside County Fire Department **July 1999 – February 2003**

The Riverside County Fire Department provides all risk emergency management to the County of Riverside and 18 contract Cities. Responsible for a $143 million dollar budget and the supervision and overall management of the Fire Department.

Fire Chief, City of Moreno Valley **February 2000 – December 2002**

Accountable for administering a $6 million budget and maintaining effective cost controls. Managed staff of 150 firefighters and administrative personnel. Coordinated resource exchanges with other California Department of Forestry (CDF) facilities and fire departments. Responsibilities included:

- *Fire Stations:* Sponsored program to facilitate reducing response time by 5 minutes.
- *Equipment Acquisition and Fire Stations:* Responsible for submitting RFP's, preparing and reviewing specifications, negotiating contracts, and awarding bids.
- *Financial Management:* Maintained the lowest per capita cost of cities in California with a population between 100,000 and 200,000.

Battalion Chief/Fire Marshal, City of Moreno Valley **November 1997 – February 2000**

Supervised clerical and engineering staff in preparation of files, records, drafts, and maps pertaining to Fire Protection Planning for the City of Moreno Valley Fire Prevention office. Provided technical assistance to Fire Protection staff, Building and Safety staff, Code Enforcement, Planning staff, and others within the City that require technical fire protection and planning information. Assisted in development of the Fire Department budget and monitor expenditures within the general Fire Department fund, development fees, and fire mitigation fees. Developed the Fire Department section of the City of Moreno Valley's new General Plan, presented to the City's Planning Commission and received approval. Attended all meetings throughout the City and County requiring the Fire Department representation. Provided a leadership role in all meetings.

Fire Captain Specialist **July 1984 – November 1997**

Managed the operation of the Fire Protection Planning and Engineering Division. Activities included:

- Participation in committees developing local and state ordinances.
- Serving as representative of the County Fire Department on planning matters before the Riverside County Board of Supervisors and Planning Commission.
- Negotiation of deal terms and purchase agreement conditions with property owners and brokers for new fire stations within the county.
- Preparation of economic and market feasibility analyses for specific plans within the county.

Responsibilities included:

- Management of current planning functions including subdivision, boundary adjustment, annexation, covenant modification, variance, and condition change.
- Preparation and presentation of staff reports and recommendations to Design Review Board and Board of Directors.
- Research and preparation of information on application processing, land use, governing documents, and regulatory code questions for staff, decision-makers, the membership, realtors and land-use professionals.
- Special projects in support or furtherance of Association policies and goals.
- Review and analyze regional plans and projects that have local impacts and generally tracking development in adjacent jurisdictions.
- Representing the Association at meetings of other jurisdictional entities.

EDUCATION

Bachelor of Science in Engineering, 1976
San Diego State

Associate of Arts in Fire Science, 1977
San Diego City College

PROFESSIONAL TRAINING AND CERTIFICATIONS

POST Basic
POST Intermediate
POST Supervision
SFM Fire Investigator 1
NFPA Fire Sprinklers
NFPA Fire Alarms

CURRENT COMMUNITY INVOLVEMENT / PROFESSIONAL AFFILIATIONS

Board Member Riverside Area Rape Crisis Center
Board Member United Way of Inland Valleys
Moreno Valley Community Hospital Foundation
Riverside Community College Foundation
RCC Community Partnership
Silver Eagles
Moreno Valley Chamber of Commerce
Building Committee, St. Patrick Church
National Fire Protection Association
International Conference of Building Officials
California Fire Chiefs Association
California League of Cities
California Conference of Arson Investigators
California Contractor (B2) License No. 81515

LAUREN JUE

Community Planning / Entitlement / Environmental Analysis
Public Services Analysis

EXPERTISE

Lauren Jue is an urban planner with over 28 years of experience managing and preparing a variety of urban design, land planning, and environmental studies throughout California. She has significant expertise in and working knowledge of the California Environmental Quality Act (CEQA), the National Environmental Policy Act (NEPA), the State of California General Plan Guidelines, and the entitlement process. Ms. Jue has been project manager for and primary contributor to environmental analyses, fire needs assessments, planning studies, land use programs, design implementation programs, Specific Plans, General Plans, and zoning documentation. She has been involved in public and private sector projects ranging from infrastructure and roadway projects, hospitals, industrial and office developments, master planned communities, resorts, recreational projects, and educational institutions including schools and university campuses.

PROFESSIONAL EXPERIENCE

- Planning Consultant – 2001 to 2011
- Associate Principal, PCR Services Corporation – 1998 to 2001
- Senior Associate, EDAW, Inc., Irvine – 1993 to 1996
- Director, STA, Inc., Newport Beach – 1989 to 1993
- Assistant Manager of Community Planning/Senior Planner, University of California, Irvine – 1986 to 1989
- Project Manager/Project Planner, Tierra Planning and Design, San Juan Capistrano – 1983 to 1986
- Management Analyst/Staff Analyst, County Administrative Office and County Fire Department, Orange County – 1982 to 1983

PROJECT EXPERIENCE

Ms. Jue has managed the preparation of planning and environmental documentation throughout California. She has recently completed or is currently working on projects in Kern, Riverside, San Bernardino, Orange, and San Diego Counties. The key issues addressed for these projects include land use compatibility, circulation and access, biological resources, cultural resources, aesthetics, geology and soils, hydrology and water quality, air quality, noise, public services and utilities, and global climate change. The settings of these projects range from undeveloped rural areas to urban infill sites. Her project experience includes the following:

- **Rice Solar Energy Project Fire Needs Assessment, Riverside County.** The project consisted of a 150-megawatt concentrating solar thermal power project located on a 2,560-acre project site in the northeastern portion of unincorporated Riverside County. The Fire

Needs Assessment was prepared to assess the impact of the project on worker safety and the resulting demand on fire protection and emergency response services. The Fire Needs Assessment defined the relevant worker safety and fire protection standards, reviewed the potential project hazards and risks, analyzed the effectiveness of the fire protection systems and safety and health programs to be provided by the project applicant and the conditions of certification recommended by the California Energy Commission, and evaluated fire department resources available to respond to emergency situations at the project. As a result of the analysis, the Fire Needs Assessment determined the level of significance of the potential project-specific and cumulative impacts related to fire protection and other emergency response services and provided recommendations to address potential hazards and minimize the risks to public health and safety.

- **Rice Solar Energy Project Construction Safety and Health Program, Riverside County.** The project consisted of a 150-megawatt concentrating solar thermal power project located on a 2,560-acre project site in the northeastern portion of unincorporated Riverside County. The Construction Safety and Health Program was prepared in accordance with the requirements of the Final Commission Decision issued by the California Energy Commission to address the potential effects of the project on worker safety and reduce the demand on fire protection and emergency response services to insignificant levels. The Construction Safety and Health Program consisted of the following programs and plans: Construction Personal Protective Equipment Program; Construction Exposure Monitoring Program; Construction Injury and Illness Prevention Program; Construction Heat Stress Program; Construction Emergency Action Plan; and Construction Fire Prevention Plan. The Construction Emergency Action Plan and Construction Fire Prevention Plan were reviewed by the Riverside County Fire Department. All of the programs and plans were reviewed and approved by the California Energy Commission staff.

- **Rice Solar Energy Project Construction Security Plan, Riverside County.** The project consisted of a 150-megawatt concentrating solar thermal power project located on a 2,560-acre project site in the northeastern portion of unincorporated Riverside County. The Construction Security Plan was prepared in accordance with the requirements of the Final Commission Decision issued by the California Energy Commission to address site security and access in order to protect employees, project resources and equipment, and reduce the need for emergency response. The plan was reviewed and approved by the California Energy Commission staff.

- **Tehachapi Hospital Project Environmental Analysis, Tehachapi Valley Healthcare District, City of Tehachapi, Kern County.** The proposed project consists of the construction of a new critical care hospital in the City of Tehachapi and the remodel of the existing hospital to provide an outpatient clinic for the community. The development of the new hospital includes: the construction of hospital buildings; a medical administration building; on-site improvements consisting of a helipad, parking, pedestrian and vehicular circulation system, stormwater facilities, utilities, a water tank for the fire protection systems and fire flow, landscaping and hardscape; and off-site improvements consisting of the extension of access roadways, utilities, and signage. The major project issues include transportation and access, noise, air quality, greenhouse gas emissions, biological resources, and public services and utilities.

- **Kern River Valley Specific Plan Environmental Impact Report, Kern County.** The proposed project consists of the implementation of the Kern River Valley Specific Plan which addresses approximately 110,510 acres in the northeastern portion of Kern County. Currently, the land use development in the Specific Plan Area is guided by the Kern County General Plan (General Plan) and two existing specific plans, the South Lake Specific Plan and the Kelso Valley Specific Plan. The proposed project will implement the General Plan and replace the existing specific plans with a single comprehensive planning document that integrates the policies and programs of the General Plan and the two currently adopted specific plans to provide a clear and unified vision and direction to guide future land use development within the Kern River Valley. The major project issues include aesthetics, air quality and global climate change, biological resources, cultural resources, fire hazards, geologic hazards, hydrology and water quality, population and housing, and utilities and service systems.

- **Children's Hospital of Orange County (CHOC) Master Plan Environmental Impact Report, City of Orange, Orange County.** The project consisted of the multi-phased upgrade of the CHOC Hospital campus that would allow for the continued use of the existing Hospital and supporting facilities during the implementation of the proposed Master Plan through the year 2020. The development program for the project would occur in three phases and result in demolition activities, new construction, and the remodeling of buildings on the project site. At build out, the project would result in the addition of approximately 600,524 gross square feet of new hospital building area that includes 202 pediatric in-patient beds, supporting diagnostic and emergency services, operating rooms, patient and visitor amenities, increased pedestrian and vehicular access, and 485 parking spaces. The major project issues included transportation/circulation, parking, aesthetics, land use compatibility, air quality, global climate change, noise, biological resources, cultural resources, geology and soils, population and housing, public services and utilities, and hazards and hazardous materials.

- **Children's Hospital of Orange County (CHOC) Parking Structure and Pedestrian Bridge Project Initial Study and Mitigated Negative Declaration, City of Orange, Orange County.** The project consisted of the construction of a nine-level parking structure and pedestrian bridge that provided access across a major arterial roadway to CHOC Hospital. The parking structure provided approximately 1,500 parking spaces for hospital staff and visitors. The major issues addressed included circulation and traffic, parking, aesthetics, air quality, noise, geology and soils, public services, and hazards and hazardous materials.

- **St. Joseph Hospital Master Plan Initial Study and Mitigated Negative Declaration, City of Orange, Orange County.** The project consisted of the multi-phased seismic upgrade of the existing St. Joseph Hospital and supporting facilities in compliance with State Senate Bill 1953 while allowing for the continued use of the existing facilities. In addition, the build out of the project by the year 2020 would allow for the development of a 404,000 square foot patient care center with a total of 240 in-patient beds, power generation facilities, pedestrian and vehicular circulation improvements, and additional parking spaces. The major issues addressed included circulation and traffic, parking, aesthetics, air quality, noise, public services and utilities, and hazards and hazardous materials.

- **Gateway Business Park Entitlement Processing and Environmental Analysis, City of Moreno Valley, Riverside County.** The project included the subdivision of the project site into six parcels for industrial and warehouse uses. The business park development consists of 253,740 square feet provided in 16 buildings with office, industrial, and warehouse space and associated parking areas organized along an the internal circulation system. The project has been design as a "gateway" to the City with extensive landscaping, decorative walls, fences, and signage. Due to the location of the project site within the Accident Potential Zone I for the March Air Reserve Base, the project was designed for occupancy by businesses at an intensity that is consistent with the land uses defined in the March Air Reserve Land Use Compatibility Plan. The actions taken by the City included the approval of a General Plan Amendment, Zone Change, Master Plot Plan, and Tentative Parcel Map. The environmental evaluation of the project included extensive technical documentation. Issues addressed included traffic and parking, noise, air quality, land use compatibility, hydrology and water quality, hazards and hazardous materials, and biological resources, including jurisdictional features.

- **California City General Plan, Kern County**. The project consisted of the preparation of a comprehensive update of the California City General Plan. The General Plan planning area is comprised of a total of 168,570 (263 square miles) located to the north of Edwards Air Force Base in the Mojave Desert. The General Plan addresses a planning horizon timeframe through the year 2030 and includes the following state-mandatory elements: Land Use, Circulation, Conservation and Open Space, Noise, and Safety. The key issues addressed included: the balance of land uses (residential with job-producing uses); regional circulation (upgrade of existing facilities, freeway access, alternative transportation); provision of adequate parks and recreational facilities; preservation of open space and natural resources; overflight hazards from Edwards Air Force Base and other military installations in the region; geotechnical hazards; flood hazards; adequacy of water supply and groundwater quality; and provision of public facilities. The scope of services included visioning workshops, community meetings for the purpose of reviewing the conceptual land use plan and alternative concepts, and joint Planning Commission/City Council meeting to review the various elements of the General Plan.

- **Archstone Gateway Project Environmental Impact Report, Cities of Anaheim and Orange, Orange County**. The project consisted of the development of an 884-unit multi-family residential community with on-site circulation, recreational amenities, and services. The development program for the project provided for two four-story on-grade residential buildings surrounding integrated four-story parking structures; and one three- to four-story residential building with the first floor serving as a screened parking garage. The 21-acre project site for the Archstone Gateway Project is located within the Cities of Anaheim and Orange, in north-central Orange County. The environmental evaluation of the proposed project included detailed analysis of traffic and parking, noise, air quality, land use compatibility, hydrology and water quality, hazards and hazardous materials, biological resources (trees), public services, and utilities and service systems.

- **Winchester 1800 Specific Plan Amendments No. 1, 2, and 3 Entitlement Processing and Environmental Analysis, Riverside County**. The project consisted of the preparation of amendments to the Winchester 1800 Specific Plan to allow for residential development, including park and school facilities, and the realignment of major transportation corridors. In addition, the project required the preparation of extensive documentation related to biological resources, cultural resources, jurisdictional waters, and soils and geology.

- **San Elijo Ridge Environmental Impact Report, City of San Marcos, San Diego County.** The Environmental Impact Report analyzed the potential impacts of the development of a 61.63-acre project site with 129 single-family residential units and three neighborhood mini-parks and the preservation of 33.54 acres as natural open space. The project was defined based on input from the community and the resource agencies. The major issues included land use compatibility, consistency with land use plans, biological resources, hydrology and water quality, aesthetics, air quality, cultural resources, hazards, noise, traffic, public services, and utilities and service systems.

- **Quail Ridge Specific Plan Environmental Impact Report, San Diego County.** The Environmental Impact Report analyzed the potential impacts of the development of a 234-acre project site with a large lot planned community consisting of 69 custom residential units and 62 acres preserved as natural open space for the purpose of protecting biological resources, cultural resources, and steep slopes. The major issues included land use compatibility, consistency with land use plans, biological resources, drainages, hydrology and water quality, aesthetics and light/glare, air quality, cultural resources, hazards, noise, traffic, public services, and utilities and service systems.

- **Rosedale Ranch Environmental Impact Report, Kern County.** This project consisted of the preparation of an Environmental Impact Report for the Rosedale Ranch project area. The project encompassed an approximately 6,550-acre area to the west of the City of Bakersfield. The goal of the project was to provide for the comprehensive planning of the project area with multiple property ownership to address the provision of adequate transportation facilities, utility infrastructure, water supply, and public services. Major project issues included land use, transportation/circulation, air quality, noise, biological resources, hydrology, water quality, population/housing, public services and utilities, and human health/risk of upset.

- **Western Rosedale Specific Plan Environmental Impact Report, Kern County**. This project consisted of the preparation of an Environmental Impact Report for the Western Rosedale Specific Plan area. The project encompassed an approximately 36,500-acre area to the west of the City of Bakersfield. The overall goal of the project was to ensure that future growth and development occurs in a comprehensive and well planned manner. Major project issues included land use, transportation/circulation, air quality, noise, biological resources, cultural resources, population/housing, public services and utilities, and human health/risk of upset.

- **Dana Point Headlands Specific Plan Environmental Impact Report, City of Dana Point, Orange County**. The Environmental Impact Report analyzed the potential impacts of the development of a 121.3-acre mixed use site within the City of Dana Point. The proposed project included a mix of residential uses varying in density from 3.5 to 14.0 dwelling units per acre for a maximum of 522 dwelling units on 53.5 acres of the project site, 12.8 acres of visitor/recreation commercial uses, and 55 acres of open space. Major project issues included land use, air quality, noise, traffic and circulation, aesthetics, geology, hydrology, biology, socioeconomics, and cultural resources. Site constraints included development within the coastal zone on bluffs which overlook the Pacific Ocean.

- **Smithcliffs Residential Development Project Environmental Impact Report, Orange County**. This project involved the preparation of an Environmental Impact Report for a

private, gate-guarded community of 26 single-family estate lots north of the City of Laguna Beach in the County of Orange. Major project issues included land use, earth resources, biological resources, cultural/scientific resources, air quality, water quality, aesthetics, transportation/circulation, noise, light and glare, public services and utilities, and public health and safety. Additional work efforts and documentation included an urban runoff management plan, Monarch butterfly surveys, extensive archaeological and paleontological assessments, a historical structure survey, and a detailed noise analysis.

- **State Route 134/San Fernando Road Access and Safety Program Initial Study/Environmental Assessment, City of Glendale and Caltrans, Los Angeles County**. The project consisted of improvements to the State Route 134 (SR 134)/San Fernando Road Interchange for the purpose of providing grade separation of Fairmont Avenue across San Fernando Road and the Southern California Regional Rail Authority (SCRRA) railroad right-of-way resulting in safety benefits by separating traffic accessing the SR-134 from the at-grade crossings along San Fernando Road. This resulted in an increase in vehicular and pedestrian access and safety and reduced the effects of noise and light and glare on adjacent residential and commercial development. The Initial Study/Environmental Assessment addressed environmental issues related to circulation and traffic, land use, right-of-way acquisition, aesthetics, light and glare, noise, air quality, biological resources, cultural and historical resources, and hazards and hazardous materials. The project required close coordination with the City, Caltrans, and the Federal Highway Administration (FHWA) and the preparation of the supporting technical documentation consistent with the requirements of Caltrans and FHWA.

- **Avenida Vista Hermosa and I-5 Interchange Initial Study/Environmental Assessment, City of San Clemente and Caltrans, Orange County**. This Initial Study/Environmental Assessment was prepared for the construction of a new freeway interchange at the proposed intersection of Avenida Vista Hermosa at Interstate 5 (I-5) in the City of San Clemente. Major project issues included circulation, land use, right of way acquisition, noise, relationship to existing interchanges, and aesthetics. The project required close coordination with the City, Caltrans, and the Federal Highway Administration.

EDUCATION

Bachelor of Science in City and Regional Planning, School of Architecture, 1982
California State Polytechnical University, San Luis Obispo

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

APPLICATION FOR CERTIFICATION
FOR THE *RIO MESA SOLAR*
ELECTRIC GENERATING FACILITY

DOCKET NO. 11-AFC-04
PROOF OF SERVICE
(Revised 2/27/12)

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*indicates change

DECLARATION OF SERVICE

I, Darin Neufeld, declare that on April 16, 2012, I served and filed copies of the attached, dated April 16, 2012. This document is accompanied by the most recent Proof of Service list, located on the web page for this project at: [http://www.energy.ca.gov/sitingcases/riomesa/index.html].

The document has been sent to the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit or Chief Counsel, as appropriate, in the following manner:

(*Check all that Apply*)

For service to all other parties:

X Served electronically to all e-mail addresses on the Proof of Service list;

X Served by delivering on this date, either personally, or for mailing with the U.S. Postal Service with first-class postage thereon fully prepaid, to the name and address of the person served, for mailing that same day in the ordinary course of business; that the envelope was sealed and placed for collection and mailing on that date to those addresses NOT marked "e-mail preferred."

AND

For filing with the Docket Unit at the Energy Commission:

X by sending electronic copies to the e-mail address below (preferred method); *OR*

___ by depositing an original and 12 paper copies in the mail with the U.S. Postal Service with first class postage thereon fully prepaid, as follows:

CALIFORNIA ENERGY COMMISSION – DOCKET UNIT
Attn: Docket No. 11-AFC-4
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

OR, if filing a Petition for Reconsideration of Decision or Order pursuant to Title 20, § 1720:

___ Served by delivering on this date one electronic copy by e-mail, and an original paper copy to the Chief Counsel at the following address, either personally, or for mailing with the U.S. Postal Service with first class postage thereon fully prepaid:

California Energy Commission
Michael J. Levy, Chief Counsel
1516 Ninth Street MS-14
Sacramento, CA 95814
mlevy@energy.state.ca.us

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, that I am employed in the county where this mailing occurred, and that I am over the age of 18 years and not a party to the proceeding.

Original Signed by
Darin Neufeld

*indicates change

CALIFORNIA ENERGY COMMISSION
1516 NINTH STREET
SACRAMENTO, CA 95814-5512
www.energy.ca.gov

TO: *All Parties* *Date: February 27, 2012*

RE: ***RIO MESA SOLAR ELECTRIC GENERATING FACILITY***
Proof of Service List
Docket No. 11-AFC-04

Attached is the ***newly revised*** Proof of Service List for the above-mentioned project, current as of February 27, 2012. Please pay particular attention to the ***new*** filing instructions.

Energy Commission regulations (Cal. Code Regs., tit. 20, § 1210) require, in addition to any electronic service, that a paper copy be served in person or by first class mail except where a party requests to receive an electronic copy when one is available. Individuals and groups on the Proof of Service list who prefer to receive filings by e-mail and do not require a paper copy shall inform the Hearing Adviser assigned to the proceeding.

The Proof of Service list for this matter will delineate those individuals and groups and it is sufficient to serve those individuals with an e-mailed copy only. Those not so delineated must be served with a paper copy in addition to any e-mailed copy that the filing party chooses to provide. Signatures may be indicated on the electronic copy by **"*Original Signed By*"** or similar words. The original signed copy or an electronic copy shall be filed with the Energy Commission's Dockets Unit.

Unless otherwise specified in a regulation, all materials filed with the Commission must also be filed with the Docket Unit. (Cal. Code Regs., tit. 20, § 1209(d).) Some regulations require filing with the Commission's Chief Counsel instead of the Docket Unit. For example, Section 1720 requires a petition for reconsideration to be filed with the Chief Counsel and served on the parties. Service on the attorney representing Commission staff does not satisfy this requirement. This Proof of Service form is not appropriate for use when filing a document with the Chief Counsel under Title 20, sections 1231 (Complaint and Request for Investigation) or 2506 (Petition for Inspection or Copying of Confidential Records). The Public Advisor can answer any questions related to filing under these sections.

New addition(s) to the Proof of Service are indicated in **bold font** and marked with an asterisk (*). Additionally, if two or more persons are listed on a Proof of Service List with a single address, only one physical copy of a document need be mailed to the address.

Use this newly revised list for all future filings and submittals. This Proof of Service List will also be available on the Commission's Project Web Site at:

[http://www.energy.ca.gov/sitingcases/riomesa/index.html]

Please review the information and contact me at sharris@energy.state.ca.us or (916) 654-3893, if you would like to be removed from the Proof of Service or if there are any changes to your contact information.

Sandra Harris
Hearing Adviser's Office

Attachment