California Energy Commission
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Applicant's Supplemental Data Response #5 to CEC Data Requests Set 1A, 1B, 2A, and 2B

Rio Mesa Solar Electric Generating Facility (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
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AUGUST 1, 2012

BrightSource

August 1, 2012

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

Subject: Supplemental Data Response #5, Set 1A, 1B, 2A and 2B (11-AFC-04)

Dear Mr. Martinez:

On behalf of Rio Mesa Solar I, LLC and Rio Mesa Solar II, LLC, collectively the "Applicant" for the Rio Mesa Solar Electric Generating Facility project, please find enclosed a copy of our Supplemental Data Response #5 to CEC Data Requests Set 1A, 1B, 2A, and 2B.

Sincerely,

Todd Stewart
Director, Project Development

Enclosure

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INTRODUCTION

On July 23, 2012, the Applicant docketed its "Supplemental Data Response Number Four, Set 1A (#16 and #26), Applicant's Environmental Enhancement Proposal" (Docket 11-AFC-04) related to removal of Unit 3 from the Rio Mesa Solar Electric Generating Facility Project Description and the Project's use of auxiliary boilers. Per Staff's request, Table 1.0 provides a cross reference table which includes a listing of every data request received thus far during the discovery process (i.e., from Energy Commission Staff, BLM, and Center for Biological Diversity) and where, if applicable, any new information related to Applicant's original data response is contained in the Environmental Enhancement Proposal. For a few of the data requests, Applicant has also provided additional information relating to the removal of Unit 3 that was not addressed in the Environmental Enhancement Proposal, but nevertheless implicated by past data requests.

Table 1.0

RMS Data Request Responses:
Cross Reference to Environmental Enhancement Proposal

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RMS Data Request Responses: Cross Reference to Environmental Enhancement Proposal

Data Set	DR #	Discipline	Data Request	Response Altered by EEP?	If Yes, Section or Page in EEP	Comments
1A	1	AQ	Please provide copies of all substantive District correspondence regarding the Preliminary or Final Determination of Compliance, including e-mails, within one week of submittal or receipt. This request is in effect until the final Commission Decision has been recorded.	No		
	2	AQ	Please describe the types of activities that emit combustion and fugitive dust emissions on the site currently and the estimated quantities of those emissions that occur from those activities.	No		
1A	3	AQ	Please describe whether those activities will be permanently discontinued when the project is completed and estimate the reductions from the current onsite baseline emissions.	No		
1A	4	AQ	Please provide the spreadsheet version, in electronic format, of the Appendix 5.1 F Construction Emission Worksheets with the embedded calculations.	No		
1A	5	AQ	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.	No		
1A	6	AQ	Please provide the input assumptions to obtain the OFFROAD and EMFAC2007 Model raw engine emission factors, the assumptions used to derive the equipment specific emission factors, and please provide the spreadsheets used to create the emission factors shown in Appendix 5.1 F, with underlying equations intact.	No		
1A	7	AQ	Please identify all feasible and cost-effective measures to mitigate the impacts of construction related NOx, VOC, PM10/2.5 and PM10/2.5 precursor emissions. These may include a dust mitigation plan, Diesel-Fueled Engine Control, Dust Plume Response Requirement, Fugitive Dust Control, etc.	No		
1A	8	AQ	Please include the emissions from mirror washing activities in the total facility emissions and corresponding impact analysis.	Yes	Section 5.1.4.5	
1A	9	AQ	Please provide a review of available alternative low emission vehicle technologies, including compressed natural gas, electric, and hydrogen fueled vehicles, and other technologies that could be used to replace the proposed diesel and gasoline fueled vehicles used for operations maintenance if lower emission alternative technology vehicles are both available and cost effective.	No		
1A	10	AQ	Please confirm that there will be no dedicated gasoline fueled onsite vehicles.	No		
1A	11	AQ	Please confirm that there will be no vehicle refueling gasoline storage tank at the site.	No		
1A	12	AQ	Please identify the locations and distances to available gasoline refueling facilities expected to be used (if any) and provide estimates of emissions due to the transportation of vehicles between the project site and the refueling facilities and include these emissions in an updated operating emissions table 5.1-26.	No		

Data Set	DR #	Discipline	Data Request	Response Altered by EEP?	If Yes, Section or Page in EEP	Comments
1A	13	AQ	Please confirm that the information provided in the data response for Hidden Hills SEGS also applies to the Rio Mesa SEGF project.	No		
1A	14	AQ	If there is any potential for NOx emissions at the surface of the solar receiver, please estimate the emission rate expected at the surface of the solar receiver (lbs/day and tons/year) and describe what can be done to offset any such emissions or provide evidence that shows there will not be significant emissions of nitrogen oxides.	No		
1A	15	AQ	Please explain why and how the same auxiliary boilers are used differently in these two projects.	No		
1A	16	AQ	Please provide the spreadsheet version, in electronic format, of the GHG emission calculations for the auxiliary boilers.	Yes	See Cover Letter	Updated spreadsheet was provided in Applicant's July 19, 2012 Confidential Filing
1A	17	AQ	Please provide details of the SF6 onsite inventory and leakage emissions both in operation and construction phases to complete the GHG emission estimates.	Yes-only operation SF6 emissions impacted	Attachment AQ-1, Appendix 5.1, Table 5.1B-12R2	
1A	18	AQ	Please explain in detail why modeling was not considered necessary for commissioning in light of the fact that some cold startups do not reflect the highest emissions scenarios.	No		
1A	19	AQ	Please provide additional results for commissioning impact analysis if impact during commissioning is higher than that during cold startups.	No		
1A	20	AQ	Please explain why the Blythe Solar Power Project is not included in the cumulative impacts analysis.	No		
1A	21	AQ	Please update the cumulative analysis by including the Blythe Solar Power Project if the exclusion of it cannot be justified.	Yes	Attachment AQ-1, Appendix 5.1, Table 5.1G-2R2	
1A	22	AQ	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.	No		
1A	23	AQ	Please provide a sensitivity study on how the total N02 impact would change if the N02 and ozone measurements are from the same monitoring station (i.e. Palm Springs).	No		
1A	24	AQ	Please provide fuel use documentation in MMBTUs that demonstrates compliance with Public Utilities Code 399.12(h)(3), which defines the maximum allowable quantity of fuel input that enables this project to qualify for renewable energy credits. This documentation should allow for computation of the percentage of annual heat input from fossil fuel use relative to total heat input.	No		
1A	25	ALT	Please provide either a copy of the PPA or relevant sections of the PPA that are referenced in the AFC with regard to determining the feasibility of the alternatives presented (with confidential information redacted, if necessary). If any of the requested information is sensitive material, staff would support a request that the filing be treated as confidential.	No		

Data Set	DR #	Discipline	Data Request	Response Altered by EEP?	If Yes, Section or Page in EEP	Comments
1A	26	ALT	Please provide information as to why there is a difference in what is presented in the SCE Advice Letter as "Rio Mesa Solar Projects" consisting of two 200 MW components and what is presented in the AFC as Rio Mesa I, II, and III consisting of three 250 MW components.	Yes	Cover Letter and Section 6	
1A	27	ALT	If the PPA contains the projects identified as Solar Partners XVI and XVII for two 200 MW projects, please explain how this precludes a decreased footprint alternative for the proposed project.	No		
1A	28	LAND	Please indicate whether applicant intends to submit to Riverside County a real property interest agreement, and if so, please provide staff with the status and a schedule as to when the will be submitted and the expected date it will be finalized with Riverside County.	No		
1A	29	LAND	Please provide the number of acres for the farmlands listed above that is currently being farmed within the proposed project site; of these acres, please provide the number of acres that will be permanently taken out of production by construction and operation of the proposed project.	No		
1A	30	LAND	Of the farmlands listed above that are within the right-of-way for the transmission line, please provide the number of acres that are currently being farmed; of these acres, please provide the number of acres that will be permanently and temporarily taken out of production by the proposed project's transmission lines.	No		
1A	31	LAND	Of the farmlands listed above that are within the right-of-way for the project's gas lines, please provide the number of acres that are currently being farmed; of these acres, please provide the number of acres that will be permanently and temporarily taken out of production by the proposed project's gas lines.	No		
1A	32	SOCIO	Please provide the contact information for those individuals or groups that provided data for the survey.	No		
1A	33	SOCIO	Please provide staff a copy of the survey.	No		
1A	34	TRANS	Please work with the responsible agencies listed above to determine the most feasible access roads, and then provide a map to Energy Commission staff confirming the locations of the proposed primary and secondary access roads.	Yes	Revised figures in Section 5.12	
1A	35	TRANS	For each solar tower, please submit Form 7460-1 "Notice of Proposed Construction or Alteration" to the FAA, and provide a copy of the submittal to staff.	No		
1A	36	TRANS	Once the FAA has completed review of the proposed towers, please provide a copy of the findings to staff.	No		
1A	37	TSE	Provide the California ISO Phase II Interconnection Study of the proposed 750 MW Rio Mesa SEGF to the California ISO control grid. The Study should analyze the system impacts with and without the project during peak and off-peak system conditions, and demonstrate conformance or non-conformance with the utility reliability and planning criteria with the following provisions (SEE DATA REQUEST FOR SPECIFICS RELATED TO ITEMS (a) - (h)	No		
1A	38	TSE	Provide a detailed one-line diagram for the Colorado River Substation before the interconnection of the project.	No		

Data Set	DR #	Discipline	Data Request	Response Altered by EEP?	If Yes, Section or Page in EEP	Comments
1A	39	TSE	Provide a detailed one-line diagram for the Colorado River Substation after addition of the project. • Show bay arrangement and the necessary protection equipments required to interconnect the project. • Provide ratings of the breakers, disconnect switches, relays, buses, etc.	Yes	Section 3.4 and revised Figure 3.3-1	
1A	40	TSE	Provide the pole configuration and the number of poles that would be required for the overhead generator-tie lines.	Yes	Section 3.3.3.3 and revised Figure 3.3-2	
1A	41	WASTE	Please explain whose responsibility it will be to dispose of waste from illegal dumping that is located on the project site and lay down areas.	No		
1A	42	WASTE	Please explain how and when the waste will be disposed of if it is the responsibility of the landowner/lessee.	No		
1A	43	WS	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. **SEE FURTHER DETAILS IN DATA REQUEST**	Yes	Applicant filed a Fire and Emergency Services Risk Assessment and Fire Protection and Emergency Services Needs Assessment on April 16, 2012.	An updated Fire and Emergency Services Risk Assessment and Fire Protection and Emergency Services Needs Assessment is attached as DR-43-1 (REV).
1A	44 (REV)	BIO	Please provide quarterly results of the migratory bird surveys to the Energy Commission, BLM, USFWS, and CDFG within two weeks of their completion. The survey report should include a detailed description of the methodology; list of surveyors and their qualifications (pre-approval of surveyors by the agencies is recommended); time, date, and weather conditions during surveys; and species observed, including abundance, locations of flying birds relative to proposed project area, flight direction, and estimates of flight altitude. Submittals of interim survey results to Energy Commission staff, BLM, USFWS, and CDFG and will be evaluated by the agencies as received.	No		

Data Set	DR #	Discipline	Data Request	Response Altered by EEP?	If Yes, Section or Page in EEP	Comments
1A	45	BIO	Please provide results of the breeding bird and Gila woodpecker surveys to the Energy Commission, BLM, USFWS, and COFG as soon as possible after their completion. The survey report should include a detailed description of the methodology; list of surveyors and their qualifications (pre-approval of surveyors by the agencies is recommended); time, date, and weather conditions during surveys; and species observed, including abundance, age class of individuals, numbers of nesting pairs or territories documented for each species, breeding success if known for each pair/territory, incidental observations of other species observed but no breeding/nesting behavior noted. The REAT agencies request that the applicant conduct focused surveys during the breeding season (March to May), to determine distribution and abundance of avifauna, including Gila woodpecker, in the microphyll woodlands and adjacent to the project footprint (within one mile) using the following methodology: **SEE DATA REQUEST FOR MORE INFO**	No		
1A	46	BIO	Please conduct additional aerial and/or ground surveys for golden eagles within a 10-mile radius of the proposed project area according to Interim Golden Eagle Inventory and Monitoring Protocols and other Recommendations (Pagel et al. 2010). Objectives of the survey and data collection requirements are listed in the data request. **SEE DATA REQUEST FOR MORE INFO**	No		
1A	47	BIO	Please provide results of the surveys as a Supplement to the Phase II Golden Eagle Report for the Rio Mesa Project within 2 weeks of finishing the surveys. The survey report should be consistent with the requirements of Pagel et al. 2010. Submit interim survey results to the Energy Commission staff, BLM, USFWS, and CDFG.	No		
1A	48	BIO	At the conclusion of eagle surveys, please prepare and submit a draft Eagle Conservation Plan to Energy Commission staff and BLM, and provide copies concurrently to the USFWS for review.	No		
1A	49	BIO	Please conduct focused nocturnal elf owl surveys throughout the microphyll woodland in the project area and within one mile using line transects or comparable technique with recorded calls (play-back method). Survey methods should generally be based on the breeding season methods approved by Arizona Game and Fish Department for a similar species, cactus ferruginous pygmy-owl (AGFD 2000). That protocol requires three repeated site visits during the breeding season. The specific number of repeated surveys should be at least three, and should be developed by qualified ornithologists to maximize likelihood of detecting the species if it is present. The survey dates should be based on the species' behavior patterns and detect ability (i.e., response to the recording), considering available records of nesting activity and timing in the low desert region. Survey results should provide absolute counts of the number of elf owls in the study area. All incidental observations of other nocturnal species, including long-eared owl, if detected, should also be recorded. Please provide results of the elf owl surveys to the Energy Commission staff, BLM, USFWS, and CDFG within two weeks of their completion. The survey report should include a detailed description of the methodology; list of surveyors and their qualifications (pre-approval of surveyors by the agencies is recommended); time, date, and weather conditions during surveys; and individuals observed, including abundance, age class of individuals, numbers of nesting pairs or territories documented for each species, breeding success if known for each pair/territory, incidental observations of other species observed but no breeding/nesting behavior noted.	No		

Data Set	DR #	Discipline	Data Request	Response Altered by EEP?	If Yes, Section or Page in EEP	Comments
1A	50	BIO	Please provide a detailed, written report, describing all methods and results of the 2011 winter and breeding season avian point counts, including dates, times, and duration of surveys conducted, maps, tables, and summary data as applicable. Using map(s) of suitable scale, please illustrate the 16 survey transects that were surveyed for birds in 2011. Please also provide all raw data in an electronic format suitable for independent analysis by the resource agencies.	No		
1A	51	BIO	Please conduct and provide the results of one year of acoustic monitoring to provide adequate information to determine bat species present and habitat use in the proposed project area. Deploy three Anabat stations within microphyll woodland habitat to provide maximum coverage of the project area. To provide maximum coverage of the project area, please locate the Anabat stations at the northernmost and southernmost applicant-proposed locations (in Figure 1 of the January counterproposal), but locate the third station in the microphyll woodland due east of the southernmost power tower location. Data shall be collected continuously for no less than one year. Please report findings quarterly as data responses, and copy the Energy Commission staff, BLM, CDFG, and USFWS with the information.	No		
1A	52	BIO	Please perform an assessment of bat roost habitat, including identification of suitable day roosts, hibernacula, and maternity roosts, within the project area and vicinity. Please provide an illustration that identifies suitable roost habitat by the aforementioned types on a figure with the proposed project components and areas of proposed ground disturbance or vegetation/structure removal.	No		
1A	53	BIO	Provide a description of movement patterns of bats between roost sites in the vicinity of the project and foraging habitat within the project area, including a map depicting suitable roosts and foraging habitat. Also, provide an assessment of the project's impacts to these movement patterns for special-status bats.	No		
1A	54	BIO	Incorporating the complete survey results for breeding, migratory, and special status birds and bats, please prepare and submit a draft Bird and Bat Conservation Strategy to Energy Commission staff and BLM, and provide copies concurrently to the USFWS for review. It is BLM's standard practice to publish this Draft Plan with the Draft Environmental Impact Statement (EIS) to provide opportunity for public review and comment.	No		
1A	55	BIO	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.	No		
1A	56	BIO	Please provide an analysis of the impacts to desert dry wash woodland and other vegetation in the project area from reflected/concentrated solar energy flux and the potential resultant changes in light, heat, and humidity.	No		

Data Set	DR #	Discipline	Data Request	Response Altered by EEP?	If Yes, Section or Page in EEP	Comments
1A	57	BIO	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.	No		
1A	58	BIO	Using the complete year of survey data requested in Data Requests 44 - 47, please conduct and provide a risk assessment for birds and bats that addresses the following questions: a. What are the predicted fatality rates for each species or species group over the life of the project? Please provide predicted fatality rates for each special status species potentially occurring in the area, as well as for larger categories or species groups including, but not limited to waterfowl, shorebirds, passerines, and raptors. b. How do the seasonal variation and weather conditions impact these fatality rates? c. How do the fatality rates compare between breeding and non-breeding seasons? d. What is the degree of accuracy in the predicted fatality rates? Please show detailed computations with case examples in responding to each of these questions.	No		
1A	59	BIO	Please provide a description of the safety requirements for workers at active power tower facilities, including personal protective equipment, safety distances, and temporal and spatial restrictions.	No		
1A	60	BIO	Please provide a draft Desert Tortoise Translocation Plan that incorporates the most recent guidance from the BLM, USFWS, and CDFG. Please discuss the rationale for not avoiding occupied habitats, translocation procedures and guidance in the plan, including a description of clearance survey protocol and desert tortoise transportation and release procedures, and develop a long-term post-translocation monitoring and reporting plan. All methods discussed in the plan must be consistent with the most recent guidance provided by the USFWS. The translocation plan shall include, but shall not be limited to, the following information, which must be consistent with the most recent guidance provided by the USFWS as well as BLM and CDFG regulations: **SEE DATA REQUEST FOR REQUIREMENTS	No		The new project configuration will be reflected in a BA/DTTP to be filed under separate cover with the BLM (and copied to the CEC).
1A	61	BIO	Please coordinate with BLM Renewable Energy Coordination Office to prepare and submit a BA to the USFWS per federal guidelines, available from the Palm Springs Fish and Wildlife Office. Note that federally listed bird species (e.g., southwestern willow flycatcher) may also be identified during the breeding and migratory bird surveys requested in data requests 44 - 50. These will need to be addressed in the BA, but the timing of surveys may not be conducive to providing a BA at the time of Draft EIS publication, as is BLM's standard practice. Please coordinate with USFWS and BLM regarding how to address this issue in BA preparation. Please also provide a copy of the BA to the Energy Commission staff when it is deemed complete by the USFWS.	No		The new project configuration will be reflected in a BA/DTTP to be filed under separate cover with the BLM (and copied to the CEC).

Data Set	DR #	Discipline	Data Request	Response Altered by EEP?	If Yes, Section or Page in EEP	Comments
1A	62	BIO	Please provide a complete report describing methods and results of the desert tortoise/burrowing owl field surveys, including: a. A complete list of all wildlife species observed during the field surveys; b. List of field staff and field survey dates, indicating which biologists participated on each date; c. Time, air temperature, wind speed and other relevant data for each survey date, per California Burrowing Owl Consortium (1997) and USFWS (2010) survey protocol for desert tortoises; d. Complete descriptions of field methods, in terms of USFWS survey protocol, and Phase I, II, and III burrowing owl survey protocol; e. Detailed description of results and all parameters recorded in the field during different phases of surveys of the burrows and sightings of Burrowing Owls and desert tortoises, including description of all desert tortoise and burrowing owl sign (include descriptions of burrows, scat, and tortoise remains by USFWS defined "classes"; description of evidence of burrowing owl activities at burrows, etc.) and maps of all desert tortoises, burrowing owls, and sign of both species; f. A completed "Burrowing Owl Burrow Surveys" form for all survey dates (a blank example of this form is provided in Appendix E of the BRTR); g. Copies of CNDDB field survey forms submitted to the CNDDB; and h. Copies of the field notes logs from surveys.	No		
1A	63	BIO	Please prepare and submit an Incidental Take Permit application to the Energy Commission staff, and provide copies concurrently to the CDFG for review. Species addressed in the application shall include, but are not limited to, desert tortoise, Gila woodpecker, and elf owl.	No		An ITP reflecting the removal of Unit 3 will be submitted to the CEC and CDFG.
1A	64	BIO	Pursuant to Section 1600 et seq. of the California Fish and Game Code, please submit an application for a Lake and Streambed Alteration Agreement, as well as an application fee, to the California Department of Fish and Game, and provide a copy of the application to the Energy Commission staff.	No		An LSAA reflecting the removal of Unit 3 will be submitted to the CEC and CDFG when CDFG approves the delineation of WSC.
1A	65	BIO	Because of the proposed project's proximity to the LCRMSCP area, please provide an analysis of the proposed project's conformance with the goals and objectives of the LCRMSCP, particularly as it relates to potential impacts to migratory birds.	No		
1A	66	BIO	Please describe the surveys conducted for special-status small mammals within the project area. If no such surveys were conducted, please provide an explanation regarding why the surveys were not completed.	No		
1A	67	BIO	Please provide an assessment of suitable habitat for special-status small mammals, including but not limited to Colorado River cotton rat and pallid San Diego pocket mouse, to occur in the project area and an explanatory rationale regarding whether these species could occur in the project area.	No		

Data Set	DR #	Discipline	Data Request	Response Altered by EEP?	If Yes, Section or Page in EEP	Comments
1A	68	BIO	Please provide an assessment of potential impacts of the proposed project to small mammals. Include impact avoidance and minimization measures or a mitigation proposal for potentially significant impacts. These surveys also must address primary prey species of raptors, including golden eagle, such as cottontails, jackrabbits, and ground squirrels.	No		
1A	69	BIO	Please define the poor, moderate, and good habitat classifications used for MFTL (AFC p. 5.2-52) and include citations articulating this' classification.	No		
1A	70	BIO	Delineate any areas of creosote scrub with an active sand layer in the BSA, possibly near the desert dunes, and clarify whether this habitat was surveyed for MFTL presence or assessed for habitat suitability.	No		
1A	71	BIO	Please explain why MFTL focused surveys were only conducted on 567 acres (AFC p. 5.2-38), when 789 acres of desert dunes, which is presumably suitable MFTL habitat, occurs in the BSA (AFC Table 5.2-5). Also, clarify the discrepancy between the 565 acres of habitat classification and 567 acres of survey area.	No		
1A	72	BIO	Please prepare and submit a Draft Integrated Weed Management Plan. The plan shall only include weed control measures with a demonstrated record of success, based on the best available information from sources such as: The Nature Conservancy's Global Invasive Species Team, Cooperative Extension, California Invasive Plant Council, and the California Department of Food & Agriculture Encyclopedia. The draft Plan must include the following components: ** SEE DATA REQUEST FOR REQUIREMENTS.	No		
1A	73	BIO	Please provide the following information on all herbicides proposed for use in the project area during construction and/or operation: a. Herbicide common name, trade name, formulation, and chemical composition; b. Proposed use and application method; c. Toxicity, leaching potential, persistence in soil; d. State- or agency-specific restrictions; and e. Analysis of potential for exposure to adjacent desirable vegetation, potential pollution of surface water based on proximity and topography, potential pollution of groundwater based on geology/soils and depth to groundwater, and potential exposure of wildlife including aquatic species.	No		
1A	74	BIO	Please provide GIS data for all biological survey results (e.g., special-status species occurrences, vegetation mapping, desert tortoise habitat, delineation of waters of the U.S. and State, etc.) to the Energy Commission staff, USFWS, BLM, and CDFG.	Yes	URS will work directly with CEC GIS Staff to provide updated files which will be publicly available	
1A	75	BIO	Please provide GIS data for all proposed project components, including those depicted on figures 5.2-2 through 5.2-4 to all of the above agencies.	Yes	URS will work directly with CEC GIS Staff to provide updated files which will be publicly available	

Data Set	DR #	Discipline	Data Request	Response Altered by EEP?	If Yes, Section or Page in EEP	Comments
1A	76	BIO	Pedestrian survey/delineation methodology. Expanding on the methodology provided to CDFG on October 7, 2011 and summarized in the AFC (pg. 5.2-40 43), please provide: a detailed description of the pedestrian survey methodology, the number of data collection points taken in the field during pedestrian surveys, a figure illustrating the locations of data collection points, coordinates of each data collection point, the geographic extent of each data collection point, the criteria for selection of the data collection points, all parameters recorded at each data collection point, and copies of field notes/logs for each data collection point.	No		
1A	77	BIO	Storm water management system. Please provide plan views and cross sections of all proposed components of the storm water management system.	No		
1A	78	BIO	Off-site downstream flows. Please provide narrative descriptions, maps, and flow calculations for all jurisdictional channels that may convey surface flow onto and off of the site. Include clear explanations of the existing conditions in and adjacent to these channels, as well as explanations of any project-related alterations to existing conditions and the locations of these alterations (Le., inside or outside of the perimeter fence). In particular, please indicate which channels (if any) would have peak flows substantially increased or decreased, and how those increases or decreases may affect downstream erosion, hydrology, and vegetation.	Yes	A summary of revised flow calculations for pre- and post- project peak flows is provided in Tables 5.15-7, 5.15-8, and 5.15-9	
1A	79	BIO	Temporary and permanent channel alterations. Please provide narrative descriptions of all proposed internal transportation system components and buried infrastructure components, with examples (plan view and cross section) of typical construction at channel crossings and across upland area. Drawings should include locations of any proposed ditches or berms relative to the road or other infrastructure 'component, their depth or height, and any proposed armoring.	No		
1A	80	BIO	Best Management Practices. Please provide narrative descriptions of any proposed best management practices or other techniques to be implemented in jurisdictional channels, or in any upstream areas where runoff might enter jurisdictional channels. Please incorporate applicable soils, drainage, erosion, storm water, and flooding BMPs in the Best Management Practices And Guidance Manual: Desert Renewable Energy Projects (Energy Commission Publication #REAT-1 000-201 0-009-F).	No		
1A	81	BIO	Feasibility of compensation or other mitigation strategies. Please provide a review and summary describing the availability of suitable compensation lands to offset the project's anticipated impacts to state jurisdictional streambeds, including microphyll woodland habitats. In addition, please provide a review and summary of any feasible alternate approaches to mitigating impacts to these resources, including habitat creation or enhancement and supporting literature demonstrating success of these activities.	No		
1A	82	BIO	Comprehensive special-status plant survey report. Please provide a complete report, describing methods and results of all botanical surveys completed to date. The report must address all content as recommended by CDFG (2009) and BLM (2009), including the requirements addressed in the Data Request. **SEE DATA REQUEST FOR REQUIREMENTS.	No		

Data Set	DR #	Discipline	Data Request	Response Altered by EEP?	If Yes, Section or Page in EEP	Comments
1A	83	BIO	As requested by Riverside County in its comments on the project (Riverside 2012), please clarify (and preferably quantify) the amount of rainfall needed in summer 2012 to be determined as adequate to conduct late-season botanical surveys in fall 2012.	No		
1A	84	BIO	Special-status plant mitigation: Please provide a description of mitigation measures for any potentially significant project impacts to special status plants, including a strong rationale to support each measure's feasibility and efficacy.	No		
1B	85	ALT	Please provide a more detailed discussion and updated analysis of the feasibility of adding energy storage capabilities to the proposed Rio Mesa Solar Electric Generating Facility (Rio Mesa SEGF) project. Please include information on new and modified equipment and processes to add molten-salt energy storage, information on the expected benefits of adding storage capabilities, information comparing the environmental effects of the proposed project as opposed to a project that includes storage capabilities, a detailed discussion of whether storage would satisfy project objectives, and a detailed discussion why salt storage was eliminated as a viable alternative. Refer to items a-e in the data request for specific requirements.	No		
1B	86	ALT	Please provide additional information on the technological feasibility of a parabolic trough alternative, including information documenting parabolic trough efficiency; information on the feasibility of energy storage; details on worker safety, fire protection, and environmental hazards; information comparing the environmental effects to an alternative, and information on the extent to which using parabolic trough would satisfy project objectives. Refer to items a-e in the data request for specific requirements.	No		
1B	87	ALT	Please provide additional information on the technological feasibility of a PV alternative, including PV location, data on the net generating capacity, information on the costs and benefits of incorporating energy storage, information comparing the environmental effects, and information on the extent to which the PV project would satisfy project objectives. Refer to items a-e in the data request for specific requirements.	No		
1B	88	ALT	Please provide the additional acreage of washes, wetlands, and jurisdictional waters (Waters of the U.S. and State of California) that would be directly impacted by the on-site alternative 2 in comparison to the preferred alternative direct impacts.	No		
1B	89	ALT	Please provide the acreage of wetlands and jurisdictional waters (Waters of the U.S. and State of California) that would be impacted by the on-site alternative 3 given the reduced footprint.	No		
1B	90	ALT	For comparison purposes, please provide a table showing the acreages of wetlands and jurisdictional waters that would be directly impacted by each on-site alternative, including the preferred.	No		

Data Set	DR #	Discipline	Data Request	Response Altered by EEP?	If Yes, Section or Page in EEP	Comments
1B	91	CUL	Please identify, with as much detail as the present state of the proposed project's design will permit, where ground disturbance (surface or excavation) would occur on the proposed project site during project construction and operation, including both the overall extent of the area(s) to be disturbed and individual locations of all project components, including the facility buildings, linears, ancillary facilities, parking, roads, and temporary construction parking, laydown, and operational areas. Also, please provide the footprint (length, width, and depth) of any excavations, including foundations and test trenches. For the purposes of staff's cultural resources analysis, it is particularly critical to know the portions of the proposed project area where construction excavation would exceed one meter in depth.	Yes	See revised figures in Section 1.0 and 2.0	
1B	92	CUL	Please describe the methodology for insertion of the heliostat pedestals as it appears vibratory techniques may be proposed. Provide proposed mitigation measures that would reduce any potentially significant impacts to cultural resources caused by heliostat pedestal installation.	No		
1B	93	CUL	Please provide a time frame for completion and submission of the referenced regional ethnographic study.	No		
1B	94	CUL	Please provide the research design, work plan, and scope of work for the ethnographic study to allow staff to understand the specific geographic areas of analysis. Please identify the specific cultural practices/beliefs, and other resource themes that will frame the study and the subsequent ethnographic report; Native Americans who have or will be interviewed for oral history data; and the archives and related data sets to be gathered for analysis.	Yes	Section 5.3.3.6 and 5.3.3.7	
1B	95	CUL	Please provide a rationale for defining an ethnographic study area (from Desert Center to the Colorado River), as identified for the referenced study, that places the project site at the far eastern side of the study boundary. Tribal ancestral territories and related ethnographic areas in the project vicinity do not end at/or rely upon the Colorado River as a natural boundary between tribes. Instead the river flows in the midst of tribal ethnographic boundaries.	No		
1B	96	CUL	Staff could not find the figures for the Geoarchaeological Assessment (Assessment) section in the electronic copy of the September 2011 Cultural Resources Technical Report for the Rio Mesa Solar Electric Generating Facility, Riverside County, California submitted to the Energy Commission. Please provide four hard copies of the referenced technical report, including all referenced figures.	No		
1B	97	CUL	Please prepare, for staff review and approval, a research design for the subsurface investigation of landforms in the PAA, any portions of which may date from the terminal Pleistocene through the Holocene epochs (ca. 16,000 years ago to the present). The multiple research objectives of the investigation should include the refinement of the geographic definitions of the landforms that compose the proposed project area, and reconstructions of the processual and historical geomorphology of each constituent landform. The reconstructions would facilitate both the definition of the lateral variation in the depositional energy responsible for the development of each pertinent landform, and determinations of lateral and vertical variations in the age of the stratigraphic units that compose each landform. The investigation should be broadened beyond the heavy emphasis in the Assessment on the search for paleosols. Refer to items a-e in the data request for specific requirements.	No		

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1B	98	CUL	Implement the approved research design and prepare, for staff review and approval, a report of the research results that includes, at a minimum: a. complete graphic, photographic, and prose presentations of the new data; b. refinements of the processual and historical geomorphology of the portions of each constituent landform sampled by the new investigation; and c. the refinement of the preliminary analysis in the Assessment of the portions of landforms that may contain buried archaeological deposits, and the potential age, type, and relative density of such deposits.	No		
1B	99	CUL	Please provide a map at a scale of at least 1:24,000 and sufficient to show the project area and the adjacent vicinity. Label places and historic features including, but not limited to, the Bradshaw Trail; the Mule Mountains Mining District; Hodges Mine; Opal Hill Mine; the powerplant(s), substation(s) and transmission lines associated with the Parker and Davis Dams; and any other places or historic features that are important in the history of the project area and vicinity. For the Hodges and Opal Hill mines, please include any associate features, such as access roads and structures.	Yes	N/A	See revised Figure DR99-1 attached.
1B	100	CUL	Please provide a more detailed discussion of the history of the area as it relates to the types of resources (e.g., mining, irrigation/agriculture, transportation, and energy infrastructure) found on and in the vicinity of the project site. Include a discussion of types and locations of features associated with these activities, as well as a more comprehensive list and discussion of resources beyond the project site that are associated with these activities to allow a better understanding of the context and interrelationship of these resources. Please provide any photos or figures that would help to illustrate how the resources on the project site relate to those outside of the project site.	No		
1B	101	CUL	There are mining roads on or adjacent to the project site, but no clear picture has been provided concerning their relationship, if any, to the larger Mule Mountains Mining District (District). The District is only mentioned in passing in the Department of Parks and Recreation (DPR) 523 forms provided with the AFC and is not addressed at all in the September 2011 Cultural Resources Technical Report. Please provide a discussion of the Mule Mountains Mining District, along with a map or maps showing the locations of the mines and major roads and other associated features.	Yes		See revised Figure DR99-1 attached.
1B	102	CUL	Please provide specific information that characterizes the nature and substance of consultation with tribal representatives as it related to the ethnogeographic parameters of the project area.	No		
1B	103	CUL	Please explain the absence of or provide the following reports missing from Appendix F. Refer to the list in the data request for the required reports.	No		
1B	103a	CUL	Since a number of these reports indicate that "[L]ocational data was not available from EIC" (Table 2.8-1, page 2-54), please explain how they were included in the records search or reviewed by the applicant.	No		
1B	104	CUL	Please provide report RI-05520 (Draft Southern California Gas Company Natural Gas Transmission Line 6902 Project, Riverside and Imperial Counties, CA, The Bradshaw Trail: Recommendation for National Register Eligibility prepared by LSA Associates, Inc. in 1993). It is directly relevant as it includes the evaluation of Bradshaw Trail which traverses the project site.	No		

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1B	105	CUL	Please provide Survey Report RI-06707 (Cultural Resources Survey of Alternative Routes within California for the proposed Devers-Palo Verde 2 Transmission Project prepared by ICF Jones & Stokes in 2008). Only the DPR forms were provided.	No		
1B	106	CUL	Regarding Table 2.8-1, Report RI-08410 – Please provide the correct report or correct Table 2.8-1 to reflect the report actually provided in Appendix F under that number.	Yes	Table 5.3-1	
1B	107	CUL	Regarding Table 2.8-1, Report RI-08411 – The date in Table 2.8-1 does not match the report in Appendix F. Please provide the correct report or correct Table 2.8-1 to reflect the report actually provided in Appendix F under that number.	Yes	Table 5.3-1	
1B	108	CUL	Regarding Appendix F, Volume 5 – The coversheet for RI-06186 says "RI- 06168." Please provide the correct report or correct the cover sheet to reflect the report actually provided in Appendix F under that number.	No		
1B	109	CUL	Appendix F includes multiple copies of some of the DPRs contained in the records search (e.g., CA-RIV-1095). Please provide a revised Appendix F. Remove any duplicate DPRs and confirm all DPRs obtained during the records search were included in Appendix F of the Cultural Resources Technical Report.	No		
1B	110	CUL	The bibliography is incomplete; many parenthetical citations referenced throughout the report are not contained in the bibliography. Please review the completeness and accuracy of the bibliography and provide a revised bibliography.	No		
1B	111	CUL	Please provide the National Register Evaluation of the Blythe-Knob 161kV Transmission Line that was prepared by Kurt Schweigert of Associated Cultural Resource Experts under contract with Western Area Power Administration. Several DPRs from the early 2000s note that it is being prepared.	No		
1B	112	CUL	Please provide the following reports. Staff has determined that they are necessary in preparing the Ethnographic portion of our analysis. a. Report RI-00991 - Persistence and Power: A Study of Native American Peoples in the Sonoran Desert and the Devers-Palo Verde High Voltage Transmission Line prepared by Cultural Systems Research, Inc. in 1978). b. RI-01038 – An Aboriginal Trail Complex in the Big Maria, McCoy and Mule Mountains of the Central Colorado Desert prepared by William D. Alderson (1977). c. RI-01300 – Mule Mountains – Area of Critical Environmental Concern – Management Plan prepared by the BLM (1981). d. Riverside County Integrated Project: Existing Setting Report prepared by LSA Associates, Inc. in 2000.	No		
1B	113	CUL	Please provide a U.S. Geological Survey quadrangle map at a scale of 1:24,000, depicting the locations of all previously known and newly identified cultural resources, with separate overlays of prehistoric and historic resources, compiled during the course of the applicant's efforts to construct a cultural resources inventory for the proposed project area. For historic resources, please distinguish WWII era resources from other historic resources. The historic components of multi-component sites should be included.	Yes		A revised Figure DR-113 will be provided under separate confidential cover.by 8/10/12.

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1B	114	CUL	Please review the completeness and accuracy of all URS prepared DPR 523 forms in the PAA, correct any absent data or incorrect data, and correct all discrepancies for each resource identified in the cultural resources section of the AFC, the technical report, and the DPR 523 forms applicable to this project. Staff found that basic information was frequently missing from the forms, such as location, owner, a photo of the site or feature, date ranges for each site, and a sketch map or equivalent GIS map. In addition, citations in the text were often not included in the bibliography. In particular, the significance recommendations were unclear and unsupported, and in some cases inconsistent between the AFC and the Technical Report. Please provide corrected versions of all DPR forms requiring clarification or further information and a brief summary of the corrections made.	No		
1B	115	CUL	Table 5-1 – many of the site designations and descriptions are incorrect. For example, many multi-component sites with both prehistoric and historic components lack the "/H" notation. Please review the completeness and accuracy of all of the information provided in Table 5-1, make any necessary corrections, and provide a revised table that includes a column that notes the NRHP/CRHR criteria for recommended eligibility of the resource.	No		
1B	116	CUL	Please provide a list of all of the NRHP, CRHR, Arizona Register of Historical Places (ARHP), and locally-listed historic resources for a 10-mile radius around the project boundary. Also provide a map depicting the location of these resources in relation to the project site and major project elements, such as the power towers.	Yes		A revised Figure DR-116 will be provided under separate confidential cover. By 8/10/12.
1B	117	CUL	Please provide an ethnobotanical and ethnozoological analysis of the plants and animals within the PAA.	No		
1B	118	CUL	Assess project impacts to traditional and current access to and use of plants and animals located within the PAA and identified as central to Native American cultural and spiritual practices, including project impacts that would substantially minimize tribal members' abilities to maintain their cultural practices (including intergenerational knowledge transmission) as they relate to the identified plant and animal populations.	No		
1B	119	CUL	Please provide a map that only shows trail segments documented in and near the project area with an overlay of the other trails that are shown in various ethnographic sources for the area.	Yes		A revised Figure DR-119 will be provided under separate confidential cover by 8/10/12.
1B	120	CUL	Please evaluate all trail segments documented in or near the PAA for Criteria A and D of the California Register of Historical Resources, and revise DPR trail site forms accordingly.	No		

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1B	121	CUL	Please conduct an aerial photography/remote sensing study as necessary to locate trail segments in the PAA not otherwise evident in pedestrian surveys, using aerial images and historic maps of the area in rectified GIS layers to determine which trails segments are connected to one another. Provide strategic dating of associated trail features along trail segments within the PAA to identify use dates. Trail segments should be identified and mapped by prehistoric, historic, and modern era formation and use. Provide maps and overlays as an element of the resulting report identifying findings and discussion of trail connectivity and significance.	No		
1B	122	CUL	Please conduct and provide an expanded record search of trail segments, associated trail features, and petroglyph sites (regardless of proximity to a trail) in a five mile radius of the project boundaries. This data will establish trail trends that will assist staff in determining connectivity to trail segments within the project area.	No		
1B	123	CUL	Please provide a clear, consistent, and substantiated discussion of the entire Xam Kwatcan (Quechan Dream) Trail, including a general discussion of setting and integrity, as well as a detailed discussion of integrity for the segments within and adjacent to the PAA or that may be in view of the project infrastructure. Include any previous documentation or evaluations of the resource. Please complete any evaluations, provide copies of completed DPR 523 forms for the resource, and ensure that it contains a discussion of the significance of the resource under CEQA Section 15064.5(a)(3), (A)(B)(C) & (D). Please evaluate whether the integrity will be significantly impacted by construction of the proposed project such that the significance of the resource will be materially impaired. In addition, please assess impacts to the trail segments that cross the project area and other impacts to Native Americans that utilize the trail, including aesthetic considerations such as, but not solely limited to, visual impacts. All trail research should be closely coordinated with affiliated tribes. See data request for more information.	No		
1B	124	CUL	Please review the completeness and accuracy of all DPR 523 forms for the built environment sites in the PAA, correct any absent data or incorrect data, correct all discrepancies for each resource identified in the cultural resources section of the AFC and the technical report and provide the revised documents. Also, please provide corrected versions of all the DPR 523 forms and a brief summary of the corrections made.	No		
1B	125	CUL	Please provide a clear, consistent, and substantiated recommendation of eligibility for the following resources: the entirety of the Bradshaw Trail, The Pilot Knob to Blythe 161 kV Transmission Line, the Niland to Blythe 161 kV Transmission Line, the Open Pit Mines 1 and 2, Hodges Mine Access Road, Open Hill Mine Access Road, SR 78, the Bradshaw Trail Borrow Pit, the Hodges Drain, the C-03 Canal, the Palo Verde Drain, the Estes Dran, and Private Drain #1. Refer to the data request for specific information.	No		
1B	126	PAL	Please provide a plan for review and approval that will be used to adequately delineate the recently discovered paleontological resource.	No		

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1B	127	PAL	Please provide a map at a scale of 1:24,000 that delineates the areal extent of the recently discovered paleontological resource within the project perimeter.	Yes		A revised Figure DR-127 will be provided under separate confidential cover by 8/10/12.
1B	128	PAL	Please provide a map at a scale of 1:24,000 that shows the thickness of the recently discovered paleontological resource within the project perimeter.	No		
1B	129	PAL	Please describe the density of the fossils throughout the paleontological resource using both the areal extent and thickness of the deposit.	No		
1B	130	PAL	Please provide an assessment of the potential impacts to paleontological resources caused by heliostat pedestal installation.	No		
1B	WQ PAL-1	PAL	Provide a description of proposed mitigation measures that could reduce the potential impacts to paleontological resources caused by heliostat pedestal installation to less than significant.	No		
1B	131	S&W	Please identify what other agencies would have jurisdiction over the proposed project water supply other than the Bureau of Reclamation.	No		
1B	132	S&W	Please discuss whether any determinations have been made that the proposed water use will or will not result in the need for the applicant to participate in MWD's Mitigation Program, or whether any are anticipated.	No		
1B	133	S&W	Should the project be required to participate in the MWD mitigation program, please provide a detailed description of the MWD mitigation program. The description should include but not be limited to the following: a. How the 'accounting surface rule' would be used as the threshold for application of MWD's mitigation requirements. b. How water pumped from above the 'accounting surface' but nonetheless in hydraulic connection to the Colorado River will be mitigated. c. Identification of the source of water that would be used as an exchange for an equal volume of MWD non-Colorado River water. d. A copy of the environmental impact analysis for the non-Colorado River exchange water. e. Demonstration that the exchange water benefits the Colorado River in equal volume to the Colorado River water used by the project.	No		
1B	134	S&W	If MWD would be a water supplier to the Rio Mesa Solar Electric Generating Facility (Rio Mesa SEGF) project for the purposes of Water Code section 10910, please provide a copy of the MWD's water supply assessment for the proposed project.	No		
1B	135	S&W	If MWD is not a water supplier for the purposes of Water Code section 10910, please provide documentation from MWD that explains why MWD would not be a water supplier for the Rio Mesa SEGF project.	No		
1B	136	S&W	Please provide an electronic copy of the groundwater model used for the project.	No		
1B	137	S&W	Please provide an electronic copy of the groundwater model input and output files for each model run presented in the AFC.	No		

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1B	138	S&W	Please provide an electronic copy of the precipitation data used in the Flo-2d modeling and the references for the source of the precipitation data used.	No		
1B	139	S&W	Please conduct an analysis of the RO system to determine the average and maximum salt production rates on a monthly basis.	No		
1B	140	S&W	Please provide a discussion of potential salt accumulation using the longest period the salt may have to be stored on site.	No		
1B	141	S&W	Please provide an analysis showing all the constituents potentially detrimental to flora and fauna that may be present in the reject of the RO system and plans to mitigate such constituents.	No		
1B	142	S&W	Please provide all information necessary to file a Report of Waste Discharge to the Regional Water Quality Control Board (RWQCB) and Energy Commission staff, and include the appropriate application fee to the RWQCB. This should include design details for evaporation ponds where generated salts will be stored.	No		A ROWD was recently submitted to the RWQCB; a copy is attached.
1B	BLM-1	S&W	Please provide a detailed description of the MWD mitigation program. The description should include but not be limited to the following: f) Demonstration that returning the exchange water to the Colorado River has no negative environmental consequences. g) With regard to Part 2.4(d) of the Agreement for Environmental Review and Option to Lease land from MWD, how paying the owner the purchase price of water from an alternative source that still involves the use of Colorado River Water would mitigate impacts of that water use on the Colorado River. h) With regard to item (g) above, how water from an alternate source would be delivered to and stored at the project site.	No		
1B	BLM-2	S&W	During the NEPA process, the applicant will need to prepare a plan for monitoring project impacts to groundwater, including a map of existing and proposed monitoring wells and what data would be recorded from each, at what time intervals, and to whom and how often the data and analyses would be presented. At a minimum, results should be sent regularly to relevant CEC and BLM staff.	No		
1B	BLM-3	S&W	The Groundwater Impact Assessment Report (GIAR) assumes that three wells, drilled side-by-side near the center of the project area, would be providing project water; yet the applicant's Plan of Development (POD) states that the three wells would be spaced out, one per plant site. There should be some assessment as to how this could affect the depth and extent of the pumping cones of depression.	No		The GIAR will be revised to reflect the EEP.
1B	BLM-4	S&W	Both in accordance to modeling results and the response to item 2 above, the applicant should provide an estimate of the percent and volume of drawdown occurring beneath BLM-administered land vs. MWD land.	No		The GIAR will be revised to reflect the EEP.
1B	BLM-5	S&W	The GIAR models pumping of 400 AFY during construction, dropping to 260 AFY during operations. However, according to the POD (Section 3.2.5.2), this does not appear to include water needed for dust abatement on roads and graded surfaces. If so, this additional water usage, which appears to be up to 200 AFY (second paragraph of Section 3.2.5), needs to be addressed in both the POD (Table 3-2) and the model. Based on comparison to proposed water usage from other solar thermal projects in the area such as the Solar Millennium Blythe project (0.117 AFY/acre) and the NextEra Genesis Ford Dry Lake project (0.452 AFY/acre), the proposed water usage during construction of this project (0.055 AFY/acre) appears surprisingly low, suggesting that overall construction water usage for this project may have been underestimated, as well as the potential impacts of	No		

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			associated pumping.			
1B	BLM-6	S&W	It is also unclear from the POD the amount of water that would be required for wet cooling during times when ambient temperatures exceed 85 degrees F, nor whether this volume has been incorporated into the water usage estimates in Section 3.2.5. If it has not, this volume also needs to be addressed in both the POD and the GIAR	No		
1B	BLM-7	S&W	If further analysis concludes that the 600 AFY allowed to be pumped from MWD land may be insufficient for water needs during construction, an alternate source needs to be identified—in particular, the applicant needs to state whether it would seek to drill any wells beneath BLM-administered portions of the project area.	No		
1B	BLM-8	S&W	The applicant will need to provide to BLM a set of detailed 30 percent design maps and diagrams. These should include locations of water wells, locations and dimensions of reverse osmosis waste stream storage basins, stormwater diversion basins, berms, water tanks, pipelines, etc. Without these, the stormflow and scour analyses may not provide adequate results for the areas where those facilities or structures would be sited or for areas downslope.	No		
1B	BLM-9	S&W	Color coding in the legends for the scour maps is non-intuitive and confusing, making it difficult to review the results. The colors should be graded similar to those presented in the stormflow flow depth maps.	No		
1B	BLM-10	S&W	The results of scour modeling appear to show fairly extensive scour in some areas where the applicant proposes to place heliostats, in particular the northernmost portion of the central solar field. There should some discussion as to whether the results of the stormflow and scour models, as well as areas of potential headcutting, may require adjustment of the overall solar project footprint. If no adjustment is proposed, the applicant should propose mitigation measures that would ensure project design would not enhance the natural scour and deposition occurring in portions of washes and headcut areas to be occupied by project components.	No		
1B	BLM-11	S&W	The Overall Existing Condition Hydrologic and Hydraulic Analysis for the project models the large majority of offsite runoff during a 100-year storm (7,018 cubic feet per second[cfs]) occurring in the watershed that feeds into onsite basin ONA, compared with 523 cfs in the watershed feeding into onsite basin ONB. Yet it models the largest component of onsite flow occurring through onsite basin ONB (459 cfs) rather than basin ONA (176 cfs). This discrepancy is not discussed, nor whether it has affected the resulting maps of flow depth, velocity, etc.	No		
1B	143	TRANS	Please provide observer incident luminous energies that would be experienced by workers, civilians, and motorists at representative viewing distances (e.g. for workers – distances from within heliostat fields, for civilians – distances from nearest residential areas, and for motorists – distances from State Route 10 and other nearby public roads).	Yes	Section 5.12	
1B	144	TRANS	Given the predicted observer incident luminous energies experienced by workers, civilians, and motorists at representative viewing distances, please address the impacts of apparent brightness, glare and visual disruption to these parties.	Yes	Section 5.12	

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1B	145	TRANS	Please address the potential for photochemical retinal damage to the public (both resident and non-resident) and project workers given the cumulative exposure effects of the combined terrestrial ambient and solar field/ tower exposure levels. Additionally, if found to be significant, please address any potential mitigating methodologies for both the general public and workers (e.g., worker sunglasses).	No		
1B	146	TRANS	Please describe any strategy in the heliostat positioning algorithms to address the intermittent presence of aircraft for either known or unknown flight paths. Also, please address the amount of energy from the heliostats which spills beyond the tower and its potential for negative impacts on aviation safety.	No		
1B	147	TRANS	Please address the frequency that the heliostats are in such standby positions, the amount of luminous energy that pilots could experience, and the potential for negative impacts on aviation safety from a glint and glare perspective.	No		
1B	148	VIS	Please provide additional description of required night lighting. For example, would night lighting be restricted to the power block area? Would night lighting be required at the common area or any other locations? What specific night lighting requirements are needed for the mirror washing? Would night lighting be installed around perimeter fencing? What operations would require lighting, and could some of these be restricted to lighting during use only? Where would roadway lighting be introduced and of what type?	No		
1B	149	VIS	Please provide a description of anticipated FAA-required lighting and marking.	No		
1B	150	VIS	Please provide high-resolution image files of individual photos in the AFC visual discussion, including simulations and character photos, in jpg or tif format. Please do not provide "paired" before and after page layouts, but rather the individual photo image files at a resolution suitable from printing in ledger-size (11"x 17") format.	Yes	Section 5.13 includes revised simulations	
1B	151	VIS	Please discuss the expected frequency, extent, brightness and appearance of visual scattering effects to the public during power generating operations.	No		
1B	152	VIS	Please discuss the expected frequency and deleterious visual impact of visual scattering effects to the public during power generation operations in terms of any direct or cumulative adverse visual resource impact on the desert visual landscape.	Yes	Section 5.13	
1B	153	VIS	Please discuss the expected frequency, extent, brightness and appearance of visual scattering effects to the public during heliostat standby operations.	No		
1B	154	VIS	Please discuss the expected frequency and deleterious visual impact of visual scattering effects to the public during heliostat standby operations in terms of any direct or cumulative adverse visual resource impact on the desert visual landscape.	Yes	Section 5.13	
2A	155	BIO	Please provide a Draft Desert Kit Fox Management Plan, to completely describe all methods that may be used for desert kit fox passive relocation, including: **SEE DR FOR FURTHER DETAIL ON REQUIREMENTS**	No		Number of dens would be reduced as a result of removal of RMS 3 (see Section 5.2.5.5)

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2A	156	BIO	Clarify whether botanical surveys of the project area targeted creosote rings.	No		
2A	157	BIO	If surveys did not target creosote rings, please determine whether any occur within the project area using high resolution aerial photography. If determined present in the project area through surveys or imagery analysis, provide a map showing the locations of all creosote rings and their estimated diameter.	No		
2A	158	BIO	Because the proposed project would remove native plants regulated under the California Desert Native Plants Act, please analyze conformance of the proposed project with this Act, including provisions for harvesting and cutting of regulated species (cacti, ocotillo, catclaw acacia, palo verde, and ironwood).	No		
2A	159	BIO	Please provide a three-dimensional graphical model of the southern 250 MW (net) facility proposed for Rio Mesa SEGF under full-load, partial-load and full standby status, illustrating the composite effect of convective heat and radiant flux. The modeled convective heat should include elevated temperature of the receiver tower and heliostat surfaces on surrounding air. The modeled radiant flux must include all radiant energy, including (1) ambient solar energy; (2) energy reflected and/or radiated from heliostats to the receiver tower, the standby locations, and the surrounding air; and (3) energy reflected and/or radiated from the receiver tower. **SEE DR FOR ADDITIONAL DETAILS**	No		
2A	160	BIO	For each drainage system within the project area, please provide representative photographs for the following feature types as applicable, and show locations of these photographs in a 1:3,600 or finer scale map: a. Narrow ephemeral channels; b. Braided ephemeral channels; c. Intermittent channels; d. Single-thread channels; e. Compound channels; f. Discontinuous channels; g. Low-flow channels and associated floodplains; h. Alluvial fans; i. Manmade ditches and culverts; and j. Wetland feature types.	No		
2A	161	BIO	In a table, please summarize the jurisdictional acreage of each of the above geomorphic feature types for each drainage system. In an Excel table, please show a detailed computation of acreage by feature type.	Yes	Section 5.2, Tables 5.2-8 and 5.2-9; and revised Figures 5.2-5a, 5.2-5b, 5.2-6a, and 5.2-6b	
2A	162	BIO	In a 1:3,600 or finer scale map, please show: a. The project footprint and outline of any project related disturbance areas; and b. Numerical values of elevation contour lines and widths of jurisdictional features.	Yes	See revised figures in Section 5.2	
2A	163	BIO	In a table, please summarize the jurisdictional acreage of each of the above Vegetation types and Land Cover for each drainage system. In an Excel table, please show a detailed computation of acreage by feature type.	No		
2A	164	BIO	In a table, please summarize the jurisdictional acreage by soil texture classes occurring in each drainage system. In an Excel table show a detailed computation of the acreage by soil classes.	No		

Data Set	DR #	Discipline	Data Request	Response Altered by EEP?	If Yes, Section or Page in EEP	Comments
2A	165	BIO	Please provide a detailed proposal for mitigating impacts to a minimum of 1,265 acres of CDFG-jurisdictional washes, including 621 acres of USACE jurisdictional washes, and 1,120 acres of microphyll (blue palo verde/ironwood) woodland, at the 3:1 compensation ratio described in the NECO Plan. The proposal should include any feasible compensation measures, such as acquisition and protection of off-site lands and/or habitat creation or restoration. If habitat creation and/or enhancement are proposed, please provide information to demonstrate that they would mitigate temporal and spatial habitat loss. The proposal should include descriptions of successful large-scale microphyll woodland restoration in California and identification of large areas of degraded lands that (1) contain suitable soils, hydrology, and topography for microphyll woodland restoration; and (2) can be protected and managed in perpetuity. If lands within the Lower Colorado River Multi-Species Conservation Plan area are proposed as a component of the mitigation proposal, please describe components of that Plan that may be applicable to microphyll woodland habitat creation and enhancement.	Yes	Section 5.2, Tables 5.2-11 and 5.2-14	
2A	166	BIO	Please identify all areas that would be graded for construction of the proposed project. Illustrate these areas on a map.	No		
2A	167	BIO	State whether any underground infrastructure would be required to operate the heliostats. If underground infrastructure is proposed, please describe the proposed installation methodology, including trench dimensions. Illustrate any areas of proposed ground disturbance necessary for operation of the heliostats on a map and provide drawings of representative trenches or other ground disturbance, including any berms or other grading to divert runoff.	No		
2A	168	S&W	Please provide documentation showing that the applicant has paid the Colorado River RWQCB the necessary fee for them to complete their review of the Report of Waste Discharge and prepare the Waste Discharge requirements for the evaporation pond monitoring and mitigation.	No		
2A	169	TRANS	Please provide accurate estimates for both irradiance (W/m2) and luminance (cd/m2) for the following conditions: a. An observer on the ground viewing the tower SRSGs (without protective eyewear) during nominal plant operational conditions of maximum power generation for viewing distances of 200, 500, 2000, 5000, and 20000 meters. b. At start-up or when the standby ring is heavily populated with heliostat reflections in the standby position, an airborne observer at viewing distances of 1000, 5000, 10000, and 20000 meters with respect to the tower SRSG, and at a slant angle sufficient to reside within the heliostat reflected zone to receive direct reflections from one or more of the heliostat reflected beams resident in the standby ring.	No		
2A	170	ALT	Please provide a discussion of pertinent contractual agreements in the applicant's PPA with SCE that would prohibit the consideration or justify the dismissal of alternatives identified in the Application for Certification (AFC).	No		
2A	171	ALT	Please provide a copy of the actual PPA, with confidential information redacted as necessary. Alternatively, staff would support a request that the filing be treated as confidential.	No		
2A	172	SOCIO	Please provide an updated Construction Craft Resources Survey.	No		

Data Set	DR #	Discipline	Data Request	Response Altered by EEP?	If Yes, Section or Page in EEP	Comments
2B	173	CUL	Please provide the following additional information about each feature referred to as a "cleared circle" that the URS CRTR identifies as a "naturally occurring plant scar," including but not limited to the 35 features mentioned as part of sites CA- Riv-1746, CA-Riv-1748, CA-Riv-6538, PVM-MK-056, PVM-MN-060, and PVM- MN-067: a. Photographs of each cleared circle. b. A list of attributes used by URS to define prehistoric cleared circles on the project site; c. A list of attributes used by URS to define historic cleared circles on the project site; d. A list of attributes associated with "plant scars" by McAuliff and McDonald 2005 and used by URS to define naturally occurring cleared circles on the project site; e. A description of each cleared circle detailing the specific attributes identified in each case, consistent with established attributes for cleared circles and their causes, and justification for the determination of the type of each cleared circle.	No		
2B	174	CUL	Please submit a plan for staff review and approval for the testing of short-term bivouac sites to determine if subsurface concentrations of metal objects are present. At a minimum, the plan needs to include a map showing the locations of proposed test sites, justification for site selection, and an explanation of the methodology for testing. If necessary, staff will meet with the applicant and/or their consultant to finalize the test sites and methodology.	No		
2B	175	CUL	Following staff's approval of the testing plan (DR174), please test specified sites, using metal detectors or magnetometer devices, to identify potential hot spots of subsurface concentrations of metal objects.	No		
2B	176	CUL	Data Set 2B did not contain a DR 176.	N/A		
2B	177	CUL	Please add the locations of the surveyed features on the site maps for the individual sites.	No		
2B	178	CUL	Please incorporate the findings into the eligibility evaluation of any sites on which they appear, in terms of their potential importance under California Register of Historic Resources Criterion 4 (National Register of Historic Places Criterion D) to provide information on the history of the sites as contributors to the DTC Cultural Landscape.	No		
2B	179	CUL	Please provide a single U.S. Geological Survey quadrangle map for the transmission line corridor, at a scale of 1:24,000, depicting the following items: a. Locations of all previously known and newly identified cultural resources, identified for the current project, as shown on previously provided maps within the CRTR; b.Each planned transmission pole location; c.Each proposed pull site; d.The BLM Right of Way (ROW) boundary for the transmission line and all its components; e. 50-foot Energy Commission-required survey buffers on either side of the transmission line and access road, and 200-foot buffer beyond the project site boundary.	No		

Data Set	DR #	Discipline	Data Request	Response Altered by EEP?	If Yes, Section or Page in EEP	Comments
2B	180	ALT	Please provide the following additional information: a. Information on the slope of the alternative site. Include shape files of the site boundaries and a map showing a possible project site and footprint. Describe the topography and elevations in the areas; b. Information on the site access from public roads in the area; c. Please provide a detailed map showing the route for a transmission line interconnection at the Colorado River Substation. Estimate a cost for the generation tie line to the Colorado River Substation and compare those costs to the known or estimated transmission costs for the Rio Mesa SEGF project; d. Information and a map showing a potential connection to a gas pipeline in the vicinity; e. Details on the individual water supply wells in the area, including the number of wells and current uses. Discuss any water allocations for agricultural use, and identify the potential source(s) of water for this alternative; f. Information on habitat types and protected plant and wildlife species that could be present in the area. Include data obtained from a California Natural Diversity Database (CNDDB) record search for the area, and a map illustrating CNDDB data and distribution; g. Information on the sensitivity of the area for cultural resources and the potential for discovery of cultural artifacts. Include information based on a California Historic Resource Information System literature search and contact with the Native American Heritage Commission. This information should be provided as a legible map depicting the cultural sites, and must be submitted under confidential cover; h. Description of the economic viability of this alternative compared to the Rio Mesa SEGF project.	Yes	Section 5.2, Table 5.2-11, and revised Figure 6.3-3	
2B	181	ALT	Please explain in detail why the energy storage technology option would require an 18 percent increase in the number of heliostats.	No		
2B	182	ALT	Please clarify the estimate of acres of disturbance within the revised fence line.	No		
2B	183	ALT	Please provide updated Tables DR 90-1 and DR90-2 with estimates of the direct impacts to jurisdictional waters within the revised 500 MW fence line.	No		
2B	184	ALT	Please provide an updated figure that shows the waters of the U.S. overlain with an outline of the revised proposed project.	Yes	Revised Figures 5.2-5a and 5.2-5b	
2B	185	ALT	Please estimate the area and megawatts of a project that would avoid all impacts to waters of the U.S. and describe the feasibility of such a project.	No		
CBD	1	BIO	Please provide information on the type of kit fox sign (scat, tracks, and dens) on the proposed site and adjacent off-site areas. Data requested includes a map showing the locations of kit fox sign, kit fox dens and complexes including the number of burrows and whether they are natal or satellite dens and an estimate of the on-site and adjacent population.	No		
CBD	2	BIO	Please provide published and/or peer-reviewed studies on avian mortality from the proposed power tower technology. Please provide data on migratory pathways in the general area of the proposed project.	No		
CBD	3	BIO	All original data, modeling and modeling assumptions relied on for statements regarding the SEDC project and Rio Mesa proposed project in the power point presentation titled "RIO MESA SOLAR ELECTRIC GENERATING FACILITY CEC BIOLOGICAL RESOURCES WORKSHOP March 13, 2012", docketed with the Commission, and posted on the web on March 14, 2012.	No		

Data Request 43

Updated Fire and Emergency Services Risk Assessment and Updated Fire Protection and Emergency Services Needs Assessment

RIO MESA SOLAR ELECTRIC GENERATING FACILITY

FIRE AND EMERGENCY SERVICES RISK ASSESSMENT

Prepared by:
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Contact:
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~~April 13, 2012~~ June 20,2012

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Appendices

Appendix A – Maps and Site Plan (refer to Section 1 and 2 of Environmental Enhancement Proposal)
Appendix B – Rio Mesa Solar Electric Generating Facility Fire Protection Design Basis

1.0 SCOPE OF STUDY

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 3,960 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 on privately owned land leased from the Metropolitan Water District of Southern California (MWD). Only the gen-tie line, emergency and construction electrical power supply, and access road will be located on public land managed by the Bureau of Land Management (BLM). Appendix A of this document provides the regional location of the project site.

The project site is located 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 Bradshaw Trail (primary) and 34th Avenue off of SR 78 (to the east). The access road would travel adjacent to agricultural land before reaching the mesa and 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 two 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 southeastern end of the project site. The second plant, known as Rio Mesa II, would be located in the northwestern 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 a start-up/auxiliary steam boiler 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 start-up/auxiliary boiler would be shut down. The daily volume of energy generated by the plant may be extended using the start-up/auxiliary boiler. In addition to the boiler, each plant would use an air-cooled condenser or dry cooling to minimize water usage.

2.2.2 Common ~~Area~~(Shared) Facilities

The shared facilities (located in the common area) will include a combined administration, control, maintenance and warehouse building, evaporation ponds, groundwater wells, water treatment plant, . and a common switchyard. The common switchyard is where underground transmission lines from both plant substations will terminate. Electricity will be transmitted on a common gen-tie line and tower system from the switchyard to SCE's new CRS, located approximately 9.7 miles to the northwest of the project site.

The plants will be operated and maintained by a common crew of operators, working out of the administration and maintenance complex located in the common area, as well as a operators and technicians at each power block.

The Construction Logistics Area (CLA), which is located east of the existing WAPA and Transcanada transmission line Right of Ways will include temporary construction and material storage, staging, and laydown areas, heliostat assembly facilities, construction trailers, and parking areas,

~~A 120-acre shared common area would be provided adjacent to the far northern reach of Rio Mesa I to accommodate: a combined administration, control, maintenance, and warehouse building; heliostat assembly 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 both plant substation underground transmission lines would terminate.~~

2.2.3 Access Roads and Drive Zones

Access to the RMSEGF project site would be provided via Bradshaw Trail (primary) as paved and/or unpaved and 34th Avenue off of SR 78 (to the east). The access road would travel adjacent to agricultural land before reaching the mesa and 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 common gas tap/meter station will be constructed

and installed east of RMS-1 power block at the terminous of the eastern spoke road. The common gas tap/meter station will be owned by TransCanada or one of its subsidiaries and will~~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 (30th 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 each 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/auxiliary boiler 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 start-up/auxiliary-boilers will be controlled using state-of-the-art systems. To ensure that the systems perform correctly, a parametric (predictive) emissions monitoring systems for nitrogen oxides (NO_x) and carbon monoxide (CO) will be employed as required by the Mojave Desert Air Quality Management District.

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

Based on an approximate ~~26~~30-month construction period, there will be an average and peak workforce of approximately ~~1,040~~ 840 and 2,200~~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 both plants. The RMSEGF is expected to employ up to 100 full-time employees: 30 at Rio Mesa I; 30 at Rio Mesa II; and 40 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 3 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	17500 ~~25,000~~ ft^3	Cylinder
Diesel Fuel	Ignitability	Emergency Generator	Hazardous Material Storage Area	6365 ~~9,500~~ gal	Tank
Oxygen-Gaseous	Ignitability	Welding Operation	Hazardous Material Storage Area	56,000 ~~80,000~~ ft^3	Cylinder
Paint, solvents, adhesives, cleaners, sealants, lubricants	Toxicity	Construction Maintenance, Painting	Hazardous Material Storage Area	300 ~~500~~ gal	Can/Small Containers
~~Sodium Hydroxide~~	~~Corrosive~~	~~Spill Neutralization~~	~~Hazardous Material Storage Area~~	1~~50 gal~~	~~Carboy~~

Source: Rio Mesa Solar Electric Generating Facility, Application for Certification, filed June 20,2012 ~~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	700 ~~1,000~~ gal	Construction Equipment
Lubricating Oil	Mildly Toxic	Lubricating Equipment Parts	Hazardous Material Storage Area	15400 ~~22,000~~ gal	Drums and Equipment

Source: Rio Mesa Solar Electric Generating Facility, Application for Certification, filed June 20 2012~~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	1,206 ~~1,800~~ gal	300 gallon totes
Aqueous Ammonia (19% concentration)	Reactivity, toxicity	pH control for boiler chemistry	Power Block: Containers near power tower	1,206 ~~1,800~~ gal	300 gallon totes
Sulfuric Acid 93% (66° Baumé)	Corrosivity, reactivity, toxicity	pH control	Power Block: Containers in water treatment building	1,809 ~~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	9,380~~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	1608 ~~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	30,820 ~~46,000~~ gal	Aboveground storage tanks and in equipment
Paint, solvents, adhesives, cleaners, sealants, lubricants	Toxicity	Equipment maintenance	Power Block: Maintenance Shop	355 ~~500~~ gal	1-gal and 5-gal containers

Source: Rio Mesa Solar Electric Generating Facility, Application for Certification, filed June 20, 2012 ~~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	2,000 ~~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	1,000 ~~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)	1,400 ~~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)	1,400 ~~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)	334 ~~500~~ gal	55 gallon drums
Avista Vitec (Scale inhibitor)	Irritant, mildly toxic	Reverse osmosis scale inhibitor	Common Area: Containers in water treatment building	600 ~~900~~ gal	300 gallon totes
Sodium Bisulfite	Irritant, mildly toxic	Dechlorination	Common Area: Containers in water treatment building	600 ~~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	1,000 ~~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	20,000 ~~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	74,667~~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	4,000~~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	1,600 ~~2,400~~ gal	300 gallon totes

Source: Rio Mesa Solar Electric Generating Facility, Application for Certification, filed June 20 2012 ~~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 provide overnight system heating, plant start-up heating, and to extend the available power used to provide supplemental steam to the turbine generator late in the day or during intermittent cloud passage. 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 10 (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 Neighbours 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 and the project access may use the County ROW or an adjacent strip of private land to access the site.

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[1]			Highest No. of Accidents Over Period	Accident Rate
		2008	2009	2010		
SR 78 south of I-15	1,728~~2,100~~	3	3	1	4	0.0019
SR 78 north of 22nd Avenue	2,268~~1,600~~	0	2	1	3	0.0018
SR 78 north of 30th Avenue	1404 ~~1,300~~	0	1	3	3	0.0023
SR 78 south of 34th Avenue	1,800~~1,100~~	2	3	2	3	0.0027
Lovekin Blvd south of I-10	7,301~~6751~~	1	4	1	4	0.0005
28th Avenue west of Lovekin Blvd	778~~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		Accident Rate	Potential Additional Accidents[1]	
		During Construction	During Operation		During Construction	During Operation
SR 78 south of I-15	1,728~~2,100~~	1890~~1795~~	662~~510~~	0.0019	3.5	1
SR 78 north of 22nd Avenue	2,268~~1,600~~	810 ~~1755~~	428~~460~~	0.0018	1.5~~3~~	1
SR 78 north of 30th Avenue	1,404~~1,300~~	1350~~1731~~	97~~430~~	0.0023	3.0~~4~~	0.22 ~~0.77~~
SR 78 south of 34th Avenue	1,188~~1,100~~	137~~226~~	22~~110~~	0.0027	0.37~~0.61~~	0.06 ~~0.29~~
Lovekin Blvd south of I-10	7,301~~6751~~	0 ~~550~~	135 ~~685~~	0.0005	0.0 ~~0.29~~	0.07~~0.34~~
28th Avenue west of Lovekin Blvd	778~~713~~	0 ~~65~~	0 ~~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 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~~ two 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.

DRAFT

RIO MESA SOLAR ELECTRIC GENERATING FACILITY

FIRE PROTECTION AND EMERGENCY SERVICES NEEDS ASSESSMENT

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~~April 13, 2012~~ June 20,2012

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Appendices

Appendix A – Maps and Site Plan (refer to Section 1 and 2 of Environmental Enhancement Proposal)
Appendix B – Rio Mesa Solar Electric Generating Facility Fire Protection Design Basis

1.0 SCOPE OF STUDY

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 3,960 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 on privately owned land leased from the Metropolitan Water District of Southern California (MWD). Only the gen-tie line, emergency and construction electrical power supply, and access road will be located on public land managed by the Bureau of Land Management (BLM). Appendix A of this document provides the regional location of the project site.

The project site is located 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 Bradshaw Trail (primary) and 34th Avenue off of SR 78 (to the east). The access road would travel adjacent to agricultural land before reaching the mesa and 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 two 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 southeastern end of the project site. The second plant, known as Rio Mesa II, would be located in the northwestern 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 a start-up/auxiliary steam boiler 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 start-up/auxiliary boiler would be shut down. The daily volume of energy generated by the plant may be extended using the start-up/auxiliary boiler. In addition to the boiler, each plant would use an air-cooled condenser or dry cooling to minimize water usage.

2.2.2 Common ~~Area~~(Shared) Facilities

The shared facilities (located in the common area) will include a combined administration, control, maintenance and warehouse building, evaporation ponds, groundwater wells, water treatment plant, . and a common switchyard. The common switchyard is where underground transmission lines from both plant substations will terminate. Electricity will be transmitted on a common gen-tie line and tower system from the switchyard to SCE's new CRS, located approximately 9.7 miles to the northwest of the project site.

The plants will be operated and maintained by a common crew of operators, working out of the administration and maintenance complex located in the common area, as well as a operators and technicians at each power block.

The Construction Logistics Area (CLA), which is located east of the existing WAPA and Transcanada transmission line Right of Ways will include temporary construction and material storage, staging, and laydown areas, heliostat assembly facilities, construction trailers, and parking areas,

~~A 120-acre shared common area would be provided adjacent to the far northern reach of Rio Mesa I to accommodate: a combined administration, control, maintenance, and warehouse building; heliostat assembly 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 both plant substation underground transmission lines would terminate.~~

2.2.3 Access Roads and Drive Zones

Access to the RMSEGF project site would be provided via Bradshaw Trail (primary) as paved and/or unpaved and 34th Avenue off of SR 78 (to the east). The access road would travel adjacent to agricultural land before reaching the mesa and 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 common gas tap/meter station will be constructed

and installed east of RMS-1 power block at the terminous of the eastern spoke road. The common gas tap/meter station will be owned by TransCanada or one of its subsidiaries and will~~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 (30th 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 each 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/auxiliary boiler 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 start-up/auxiliary-boilers will be controlled using state-of-the-art systems. To ensure that the systems perform correctly, a parametric (predictive) emissions monitoring systems for nitrogen oxides (NO_x) and carbon monoxide (CO) will be employed as required by the Mojave Desert Air Quality Management District.

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

Based on an approximate ~~26~~30-month construction period, there will be an average and peak workforce of approximately ~~1,040~~ 840 and 2,200~~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 both plants. The RMSEGF is expected to employ up to 100 full-time employees: 30 at Rio Mesa I; 30 at Rio Mesa II; and 40 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 3 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 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

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 agreements, 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 total of 947 annual 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 a demand for responses to a emergency medical incident, 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 woud 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.

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 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~~ two 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.

Data Request 142

Report of Waste Discharge

R E P O R T

REPORT OF WASTE DISCHARGE - LINED WASTEWATER EVAPORATION PONDS - RIO MESA SOLAR ELECTRIC GENERATING FACILITY (RIO MESA SEGF)

Submitted to the

Colorado River Basin Regional Water Quality Control Board

Submitted by

Rio Mesa Solar I, LLC and Rio Mesa Solar II, LLC

July 2012

July 23, 2012

Ms. Maribel Rodriguez
Water Quality Control Board Colorado River Basin Region
73-720 Fred Waring Drive, Suite 100
Palm Desert, CA 92260

SUBJECT: Report of Waste Discharge for Lined Wastewater Evaporation Ponds - Rio Mesa Solar Energy Generating Facility
URS Project No. 27652105.00512

Dear Ms. Rodriguez:

On behalf of Rio Mesa Solar I, LLC and Rio Mesa Solar II, LLC, collectively the "Applicant" for the Rio Mesa Solar Electric Generating Facility project ("Rio Mesa SEGF"), URS is providing the attached Report of Waste Discharge (ROWD) for proposed Lined Wastewater Evaporation Ponds. This ROWD, Form 200, and fee (submitted previously) for the proposed Rio Mesa SEGF was prepared and is being submitted to the Colorado River Basin Regional Water Quality Control Board (RWQCB) at the request of the California Energy Commission (CEC), as part of the project Application for Certification (AFC) (11-AFC-04). The ROWD contains information previously submitted to the CEC as part of the AFC, updated to reflect current project conditions, to assist the RWQCB in preparing Waste Discharge Requirements for the project that will become part of the final CEC project permit.

Note that the fee for this project was determined by Mr. Herbert Jackson of the RWQCB to be $18,158.31. A check (No. 14114), dated June 14, 2012, from BrightSource Energy, Inc. for that amount was previously submitted to the RWQCB.

Sincerely,

URS CORPORATION

Matthew C. Moore

Matthew C. Moore, PE, CPESC, CPSWQ
Project Engineer

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Appendices

Appendix A Report of Waste Discharge Application (Form 200)

AFC	Application for Certification
APN	Assessor Parcel Number
BFE	Base Flood Elevations
BGS	Below ground surface
BLM	Bureau of Land Management
CAISO	California Independent System Operator
CCR	California Code of Regulations
CDCA	California Desert Conservation Plan
CEC	California Energy Commission
cfs	cubic feet per second
CQA	Construction Quality Assurance
DWR	California Department of Water Resources
EC	electrical conductivity
FEMA	Federal Emergency Management Agency
HDPE	High Density Polyethylene
LCRS	Leachate Collection and Removal System
lbm	Pounds mass
mil	A unit of length equal to one thousandth (10^{-3}) of an inch
mgd	Million gallons per day
msl	mean sea level
MW	Megawatt
PCC	Portland Cement Concrete
PCU	Power Conversion Unit
PGA	Peak Ground Acceleration
PPE	Personal Protective Equipment
Project	Rio Mesa Solar Electric Generating Facility
PVC	Polyvinyl chloride
RCC	Roller Compacted Concrete
RO	Reverse Osmosis
ROW	Right-of-Way
ROWD	Report of Waste Discharge
RWQCB	Regional Water Quality Control Board
SRSG	Solar Receiver Steam Generator
SWPPP	Stormwater Pollution Prevention Plan
TDS	total dissolved solids
USCS	Unified Soil classification System
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
WDR	Waste Discharge Requirements

SECTION 1 INTRODUCTION

This Report of Waste Discharge (ROWD) for the proposed Rio Mesa Solar Electric Generating Facility (Rio Mesa SEGF) was prepared at the request of the California Energy Commission (CEC) as part of the project Application for Certification (AFC) (11-AFC-04). This ROWD submittal to the Colorado River Basin Regional Water Quality Control Board (RWQCB) contains information previously submitted to the CEC as part of AFC Supplemental Filing 1-A, updated to reflect the current project layout and features. This ROWD submittal (and associated fee) to the RWQCB satisfies the requirements of CEC Data Requests Nos. 142 and 168.

The CEC is the lead agency (for licensing thermal power plants 50 megawatts [MW] and larger) under the California Environmental Quality Act (CEQA) and has a certified regulatory program under CEQA. Under its certified program, the Energy Commission is exempt from having to prepare an environmental impact report. Its certified program, however, does require environmental analysis of the project, including an analysis of alternatives and mitigation measures to minimize any significant adverse effect the project may have on the environment. The United States Bureau of Land Management (BLM), as lead Federal agency for the Project, is responsible for preparation of an Environmental Impact Statement in compliance with National Environmental Policy Act to evaluate the environmental impacts of the portions of the Rio Mesa SEGF on Federal lands.

The Rio Mesa Solar Electric Generating Facility (Rio Mesa SEGF) is being proposed for development by Rio Mesa Solar I, LLC and Rio Mesa Solar II, LLC, subsidiaries of BrightSource Energy, Inc., a Delaware corporation. The proposed project site consists of two 250 MW (nominal) solar concentration thermal power plants situated on the Palo Verde Mesa in Riverside County, California, 13 miles southwest of Blythe, and is located partially on private land and partially on public land administered by the BLM. See Figure 1 for the project location and layout. Each plant will utilize a solar power boiler, located on top of a concrete tower (approximately 750-feet tall), surrounded by heliostat (mirror) fields (approximately 85,000 per plant) which focus solar energy on the boiler.

The first plant, a 250 MW (nominal) facility known as Rio Mesa I, will be constructed at the southeastern end of the project and owned by Rio Mesa Solar I, LLC. The second plant, another 250 MW (nominal) facility known as Rio Mesa II, will be located in the northwestern portion of the project site and owned by Rio Mesa Solar II, LLC. A common facilities area including a switchyard will be located adjacent the far northern reach of the Rio Mesa Solar I solar field on MWD property. The common facilities area will include the project's wastewater treatment facility with discharge to two lined evaporation ponds (each two acres in size). These evaporation ponds will be designated as Class II Surface Impoundments Waste Management Units and will meet the requirements of the California Code of Regulations (CCRs), Title 27, CCR §20200 et seq. See Figure 2 for the site common area layout and evaporation pond locations.

SECTION 2 BACKGROUND

This section summarizes the responses to the CEC regarding AFC data adequacy and data requests related to development of waste discharge requirements for the evaporation pond discharge. This section is included in the ROWD submittal for reference background and reference purposes.

2.1 CEC DATA ADEQUACY SUBMITTALS

As part of the AFC data adequacy review, CEC staff requested that the project provide the following information:

> *In support of the development of Waste Discharge Requirements for discharge of industrial wastewater to the proposed evaporation ponds, provide a complete characterization of the discharge including but not limited to:*
>
> - *design and actual flows;*
> - *list of constituents and the discharge concentration of each constituent;*
> - *list of other appropriate waste discharge characteristics;*
> - *description and schematic drawing of all treatment processes;*
> - *description of any Best Management Practices used; and*
> - *description of disposal methods.*
>
> *To facilitate a more timely review and agency coordination, this information may be presented using the Regional Water Quality Control Board Application/Report of Waste Discharge General Information Form for Waste Discharge Requirements or NPDES Permit (Form 200).*
>
> *Characteristics of the source and discharge water(s) including identification of both organic and inorganic constituents before and after any project-related treatment. For source waters with seasonal variation, provide seasonal ranges of the expected physical and chemical characteristics. Provide information about the expected physical and chemical characteristics of the wastewater to be discharged to the proposed evaporation pond.*

The applicant provided the above information to the CEC on December 9, 2011 as part of AFC Supplemental Filing 1-A.

2.2 CEC DATA REQUESTS

2.2.1 Data Request Set 1B

The CEC staff requested in Data Requests Nos. 139 to 142, Set 1B, dated February 28, 2012 the following:

> *"**Background***
> *The applicant proposes to utilize Reverse Osmosis (RO) to treat the groundwater produced for water needs. The RO system will create reject water or concentrate with very high concentrations*

of total dissolved solids. The amount of reject water was not provided. The RO reject water is directed to on-site wastewater treatment plants. The RO system produces salts that have to be stored on-site in evaporation ponds and then later disposed of off-site. Staff needs to verify the handling of salts produced by the RO system to complete the Report of Waste Discharge.
Staff needs to verify that the applicant has done the following:

- *Conducted an analysis of the quantity of salts that would be generated by the RO system;*
- *Performed an analysis to determine the longest period that could occur where saltswould accumulate on site;*
- *Addressed all potential constituents that may be present and could be detrimental toflora and fauna; and,*
- *Provided adequate design details for evaporation ponds where salts will be storedfor offsite disposal.*

Data Request

139. Please conduct an analysis of the RO system to determine the average and maximum salt production rates on a monthly basis.

140. Please provide a discussion of potential salt accumulation using the longest period the salt may have to be stored on site.

141. Please provide an analysis showing all the constituents potentially detrimental to flora and fauna that may be present in the reject of the RO system and plans to mitigate such constituents.

142. Please provide all information necessary to file a Report of Waste Discharge to the Regional Water Quality Control Board and Energy Commission staff, and include the appropriate application fee to the RWQCB. This should include design details for evaporation ponds where generated salts will be stored."

2.2.2 Data Request Set 2A

Subsequent to Data Request Set 1B, the CEC staff issued Data Request No. 168, Set 2A, dated May 21, 2012 which stated the following:

*"**Background***
Staff requested in Data Request No.142, Set 1B., that the applicant pay the necessary fee for the Colorado River Regional Water Quality Control Board (RWQCB) to review the applicant's Report of Waste Discharge for the evaporation ponds that will be used for management and disposal of the proposed project's process wastewater. This fee is necessary for the Colorado River RWQCB to prepare the Waste Discharge Requirements; without payment of the fee, the RWQCB cannot begin work analyzing the proposed project and developing the necessary requirements. In accordance with the Energy Commission's in-lieu permit authority, staff works closely with RWQCBs to ensure that the identified requirements are incorporated into the final

project permit. These discharge requirements are necessary to ensure that any potential impacts from the evaporation ponds would be monitored and mitigated.

Data Request

168. Please provide documentation showing that the applicant has paid the Colorado River RWQCB the necessary fee for them to complete their review of the Report of Waste Discharge and prepare the Waste Discharge requirements for the evaporation pond monitoring and mitigation."

This ROWD combines and updates the information previously submitted to the CEC to satisfy the AFC submittal requirements (data adequacy requirements). The information previously submitted to the CEC can be located on the CEC website at:

Rio Mesa Project
http://www.energy.ca.gov/sitingcases/riomesa/documents/index.html

AFC Submittal
http://www.energy.ca.gov/sitingcases/riomesa/documents/applicant/afc/

AFC Supplemental Filing
http://www.energy.ca.gov/sitingcases/riomesa/documents/applicant/afc/supplement/2011-11-18_Response_to_Data_Adequacy_Review_TN-62930.pdf

AFC Supplemental Filing 1-A
http://www.energy.ca.gov/sitingcases/riomesa/documents/applicant/afc/supplement-1A/Supplement_1A_Water_Resources.pdf

Data Request Set 1B Response
http://www.energy.ca.gov/sitingcases/riomesa/documents/applicant/2012-03-29_Applicants_Response_to_Data_Requests_Set_1B_TN-64486.pdf

Data Request Set 2A Response
http://www.energy.ca.gov/sitingcases/riomesa/documents/applicant/2012-06-08_Applicants_Notice_for_Staffs_Data_Requests_Set_2A_TN-65696.pdf

SECTION 3 EVAPORATION POND DESIGN DATA

The two, two (2) acre evaporation ponds will be designed with a primary and secondary liner system and an intervening Leachate Collection and Recovery System (LCRS). The LCRS design provides for capture and conveyance of the seepage through the upper primary liner to a collection sump. LCRS sumps will be included in the design of each evaporation pond cell. Solution collected in the LCRS sumps will be pumped using a mobile pump, and returned to the evaporation ponds. These evaporation ponds will be designated as Class II Surface Impoundments Waste Management Units (WMU) and will meet the requirements of the California Code of Regulations (CCRs), Title 27, CCR §20200 et seq.

3.1 GENERAL EVAPORATION POND DESIGN CONCEPTS

The evaporation ponds are designed to provide contingency storage for the 100-year storm event acting over the respective pond area, with an additional one foot of freeboard (above the required design capacities). Pond berms with a minimum crest width of 15 feet are designed between ponds to allow access from all sides, as well as installation of bird netting supports. LCRS sumps will be included in the design of each evaporation pond cell. Solution collected in the LCRS sumps will be pumped using a mobile pump, and returned to the evaporation ponds.

Surface water run-on into the evaporation ponds includes surface water run-off from the perimeter berms and direct precipitation onto the evaporation pond area.

The evaporation pond design utilizes a double liner system with an intervening LCRS for groundwater protection and enhanced seepage protection, as follows (from top to bottom):

- Hard surface protective layer
- Non-woven geotextile
- 60-mil high density polyethylene (HDPE) upper (primary) geomembrane;
- An interstitial LCRS consisting of HDPE geonet;
- 60-mil HDPE lower (secondary) geomembrane;
- Reinforced geosynthetic clay liner (GCL) as the underliner component of the secondary composite liner system; and
- Prepared subgrade

An aggregate road base material will be placed along the top of each berm to provide an all-weather access location for maintenance vehicles. The material will conform to the California Department of Transportation (Caltrans) Specifications for Class II Aggregate Base. This will be installed to a minimum thickness of 6 inches and will be placed and compacted in accordance with Caltrans requirements.

See Figure 3 for the leak collection and recovery system pond cross section and details.

3.2 HARD SURFACE PROTECTIVE LAYER

A hard surface / protective layer will be constructed over a non-woven geotextile that covers the primary liner. The hard surface will allow for vehicular traffic during unscheduled or emergency maintenance or cleanout. Hard surface types to be considered and assessed include compacted clay, roller compacted concrete, or an approved equivalent (formed concrete, gunite, or other alternates).

Prior to the placement of the hard surfacing, a 1 foot thick sub-base layer consisting of granular fill with a maximum particle size of one-half inch (1/2") shall be placed and spread over the non-woven geotextile. The sub-base layer will be spread carefully and sequentially to avoid damage to the underlying liner system. After placement, the granular layer will be proof rolled using light compaction equipment.

3.3 UPPER (PRIMARY) LINER

The upper primary liner will consist of a conductive smooth 60-mil HDPE geomembrane sheet. An HDPE liner was chosen for its long term performance due to its chemical resistance properties, resistance to ultraviolet radiation, high tensile strength, and high stress-crack resistance.

To facilitate quality assurance during installation of the liner system, the upper primary geomembrane liner will be conductive to facilitate spark testing of the liner surface upon completion of the installation. This liner will be installed in accordance with current practices and will employ the use of wedge welding and extrusion welding procedures. In addition, destructive and non-destructive testing procedures will be used to ensure liner quality and continuity.

3.4 LEACHATE COLLECTION RECOVERY SYSTEM (LCRS)

As part of the evaporation pond design, a leachate collection and recovery system (LCRS) will be incorporated. If a leak occurs in the upper primary geomembrane, the LCRS is designed to minimize the hydraulic heads on the lower geomembrane liner.

The LCRS layer is designed with a thickness of 200 mil. In the event that leakage occurs through the upper geomembrane liner, it will be collected in the LCRS layer and routed (via gravity flow) to a LCRS sump located in each evaporation pond cell. The LCRS sumps will be conservatively sized using a minimum base dimension of approximately 10 feet for constructability. The sump for each evaporation pond cell is designed to have base dimensions of approximately 10 feet by 30 feet, with 3Horizontal to 1 Vertical (3H:1V) side slopes, and a 5-foot depth based on the designed grading for the pond cells (i.e., flat portions of the cell are underlain by the LCRS sump). The LCRS sump provides for sampling, removal of leachate solution, and return to the evaporation ponds by use of portable pump. This design is consistent with CCR, Title 27, Section 20340.

3.5 LOWER (SECONDARY) COMPOSITE LINER SYSTEM

Beneath the LCRS layer is a 60 mil smooth HDPE secondary geomembrane liner. This liner provides secondary containment of process solutions should leakage occur through the upper primary geomembrane liner. This liner will be installed in accordance with current industry practices and will

employ the use of wedge welding and extrusion welding procedures. In addition, destructive and non-destructive testing procedures will be used to ensure liner quality and continuity.

The lower secondary geomembrane liner will be underlain by a GCL, which consists of a layer of sodium bentonite encapsulated between two geotextiles with an upper woven geotextile and lower non-woven geotextile which is subsequently needle-punched together to form a hydraulic barrier material (i.e., CETCO Bentomat ST, or equivalent). The GCL is approximately 0.4 inches thick with a reported hydraulic conductivity of $5x10^{-9}$ centimeters per second (cm/sec). The sub grade under the GCL system will be scarified, moisture conditioned, compacted, and proof-rolled with a smooth drum roller to form a competent working surface. Use of the existing in-situ soils as a sub-base will be evaluated from geotechnical investigation and tests performed during the detailed design phase. Should the existing material be deemed not-suitable as a sub-base, imported fill material will be imported and placed according to the geotextile and GCL manufacturer's specifications.

3.6 LEACHATE COLLECTION AND RECOVERY SYSTEM DESIGN

Two sloped LCRS riser pipes will be provided within each sump to add redundancy to the system. The risers consist of 10-inch diameter, SDR-17 HDPE pipes. The lower ends of the pipes are slotted in the sump area to provide solution access into the risers. Solution is recovered via a mobile submersible pump which will be installed in the riser as needed. Recovered solutions will be returned to the evaporation pond system.

3.7 BIRD NETTING DESIGN

The acidic solution contained within the evaporation ponds represents a potential threat to endangered birds and migratory waterfowl. Birds view these ponds as an opportunity to rest and feed. If allowed to land, the birds may become poisoned by getting into contact with chemicals present in the evaporation ponds. In order to limit bird mortality, a bird netting system will be designed to reduce water fowl access to the evaporation ponds.

The individual pond cell dimensions of 140 feet by 280 (nominal) feet were selected based on a reasonable and practical span for the bird netting system. The bird netting system will consist of wooden support poles spaced approximately 48 feet apart along the 15-foot wide pond divider berms, designed to elevate and support the primary cable system. A secondary cable system will link the primary cables, creating a cable grid over which the netting can then be placed. The base of each wooden support pole will be sealed to prevent infiltration around the liner at the pole locations. The bird netting is designed with two-inch openings to prevent access from water fowl.

3.8 GCL UNDERLINER CONSTRUCTION CONSIDERATIONS

A geosynthetic clay liner (GCL) will be provided as the underliner component of the secondary composite liner system for the evaporation ponds. The design drawings and Technical Specifications will include increasing the manufacturer-recommended longitudinal overlap of the GCL (from 6 to 12 inches) and increasing the manufacturer-recommended end-of-roll overlaps (from 2 to 4 feet) to limit effects of GCL shrinkage within the evaporation pond liner system.

In addition to the construction considerations discussed previously, pre-hydration of the GCL is provided during the construction process to enhance the permeability characteristics of the GCL. Prior to GCL placement, the subgrade soils will be moisture conditioned and compacted to a minimum 95 percent of the standard Proctor (ASTM D 698) maximum dry density at optimum to plus 4 percent of the optimum moisture content. This recommended specification is based on the results obtained from research which shows that prehydration of the GCL is obtained via subgrade moisture absorption.

SECTION 4 MONITORING AND REPORTING PLAN

4.1 APPLICATION FORM

The RWQCB Report of Waste Discharge Application Form 200 is provided in Appendix A.

4.2 PROJECT AND FACILITY DESCRIPTION

The proposed project will include two solar concentrating thermal power plants and a shared common area to include shared systems. Each solar concentration thermal power plant will utilize a solar power boiler, located on top of a dedicated concrete tower, and solar field based on heliostat mirror technology developed by BrightSource, known as "LPT". The reflecting area of an individual heliostat (which includes two mirrors) is about 19 square meters [205 square feet (sq. ft.)]. The heliostat (mirror) fields will focus solar energy on the solar power boiler, referred to as "solar receiver steam generator" (SRSG) which converts the solar energy to superheated steam. In each plant, a Rankine cycle non-reheat steam turbine receiving this superheated steam will be directly connected to a rotating generator that generates and pushes the electricity onto the transmission system steam. Each power plant will generate electricity using solar energy as its primary fuel source. However, auxiliary boilers will be used to operate in parallel with the solar field during partial load conditions and occasionally in the afternoon when power is needed after the solar energy has diminished to a level that no longer will support solar-only generation of electricity. These auxiliary boilers will also assist with daily start-up of the power generation equipment and night time preservation.

The shared facilities (located in the common area) will include a combined administration, control, maintenance and warehouse building, evaporation ponds, groundwater wells, water treatment plant, and a common switchyard. The common switchyard is where underground transmission lines from both plant substations will terminate. Electricity will be transmitted on a common gen-tie line and tower system from the switchyard to Southern California Edison's new Colorado Rivers Substation, located approximately 9.7 miles to the northwest of the project site. These shared facilities will be jointly and equally owned by both project companies.

The plants will be operated and maintained by a common crew of operators, working out of the administration and maintenance complex located in the common area, as well as a operators and technicians at each power block.

The Construction Logistics Area (CLA), which is located east of the existing WAPA and Transcanada transmission line Right of Ways will include construction and material storage, staging, and laydown areas, heliostat assembly facilities, construction trailers, and parking areas,

A common gas tap/meter station will be constructed and installed east of RMS-1 power block at the terminus of the eastern spoke road. The common gas tap/meter station will be owned by TransCanada or one of its subsidiaries.

More detailed project and facility description information is included in the AFC and supplements. The following sub-sections outline the project water use and wastewater treatment facilities.

4.2.1 Water Supply and Use

Raw water will be drawn daily from on-site wells located in the common area. The wells will be designed to have sufficient capacity to supply water required for operation of the Project. Groundwater will pass through a treatment system before being used for potable water, service water, firewater, boiler make-up water, auxiliary cooling water, and to wash the heliostats. A raw water treatment plant will be located in the common area to clean raw well water for use by the Project. The treatment plant will be designed to remove impurities and make the water suitable for use in process production and mirror washing

To save water, due to the desert environment in which the site is located, each plant will use an air-cooled condenser (ACC) for the main steam cycle. Water consumption, therefore, will be minimal [estimated at no more than 84.5 acre-feet (ac-ft) per year (afy) for each plant, and 4.3 afy for the common area, for a total of 173.3 afy]. Water consumption during construction will peak at no more than 400 afy. Major contributors to water use during construction will include dust control activities and on-site concrete batch plants. The land lease agreement with MWD allows for access to up to 600 afy of water.

A treated water tank sized to accommodate a two-day reserve of process water that will include makeup for the demineralizer and wet surface air-cooled condenser will be located in the common area. A separate mirror wash tank will 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 firewater will be provided in the each power block area. A dedicated firewater storage tank, with the capacity to fight a 2-hour fire, also will be provided in the common area.

The Rio Mesa SEGF will 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.

4.2.2 Wastewater Discharges and Disposal

The primary wastewater collection system will collect process wastewater from all of the plant equipment, including the boilers and WSAC blowdowns. To the extent practical, process wastewater will be recycled and reused. Each plant and the common area will have an onsite Waste Water Treatment System (WWTS) consisting of either thermal distillation with mechanical vapor compression or a reverse osmosis system with ion exchange. Distillate/permeate collected from the WWTS will be recycled to the respective treated water storage tanks for reuse within the project site. Effluent from the WWTS will be diverted to two evaporation ponds (each two acres in size) located within the common area and allowed to evaporate. See Figure 4 for a diagram of the WWTS. Each pond will be lined with a HDPE liner to prevent infiltration of process wastewater into the subsoil below. Provisions to discourage use of ponds by avian species will be determined based on agency requirements. When needed, pond sludge will be removed and properly disposed of at an off-site facility by an outside contractor.

Domestic waste streams for items such as showers and toilets at each plant and the common facilities will be routed through separate on-site septic systems and leach fields. Sewage sludge from the septic tanks will be removed from the project site by a local sanitary service provider.

General plant drains will collect containment area washdown, and wastewater from sample drains and plant equipment drains. Water from these areas will be collected in a system of floor drains, hub drains, sumps, and piping and routed to the wastewater collection system. Wastewater from drains that potentially could contain oil or grease will first be routed through an oil/water separator. Similarly, drains in the common area are only located in the water treatment building. These drains will be collected and routed to a sump and pumped back to the wastewater collection tank for process in the WWTS. Any of these drains that could potentially contain oil or grease will be administratively controlled via operational procedures. Wastewater from the power blocks will be piped to the common area. Reject waste produced from the reverse osmosis process in the raw water treatment in the common area will be captured in the wastewater collection tank and treated in the wastewater treatment system.

Demineralized water from the mixed-bed system in each plant will be used as the feed water for power cycle makeup. The mixed-bed unit will be a self-contained, skid-mounted unit and the resin will be regenerated off site.

Boiler water discharged from each SRSG, boiler blowdown, will be treated to maintain the water chemistry within acceptable ranges. Boiler blowdown from the SRSG will be routed to the SRSG flash tank. Flash steam from the flash tank will be recovered back into the steam cycle via the deaerator. Condensate from the flash tank will be further flashed to 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, startup/auxiliary boiler will also be collected in blowdown tanks and recovered in the treated water storage tank. As with SRSG boiler blowdown, this water may alternatively be discharged to the wastewater collection tank for treatment.

4.3 PHYSICAL SETTING

Note that the references within the section subheadings below refer to the Title 27 section reference.

4.3.1 Site Location [21600(B)(3)(D)]

The Rio Mesa SEGF site will be located in an unincorporated area of eastern Riverside County, California, situated 13 miles southwest of Blythe, California. It is located partially on private land owned by the Metropolitan Water District of Southern California (MWD), a California public agency, and partially on public land administered by the BLM.

The project site and linear features are located in the Palo Verde Valley, south of Interstate 10 (I-10) freeway and north of the Imperial County line. The site is west of State Route 78. There is an existing SCE transmission line along State Route 78 through agricultural fields. The existing Imperial Irrigation District (IID) transmission line and the Western Area Power Administration (WAPA) transmission line border the project site on the northwest and east, respectively. The existing TransCanada Gas Transmission Company (TCGT) North Baja Pipeline borders the site on the east. Bradshaw Trail intersects the project site at an east-west orientation. The Colorado River borders eastern Riverside County and Arizona approximately 5 miles to the southeast at its nearest point.

The Palo Verde Valley is situated between the project site on the Palo Verde Mesa to the west and the Colorado River to the east. The area is comprised primarily of open space and agricultural land. There is some very low density residential use in the vicinity of the project site. Palo Verde is the closest community to the project site, which is approximately 2.3 miles east of the southeast corner of the project site boundary on the border of Riverside and Imperial Counties but located within Imperial County. AFC Figures 5.15-1 and 5.15-2 provide the surface water and groundwater basin maps, respectively.

4.3.2 Land Use [21600(B)(3)(E), 21750(H)]

The Project will include two solar concentrating thermal power plants and a shared common area to include shared systems. Each plant will have a nominal output of 250 MW. The Project will be executed in two phases. Each 250 MW plant requires about 1,850 acres (2.9 square miles), for a total project area of approximately 4,000 acres required both plants and the common area.

The legal description of the land administered by BLM on which the generator tie-line (gen-tie line) will be located is:

> *Portions of Sections 7, 8, 9, 15, 16, 17, 22, 23, 26, and 35, Township 07 South, Range 21 East, San Bernardino Meridian, Riverside County, California.*
>
> *Portions of Sections 2, 11, 13, 14 and 15, Township 08 South, Range 21 East, San Bernardino Meridian, Riverside County, California.*

The legal description of the private lands under lease from MWD on which the balance of the Rio Mesa SEGF facility will be located is:

> *All of Section 28 and portions of Sections 15, 16, 20, 21, 22, 23, 27, 29, 33, and 34, Township 08 South, Range 21 East, San Bernardino Meridian, Riverside County, California.*

Four additional features, consisting of linear corridors used for site access and electrical service lines, also are part of the Project. For purposes of defining the approximate ROW for each 200-foot corridor, the areas extending 100 feet on either side of centerline are included in the ROW descriptions. The legal descriptions of the land on which these four linear features will be located are as follows:

Bradshaw Trail Access Road Corridor:

> *Portions of Sections 12 through 15, Township 08 South, Range 21 East, and Portions of 7 and 18, Township 08 South, Range 22 East, San Bernardino Meridian, Riverside County, California.*

33 kV Service Line Corridor New ROW:

> *Portions of Sections 12 through 14, 22 and 23, Township 08 South, Range 21 East, San Bernardino Meridian, Riverside County, California.*

33 kV Service Line Corridor Existing ROW Overbuild:

Portions of Sections 3 through 10, 17, and 18, Township 08 South, Range 22 East, San Bernardino Meridian, Riverside County, California.

34th Avenue Access Road Corridor:

Portions of 23 through 27, Township 08 South, Range 21 East, San Bernardino Meridian, Riverside County, California.

The site is currently mostly undeveloped and is surrounded primarily by undeveloped land to the north, south, and west with agricultural lands located to the east. The project site is comprised primarily of creosote desert scrub with areas of desert wash scrub within the on-site washes. Portions of the site are disturbed due to existing infrastructure (transmission lines, pipelines, past military training activities, etc.). The gen-tie line passes through BLM lands and other private lands and is mainly comprised of desert scrub habitat and disturbed lands associated with existing infrastructure. The project site has several utility lines with maintenance roads running through it and has been subject to disturbance from illegal off-road vehicle use, dumping of trash, and historic use for military training during World War II including tank training.

4.3.3 Soil Contamination

A Phase I Environmental Site Assessment was completed for the Rio Mesa SEGF in September 2011 (URS, 2011). No contaminated soils have been specifically identified in the areas of the site inspected as part of this assessment.

4.3.4 Topography [21750(D)(1)]

The project site is mapped within the Thumb Peak and Roosevelt Mine, California, 7½-minute topographic quadrangles. The site is located on Palo Verde Mesa which lies on the eastern flank of the Mule Mountains to the west and Palo Verde Valley (the floodplain of the Colorado River) to the east (Figure 1). The ground surface elevation across the main project site ranges from approximately 245 feet above mean sea level (amsl) at the southeastern corner to approximately 500 feet amsl near the northwestern corner. The ground surface elevation at the northwestern end of the corridor is approximately 475 feet amsl and approximately 300 feet amsl at the southern junction with the main project site.

4.3.5 Flooplain [21750(D)(2)]

The project site generally slopes to the east. The average slope is approximately one percent. Sparse desert vegetative brush covers most of the area within the project site, with the exception of barren, hilly areas located along the north-western boundary of the site. The project site and tributary area runoff discharges east through several ephemeral washes on site. The washes convey runoff to Hodges Drain (a man-made drainage canal), which borders the project site to the east. Hodges Drain conveys runoff approximately two miles south to the Palo Verde Outfall Drain. Runoff continues south approximately 6.5 miles within the Palo Verde Outfall Drain where it discharges to the Colorado River. No dams or levees are located upstream of the project site. With the exception of Hodges Drain and Palo Verde

Outfall Drain, there are no other identified large scale existing or proposed offsite flood control projects in the vicinity of the Rio Mesa SEGF.

4.3.6 Climatology [21750(E)]

Annual rainfall amounts in the Colorado River Hydrologic Region range from less than 3 to approximately 6 inches. Most of the precipitation for the region occurs in the winter and spring. However, monsoonal thunderstorms, created by the movement of subtropical air from the south, do occur in the summer and have generated significant rainfall in some years. Higher annual rainfall and milder summer temperatures occur in the mountains to the north and west of the hydrologic region. Clear and sunny conditions typically prevail, and the region receives 85 to 90 percent of the maximum possible sunshine each year; the highest value in the U.S. Table 1 provides average historical rainfall from the meteorological station at the Blythe Airport weather station, approximately 10 miles northeast of the project site.

Table 1
Rainfall Near the Proposed Project Site (1948-2010) (AFC Table 5.15-2)

Precipitation (inches)	Annual	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average	3.54	0.49	0.44	0.36	0.15	0.02	0.02	0.23	0.62	0.35	0.26	0.19	0.41
Maximum	9.16	2.48	3.03	2.15	3.00	0.22	0.91	2.44	0.92	2.14	1.89	1.84	3.33
Minimum	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: Western Regional Climate Center, 2010

The mean annual precipitation (1948 to 2010) recorded at the Blythe Airport weather station is 3.54 inches per year. The minimum and maximum annual precipitation for the period of record is 0.59 inches and 9.16 inches, respectively. According to the National Oceanic and Atmospheric Administration Atlas 14 for Southeastern California (2003), between 3 and 3.5 inches of rain are expected to fall in a 100-year, 24-hour storm event.

4.3.7 Geology and Seismicity [21750(F)]

The project area is located in southeastern California along the western flank of the Colorado River floodplain. According to Note 36 from the California Geological Survey (CGS), which outlines California's Geomorphic Provinces, the general area is within the Mojave Desert Physiographic Province (CGS, 2002). The Mojave Desert Physiographic Province is described as a high desert, whereas the project area is in an area that would be described as a low desert, which is more typical of the characteristics of the Colorado Desert Physiographic Province (Norris and Webb, 1990). For this reason, there is some debate about which physiographic province the project area fits.

In general, the region consists of desert mountain ranges surrounded by extensive alluvial fans and plains. However, the Colorado River has played a major role in reworking the landforms in its path and plays an intricate part in the local geology.

In 1967, Jennings mapped the Needles 30' by 60' quadrangle at a scale of 1:100,000. Until recently, this was the most detailed geologic map that encompassed the entire project area. In 2006, the United States Geological Survey (USGS) produced an in-depth geologic study with a geologic map at a scale of 1:24,000 that covered the western Blythe area and extended south into the northern portion of the project area (USGS, 2006). Expansion of this data southward to encompass the entire project site was performed in March of 2010 by URS Corporation (URS, 2011b). This additional mapping effort was initially done using GIS and aerial photographic analysis, and was followed up with verification field mapping.

The project area is primarily situated on the Palo Verde Mesa. The Palo Verde Mesa is bounded to the south and west by the volcanic and plutonic rocks that form the Mule Mountains, to the north by an extension of the Chuckwalla Valley that separates the Mule and McCoy Mountains, and to the east by the broad floodplain of the Colorado River. The rock outcrops of the Mule Mountains are heavily eroded and mantled by a series of Quaternary-age alluvial fans. Alternatively, the Colorado River floodplain is composed of more recent alluvial material deposited by the river. Between these two areas lies the Palo Verde Mesa, which is primarily composed of inset Pleistocene terraces of the Colorado River (URS, 2011b).

The project area can be divided into two dominant structural sections. One section consists of the Mule Mountains and associated coalescing alluvial fans (western area) gradually sloping down to the east. These alluvial fans have varying degrees of desert pavement development on the surface. The second dominant structural section is formed by several inset alluvial terraces which form the Palo Verde Mesa (central area), and the modern Colorado River floodplain (eastern area). These alluvial terraces were formed by successive aggradations and degradations of the Colorado River (URS, 2011b).

Ninyo & Moore performed a Preliminary Geotechnical Evaluation for the Project (Ninyo & Moore, 2011). Subsurface investigations included borings, Cone Penetration Tests (CPTs), and test pits through much of the main project area. The explorations encountered primarily silty fine sands with gravel and coarse sands. The materials ranged in density from loose to very dense; however, the majority of the subsurface investigations reported medium dense to dense silty sands. None of the subsurface investigations encountered groundwater. The depth to groundwater is anticipated to be approximately equivalent to the surface of the nearby Hodges Drain located east of the project site.

The project area is located in seismically active Southern California, a region that has experienced numerous earthquakes in the past. According to the Alquist-Priolo Earthquake Fault Zone Maps (CGS, 2000), there are no Earthquake Fault Zones within the project area. In addition, no active fault zones are present within 20 miles of the Project. The majority of fault activity in the region is to the west of the project area. The nearest active fault (showing movement in the last 11,000 years) is the San Andreas Fault, located approximately 55 miles to the southwest. Inactive faults exist in the mountains that border the western edge of the project area but none are mapped within its boundaries. The nearest fault to have shown activity in the Quaternary period is the Blythe Graben located approximately 20 miles north of the project area. The tectonic significance and age of this fault is unknown.

The project area is subject to an estimated peak ground acceleration (PGA) between approximately 0.10 percent of gravity (g) and 0.12g with a 10 percent probability of being exceeded in 50 years, and a PGA between 0.12g and 0.16g with a 2 percent probability of being exceeded in 50 years (Ninyo & Moore, 2011).

The following subsections discuss the potential geological hazards that might occur in the Project area.

Ground Rupture

The site is not located within an area delineated by the AP Earthquake Fault Zone Act. Based on the referenced sources reviewed, no faults have been mapped transecting the proposed project site or linear elements. The potential for ground rupture to impact the Project is considered low.

Seismic Shaking

During an earthquake, seismic waves are produced that emanate in all directions from the fault rupture. Seismic waves can produce strong ground shaking that is typically strongest near the fault and attenuates as the waves move away from the source. The severity of ground shaking is controlled by the interaction of magnitude, distance, and the type, thickness, and condition of underlying geologic materials. Areas underlain by unconsolidated, recent alluvium or fill may amplify the strength and duration of strong ground motion.

Based on the seismic setting, the Project is likely to experience strong seismic shaking within the lifetime of the Project.

Liquefaction and Seismic Settlement

During strong ground-shaking, loose, saturated, cohesionless soils can experience a temporary loss of shear strength. This phenomenon is known as liquefaction. Liquefaction is dependent on grain size distribution, relative density of the soils, degree of saturation, and intensity and duration of the earthquake. Potential hazards associated with liquefaction are seismically induced settlement and lateral spreading. Large scale GIS based natural hazard mapping performed by Earth Consultants International (ECI) in 2000 delineates the Colorado River Valley area to have a liquefaction susceptibility as high (ECI, 2000). However, based on recent groundwater data collected that shows groundwater to be greater than 150 feet deep on the mesa, the susceptibility is low (Ninyo & Moore, 2011). According to Ninyo & Moore (2011), the majority of the subsurface soil on the Palo Verde Mesa and in the alluvium to the east, is medium dense to dense silty sands. Furthermore, shallow groundwater conditions are not expected along the proposed linear elements. Due to the geologic setting of the project area, the site is considered to have a low potential for liquefaction.

Settlement of dry sands can occur during a seismic shaking event, potentially resulting in settlement of the ground surface and supported structures. One of the most important parameters affecting the settlement of dry sands is the relative density of the soil (Silver & Seed, 1971). Subsurface evaluations (Ninyo & Moore, 2011) indicated subsurface materials are generally medium dense to very dense. However, in some locations loose sands extended to depths up to 10 feet below the ground surface. The active alluvial channels that transect the project area, as well as the areas underlain by eolian sands may be relatively loose at or near the ground surface. Foundation design considers the potential presence of loose sands.

Subsidence

Subsidence can be caused by natural phenomena during tectonic movement, consolidation, hydro-compaction, liquefaction and seismic settlement, or rapid sedimentation. Subsidence can also result from human activities, such as withdrawal of water and/or hydrocarbons in the subsurface soils. As of 2000, no documented subsidence has been noted in the area of the project site (ECI, 2000). Based on the geologic setting, the potential for widespread subsidence is considered low inasmuch as there is no significant fluid withdrawal in the project area.

Expansive Soils

Expansive soils are clay-rich soils that have the ability to shrink and swell with wetting and drying. The shrink-swell capacity of expansive soils can result in differential movement beneath foundations. Based on the preliminary geotechnical evaluation by Ninyo & Moore (2011), the soils in the project area are primarily composed of coarser grained material, such as sands and silty sands, with minor amounts of gravel. A minor clay layer was noted to exist within the project site as observed during field mapping in March of 2011 (URS, 2011b). In general, the potential for expansive soils in the main project area is low.

Subsurface data is not available in the within the gen-tie line corridor. However, this area is mapped with similar geology as the main project area and is likely to have similar non-expansive soil characteristics. Similarly, geotechnical data is not available for the linear elements that extend eastward into the Colorado River Plain. There is considered to be some potential for finer grained-materials with expansive properties along these linear elements. Further geotechnical studies and the engineering design for the Project will consider the potential for expansive soil. Expansive soils, if present, can be mitigated by removing the soil and backfilling with non-expansive soil, instituting chemical stabilization of the soil, or designing foundations to resist uplift of the expansive soil.

Slope Stability

Slope instability depends on slope inclination, underlying geology, surface soil strength, and pore pressures in the soil. Significant excavating, grading, or fill work during construction could also introduce temporary slope stability hazards.

Slope stability hazards are not expected to be a concern across the majority of the project area where topographic relief is minimal (ECI, 2000). Further, significant earthwork consisting of large cuts and fills is not planned for the Project. However, areas where the alluvial washes have incised relatively steep walls in the existing Palo Verde Mesa, as well as the eastern edge of the Palo Verde Mesa where it rises above the Colorado River Basin, have a higher potential for slope instability as a result of natural erosion. Site-specific slope stability evaluations will be required for development adjacent to these slopes, if impacted by the Project.

4.3.8 Hydrogeology [21750(G)]

The project site, which is underlain by the Palo Verde Mesa Groundwater Basin (PVMGB), lies on a mesa at a higher elevation than the Colorado River floodplain. The boundary between the PVMGB and the Palo Verde Valley Groundwater Basin (PVVGB) is not a barrier, but appears to be defined based on

surface water flow and topography. The PVMGB is bounded by non-water-bearing rocks of the Big Maria and Little Maria Mountains on the north, the McCoy and Mule Mountains on the west, the edge of the Palo Verde Mesa on the east, and the Palo Verde Mountains on the south. The northwest boundary and parts of the western boundary are drainage divides (Metzger et al. 1973; Jennings 1967). Groundwater is derived primarily from a surficial alluvial aquifer that is connected to the Colorado River. In the PVMGB, groundwater is also derived from the surficial alluvial aquifer and older Tertiary deposits, including Miocene-age fanglomerate and the Bouse Formation.

Quaternary Alluvium. Alluvium is the water-bearing material that forms the basin and includes unconsolidated Holocene age deposits and overlying unconsolidated to semi-consolidated Pleistocene deposits (DWR 1954, 1963). Holocene alluvium is composed of poorly sorted gravel, sand, silt, and clay that typically lie above the water table (DWR 1963). Pleistocene alluvium is composed of well sorted sand, interbedded with gravel, silt, and clay that, where saturated, yields water freely to wells (DWR 1963).

Jennings (1967) mapped the sediments of the Palo Verde Mesa as Qc and Qal (Pleistocene nonmarine deposits and Quaternary alluvium). Metzger et al. (1973) mapped them as QTa and Qa (older alluviums and younger alluvium). Jennings (1977) mapped them as Qoa and Qal (older Quaternary alluvium and Quaternary alluvium). Stone (1990) mapped them as QTa (alluvial fan and fluvial deposits) and Stone (2006) mapped them as Qpv (alluvial deposits of Palo Verde Mesa).

According to Metzger et al. (1973), the Palo Verde Mesa consists of five alluviums (units A through E). Unit B (subsurface) has Pliocene roundstone gravels of exotic provenance. The rounded pebbles and cobbles of the Pliocene unit B are polymineralic. They are composed of various sedimentary, metamorphic, and igneous rock types.

Pliocene Bouse Formation. The regionally extensive Pliocene Bouse Formation has been identified as underlying the Quaternary Alluvium in the area. Metzger (1968) reported that erosional remnants of the Bouse Formation are present in a belt approximately 20 to 30 miles wide extending along the Lower Colorado River for approximately 190 miles from Lake Mohave to near Yuma, Arizona.

The Bouse Formation includes a marine to brackish-water estuarine sequence deposited in an arm of the proto-Gulf of California (Metzger 1968; Wilson and Owen-Joyce, 1994). This formation has alternatively been interpreted as, or may include, lacustrine sediments deposited in a closed, brackish basin (Stone, 2006). It is reported to be composed of a basal limestone (marl) overlain by interbedded clay, silt, sand and tufa. The top of the Bouse Formation is relatively flat lying with a reported dip of approximately 2 degrees south of Cibola (Metzger and others, 1973).

Natural recharge of the PVMGB is chiefly from percolation of precipitation and subsurface inflow from the Chuckwalla Valley Groundwater Basin to the west and the PVVGB to the east (DWR, 2004). Irrigation water percolation contributes approximately 10% of the PVMGB and PVVGB recharge. Recharge to the PVMGB and PVVGB totals approximately 424,600 acre-feet (af) (WP 2011). Groundwater movement is generally in the southeast direction

Groundwater flow in the PVMGB is generally toward the southeast to Palo Verde Valley. Depth to groundwater on site ranges from about 140 to 160 feet below the ground surface (bgs) based on

information in the National Water Information System (NWIS) database (USGS 2010-2011). This corresponds with groundwater elevations ranging from approximately 224 to 232 feet above mean sea level (amsl). In addition to the wells that appear to be associated with the SunDesert Project, the USGS NWIS database indicates that there are many observations, destroyed, abandoned, and pumping wells in the PVMGB and the adjacent PVVGB. These wells are shown on AFC Figure 5.15-4. A *Report of Groundwater Sampling and Monitoring* at the Rio Mesa SEGF site, prepared by URS, includes the results of water-level monitoring for 19 wells and groundwater quality analyses for two wells sampled in the project area (URS 2011; Appendix 5-15E). The water level monitoring results are shown in Table 5.15-3 below and the well locations are provided on AFC Figure 5.15-5. WP also analyzed several wells within the PVMGB and PVVGB to determine groundwater level trends in the *Assessment of Groundwater Conditions Report* for the Project (WP 2011). The report (Appendix 5.15D) indicated that groundwater levels within the PVMGB have remained relatively stable, with some localized water level declines due to pumping.

Table 2
Groundwater Well Information and Water-level Measurements (AFC Table 5.15-3)

Well ID	Notes	Depth to Groundwater (btoc)	Total Depth (feet btoc)	Riser Height (inches ags)	Easting	Northing	Location ID on AFC Figure 5.15-5
27R001S	1	DRY	36.84	15.6	7009396.19	21103178.85	7
28R001S (B-OB-2) [a]	2	145.10	350.10	--	7009386.21	2110319.95	3
28R002S [a]	2	142.66	339.20	21	7009415.58	2110068.11	4
28R003S [b]	3	144.66	345.80	--	7009309.57	2110238.30	1
28P001S [a] (Well O/BDH-42)	4	163.10	417.30	16.8	7007638.85	2110073.52	6
28Q001S (B-OB-1)	2	145.68	404.50	21	7009045.85	2110381.36	2
28Q002S (Well D/BHD-39)	4	147.87	506.35	20.25	7008606.64	2110591.79	5
33G001S (B-DH-19)	4	DRY	132.56	8	7008817.77	2107392.13	8
33J001S	5	DRY	18.28	14.25	7010313.56	2106918.94	9
34M001S	5	DRY	15.91	21	7010499.84	2106858.70	10
A	4	DRY	101.52	20.25	7008261.33	2111003.53	11
B	4	32.40	86.76	18.5	7008464.32	2111010.90	12
C (SB6-83)	4	DRY	101.46	15.5	7008668.49	2111003.58	13
E	4,5	16.18	98.30	0	7008852.36	2111005.03	14
F	4	DRY	99.60	9.5	7009098.89	2111004.13	15

Table 2
Groundwater Well Information and Water-level Measurements (AFC Table 5.15-3)

Well ID	Notes	Depth to Groundwater (btoc)	Total Depth (feet btoc)	Riser Height (inches ags)	Easting	Northing	Location ID on AFC Figure 5.15-5
G	4	DRY	100.55	22	7009300.39	2111003.81	16
H	4	145.43	490.00	23	7009183.60	2111138.48	17
I	4	DRY	100.99	28	7009097.75	2111155.33	18
J	4	100.70	100.80	15.5	7009097.91	2111618.16	19

Notes:
[a] Observation well
[b] Pumping well
1 - 8" Galvanized Steel
2 - 4" polyvinyl chloride (PVC) with Drum Cap
3 - 12" Steel Casing
4 - 3" PVC
5 - No Cap

btoc - below top of casing
ags - above ground surface

The total storage capacity of the PVMGB is estimated at 6,840,000 af (DWR 1975). The total amount of groundwater in storage is unknown. Despite drier than normal conditions in the past 10 years, consumption of surface water from the Colorado River and groundwater has remained constant through the period.

Groundwater is calcium-sodium chloride or calcium-sodium sulfate in character. Groundwater quality impairments in the basin consist of arsenic, selenium, fluoride, chloride, boron, sulfate, and total dissolved solids (TDS) concentrations are above their respective maximum contaminant levels (MCLs) for drinking water in California. Because of the higher than recommended values of TDS, some groundwater in the basin is unsuitable for domestic and irrigation purposes. Fluoride concentrations above the MCL for drinking water has been found in the older geologic units such as the Bouse Formation and Miocene-age fanglomerate (DWR 2004). The water quality in the surficial deposits is generally of slightly better quality than the Bouse Formation (DWR 2004).

As part of the Report of Groundwater Sampling and Monitoring at the Rio Mesa SEGF site, prepared by URS, sampling and analyses of groundwater from two on site wells (28R003S and 28Q002S) located in Township 8 South, Range 21 East (URS 2011, Appendix 5.15E). Laboratory analytical results for the groundwater samples collected and analyzed are provided in Table 3. The two well locations are shown as Wells 1 and 5, respectively, on AFC Figure 5.15-5. Analytical data for Well 28R003 from 1976 are included in this table for comparison to the recent data.

Table 3
Groundwater Analytical Results for Two Test Wells on Project Site (AFC Table 5.15-4)

Analyte	Well #28R003S			Well #28Q002S	Primary/ Secondary MCL
Date Sampled	1976a	1/26/11	5/11/11	1/26/11	
Title 22 Metals:					
Antimony	NA	<0.000380	<0.000380	<0.000380	0.006
Arsenic	NA	0.00919	0.0129	<0.000589	0.01
Barium	NA	0.0184	0.0269	0.0845	1.0
Beryllium	NA	<0.000131	<0.000131	<0.000131	0.004
Cadmium	NA	<0.000266	<0.000266	<0.000266	0.005
Chromium	NA	0.00151	0.00138	0.00351	0.05
Cobalt	NA	<0.000618	<0.000140	0.00027J	NE
Copper	NA	0.00054 J	0.00121	0.0483	1.0*
Lead	NA	<0.000170	<0.000170	0.00033J	0.015
Mercury	NA	<0.0000348	<0.0000348	<0.0000348	0.002
Molybdenum	NA	0.0438	0.0589	0.0249	NE
Nickel	NA	0.00067J	0.00164	0.0117	0.1
Selenium	NA	<0.000554	0.00461	0.00173	0.05
Silver	NA	<0.000120	<0.000120	<0.000120	0.1*
Thallium	NA	<0.000498	<0.000498	<0.000498	0.002
Vanadium	NA	<0.000790	<0.000790	<0.000790	NE
Zinc	NA	0.00635	0.0101	0.350	5.0
Base Cations:					
Calcium	56	18.3	36.2	89.8	NE
Magnesium	5	2.27	3.70	19.1	NE
Sodium	580	511	615	363	NE
Potassium	11	5.02	6.81	5.28	NE
Other Metals:					
Aluminum	NA	<0.0105	<0.0105	<0.0105	0.2*
Iron	0.08	0.321	0.250	0.0618	0.3*
Manganese	NA	0.00782	0.0188	0.00991	0.05*
Anions:					
Fluoride	3.8	4.2	4.2	0.41	2.0
Chloride	604	740	730	470	250*

Table 3
Groundwater Analytical Results for Two Test Wells on Project Site (AFC Table 5.15-4)

Analyte	Well #28R003S			Well #28Q002S	Primary/ Secondary MCL
Date Sampled	1976a	1/26/11	5/11/11	1/26/11	
Nitrate (as N)	2	<0.017	0.0045	0.070J	10
Total Alkalinity (as CaCO3)	160b	74.0	95.0	124	NE
Sulfate	450	390	420	410	250*
o-Phosphate (as P)	NA	<0.014	<0.047	<0.014	NE
Bicarbonate (as CaCO3)	140	74.0	95.0	124	NE
Hydroxide (as CaCO3)	NA	<0.85	<0.85	<0.85	NE
Silica:					
Total	32	19.000	36.6	15.000	NE
Dissolved	NA	17.000	34.7	14.000	NE
Colloidal (Reactive)	NA	19	30	15	NE
General Water Quality Parameters:					
SC (umhos/cm)	2900	2900	2600	2300	900*
TDS	1815	1850	1840	1570	500*
pH (unitless)	7.7	8.60	8.12	7.27	NE
Turbidity (NTU)	0	14	4.8	5.6	NE
TSS	5	5.4	5.9	8.9	NE
Phosphorus	NA	0.27	0.12	0.35	NE
Carbon Dioxide	NA	<1.0	1.5	12	NE
Total Organic Carbon (TOC)	NA	NA	0.12	NA	NE
Other Priority Pollutants:					
Cyanide	NA	<0.050	<0.0070	<0.050	NE
SVOCs: Bis (2-Ethylhexyl) Phthalate (ug/l)	NA	<10	ND	2.3J	NE
OCPs	NA	ND	ND	ND	NE
PCBs	NA	ND	ND	ND	NE
VOCs: Toluene (ug/l)	NA	ND	1.4	ND	NE

Table 3
Groundwater Analytical Results for Two Test Wells on Project Site (AFC Table 5.15-4)

Analyte	Well #28R003S			Well #28Q002S	Primary/ Secondary MCL
Date Sampled	1976a	1/26/11	5/11/11	1/26/11	

Notes:
a: From Stone and Webster, 1976. Represents average concentrations for five samples collected during aquifer testing.
b: Reported as total hardness (as CaCO3).
J: Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
NA: Not Analyzed
NE: None Established
ND: None detected; see laboratory report for detection limits for specific compounds.
SVOCs: Semivolatile organic compounds
OCPs: Organochlorine pesticides
PCBs: Polychlorinated biphenyls
VOCs: Volatile organic compounds
MCL: Maximum Containment Level
MCL is primary, unless indicated with an asterisk (*) that indicates secondary
BOLD indicates concentration is above MCL
The symbol "<" (less than) indicates the constituent was not detected above the analytical detection limit specified
Units are given in mg/L, unless otherwise noted.

The main project site is not located within the service area of any municipal or commercial water supplier. According to the "Law of the River", which includes several compacts, agreements, court decisions, decrees, contracts and regulatory guidelines, consumptive use of Colorado River water can occur through direct diversions of surface water, as well as through withdrawal of water from the river by underground pumping.

4.3.9 Water Use [21750(H)]

In the mid-1970s, the project site was considered as a possible location for a nuclear power plant (SunDesert Project). Extensive studies were conducted as part of a Final Site Environmental Statement (ES) on behalf of San Diego Gas & Electric Company (SDG&E) (U.S Nuclear Regulatory Commission 1978). As part of this effort, many wells were installed to evaluate the characteristics of the underlying aquifers as a potential source for water supply. A report (Stone and Webster 1976) was prepared that analyzed the groundwater table elevations. WorleyParsons (WP) also analyzed the groundwater table elevations within the project vicinity in the Assessment of Groundwater Conditions Report provided in the Rio Mesa SEGF AFC Appendix 5.15D (WP 2011). Groundwater table elevations decrease in a southeasterly direction to an outfall drain located within the agricultural area east of the project site at a gradient of approximately 2 to 3 feet per mile (0.0004 to 0.0006 foot per foot).

In addition to the wells that appear to be associated with the SunDesert Project, the USGS NWIS database indicates that there are many observations, destroyed, abandoned, and pumping wells in the PVMGB and the adjacent PVVGB. A *Report of Groundwater Sampling and Monitoring* at the Rio Mesa SEGF site,

prepared by URS, includes the results of water-level monitoring for 19 wells and groundwater quality analyses for two wells sampled in the project area (URS 2011). WP also analyzed several wells within the PVMGB and PVVGB to determine groundwater level trends in the *Assessment of Groundwater Conditions Report* for the Project (WP 2011). The report indicated that groundwater levels within the PVMGB have remained relatively stable, with some localized water level declines due to pumping.

4.4 WASTE CLASSIFICATION AND MANAGEMENT [21600(2), 21740, 21760(B)]

The evaporation ponds will be designated as Class II Surface Impoundments Waste Management Units and will meet the requirements of the California Code of Regulations (CCRs), Title 27, CCR §20200 et seq.

4.4.1 Raw Water Treatment System

The Raw Water Treatment System (RWTS), located in the Common Area, will treat raw well water to produce high quality treated water for plants and common area uses. The RWTS will consist of a two pass reverse osmosis system with multimedia or ultrafiltration type pre-filter. The pre-filters will be used to remove excess suspended solids that could harm reverse osmosis membranes. Anti-scalant, biocide, acid and dechlorination agent will be added (as needed) to maintain chemistry during operation. Reject from the first pass RO along with pre-filter waste and pre-flushes will be collected in the wastewater collection tank and treated by the WWTS (see below). Permeate from the 1st pass RO will be collected in a break tank and injected with caustic to maintain chemistry prior to being treated by the second pass RO. Permeate from the second pass RO will be collected in the Common Area Treated Water Storage Tank. The RWTS is expected to operate with a minimum 80 percent recovery. The RWTS will be designed for continuous operation (24/7).

4.4.2 Potable Water Treatment System

A Potable Water Treatment System (PWTS) will be provided in each plant and the Common Area to provide potable drinking water. The system will consist of a solids filter, softener and reverse osmosis. Waste from the PWTS (not sanitary waste) will be forwarded to the respective Wastewater Collection Tank.

4.4.3 Wastewater Treatment System and Common Area

Wastewater from the RWTS and the Common Area PWTS will be collected in the Common Area Wastewater Collection Tank. Once collected, wastewater will be fed through the WWTS. The WWTS utilizes evaporation inside an evaporator to separate water as steam from the brine solution. Collected vapor is mechanically recompressed and used (along with supplemental electric heating) to heat the wastewater feed. During operation, dissolved solids will be purged as required to maintain chemistry in the evaporator. Minimal anti-scalant and anti-foam will be added along with pH adjusters (acid and caustic) to maintain chemistry. The wastewater treatment system will be designed to operate at a minimum 85 percent recovery. The collected distillate water is high quality water and is collected

(without additional treatment) in the Common Area Treated Water Storage Tank. The WWTS will be designed to operate over 12 hours during night-time operation.

4.4.4 Power Block

Located in each plant will be a smaller WWTS designed to treat Wet Surface Air Cooler (WSAC) blowdown, SRSG blowdown (when required), PWTS waste, misc. service water waste generated during operation. Second pass RO permeate quality water will be used for general plant makeup. The blowdowns from SRSG and WSAC are considered to be better quality than that found in raw well water. Wastewater generated by the Plant specific PWTS (located at each plant) will be very small in volume and is not considered influential to the wastewater quality going to the evaporation ponds. Wastewater collected in each Plant will be of much better quality (lower TDS) than that found in the Common Area; therefore, the wastewater presented above from the Common Area WWTS is considered enveloping for all WWTS residue streams. Residue from each plant will be collected and trucked to the Common Area Evaporation Ponds. The WWTS will be designed to operate over 12 hours during night-time operation.

4.4.5 Design Flows

Due to variations in Power Block operation and seasonal effects on water usage (i.e. WSAC in use), the daily volume of residue sent to the evaporation pond will vary between ~8,620 gallons per day (gpd) during the summer season (max evaporation) and ~3,200 gpd during winter season. The evaporator recirculation pumps will be sized later during detailed design; however, the purge rate from the evaporator may be as high as 50 gallons per minute (gpm) into the evaporation pond. This flow rate is a maximum instantaneous flow rate that may be used in the design to maintain chemistry of the wastewater treatment system.

4.4.6 Constituents and Discharge Concentration

The expected water quality constituents and the discharge concentration of each constituent to be discharged to the evaporation ponds are provided in Table 4 below.

Table 4
Evaporation Pond Constituent Concentrations

Maximum Residue Dissolved Constituent Concentrations for Discharge to Evaporation Ponds, milligrams per liter (mg/L)	
Arsenic	0.43
Barium	3
Chromium	0.2
Copper	2
Molybdenum	2
Nickel	0.4
Selenium	0.2
Zinc	12
Calcium	3,000
Magnesium	640
Sodium	20,500
Potassium	370
Iron	11
Manganese	0.7
Fluoride	140
Chloride	25,000
Nitrate, as N	0.15
Sulfate	15,000
Phosphate	2
Alkalinity, as CaCO3	4,200
Silica	1,200
pH	5-7
TDS	72,000

The concentrations stated in the table above are the maximum possible concentration in the wastewater purge if all salts (cations+anions) are dissolved in the fluid. Due to pH, temperature and constituent concentrations, the residue from the WWTS will begin to precipitate solids (i.e. CaPO4, CaF, MgCl, etc.). This precipitation will occur until the constituent concentrations are at steady state based on each respective solubility indexes (based on temperature and pH).

In response to CEC staff Data Request No. 139, the applicant conducted an analysis of the RO system to determine the average and maximum salt production rates on a monthly basis. Tables 5 and 6 below provide the preliminary RO analysis and the preliminary salt production rates, respectively.

Table 5
Preliminary Reverse Osmosis Analysis

Constituent List	Maximum Concentration Raw Water Quality[1] (mg/L or ppm)	RO Reject Concentration w/ 80% Recovery Rate[2] (mg/L or ppm)	RO Reject Concentration w/ 95% Recovery Rate[3] (mg/L or ppm)
Title 22 Metals			
Antimony	<0.000380	0.002	0.009
Arsenic	0.0129	0.08	0.31
Barium	0.0845	0.6	2.1
Beryllium	< 0.000131	0.0008	0.0031
Cadmium	< 0.000266	0.002	0.006
Chromium	0.00351	0.02	0.08
Cobalt	< 0.000618	0.004	0.015
Copper	0.05	0.32	1.18
Lead	< 0.0483	0.002	0.008
Mercury	< 0.0000348	0.0002	0.0008
Molybdenum	0.0589	0.4	1.4
Nickel	0.0117	0.077	0.283
Selenium	0.00461	0.029	0.109
Silver	< 0.000120	0.001	0.003
Thallium	< 0.000498	0.003	0.012
Vanadium	< 0.000790	0.005	0.019
Zinc	0.35	2.2	8.2
Base Cations			
Calcium	89.8	575	2,120
Magnesium	19.1	128	471
Sodium	615	3,931	14,484
Potassium	11	70	259
Other Metals:			
Aluminum	< 0.0105	0.067	0.247
Iron	0.321	1.9	7.1
Manganese	0.0188	0.13	0.47
Anions			
Fluoride	4.2	27	99
Chloride	740	4,730	17,428

Table 5
Preliminary Reverse Osmosis Analysis

Constituent List	Maximum Concentration Raw Water Quality[1] (mg/L or ppm)	RO Reject Concentration w/ 80% Recovery Rate[2] (mg/L or ppm)	RO Reject Concentration w/ 95% Recovery Rate[3] (mg/L or ppm)
Nitrate, ppm as N	<0.0175	0.03	0.12
Total Alkalinity, ppm as $CaCO_3$	140	1,023	3,768
Sulfate	450	2,876	10,598
o-Phosphate, ppm as P	< 0.047	0.3	1.11
Bicarbonate, ppm as CaCO3	140	895	3,297
Hydroxide, ppm as CaCO3	< 0.85	5.4	20
Silica			
Total Silica	37	236	871
Dissolved Silica	35	224	824
Colloidal Silica (reactive)	N/A	192	707
General Water Quality Parameters			
Specific Conductivity (SC), umhos/cm	2,900	TBD	TBD
Total Dissolved Solids4	2,162	13,816	50,906
pH.4	5.4 -8.9	6-8	6-8
Turbidity, NTU	< 0.1	N/A	N/A
Total Suspended Solids (TSS)	9	58	212
Phosphorus	0.35	2.2	8.2
Carbon Dioxide	12	N/A	N/A
Total Organic Carbon (TOC)	0.12	0.77	2.83
Other Priority Pollutants			
Cyanide	< 0.050	0.32	1.18
SVOCs [Bis (2-Ethylhexyl) Phthalate]	< 10	TBD	TBD
OCPs	ND	TBD	TBD
PCBs	ND	TBD	TBD
VOCs (toluene)	1.4	TBD	TBD

Table 5
Preliminary Reverse Osmosis Analysis

Constituent List	Maximum Concentration Raw Water Quality[1] (mg/L or ppm)	RO Reject Concentration w/ 80% Recovery Rate[2] (mg/L or ppm)	RO Reject Concentration w/ 95% Recovery Rate[3] (mg/L or ppm)

Notes:

1. Maximum concentration raw water quality was extrapolated from available well water analysis and is consistent with data provided in AFC.

2. RO projections will be developed during detailed design once a water treatment supplier is determined. 100 percent salt rejection by the RO membranes is provided in the columns above; however, based on the valence and permeability through the membrane during operation, the concentration could be lower (i.e. salt could pass through the membrane into the permeate). To account for variations in raw water concentrations, a design margin of 30 percent was added.

3. Current raw water treatment configuration has a chemistry limited recovery rate of 80 percent. Through additional optimization of the raw water treatment system design, the recovery rate could increase to as high as 95 percent; however, this recovery rate cannot be guaranteed to operate at this time. The concentration of the raw water treatment reject at 95 percent is for reference only. To account for variations in raw water concentrations, a design margin of 30 percent was added.

4. pH and TDS of any of the treatment streams will be dependent on the operation (i.e. which train is in backwash, cleaning modes, etc.). A range of 6-8 is considered to envelope all operating conditions. For purposes of calculations, the TDS is provided as a calculated number based on constituent concentrations.

5. Nitrate concentration of 2 ppm as N in the well water was observed in 1976; however, during recent testing nitrate has not been observed in the ground water (non-detectable). The 1976 (highest) concentration is considered to be representative of nitrate levels at that time, but has since decreased to undetectable levels.

Table 6
Preliminary Salt Production Rates (for 173.3 afy water use)

Constituent List	Salt Production Rates[1] (lbm/day)	Salt Production Rates[2] (lbm/year)	Average Monthly Salt Production[2] (lbm/month)	Maximum Monthly Salt Production[1] (lbm/month)
Title 22 Metals				
Antimony	0.001	0.23	0.0197	0.031
Arsenic	0.033	7.9	0.67	1.04
Barium	0.23	55.3	4.6	7.2
Beryllium	0.0003	0.08	0.0067	0.0102
Cadmium	0.00067	0.16	0.0137	0.0212
Chromium	0.0093	2.14	0.18	0.28
Cobalt	0.0016	0.38	0.0317	0.0492
Copper	0.13	30.7	2.54	4.0
Lead	0.00087	0.2	0.017	0.027
Mercury	0.00009	0.021	0.0018	0.0028
Molybdenum	0.15	36	3	4.73
Nickel	0.033	7.3	0.62	0.96
Selenium	0.012	2.8	0.24	0.367
Silver	0.00033	0.073	0.0062	0.0096
Thallium	0.0013	0.31	0.026	0.04
Vanadium	0.002	0.49	0.041	0.063
Zinc	0.93	214.7	18	28
Base Cations				
Calcium	236	55,146	4,595	7,187
Magnesium	52.7	12,255	10,214	1,597
Sodium	1,615	376,831	31,403	49,110
Potassium	28.7	6740	562	879
Other Metals				
Aluminum	0.027	6.5	0.53	0.84
Iron	0.787	184	15.3	24
Manganese	0.052	12	1.0	1.6
Anions				
Fluoride	11.3	2,573	215	335
Chloride	1,943	453,422	377,855	59,092

Table 6
Preliminary Salt Production Rates (for 173.3 afy water use)

Constituent List	Salt Production Rates[1] (lbm/day)	Salt Production Rates[2] (lbm/year)	Average Monthly Salt Production[2] (lbm/month)	Maximum Monthly Salt Production[1] (lbm/month)
Nitrate, ppm as N	0.013	3.1	0.25	0.4
Total Alkalinity, ppm as $CaCO_3$	420	98,037	8,170	12,777
Sulfate	1,181	275,729	22,977	35,934
o-Phosphate, ppm as P	0.13	28.7	2.4	3.7
Bicarbonate, ppm as $CaCO_3$	3,673	85,783	7,149	11,179
Hydroxide, ppm as $CaCO_3$	2	N/A	N/A	N/A
Silica				
Total Silica	97.3	22,671	1,889	2,955
Dissolved Silica	N/A	N/A	N/A	N/A
Colloidal Silica (reactive)	TBD	TBD	TBD	TBD
General Water Quality Parameters				
Specific Conductivity (SC), umhos/cm	TBD	TBD	TBD	TBD
Total Dissolved Solids (TDS)[3]	5,675	1,324,451	110,371	172,609
pH[3]	N/A	N/A	N/A	N/A
Turbidity, NTU	N/A	N/A	N/A	N/A
Total Suspended Solids (TSS)	23.3	5,515	459	719
Phosphorus	0.93	215	18	28
Carbon Dioxide	N/A	N/A	N/A	N/A
Total Organic Carbon (TOC)	0.31	73.3	6.16	9.6
Other Priority Pollutants				
Cyanide	0.13	30.7	2.5	4
SVOCs [Bis (2-Ethylhexyl) Phthalate]	TBD	TBD	TBD	TBD
OCPs	TBD	TBD	TBD	TBD
PCBs	TBD	TBD	TBD	TBD
VOCs (toluene)	TBD	TBD	TBD	TBD

Notes:

1. Columns provides salt production in lbm per day and month based on both of the plants requiring a maximum well withdrawal rate of 242,000 gallons per day for Raw Water Treatment makeup during peak summer conditions.

2. Columns provide salt production in lbm per month based on Rio Mesa SEGF requiring a total of 173.3 afy of well water for makeup. To account for variations in raw water concentrations, a design margin of 30 percent was added.

3. pH and TDS of any of the treatment streams will be dependent on the operation (i.e. which train is in backwash, cleaning modes, etc.). A range of 6-8 is considered to envelope all operating conditions. For purposes of calculations, the TDS is provided as a calculated number based on constituent concentrations.

Based on a dried sludge density close to that of dried gypsum (70-100 lbm/ft^3), each pond can hold approximately 3,050-4,360 tons per foot of sludge. Approximately 662 tons per year of sludge will be produced based on the project using 173.3 acre-feet/year of 2,162 ppm TDS (173.3 acre-feet/year * 325,851 gallons/acre-feet * 8.345 lbm/gal * 2,162 ppm *1.3 / 1,000,000 / 2,000 lbs/ton = 662 tons). This value also includes a 30 percent design margin to account for variations in raw water quality. At this rate, each pond will be able to hold 4 to 6 years' worth of water usage before sludge will need to be removed. The current area of the ponds is based on providing enough evaporation area so that no substantial accumulation of water is experienced during operation. During operation, the concentration of each constituent will meet its respective solubility limits and begin to fall out of the water, along with the precipitation of salts such as $NaHSO_4$, $CaCO_3$, $CaPO_4$, $CaSO_4$, and NaH_2PO_4.

4.4.7 Evaporation Pond Residual Handling

The facility will operate as a near zero liquid discharge; therefore, requiring maximum recycling within the facility to minimize the losses due to evaporation from the evaporation ponds. None of the liquid waste will be discharged to bare land or a body of water.

Residue from each Plant and the Common Area's WWTS are collected in the evaporation pond. The evaporation pond will be double lined with leachate monitoring. For avian protection, the ponds will be outfitted with bird netting. During the course of operation, the sludge developed within the ponds will become too thick and require removal. Once the sludge is removed from the ponds, it will be analyzed to the WET method to determine the hazardous class rating. The evaporation pond is expected to be stable and not considered hazardous when removed. If the sludge is deemed hazardous, it will be disposed of in accordance with local codes, regulations and permits.

The evaporation ponds will be 'Clean-closed'. All residual wastes completely removed and discharged to an appropriate waste management unit. If, after reasonable attempts to remove all wastes, the discharger can demonstrate removal is infeasible then the basin shall be closed as a landfill pursuant to CCR, Title 27, §21090.

4.4.8 Groundwater Monitoring Wells

Groundwater monitoring wells for the evaporation ponds will be installed per Riverside County requirements and will be installed within the first encountered groundwater and be screened within approximately 5 feet above the water surface elevation and extend 25 feet below the water surface elevation. The groundwater gradient in the vicinity of the proposed evaporation ponds is from northeast to southwest. Three monitoring wells are proposed in the vicinity of the ponds to provide background and operation phase water level and water quality monitoring. See Figure 2 for the proposed evaporation pond groundwater monitoring well locations.

4.5 DESIGN AND CONSTRUCTION STANDARDS

4.5.1 General Design Description [21600(4)(A) & (B), 2170 (A), 20320, 20330, 20360]

The containment strategy for the evaporation ponds is summarized as follows:

- Size the ponds to achieve sufficient evaporative capacity under annual average and peak discharge conditions, allow for storage of evaporative residue for the full 30 year operating life of the facility, maintain a minimum of 2 feet freeboard at all times, and to allow one pond to be taken out of service for one year for maintenance without impacting the operation of the plant.
- Meet or exceed regulatory requirements for containment of liquid designated wastes.
- Select materials that are compatible with the physical, chemical and thermal characteristics of the wastewater and evaporation residue being contained.
- Include the ability to monitor the integrity of the containment system, to collect and recover leakage through the primary liner, and to transfer fluids from one evaporation pond to another.

The proposed design for the evaporation ponds has been selected to optimize performance based on these operating criteria. The location of the evaporation ponds are shown in the attached figure.

The following sections contain further information about each layer of the containment system.

4.5.2 Hard Surface / Protective Layer

A ramp consisting of a hard surface / protective layer shall be provided for the length of each pond to allow access by equipment into the evaporation pond for maintenance purposes. The ramp will extend at an angle down the side slopes, to provide a shallower slope than 3:1 for access by equipment. This layer will provide protection of the HDPE if access by equipment is necessary, such as for insertion of pumps or launching of floatation devices.

Various hard surface media such as reinforced concrete, gunite, roller compacted concrete, revetments, or combinations of these media will be assessed prior to the selection of the preferred option for ramp construction. A compacted granular fill base course and non-woven geotextile are required between the HDPE liner and concrete to act as a supporting base to the hard surfacing and protection to the HDPE.

4.5.3 Liner System

HDPE was selected as the preferred material for the primary and secondary liners for the following reasons:

- it is chemically resistant to potentially high concentrations of dissolved salts;
- it is very durable during installation;
- it is strong and possesses desirable stress-strain characteristics; and
- it is the most common synthetic liner material and as such there is a broad base of practical experience associated with the installation of HDPE amongst construction contractors.

A 60 mil primary liner was selected to provide appropriate balance between strength and ductility characteristics, which is very important during liner installation. This liner will consist of white, UV-resistant geomembrane or equivalent. White co-extruded HDPE geomembrane reflects light and does not absorb radiant heat energy as does an exposed black (standard) HDPE geomembrane liner. In addition,

the liner will be textured on both sides, for safety purposes and to increase the frictional strength of the installation.

The secondary liner, with a minimum thickness of 40 mil, was selected to provide slightly better ductility and handling characteristics during installation, as strength is of lesser importance for the secondary liner. The secondary liner will also be textured on both sides.

HDPE possesses large thermal expansion and contraction characteristics, and exhibits stress when liner temperature exceeds 122°F. The temperature of the blowdown water is not expected to exceed 122°F.

The liner system will be installed in accordance with current practices and will employ the use of wedge welding and extrusion welding procedures. In addition destructive and non-destructive testing procedures will be used to ensure liner quality and continuity.

4.5.4 Base Layer

A base layer is required to protect the underlying groundwater in the unlikely event that both synthetic liner materials are punctured during construction or operation of the evaporation ponds. This base layer also serves to provide a smooth, competent surface to support the overlying synthetic liners and leachate detection system layers.

The preferred design for the base layer is 2 feet of onsite material with a hydraulic conductivity of less than 1×10^{-6} cm/s, of which at least 30 percent of the material, by weight, shall pass through a No. 200 U.S. Standard sieve. If this material is unavailable on site, then a geosynthetic clay liner (GCL) or approved equivalent is the alternative design for the base layer. For the project, GCL is proposed as an engineered alternative. GCL's are relatively simple to install and there are a number of manufacturers that provide a GCL product adequate to meet the project requirements (for example Bentomat by CETCO). Title 27 of the CCR, Section 20330 outlines the requirements for clay liners. GCL's are not referenced in this section, therefore explanation to this engineering alternative is provided in Section 6.2.

4.5.5 Leak Detection, Collection and Removal System

A HDPE geonet drainage layer, with an option for non-woven geotextile heat bonded to one or both sides, will be used in the leachate detection and collection layer between the primary and secondary liners. HDPE geonet used in combination with geotextile materials has been selected because polyethylene is not reactive with the fluids and provides a highly conductive layer, it is readily available, and is easily installed with minimal potential for damage to the liner system during installation.

The base of the evaporation pond leachate detection and collection layer will slope at a minimum inclination of one-percent (1%) to a leachate collection trench. The trench will contain screened sand (with no fines) and a perforated pipe that will slope at a minimum inclination of three-quarters of a percent (0.75%) towards a leachate detection and collection sump, located at the lowest point in the pond. The water in the collection sump will drain by gravity to a monitoring well that is constructed for each evaporation pond (one well per pond). Automated pneumatic pumping systems in the monitoring wells will automatically return water collected in the sump to that evaporation pond, which in turn minimizes

the hydraulic pressures across the secondary liners and therefore the risk of leakage through the secondary liner. Leakage rates will be measured using a flow totalizer.

The collection sump, pipe, and monitoring well, will include prefabricated and field-fabricated HDPE components with water tight, extrusion welded and wedge welded seams and penetrations. The liner system will be installed in accordance with current practices. Destructive and non-destructive testing procedures will be used to verify sump and penetration tightness and continuity. This design is consistent with CCR, Title 27, Section 20340, which requires a LDRS between the liners for surface impoundments.

4.5.6 Berms and Sideslopes

The side slopes around the evaporation ponds will contain the same liner system as the base of the ponds, except that leachate collection pipes will not be located on the pond side slopes.

The berms shall be covered with a minimum 6-inch thickness of road base or approved equivalent. The top of the berms will be a minimum of 2 feet above the surrounding existing grade to prevent potential inflow of storm water.

4.5.7 Material Compatibility

The wastewater will come into contact with the primary liner. HDPE is chemically resistant to saline solutions and long term contact between the wastewater in the evaporation ponds and the HDPE liner system will not compromise liner integrity.

The liner system and base layer will have the ability to withstand the dissolved solids content of the water without degradation. These systems will not fail due to pressure gradients from physical contact with the wastewater and residue or undergo chemical reactions or degradation.

4.5.8 Engineered Alternative

4.5.8.1 Regulatory Requirement

The performance standard for the liner system is outlined in CCR, Title 27, Section 20330:

> *"Liners shall be designed and constructed to contain the fluid, including landfill gas, waste and leachate, as required by Article 3 of this subchapter (Section 20240 et seq.., and section 20310"*

Under Section 20240 *et seq*., the relevant section to liner design is Section 20250, 'Class II: Waste Management Units for Designated Waste" (emphasis added):

> *(4) Class II surface impoundments are not required to comply with the requirements of (b)(1), but shall have a liner system designed in accordance with the applicable SWRCB-promulgated provisions of Article 4 of this subchapter (Section 20310 et seq.). The RWQCB can allow Class II surface impoundments which are designed and constructed with a double liner system in accordance with that article to use natural geologic materials which comply with (b)(1) for the outer liner.*

Under Article 4, Section 20320 (d) requires that soils used within containment structures must have the following characteristics:

> *(1) At least 30 percent of the material, by weight, shall pass a No. 200 U.S Standard Sieve*
>
> *(2) The materials shall be fine grained soils with a significant clay content without organic matter, and which is a clayey sand, clay, sandy or silty clay, or sandy clay under a soil classification system having industry-wide use.*

In addition, Table 4.1 in this section requires clay liners to have a hydraulic conductivity of not more than $1x10^{-6}$ cm/sec.

Section 20330 also outlines the requirements for liners:

> (b) *Clay Liners: Clay liners for a Class II Unit shall be a minimum of 2 feet thick and shall be installed at a relative compaction of at least 90 percent.*
>
> *(d) Lined Area - Liners shall be installed to cover all natural geologic materials (at the Unit) that are likely to be in contact with waste (including landfill gas or leachate).*

4.5.8.2 Alternative Design

The preferred design for the base layer is 2 feet of on-site material with a hydraulic conductivity of less than 1×10^{-6} cm/s, of which at least 30 percent of the material, by weight, shall pass through a No. 200 U.S. standard sieve.

Tests have not been made on the hydraulic conductivity of the soil on site. Without a proper grain size distribution, it is not known whether the material can be placed to achieve a hydraulic conductivity of less than 1×10^{-6} cm/s.

It is not known, at this time how much effort and expense will be required to generate enough material to meet the requirements (maximum hydraulic conductivity and minimum quantity passing the No. 200 standard sieve). Trucking the material from an off-site source to meet the gradation and hydraulic conductivity would prove very costly. Therefore a GCL is proposed as an alternative design for the base layer. The GCL is not mentioned specifically in the regulations and therefore would be considered an alternative design.

GCL is an acceptable alternative for many reasons;

- GCL has been demonstrated as a suitable base under HDPE liner systems, and has been used as a primary containment layer in many applications. GCL has been used successfully as an alternate to soil layers in many Class II impoundments in the State of California (Buena Vista Landfill in Watsonville and the Desert Valley Center Landfill to name several recent projects). Additionally, GCL was used in a similar application at the Carlota Heap Leach Containment in Arizona.
- Performance of GCL as a fluid barrier has been well documented. A report by the industry and academic professionals has been developed to support the design and use of GCL as a fluid barrier. The paper found at the following link discusses this subject:

http://www.rsgengineers.com/docs/2002-GCL%20design%20series%20part%201%20gcl%20performance%20as%20a%20fluid%20barrier.pdf

- GCL is equivalent or superior to placement of a compacted low permeability base liner in several key respects:
  - GCL liners are constructed in a factory setting and subject to rigorous QA/QC protocols to assure uniform properties throughout the application. In situ construction of a compacted low permeability liner is also subject to rigorous field QA/QC, but is inherently more subject to variation than GCL as a result of the field construction process.
  - The permeability of GCL liners is designed to be equal to or less than a 2-foot layer of low permeability material with a hydraulic conductivity of 1×10^{-6} m/s.
  - GCL liners will not contain coarse-grained particles that could potentially puncture the secondary HDPE liner during installation. Even with rigorous QA/QC, the presence of such particles in low permeability native or imported materials cannot be ruled out.
  - If a hole forms in the secondary HDPE liner, the GCL will swell with contact of wastewater and fill in the hole in the HDPE liner, to help prevent wastewater from escaping in the containment system. Native or locally imported low permeability materials may have less swell and hole plugging capability than the materials used in GCLs.

As this system has been previously demonstrated at many sites, no pilot studies are proposed for this location if GCL is used. Carrier pipes are located below the base liner which shall be scanned with neutron probes semi-annually to detect moisture. Leak detection monitoring reports that present the results from the neutron probe moisture detection system will be submitted to the RWQCB.

4.5.9 Construction Methods and Sequence [21600(4)(C) & 20313]

4.5.9.1 Overview

The containment construction process will follow these general steps:

a) Stripping, grubbing and clearing of organic materials and topsoil from the construction area;

b) Excavation and rough grading of the pond area, construction of berms, stockpiling of excess soil for later reuse;

c) Installation of carrier pipe for the moisture detection (neutron probe) system beneath the base of the ponds;

d) Construction of finish grading to sub grade, as needed, and excavation of the leachate collection trench and detection/collection sumps;

e) Scarification, moisture conditioning, compaction, proof rolling and testing of sub grade materials;

f) Supplemental moisture conditioning of subgrade and placement of the GCL or on-site material base layer;

g) Installation of secondary HDPE liner;

h) Installation of leak detection layer, sump, and leachate detection monitoring wells/extraction risers;

i) Installation of primary HDPE liner;

j) Installation of hard surface / protective layer ramp; and

k) Installation of protective material on top the berm.

4.5.9.2 Moisture Detection System

The moisture detection system below the liner system consists of continuous carrier pipes installed at the sides and low point of each pond (one carrier pipe per pound) at a depth of approximately 5 feet below the secondary liner. The carrier pipes will be terminated at the surface on each side of the pond and will be equipped with a pull cable system for conveyance of a neutron probe for moisture detection.

4.5.9.3 Site Preparation, Excavation and Compaction

The excavation and berm construction will use standard cut and fill techniques. The subgrade is to be scarified and moisture conditioned to 2 percent above the optimum moisture content, compacted to at least 90 percent relative compaction as determined by American Society for Testing and Materials (ASTM) D1557, and proof-rolled using a smooth drum roller prior to placement of the GCL or the 2 feet of low permeable onsite material.

4.5.9.4 Liner System Installation

4.5.9.4.1 Subgrade

The sub grade under the liner system will be scarified, moisture conditioned, compacted, and proof-rolled with a smooth drum roller to form a competent working surface. The subgrade beneath the GCL needs to have an adequate moisture content to ensure effectiveness of the GCL layer. Therefore, additional moisture conditioning will be specified immediately prior to installation of the GCL layer. The purpose of this is to add additional moisture beneath the GCL to provide moisture for hydration of the GCL material.

4.5.9.4.2 GCL / Onsite Material

The GCL liner or onsite material base will be installed in accordance with current practices and will employ the use of proper installation requirements, following manufacturer requirements for the GCL and proper QA/QC during installation to ensure proper continuity of the base layer.

4.5.9.4.3 Secondary Liner

The secondary liner or lower liner will consist of a 40 mil thick HDPE geomembrane liner. This liner will be installed in accordance with current practices and will employ the use of wedge welding and extrusion welding procedures. In addition destructive and non-destructive testing procedures will be used to ensure liner quality and continuity.

4.5.9.4.4 Leak Detection Systems

The leak detection system between the upper and lower liners consists of a geonet drainage media and a trench containing piping and sand bedding. The sand bedding in the trench, including the perforated piping system will have to be carefully placed on top of the underlying 40 mil HDPE liner. The geonet shall be placed across the top of the trench to avoid strain on the material. The construction sequence will have to be developed with the emphasis of material placement, spreading, and consolidation techniques that will ensure that damage to the liner does not occur.

4.5.9.4.5 Primary Liner

The upper or primary liner will consist of a 60 mil thick HDPE geomembrane liner. Consistent with installation of the secondary 40 mil HDPE liner, current installation, quality control monitoring, testing, and quality assurance measures and techniques will be employed to ensure liner quality and continuity.

4.5.10 Hard Surface / Protective Layer – Ramp

A ramp consisting of a hard surface / protective layer shall be provided for the length of each pond to allow access by equipment into the evaporation pond for maintenance purposes.

Hard surface types to be considered and assessed include roller compacted concrete, or an approved equivalent (formed concrete, gunite, or other alternates, all of which must be submitted for approval). Prior to the placement of the hard surfacing, a one (1) foot thick sub-base layer consisting of granular fill with a maximum particle size of one-half inch (½") shall be placed and spread over a non-woven geotextile. The sub-based layer will be spread carefully and sequentially to avoid damage to the underlying liner system. After placement, the granular layer will be proof rolled using light compaction equipment.

Roller compacted concrete (RCC) can be transported in dump trucks and can be spread with a dozer or motor grader and compacted with a vibratory roller. Additionally, the RCC can be placed without joints, forms, reinforcing steel, and is not required to be finished. This will make the application of the hard surface/protective layer relatively economical.

4.5.11 Berm Surface

An aggregate road base material will be placed along the top of each berm to provide an all-weather access location for maintenance vehicles. The material will conform to the California Department of Transportation Standard Specifications for Class II Aggregate Base, or be of similar gradation and durability to suit the requirements for all weather access. This will be installed to a minimum thickness of

6 inches and will be placed and compacted in accordance with the Department of Transportation Standard Specifications.

4.5.12 Construction Quality Assurance [20323 & 20324]

4.5.12.1 Introduction

The quality assurance program is based on the State Water Resources Control Board-Construction Quality Assurance (CQA) Requirements under CCR, Title 27. The requirements themselves will be highlighted and an explanation of how the requirements will be met will follow immediately afterwards.

The evaporation ponds will be constructed as per the construction specifications that will be developed in accordance with the CQA plan provided herein. The CQA program will be implemented to ensure that construction is completed in accordance with design specifications. CQA testing will be performed on the sub-grade, GCL, HDPE liners, granular/free draining native soil, and hard surface materials.

Construction inspection requirements will include approving of each layer to ensure that there are no deficiencies in that layer prior to placement of the next material based on observation and field tests. This will also include review of other CQA results to ensure that they are within the project's specifications.

Change authorization will flow through the on-site construction manager and will ensure that the Engineer of Record, as well as other required personnel have input in the decision of any change. Daily reports will be kept to ensure that activities are documented and personnel involved in the project are updated daily.

4.5.12.2 Performance Standard

Quoting from the State Water Resources Control Board CQA requirements section (a):

> *The construction quality assurance (CQA) program, including all relevant aspects of construction quality control (CQC), shall provide evidence that materials and procedures utilized in the placement of the any containment feature at a waste management unit (Unit) will be tested and monitored to assure the structure is constructed in accordance with the design specifications approved by the RWQCB.*

Rio Mesa Solar I, LLC and Rio Mesa Solar II, LLC will implement quality control procedures that incorporate inspection and test procedures to make sure that the containment facilities are constructed properly and that they are monitored appropriately throughout the life of the project. These tests and procedures will be documented in detail throughout the project.

4.5.12.3 Professional Qualification

Quoting from the State Water Resources Control Board CQA requirements section (b):

(1) The design professional who prepares the CQA plan shall be a registered civil engineer or certified engineering geologist; and

(2) The construction quality assurance program shall be supervised by a registered civil engineer or certified engineering geologist who shall be designated the CQA officer.

Rio Mesa Solar I, LLC and Rio Mesa Solar II, LLC will ensure that a design professional will prepare the CQA plan and will provide a design professional that will act as a CQA officer whose responsibility is to supervise the CQA program.

Construction activities and operations will be directed and supervised by qualified individuals and the design will be conceived and presented in accordance with recognized civil, mechanical and electrical engineering procedures and practices.

4.5.12.4 Reports

Quoting from the State Water Resources Control Board CQA requirements section (c):

(1) The project's CQA report shall address the construction requirements, including any vegetation procedures, set forth in the design plan for the containment system. For each specified phase of construction, this report shall include, but not be limited to:

(A) a delineation of the CQA management organization, including the chain of command of the CQA inspectors and contractors;

(B) a detailed description of the level of experience and training for the contractor, the work crew, and CQA inspectors for every major phase of construction in order to ensure that the installation methods and procedures required in the containment system design will be properly implemented;

(C) a description of the CQA testing protocols for preconstruction, construction, and postconstruction which shall include at

1. the frequency of inspections by the operator;

2. the sampling and field testing procedures and equipment to be utilized, and the calibration of field testing equipment;

3. the frequency of performance audits determined by the design professional and examined by the CQA officer;

4. the size, method, location and frequency of sampling, sampling procedures for laboratory testing, the soils or geotechnical laboratory to be used, the laboratory procedures to be utilized, the calibration of laboratory equipment and quality assurance and quality control of laboratory procedures;

5. the pass/fail criteria for sampling and testing methods used to achieve containment system design; and

6. a description of the corrective procedures in the event of test failure.

Rio Mesa Solar I, LLC and Rio Mesa Solar II, LLC will provide the following:

- An outline of the chain of command of the CQA inspectors and contractors in the CQA management organization.
- A description of the CQA testing procedures for the preconstruction, construction, and post construction phases of the RSEP.
- A CQA report that includes construction quality control requirements included in the design plan for each specified phase of construction of the RSEP.

4.5.12.5 Documentation

Quoting from the State Water Resources Control Board CQA requirements section (d):

> *Construction quality assurance documentation requirements shall include, at the minimum: reports bearing unique identifying sheet numbers for cross referencing and document control, the date, project name, location, descriptive remarks, the data sheets, inspection activities, and signature of the designated authorities with concurrence of the CQA officer.*
>
> *(1) The documentation shall include:*
>
> > *(A) Daily Summary Reports — daily record keeping, which shall include preparation of a summary report with supporting inspection data sheets, problem identification and corrective measures reports. Daily summary reports shall provide a chronological framework for identifying and recording all other reports. Inspection data sheets shall contain all observations (i.e., notes, charts, sketches, or photographs), and a record of field and/or laboratory tests. Problem identification and corrective measures reports shall include detailed descriptions of materials and/or workmanship that do not meet a specified design and shall be cross referenced to specific inspection data sheets where the problem was identified and corrected;*
> >
> > *(B) Acceptance Reports — all reports shall be assembled and summarized into Acceptance Reports in order to verify that the materials and construction processes comply with the specified design. This report shall include, at a minimum, inspection summary reports, inspection data sheets, problem identification and corrective measures reports;*
> >
> > *(C) Final Documentation — at the completion of the project, the operator shall prepare a Final Documentation which contains all reports submitted concerning the placement of the containment system. This document shall provide evidence that the CQA plan was implemented as proposed and that the construction proceeded in accordance with design criteria, plans, and specifications. The discharger shall submit copies of the Final Documentation report to the RWQCB as prepared by the CQA officer*
>
> *(2) Once construction is complete, the document originals shall be stored by the discharger in a manner that will allow for easy access while still protecting them from any damage. All documentation shall be maintained throughout the post closure maintenance period.*

These documents will include daily summary reports with supporting inspection data sheets that contain all observations. A record of field and laboratory tests will also be kept. Acceptance reports will be documented to ensure construction and materials comply with the original design and specifications. At the completion of the project, project closure documentation will be submitted to provide evidence that the CQA plan was implemented as proposed and that construction met design criteria, plans and specifications. The evaporation ponds will undergo clean-closure therefore the post-closure maintenance period will not be applicable to the RSEP.

4.5.12.6 Laboratory Testing Requirements

Quoting from the State Water Resources Control Board CQA requirements section (e):

> *(1) Analysis of earthen materials shall be performed prior to their incorporation into any containment system component. Representative samples for each layer within the containment system shall be evaluated. The following minimum laboratory testing procedures shall be performed:*
>
> > *(A) ASTM Designation: D 1557 91 [1/91], "Laboratory Compaction Characteristics of Soil Using Modified Effort (2,700 kN-m/m3)" which is incorporated by reference;*
> >
> > *(B) ASTM Designation: D 422 63 (Reapproved) [9/90], "Standard Method for Particle Size Analysis of Soils," which is incorporated by reference; and*
> >
> > *(C) ASTM Designation: D 2487 93 [11/93], "Standard Classification of Soils for Engineering Purposes," which is incorporated by reference.*
>
> *(2) In addition to the tests listed in (e and f), the following minimum laboratory tests shall be performed on low-hydraulic-conductivity layer components constructed from soil:*
>
> > *(A) ASTM Designation: D 4318 93 [11/93], "Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils," which is incorporated by reference; and*
> >
> > *(B) United States Environmental Protection Agency (USEPA) Test Method 9100 [Approved 9-86], "Triaxial-Cell Method with Back Pressure," which is incorporated by reference.*

Rio Mesa Solar I, LLC and Rio Mesa Solar II, LLC will send materials proposed for construction to an accredited laboratory so that the quality and characteristics can be confirmed and compared to project specifications.

The tests will include the following as per section (e) of the State Water Resources Control Board CQA requirements above:

- ASTM Designation: D 1557 91 [1/91], "Laboratory Compaction Characteristics of Soil Using Modified Effort (2,700 kNm/m3)"

- ASTM Designation: D 422 63 (Reapproved) [9/90], "Standard Method for Particle Size Analysis of Soils,"
- ASTM Designation: D 2487 93 [11/93], "Standard Classification of Soils for Engineering Purposes,"
- For permeability (hydraulic conductivity) layers the following tests will be taken at a minimum:
- ASTM Designation: D 4318 93 [11/93], "Standard Test Method for Liquid Limit, Plastic
- Limit, and Plasticity Index of Soils,"
- United States Environmental Protection Agency (USEPA) Test Method 9100 [Approved 9-86], "Triaxial-Cell Method with Back Pressure,"

Periodic laboratory and In-situ analysis may be completed to supplement the CQA.

4.5.12.7 Field Testing Requirements

Quoting from the State Water Resources Control Board CQA requirements section (f):

> *The following minimum field test procedure shall be performed for each layer in the containment system: ASTM Designation: D 2488 93 [9/93], Standard Practice for Description and Identification of Soils (Visual Manual Procedure), which is incorporated by reference.*

Rio Mesa Solar I, LLC and Rio Mesa Solar II, LLC will use the following test on each layer in the containment systems associated with the evaporation ponds:

- ASTM Designation: D 2488 93 [9/93], Standard Practice for Description and Identification of Soils (Visual Manual Procedure)

In addition, in place nuclear densiometer testing ASTM D2922 will be performed paired with maximum density and optimum moisture content test, ASTM D 698.

4.5.12.8 Test Fill Pad Requirements

Quoting from the State Water Resources Control Board CQA requirements section (g):

> *Before installing the compacted soil barrier layer component of a final cover system, or the compacted oil component of a liner system, the operator shall accurately establish the correlation between the design hydraulic conductivity and the density at which that conductivity is achieved.*
>
> *To accomplish this, the operator shall:*
>
> *(1) Provide a representative area for a test on any compacted foundation and low-hydraulic conductivity layers. The following minimum testing procedures shall be performed:*

(A) the test pad foundation and, for final covers, the barrier layers shall be compacted with the designated equipment to determine if the specified density/moisture-content/ hydraulic conductivity relationships determined in the laboratory can be achieved in the field with the compaction equipment to be used and at the specified lift thickness;

(2) perform laboratory tests as specified in State Water Resources Control Board CQA requirements subsection (e); and

(3) perform field tests as specified in State Water Resources Control Board CQA requirements subsection (f). The discharger shall perform hydraulic conductivity tests in the test area under saturated conditions by using the standard test method ASTM Designation: D 3385 94 [9/94], "Standard Test Method for Infiltration Rate of Soils in Field Using Double Ring Infiltrometer," which is incorporated by reference, for vertical hydraulic conductivity measurements. A sufficient number of tests shall be run to verify the results. Other methods that provide an accurate and precise method of measuring field hydraulic conductivity may be utilized as approved by the RWQCB.

(4) Correlations between laboratory tests and test pad results shall be established for each of the various types of fill materials and blends to be used in construction of the actual cover.

When constructing compacted soil barrier layers, or a compacted soil component of a liner system, Rio Mesa Solar I, LLC and Rio Mesa Solar II, LLC will provide a representative area for a test. The soil layers will be compacted with equipment that can achieve density, moisture content, and hydraulic-conductivities, where applicable at specified lift thicknesses. The laboratory tests mentioned in State Water Resources Control Board CQA requirements section (e) will all be performed.

Results from lab tests and field tests will be compared to ensure that the specified requirements can be met and that the methods and procedures selected and used achieve the required construction quality standard.

4.5.12.9 Earthern Material Requirements

Quoting from the State Water Resources Control Board CQA requirements section (h):

(1) The following minimum tests shall include, but not be limited to:

(A) Laboratory tests as specified in State Water Resources Control Board CQA requirements subsection (e); and

(B) Field tests as specified in State Water Resources Control Board CQA requirements subsections (f and g).

(2) The following minimum testing frequencies shall be performed:

(A) Four (4) field density tests shall be performed for each 1,000 cubic yards of material placed, or at a minimum of four (4) tests per day;

(B) Compaction curve data (ASTM Designation: D 1557 91) graphically represented, and Atterberg limits (ASTM Designation: D 4318 93) shall be performed on the barrier layer material once a week and/or every 5,000 cubic yards of material placed;

(C) For field hydraulic conductivity tests, representative samples shall be performed on barrier layer material;

1. The frequency of testing may be increased or decreased, based on the pass/failure status of previous tests, as approved by the RWQCB.

2. Field infiltration tests shall be performed for the duration necessary to achieve steady conditions for the design hydraulic conductivity.

3. The following interpretive equation shall be used to determine the design hydraulic conductivity:

The infiltration rate (I) is defined as:

where:

Q = volume of flow;

I = Q/(tA) t = interval of time corresponding to flow Q; and A = area of the ring;

then the hydraulic conductivity (k) can be calculated from Darcy's law as follows:

where:k = I/i

I = infiltration rate; and

i = hydraulic gradient.

When testing any soils used for construction, the tests mentioned in State Water Resources Control Board CQA requirements section e) above, will be performed as a minimum. There will be four field density tests performed per 1000 cubic yards of material placed or at least four tests per day.

Compaction curve data including Atterberg Limits, will be performed at least once per week or every 5000 cubic yards of material placed. For field hydraulic conductivity tests (critical for the onsite material used in the base layer), the frequency of testing will be based on the pass/failure status of previous tests. They will be performed for the amount of time necessary to make sure steady conditions for the design hydraulic conductivity are met. The above equation I = Q /(tA) will be used to determine design hydraulic conductivity.

During construction, all compacted soils and granular material will be tested using a nuclear density / moisture gauge (densiometer) (ASTM D2922 and D3017) to determine compaction percentage and moisture content. Nuclear densiometer testing will be performed to ensure compaction and moisture condition requirements as outlined in the project specifications are being achieved. Each material will be tested following compaction in multiple locations to ensure compliance to projects specifications prior to proceeding with placement of the next material.

4.5.12.10 Geosynthetic Membrane Requirements

Quoting from the State Water Resources Control Board CQA requirements section (i):

(1) Performance requirements for the geosynthetic membrane include, but are not limited to, the following:

(A) a need to limit infiltration of water, to the greatest extent possible;

(B) a need to control landfill gas emissions;

(C) for final covers, mechanical compatibility with stresses caused by equipment traffic, and the result of differential settlement of the waste over time; and

(D) for final covers, durability throughout the post closure maintenance period.

(2) Minimum Criteria — The minimum construction quality assurance criteria to ensure that geosynthetic membranes will meet or exceed all design specifications shall include, but not be limited to:

(A) Preconstruction quality control program:

1. inspection of the raw materials (e.g., density, melt flow index, percent carbon Black);

2. manufacturing operations and finished product specifications (e.g., thickness, puncture resistance, multi axial stress/strain tests),

3. fabrication operations (e.g., factory seaming);

4.observations related to transportation, handling, and storage of the geosynthetic membrane; and

5. inspection of foundation preparation;

(B) Construction activities:

1. the geosynthetic membrane shall have thickness strength sufficient to withstand the stresses to which it shall be subjected, including shear forces, puncture from rocks or, for final covers, penetration from roots.

2. inspection of geosynthetic membrane placement (e.g., trench corners, monitoring systems).

3. seaming of the material; and

4. *installation of anchors and seals;*

(C) Post Construction Activity — post construction activity includes checking for material and placement imperfections in the installed geosynthetic membrane. Imperfections that jeopardize the integrity of the membrane's function as an impermeable barrier (i.e., pin holes, rips, creases created during placement) shall be repaired to the original manufacturer's specifications and reinspected by the CQA officer; and

(D) Evaluation — evaluation of the personnel and equipment to be used to install and inspect the geosynthetic membrane, and pass/fail criteria and corrective procedures for material and installation procedures shall be specified as required in State Water Resources Control Board CQA requirements subsection (c).

Rio Mesa Solar I, LLC and Rio Mesa Solar II, LLC will make sure that the geosynthetic membrane (geomembrane) used for containment will limit the infiltration of water to the greatest extent possible and be designed to maintain durability throughout the life of the project. Rio Mesa Solar I, LLC and Rio Mesa Solar II, LLC will ensure that a preconstruction quality control program is in place to ensure that manufactured geomembrane products conform to the project specifications.

Once construction activities begin, Rio Mesa Solar I, LLC and Rio Mesa Solar II, LLC will make sure that the proper material is used and supervise and inspect the placement of the geomembrane and the seaming of the material in the evaporation ponds. After construction, Rio Mesa Solar I, LLC and Rio Mesa Solar II, LLC will check for imperfections in the installed geomembrane and ensure that repairs are completed in accordance with project specifications. The HDPE liners will be manufactured and installed according to industry standards and test procedures and the installer’s CQA methods and procedures. Typical quality assurance methodologies include the review and inspection of the following:

- Copy of the mill certificates;
- Coupons from every seam;
- Perform air pressure tests;
- Inspections to ensure the absence of tears, punctures, and blisters;
- Liner production tests, thickness, dimensions, visual inspection;
- Product testing, tensile properties, tear resistance, etc.;
- Sub-grade preparation sign-off; and
- Wedge welding and extrusion welding seam logs and weld tests;

4.5.12.11 Relevant Specifications

The following specifications from the Construction Specification Institute will be developed, as a minimum:

- 31 14 13 Soil Stripping and Stockpiling;
- 31 14 11 Earthwork and Related Work;
- 31 23 10 Excavating, Trenching and Backfilling;
- 32 11 23 Aggregate Base Courses;
- 31 32 21 Geotextiles;
- 31 32 22 Geomembranes;
- 32 12 16 Asphalt Paving (If applicable);
- 32 13 23 Roller Compacted Concrete Paving (If applicable); and
- 32 21 13 or 32 31 25 Fencing.

4.6 GRADING AND DRAINAGE

The site grading and drainage plans are included in the AFC and supplements. The evaporation ponds will be bermed to preclude surface water runoff from entering the ponds. In general, sheet flow and existing natural contours will be maintained to the extent practicable to maintain existing flow rates. The majority of the original grades and natural drainage features at the project site will be maintained and, therefore, no added storm drainage control will be required. In limited areas, such as the power blocks, substation, heliostat assembly buildings and administrative areas, the stormwater management system will include berms/ditches, bypass channels, or swales to direct run-on flow from upslope areas and run-off flow through and around each facility. To reduce erosion, storm drainage channels may be lined with a non-erodible material, such as compacted rip-rap, rock gabions, geo-synthetic matting, or engineered vegetation. Additionally, storm drainage channels will include a downstream flow dispersion features to reduce the depth and velocity of the flows.

Protection of soil resources during construction activities will be an important factor in the design of the erosion and sedimentation controls. To minimize wind and water erosion, open spaces will be preserved and left undisturbed maintaining existing vegetation (to the extent possible with respect to site topography and access requirements).

If needed, stone filters and check dams will be placed throughout the project site to provide areas for sediment deposition and to promote sheet flow. Where available, native materials (rock and gravel) will be used for the construction of the stone filter and check dams. Diversion berms and ditches will be used to direct stormwater around critical facilities, as required. Periodic maintenance will be conducted as required after major storm events. Stone filters and check dams are not intended to alter drainage patterns, but to reduce the potential for soil erosion and promote sheet flow. Additionally, temporarily disturbed areas associated with the Project site, gen-tie-line, emergency and construction electrical power supply

line, and access road will be re-vegetated as appropriate after construction in order to prevent increased soil erosion.

Paved access roads will be protected from floods via ditches, culverts, and local fords with reinforced concrete shoulders. Overall, the project is being designed to maintain, to the extent practicable, the existing sheet flow patterns on the site.

Surface runoff during and after construction will be controlled in accordance with the requirements of the DESCP, construction- and industrial-phase SWPPPs, and all other applicable Laws, Ordinances, Regulations, and Standards.

4.7 OPERATING CRITERIA

4.7.1 Site Records [21600(B)(5)(A), 20375 & 21720]

In accordance with Title 27 CCR 20510, key site records will be kept in the office at the Rio Mesa SEGF site. Records will be available for inspection by authorized representatives of the LEA (Local Enforcement Agency) and RWQCB during the Rio Mesa SEGF regular working hours. Alternatively, an inspection can be arranged by notifying the Rio Mesa SEGF site manager. All required records will be properly completed, filed for retention and maintained throughout the operating life of the evaporation ponds.

4.7.2 Operating Record

The operating record maintained at the project site will include the following information:

- Discharge Volumes - Date and volume of discharges into each evaporation pond.
- Monitoring Results - Results of sampling, monitoring, analyses, and testing required by permit or regulatory requirement (including the daily water level measurements, a hydrometer for daily salinity measurements, and a direct reading thermometer with the temperature data recorded at least diurnally required for avian management).
- Waste Manifests - Volume of precipitated solids removed from the evaporation pond if cleanout is required, sampling results and completed non-hazardous or hazardous waste manifests for all precipitated solids which were removed from the facility for off-site disposal.
- Inspection Forms - Inspection results that include a description of any required maintenance or remedial action and the date of implementation.
- Contingency Implementation -Written reports prepared in response to any incident requiring implementation of the Contingency Plan.
- Correspondence with Local Agencies -Correspondence associated with emergency arrangements agreed to or refused by local authorities.
- Employee Information Records - Records documenting employee information such as job title for each position, job description, names of employees in each job, and introductory and continuing training received.

- Notifications of Violations - Notices of deficiency, abatement orders or any other notification of violation by any regulatory agency.
- Complaints - The Facility manager will record public complaints received regarding operation of the evaporation ponds, including:
    - the nature of the complaint;
    - the date the complaint was received;
    - if available, the name, address, and telephone number of the person or persons making the complaint; and
    - actions taken to respond to the complaint.

4.7.3 Wastewater Discharge Volumes

In accordance with Title 27 CCR 21720(f), all discharges into the evaporation ponds will be recorded in the Operating Record. The following items will be recorded include:

- Volume in million gallons per day (mgd)
- Cumulative total of wastewater flow, in million gallons, per month
- The maximum daily flow rate, in mgd, each month.

4.7.4 Wastewater Levels

The water level in the pond will be dependent on the quantity of wastewater discharged in to the pond, evaporation rate and sludge accumulation. The evaporation ponds will be outfitted with a level gauge for daily water level information. Discharge to the evaporation ponds will be managed as needed to discourage wading birds from using the evaporation ponds.

4.7.5 Monitoring Results

Monitoring Plan results will be retained at the Facility as part of the Operating Record.

4.7.6 Inspection and Operations Record

Site personnel will complete the inspection logs and other required operation documentation and the facility management will review the applicable documents for completeness and accuracy. Completed inspection logs and notations of needed repairs will be maintained for a minimum of three years.

4.7.7 Record of Contingency Plan Implementation

Following any incident which requires implementation of the Rio Mesa SEGF Site Contingency Plan, a report will be prepared containing the information described in Title 27 CCR Section 21760(b)(2). As a minimum, the report will be submitted to the Local Enforcement Agency and the RWQCB. In addition, a copy will be retained on filed at the Facility as part of the Operating Record.

4.7.7.1 Training Records

In accordance with Title 27 CCR Section 20610, the following records will be retained for each position related to waste management as part of the Operating Record:

- A job title and written job description including assigned duties and required qualifications;
- Name of the employee filling each job;
- Description of initial and continuing training; and
- Documentation of initial and continuing training received.

Whenever a training course is conducted, the records for each employee who completed the course will be updated. When a new employee is hired, a training record file will be initiated for the new employee. Personnel training records on current employees are retained until final closure of the Facility. Records on former employees are retained for three years after the employees' leave date.

4.7.7.2 Design Documents

In accordance with the requirements of Title 27 CCR Section 21760, design, as-built, and operating documentation related to the evaporation ponds will be retained at the project site as part of the Operating Records.

4.7.7.3 Other Required Technical Documents

In accordance with Title 27 CCR Section 20510 and 20517, all other technical records associated with the evaporation ponds will be retained at the project site as part of the Operating Record.

4.7.7.4 Operator / Responsible Party Records

Records of written notification to the LEA, local health agency, and fire authority of names, addresses and telephone number of the operator or responsible party of the Rio Mesa SEGF, as required by 27 CCR, Section 20510(e), will be kept in the operating record.

4.7.8 Security [21600(B)(5)(B)]

In accordance with Title 27 CCR Section 21600(b)(5)(B) and 20530, security measures will be provided to ensure the safest environment for employees working at the Rio Mesa SEGF. Security measures include barriers and warning signs. In the unlikely event of an unplanned (forced) outage situation that causes a long-term cessation of facility operations, security of the facilities will be maintained on a 24-hour basis, and the CEC will be notified.

4.7.8.1 Barriers

The entire site will be fenced appropriately to restrict public access during construction and operations. Chain-link security fencing will be installed around the site perimeter, switchyard and other areas requiring controlled access.

Controlled access gates will be located at the entrances to the facility. Site gates will be swing or rolling type access gates. Access through the main gate will require an electronic swipe card, preventing unaccompanied visitors from accessing the project site. All Rio Mesa SEGF personnel, contractors and visitors will be logged in and out of the Rio Mesa SEGF site at the main office during normal business hours. Visitors and non-Rio Mesa SEGF employees will be allowed entry only with approval from a staff member at the Facility.

4.7.8.2 Warning Signs

Each point of access from a public road shall be posted with sign indicating the facility name, and other pertinent information as required by the WDR.

4.7.9 Sanitary Facilities [21600(B)(5)(C)]

In accordance with Title 27 CCR Section 21600(b)(5)(C), sanitary facilities will be provided at the project site for Rio Mesa SEGF employees in the office. The project site will maintain all sanitary and hand-washing facilities which may be required, by applicable state or local requirements, in a reasonably clean and adequately supplied condition.

4.7.10 Communication Systems [21600(B)(5)(D)]

Communication facilities will be provided at the site for facility employees that meet the requirements specified in the AFC and Title 27 CCR Section 21600(b)(5)(D). Internal Communication The internal communication system for the project site will include the following devices:

- Alarm system
- Two-way radios
- Telephones
- Intercoms

Each Rio Mesa SEGF building will also be equipped with telephones. Operations supervisors and other key personnel may carry hand-held two-way radios that can be used to contact the Rio Mesa SEGF site office or other site personnel in an emergency. The selected frequency of the radios will be chosen as not to interfere with frequencies used by the military.

4.7.10.1 External Communication

Twenty-four hour access to outside emergency services, including police and fire departments and emergency response teams, is available through the commercial telephone system at the project site.

4.7.11 Lighting [21600(B)(5)(E)]

Plant lighting will be provided throughout the facility at the minimum luminescence in any given area as required for personnel and plant safety and will meet the requirements of Title 27 CCR Section 21600(b)(5)(E) and other relevant codes and standards that dictate design with due regard to minimize spillage and lighting efficiency. Lighting will generally be applied in the following areas:

- Building interior equipment, office, control, shop maintenance, water treatment, and steam generation buildings.
- Building exterior entrances and driveways.
- Outdoor equipment within the power block and switchyard areas including the steam turbine, pipe rack and air cooled condenser.
- Power block area, including around the thermal storage tank containment areas to observe for leakage, power transformers, outdoor power and control panels, and the roadway and internal driveways.
- Administration building parking, parking areas within the power block.
- Plant entrance road, signage, and main gate.
- Water treatment building exterior where any cycle treatment chemical tanks are located. Emergency lighting shall be provided for safe egress from all plant areas.

Outdoor lighting shall be photocell controlled through contactors that feed or control the outdoor lighting. To reduce the visual impact created by outdoor lighting, the following mitigation measures shall be adopted:

- Even though the project is in the remote area, according to CEC requirements, lighting on the project site shall be limited to areas required for safety and shall be shielded from public view to the extent possible.
- Lights shall be directed on site so that significant light or glare shall not be created.
- Nighttime backscatter illumination shall be avoided by directional shielding of lights.
- Lighting in the evaporation pond area will be provided when needed using portable light stands.

4.7.12 Safety Equipment [21600(B)(5)(F)]

In accordance with 27 CCR Section 21600(b)(5)(F), safety equipment will be provided for the health and safety of employees at the Facility. As specified in the AFC (Section 5.16, Worker Safety), a Personnel

Protective Equipment (PPE) Program will be developed for the facility, which will apply to all contractor and subcontractor employees, as well as direct Rio Mesa SEGF employees during operation.

Specific requirements of the PPE Program include:

- Hazard analysis and prescription of PPE
- Personal protective devices
- Head protection
- Eye and face protection
- Body protection
- Hand protection
- Foot protection
- Skin protection
- Sanitation
- Safety belts and life lines for fall protection
- Protection for electric shock
- Medical services and first aid/bloodborne pathogens
- Respiratory protective equipment
- Hearing protection
- Employee ocular exposure to glint/glare hazards
- Hazards associated with hot salt Training

Required PPE will be approved for use and distinctly marked to facilitate identification. The type of PPE required to operate, maintain, and monitor the evaporation ponds will be described in the job safety analysis undertaken prior to the commencement of operations.

4.7.12.1 Required Equipment

The following equipment shall be available at the Rio Mesa SEGF to minimize hazards associated with Project operations:

- Alarm systems and internal communications;
- Radio and telephone systems;
- Emergency equipment for fires and spills; and
- Water supplies for firefighting

4.7.12.2 Emergency Equipment

In accordance with the Emergency Action Plan as specified in the AFC, the Facility will include obtaining emergency response equipment. This equipment will be strategically located throughout the project site in order to respond to emergencies in a timely fashion.

4.7.12.3 Water Supplies for Equipment

In accordance with the Fire Protection and Prevention Plan as specified in the AFC, the project site will be equipped with water at adequate volume and pressure to supply water hose streams. The fire projection water system will be supplied from a dedicated 360,000-gallon portion of the raw water storage tank located on the plant site.

4.7.12.4 Equipment Testing and Maintenance

In accordance with the Emergency Action Plan as specified in the AFC, all emergency equipment at the project site, including communications and alarm systems and fire and spill prevention equipment, will be tested and maintained.

4.7.13 Personnel Requirements [21600(B)(5)(G)]

In accordance with Title 27 CCR Section 21600(b)(5)(G), written job descriptions will be maintained for each position at the Rio Mesa SEGF related to management of waste in the permitted evaporation ponds. These descriptions will be updated periodically by facility managers and supervisors to reflect the changing needs of the Rio Mesa SEGF. Job descriptions will be kept on file at the facility and include the following information:

- Job title/position
- Duties/responsibilities
- Job prerequisites and qualifications

All Rio Mesa SEGF employees will receive training in general project site procedures and operations and emergency response procedures. Personnel receive job-specific training during on-the-job training as required. This training ensures that personnel are sufficiently proficient in the particular skills required to perform their assigned duties and that they are aware of the inherent hazards. The management, planning, and operations personnel will have varying backgrounds with respect to the management and operation of the evaporation ponds at the project site. Technical staff will gain experience with these systems mainly through on-the-job training. A record of training and experience of each employee will be maintained at the Rio Mesa SEGF office.

4.7.14 Personnel Training [21600(B)(5)(H)]

An Operations & Maintenance Health and Safety Health Program (Operations Safety Program)for employees and contractors will be developed for Rio Mesa SEGF as specified in the AFC (Section 5.16, Worker Safety) that will meet the requirements of Title 27 CCR Section 21600(b)(5)(H). The Operations

Safety Program will be revised as required to include any additional training necessary as Rio Mesa SEGF equipment or operations change. Additional job-specific training may be completed by Project personnel as needed.

The staff person overseeing the portion of the training program pertinent to the evaporation ponds will be experienced in the operation of such units, waste management procedures and applicable regulations, emergency response and contingency plan implementation.

All Rio Mesa SEGF employees will be required to receive training in the following areas:

- Injury and Illness Prevention
- Emergency Action Plan
- PPE
- Hearing Conservation Training
- Back Injury Prevention Training
- Fire Protection and Prevention Training
- First Aid, Cardiopulmonary Resuscitation (CPR), and Automated External Defibrillator (AED) Training.

In addition, employees who work in the relevant work fields will receive training in the following areas:

- Excavation/Trenching Safety Training for employees involved with trenching or excavation.
- Scaffolding/Ladder Safety Training for employees required to erect or use scaffolding.
- Fall Protection Training for employees required to use fall protection.
- Forklift Operation Training for employees operating forklifts.
- Crane Safety Training for employees supervising or performing crane operations.
- Workplace Ergonomics for employees performing repetitive activities.
- Fire Protection and Prevention Training for employees responsible for the handling and storage of flammable or combustible liquids or gasses.
- Hot Work Safety Training for employees performing hot work.
- Electrical Safety Training for employees performing “lock out / tag out” and employees required to work on electrical systems and equipment.
- Permit-required Confined-space Entry for employees required to supervise or perform confined-space entry.
- Hand and Portable Power Tool Safety Training for employees that will be operating hand and portable power tools.
- Heat Stress and Cold Stress Safety Training for employees exposed to temperature extremes.

- Safe Driving Training for employees supervising or driving motor vehicles.
- Hazard Communication Training for employees handling or working around hazardous materials.
- Pressure Vessel and Pipeline Safety Training for employees supervising or working on pressurized systems or equipment.
- Respiratory Protection Program for employees required to wear respiratory protection.

Additional training will be required for specific tasks related to evaporation ponds which may include:

- Evaporation Pond Operation
- Mobile Equipment Safety
- Inspection and Monitoring Program
- Sludge and Water Sampling
- Equipment Inspections
- Employee Exposure Monitoring Program
- Housekeeping and Material Handling

4.7.15 Supervisory Structure [21600(B)(5)(I)]

In accordance with 27 CCR Section 21600(b)(5)(I), the Rio Mesa SEGF Site Supervisor will be experienced in solar facilities operations and maintenance to ensure that the facility is properly operated in accordance with all applicable laws, regulations, permit conditions and other requirements. All shift managers and equipment operators will report to the Rio Mesa SEGF Site Supervisor.

4.8 RECORD KEEPING AND REPORTING PROGRAM

4.8.1 General Reporting

A semi-annual and annual report will be submitted to the RWQCB. Each report will contain the following statement:

> *"I declare under the penalty of law that I have personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment for knowing violations."*

Further information regarding requirements for the semi-annual and annual reports are provided in the following section.

4.8.2 Semi-Annual Report

A semi-annual monitoring report will be submitted to the RWQCB containing the results from the sampling of the evaporation ponds and groundwater detection monitoring program.

The semi-annual periods and report submittal dates are:

- January 1 to June 30 ~ report due by August 1; and
- July 1 to December 31 ~ report due March 1.

The detection monitoring report (refer Appendix B) will include the following:

- A letter transmitting the essential points in each report, signed by a principle executive officer at a level of vice-president or above, or by his/her authorized representative and will include:
    - A discussion of any violations noted since the previous report submittal and a description of the actions taken or planned for correcting those violations. If no violations have occurred since the last submittal, that should be so stated;
    - If a detailed time schedule or plan for correcting any violations has been previously submitted, a progress report on the time schedule and status of the corrective actions being taken; and
    - A statement by the official, under penalty of perjury, that to the best of the signer's knowledge the report is true, complete, and correct.
- A Compliance Evaluation Summary which will include:
    - A description and graphical presentation of the velocity and direction of groundwater flow under/around the Rio Mesa SEGF, based upon water level elevations taken during the collection of the water quality data submitted in the report;
    - Methods used for water level measurement and pre-sampling purging for each monitoring well; and
    - Methods used for sampling each monitoring point.
- A map or aerial photograph showing the locations of observation stations, monitoring points, and background monitoring points;
- Results of sampling analysis, including statistical limits for each monitoring point;
- An evaluation of the effectiveness of the leakage monitoring and control facilities, and of the runoff/run-on control facilities; and

A summary of reportable spills/leaks occurring during the reporting period; including estimated volume of liquids/solids discharged outside designated containment area, a description of management practices to address spills/leaks, and actions taken to prevent reoccurrence.

4.8.3 Annual Report

The annual reporting period is from January 1 to December 31. By March 15th of each year, BrightSource will submit an Annual Report to the RWQCB including:

- Detection Monitoring Report:
  - A graphical presentation of analytical data for each monitoring point for all samples taken within at least the previous five calendar years. Each such graph shall plot the concentration of one or more constituents over time for a given monitoring point, at a scale appropriate to show trends or variations in water quality.
  - A tabular presentation of all monitoring analytical data obtained during the previous two monitoring and reporting periods, submitted on hard copy within the annual report as well as digitally on electronic media in a file format acceptable to the Regional Water Board Executive Officer.
  - A comprehensive discussion of the compliance record and any corrective actions taken or planned, which may be needed to bring the Rio Mesa SEGF into full compliance with WDRs.
  - A written summary of the groundwater analyses, indicating changes made since the previous annual report.
  - An evaluation of the effectiveness of the run on/run-off control facilities.
- Records of the evaporation pond wastewater and precipitated sludge residue including:
  - The date, exact place and time of sampling or measurement
  - The individual performing the sampling or measurement
  - The date the analysis was performed
  - The initials of the individual performing the analysis
  - The analytical technique or method uses
  - Results of the analysis
- Financial Assurance:
  - Evidence that adequate financial assurance for closure, post-closure, and reasonably foreseeable releases is still in effect and may be verified by including a copy of the renewed financial instrument or a copy of the receipt for payment of the financial instrument.
  - Evidence that the amount is still adequate or if not, that the amount of financial assurance has been increased by the appropriate amount, due to inflation, a change in the approved closure plan, or other unforeseen events.
- A review of the closure plan and a statement that the closure activities described are still accurate or an updated closure plan.

4.8.4 Vector Control Reporting Requirements

At the conclusion of every operational year, the ECM will prepare a report for submittal to the CEC Compliance Project Manager (CPM), summarizing the results of the various tests and monitoring efforts, described as a part of the evaporation pond monitoring plan. The summary report will include copies of the water quality tests, a chronological listing of the overnight water temperatures, water levels and salinity measurements for the active evaporation ponds, and any results of necropsies performed on birds salvaged from in or around the ponds.

Recommendations for changes to the monitoring program or pond management approach will be made, as warranted.

4.8.5 Unscheduled Reports to be Filed with the Regional Board

Incidents that result in implementation of the Contingency Plan will be reported to the appropriate agencies. If such incidents threaten to result in an off-site discharge or may present a potential threat to human health or the environment, immediate verbal notification shall be made as specified in the Contingency Plan. A record of such verbal communications will be maintained in the operating record.

Any spill shall be reported to the RWQCB within 48 hours of discovery, regardless of the type or size. After reporting the spill, written notification will be provided to the RWQCB by certified mail within seven days of such determination which contains the following information:

- A map showing the location(s) of the discharge/spill
- A description of the nature of the discharge (all pertinent observations and analyses including quantity, duration, etc.)
- Corrective measures underway or proposed

Additional reporting may be required under the Waste Discharge Requirements and Monitoring and Reporting Program established by the RWQCB. Further discharge situations are outlined in the following sections.

4.8.5.1 Release from the Evaporation Ponds

The RWQCB will be immediately notified (verbally) whenever a determination is made that there is a physical or statistically significant evidence of a release from the evaporation ponds. The verbal notification will be followed by a written notification, via certified mail, within seven days of such determination. The notification shall include the following information:

- Evaporation pond that may have released or be releasing;
- General information including the date, time, location and cause of the release;
- An estimate of the flow rate and volume of the waste involved;
- A procedure for collecting samples and description of laboratory tests to be conducted;

- Identification of any water bearing media affected or threatened;
- A summary of proposed corrective actions; and
- For statistically significant evidence of a release - monitoring parameters and/or constituents of concern that have indicated statistically significant evidence of a release from the evaporation pond; or
- For physical evidence of a release - physical factors that indicate physical evidence of a release.

Upon notification, Rio Mesa Solar I, LLC and/or Rio Mesa Solar II, LLC may initiate verification procedures, or demonstrate that a source other than the evaporation ponds, caused the evidence of a release. A supporting technical report must be provided to the RWQCB within 90 days demonstrating the different source of the discharge.

4.8.5.2 Exceeding the Action Leakage Rate

If the Action Leakage Rate is exceeded, the RWQCB will be notified within 24 hours of the determination. The verbal notification shall be followed by a written notification via certified mail, within seven days of such determination. This written notification shall be followed by a technical report via certified mail within thirty days of such determination. The technical report shall describe the actions taken to address the adverse condition, and shall describe any proposed future actions to abate the adverse condition.

4.8.5.3 Material Change

Pursuant to California Water Code Section 13260 (c), any proposed material change in the character of the waste, manner or method of treatment or disposal, increase of discharge, or location of discharge, shall be reported to the RWQCB at least 120 days in advance of implementation of any such proposal. This shall include, but not be limited to, all significant soil disturbances.

SECTION 5 REFERENCES

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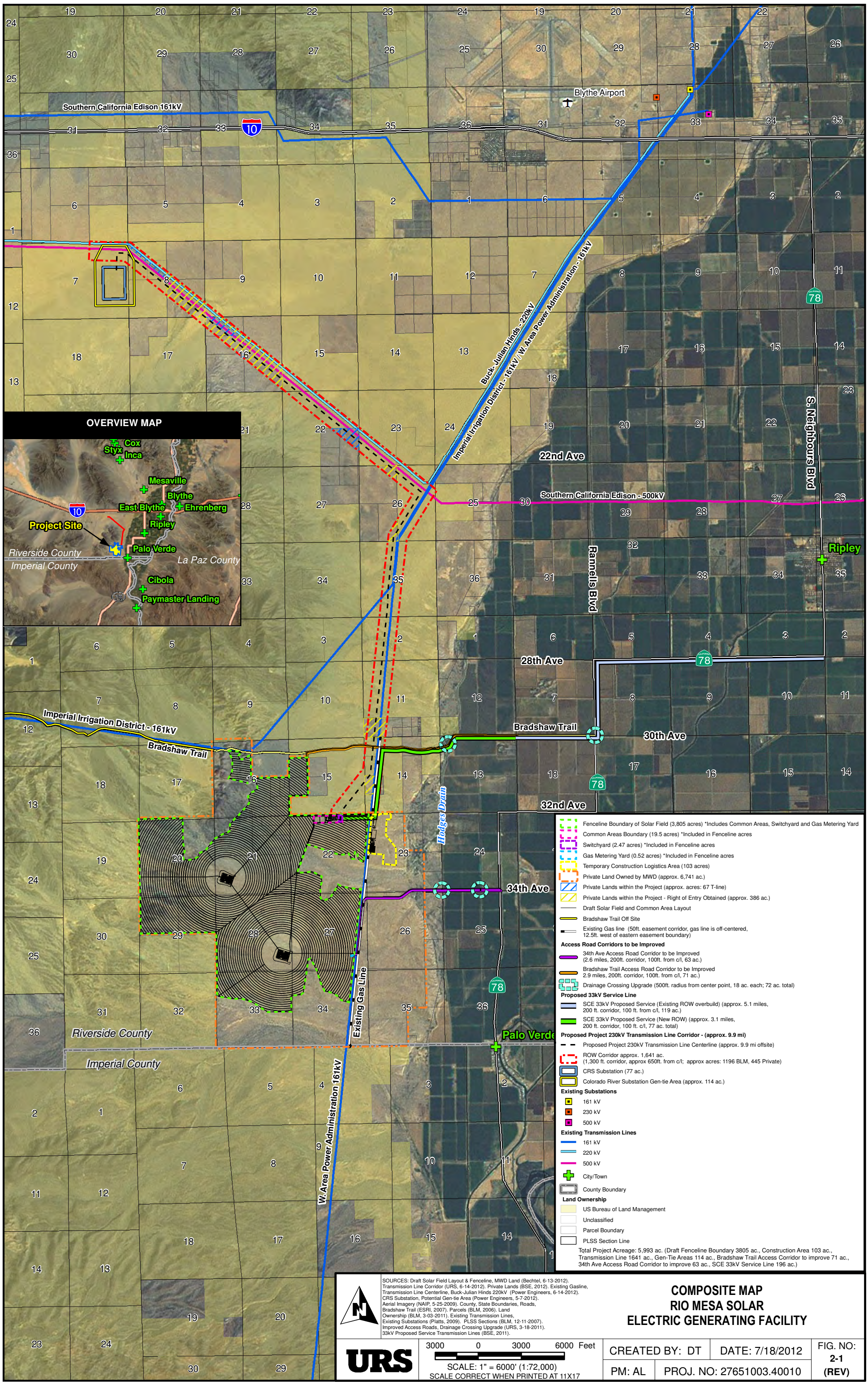

SOURCES: Draft Solar Field Layout & Fenceline, MWD Land (Bechtel, 6-13-2012). Transmission Line Corridor (URS, 6-14-2012). Private Lands (BSE, 2012). Existing Gasline, Transmission Line Centerline, Buck-Julian Hinds 220kV (Power Engineers, 6-14-2012). CRS Substation, Potential Gen-tie Area (Power Engineers, 5-7-2012). Aerial Imagery (NAIP, 5-25-2009). County, State Boundaries, Roads, Bradshaw Trail (ESRI, 2007). Parcels (BLM, 2006). Land Ownership (BLM, 3-03-2011). Existing Transmission Lines, Existing Substations (Platts, 2009). PLSS Sections (BLM, 12-11-2007). Improved Access Roads, Drainage Crossing Upgrade (URS, 3-18-2011). 33kV Proposed Service Transmission Lines (BSE, 2011).

COMPOSITE MAP
RIO MESA SOLAR
ELECTRIC GENERATING FACILITY

URS

3000 0 3000 6000 Feet

SCALE: 1" = 6000' (1:72,000)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: DT	DATE: 7/18/2012	FIG. NO: 2-1 (REV)
PM: AL	PROJ. NO: 27651003.40010	

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FIGURE 2 **Common Area and Evaporation Pond Monitoring Well Locations**

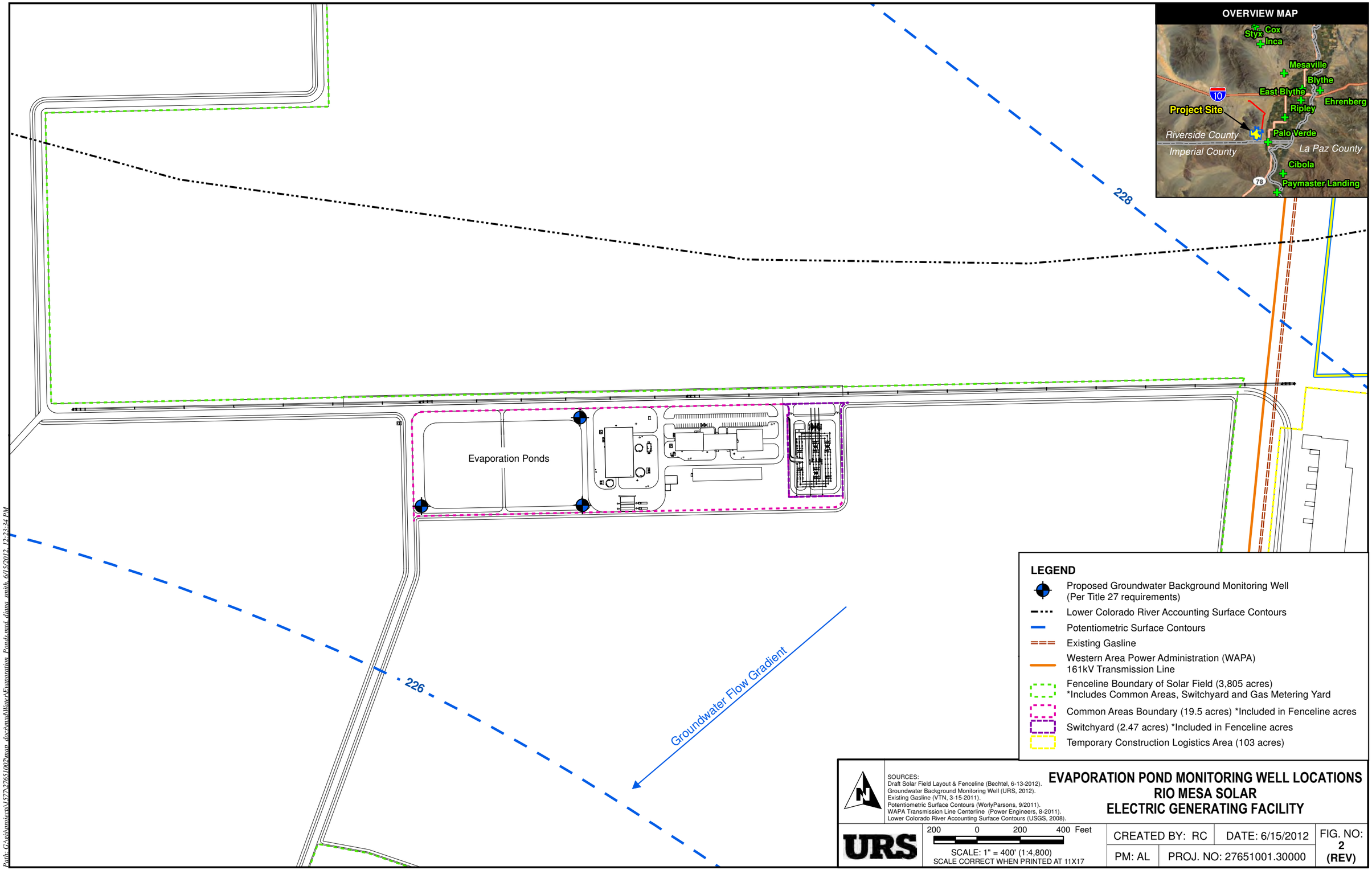

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FIGURE 3 **Leak Collection and Recovery System Pond Section and Details**

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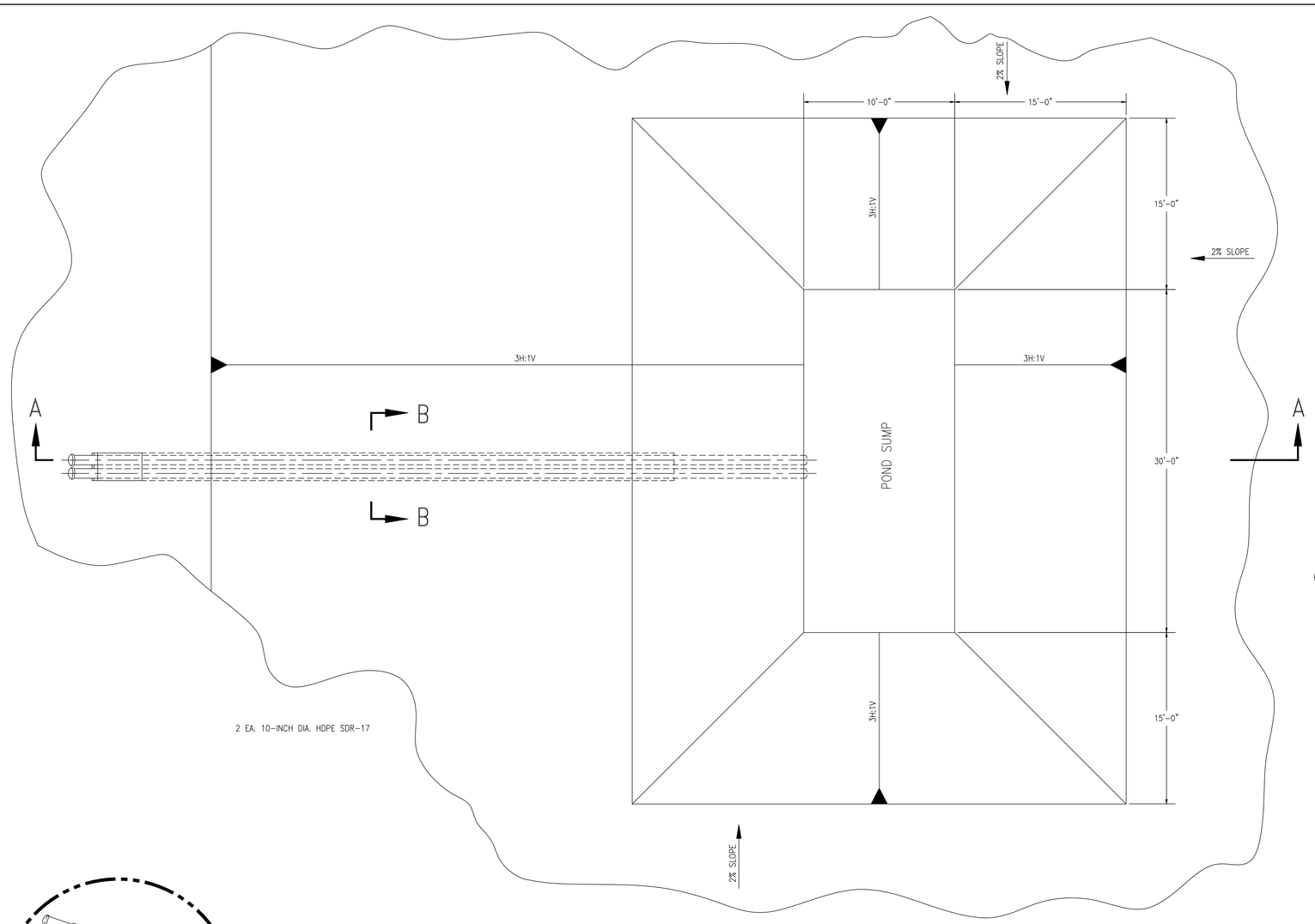
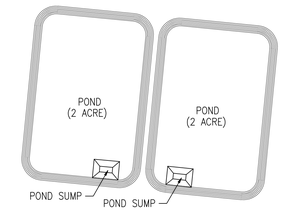
NOTES:

1. USE OF THE EXISTING IN-SITU SOILS AS A SUB-BASE WILL BE EVALUATED FROM GEOTECHNICAL INVESTIGATION AND TEST PERFORMED DURING THE DETAILED DESIGN PHASE. SHOULD THE EXISTING MATERIAL BE DEEMED NOT-SUITABLE AS A SUB-BASE, IMPORTED FILL MATERIAL WILL BE IMPORTED AND PLACED ACCORDING TO THE GEOTEXTILE AND GCL MANUFACTURERS' SPECIFICATIONS.
2. PRIMARY AND SECONDARY GEOMEMBRANE LINERS SHALL CONSIST OF SMOOTH BLACK HIGH DENSITY POLYETHYLENE GEOMEMBRANE. PRIMARY MEMBRANE SHALL BE CONDUCTIVE TO FACILITATE SPARK TESTING.
3. TOP OF BERM TO BE HIGHER THAN SURROUNDING GRADE SUFFICIENT TO PREVENT STORM WATER INFILTRATION INTO THE EVAPORATION POND (100 YEAR STORM).



POND SUMP PLAN VIEW

PLAN VIEW ROTATED FOR CLARITY
SCALE: N.T.S.



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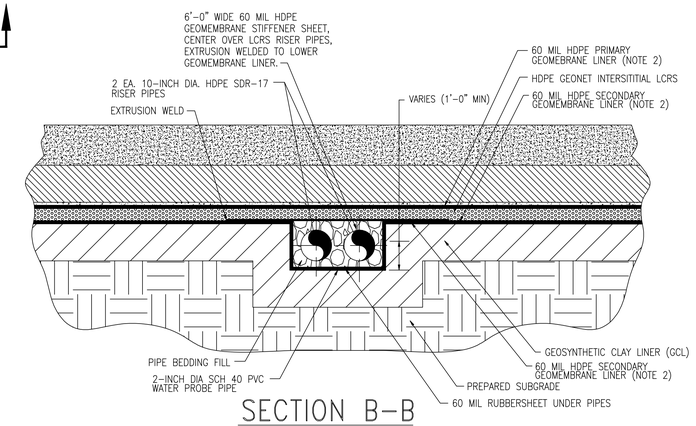

SECTION B-B
LCRS RISER PIPE SECTION

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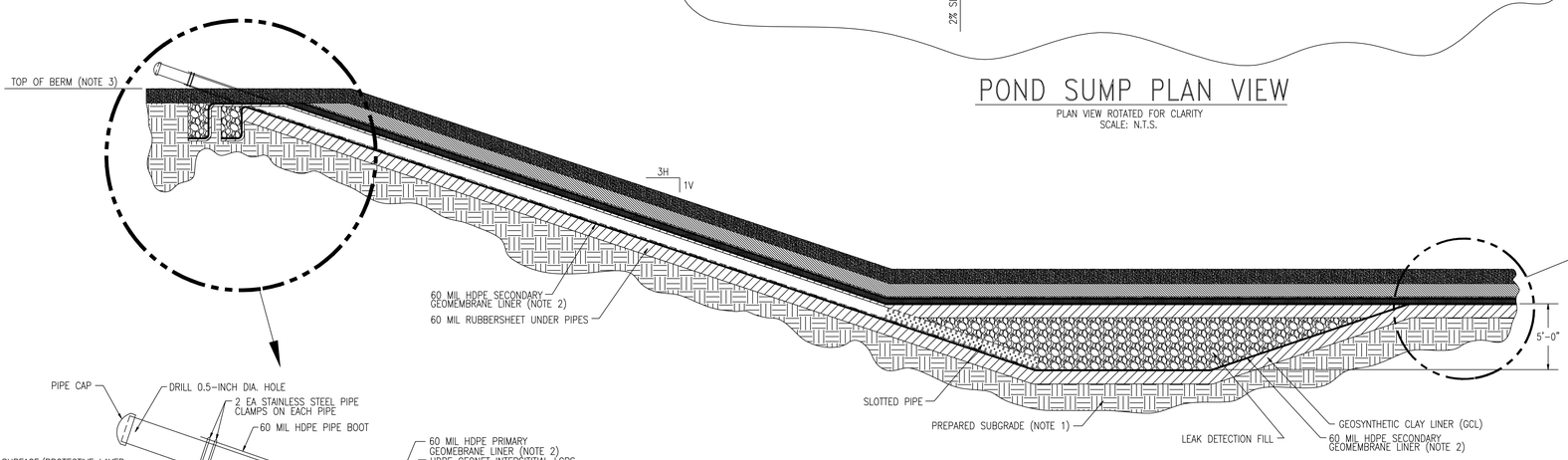

SECTION A-A
TYPICAL LCRS RISER PIPE AND POND PROFILE

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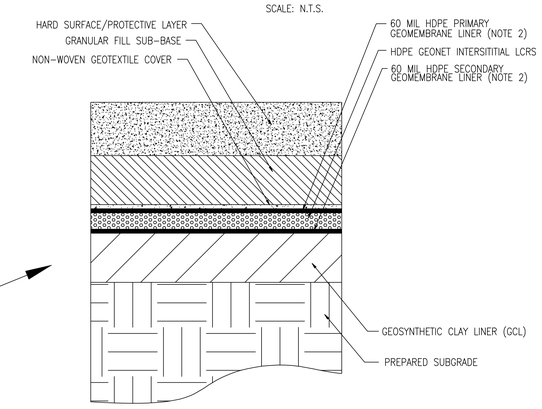
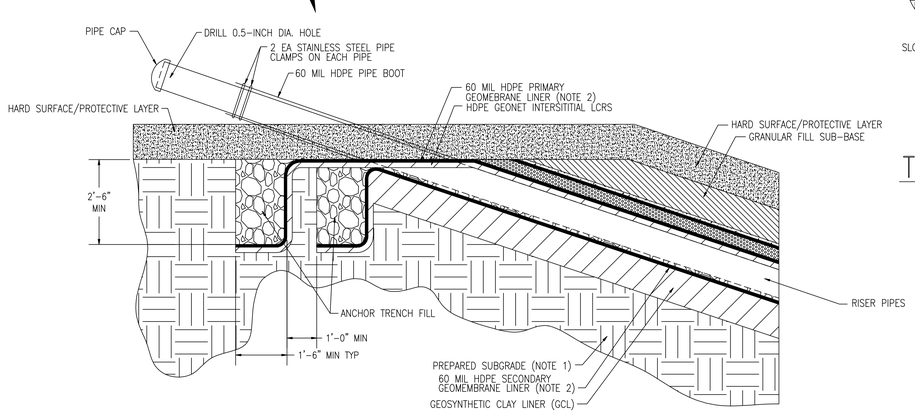


POND PROFILE DETAIL
(TYPICAL FOR ENTIRE POND)

SCALE: N.T.S.



LCRS RISER OUTLET DETAIL

SCALE: N.T.S.

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1	9/DEC/11	ISSUED FOR INFORMATION	RPT	TWA	RPT		TWA	

SCALE: AS SHOWN | DATE: 08SEP11 | DESIGNED: AKS | DRAWN: AKS | CHIEF ENGR.

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FREDERICK, MARYLAND

RIO MESA
SOLAR ELECTRIC GENERATING FACILITY

LEAK COLLECTION AND RECOVERY
SYSTEM POND SECTION & DETAILS

BSII (Ltd.) — OWNER DRAWING NO.: TBD

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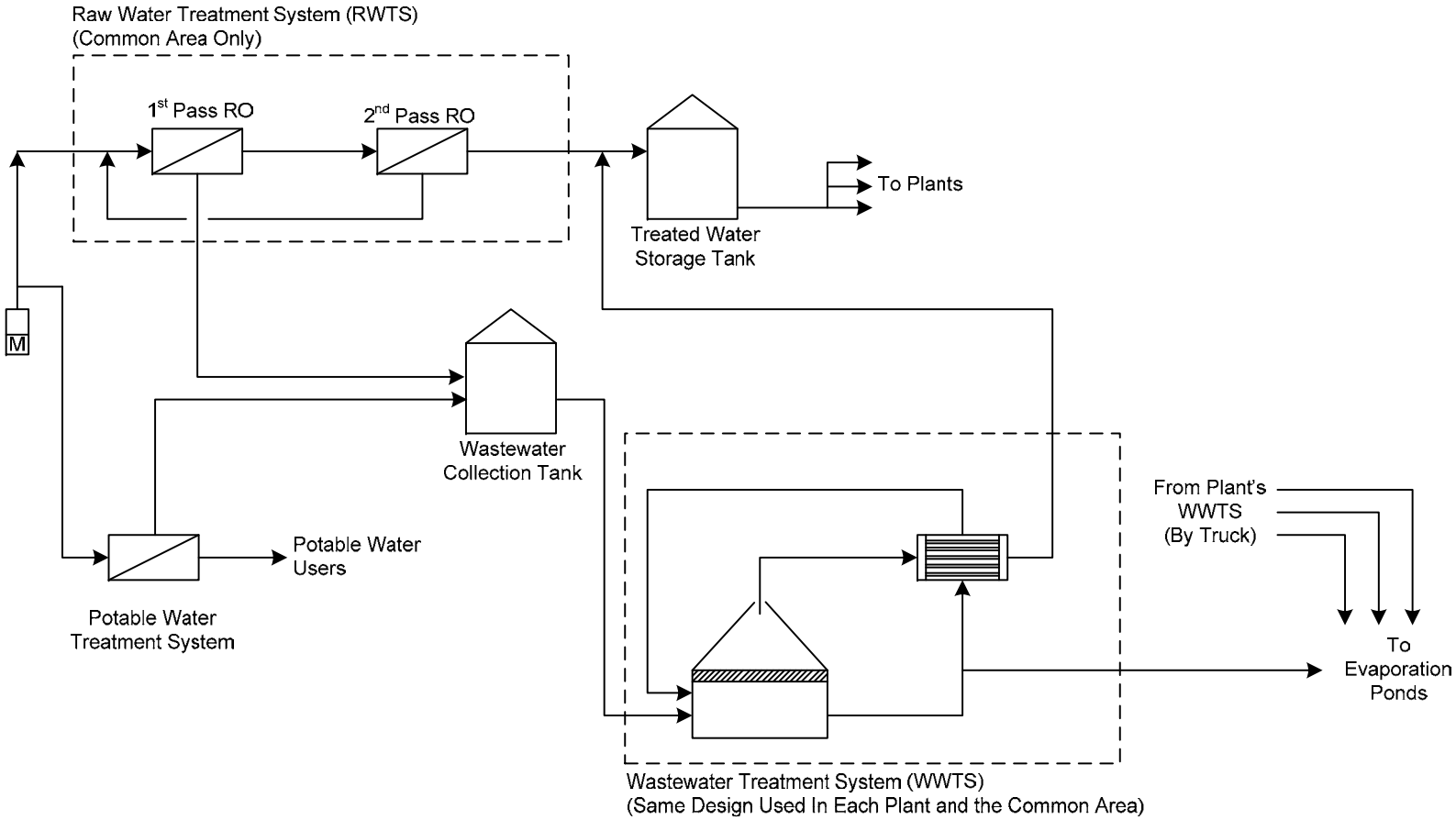
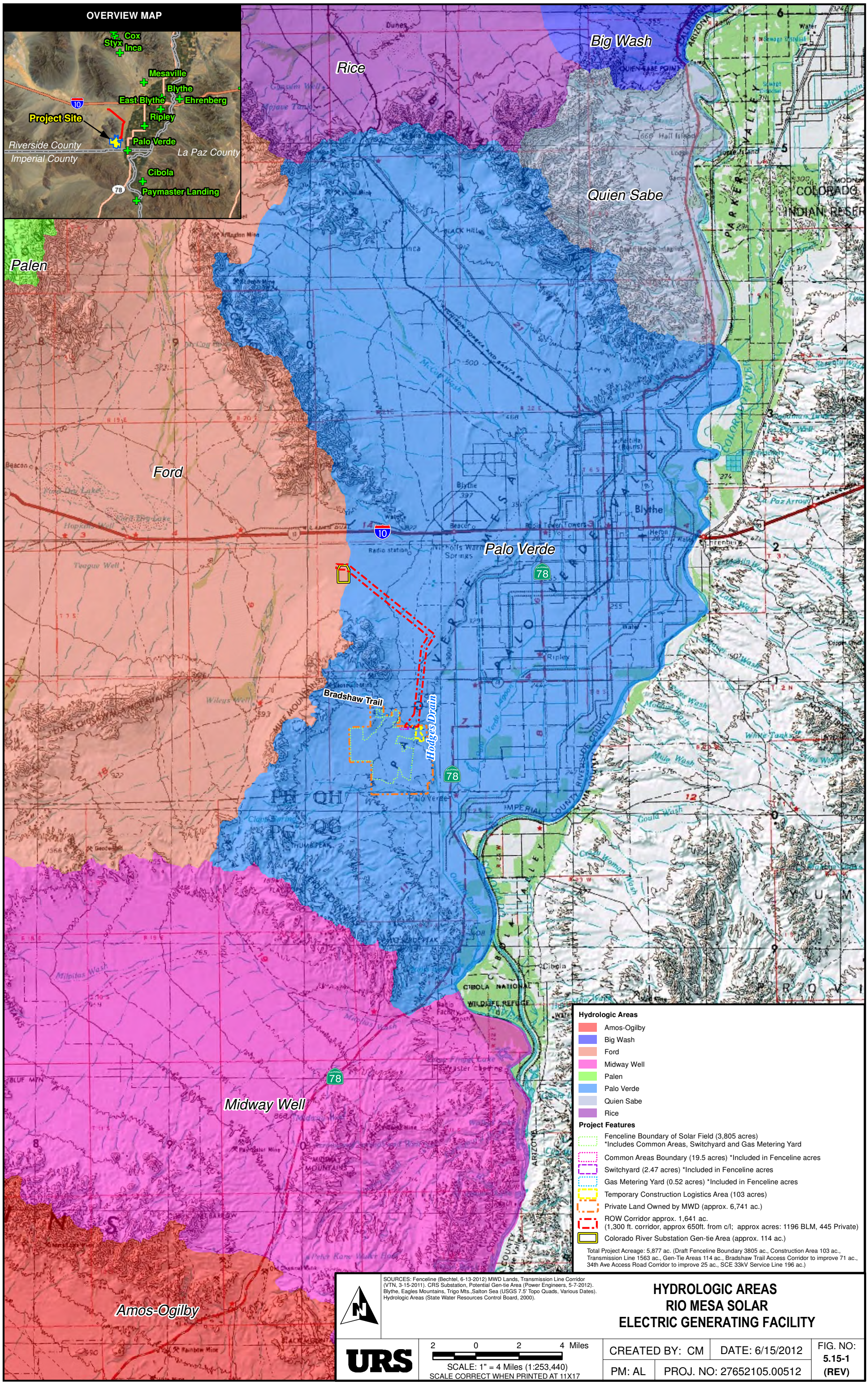
25670	009-CGK-0010-00001	A

34"X44"E SIZE

FIGURE4 Wastewater Treatment System Diagram





HYDROLOGIC AREAS
RIO MESA SOLAR
ELECTRIC GENERATING FACILITY

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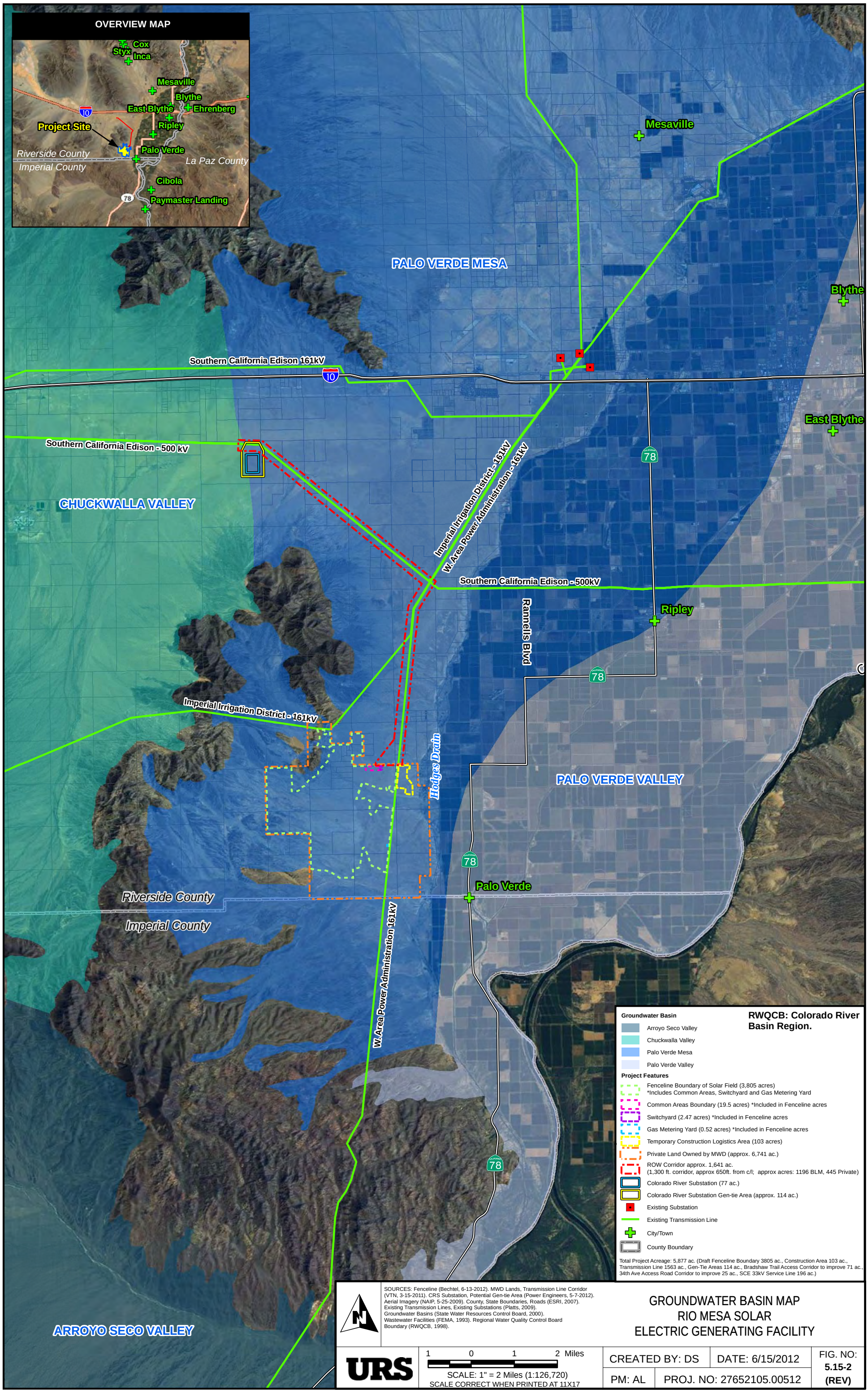

SOURCES: Fenceline (Bechtel, 6-13-2012). MWD Lands, Transmission Line Corridor (VTN, 3-15-2011). CRS Substation, Potential Gen-tie Area (Power Engineers, 5-7-2012). Aerial Imagery (NAIP, 5-25-2009). County, State Boundaries, Roads (ESRI, 2007). Existing Transmission Lines, Existing Substations (Platts, 2009). Groundwater Basins (State Water Resources Control Board, 2000). Wastewater Facilities (FEMA, 1993). Regional Water Quality Control Board Boundary (RWQCB, 1998).

GROUNDWATER BASIN MAP
RIO MESA SOLAR
ELECTRIC GENERATING FACILITY

URS

1 0 1 2 Miles

SCALE: 1" = 2 Miles (1:126,720)
SCALE CORRECT WHEN PRINTED AT 11X17

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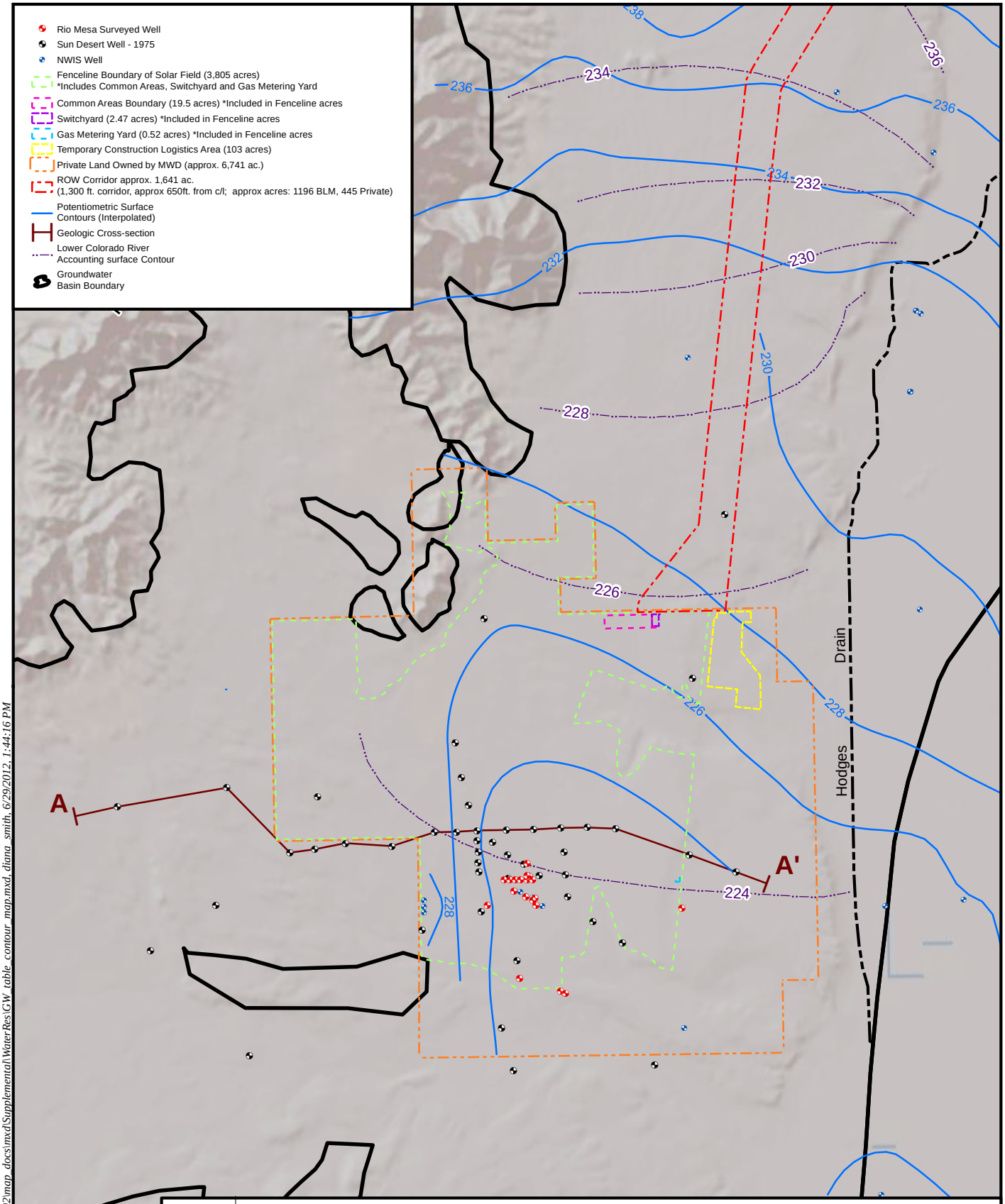

SOURCES: Groundwater Features (Worley Parsons,2012). Transmission Line Corridor (URS, 2012). Fenceline (Bechtel, 6-13-2012). MWD (Bechtel, 2011).

GROUNDWATER TABLE CONTOUR MAP
RIO MESA SOLAR
ELECTRIC GENERATING FACILITY

URS

2500 0 2500 5000 Feet

SCALE: 1" = 5000' (1:60,000)
SCALE CORRECT WHEN PRINTED AT 8.5X11

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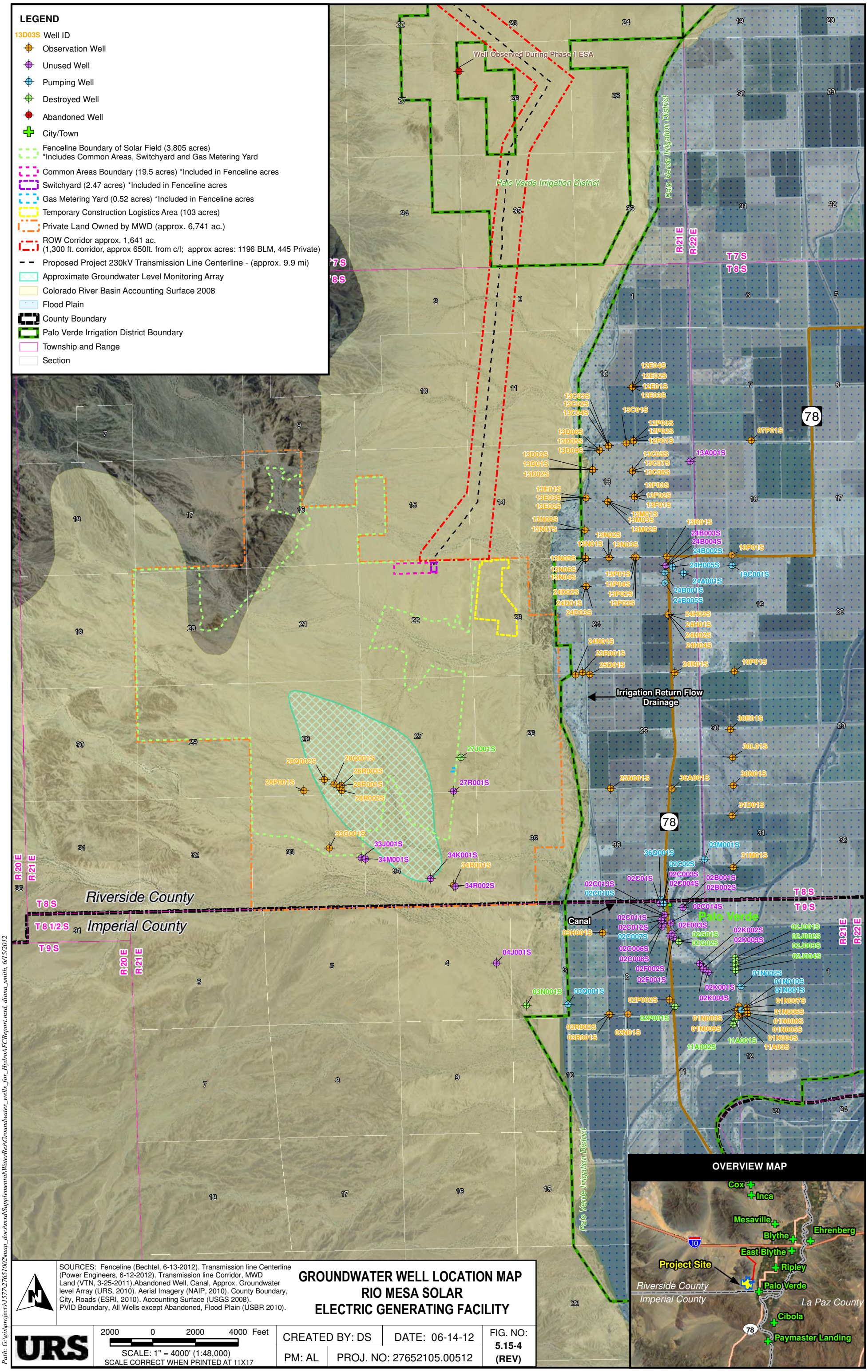

SOURCES: Fenceline (Bechtel, 6-13-2012). Transmission line Centerline (Power Engineers, 6-12-2012). Transmission line Corridor, MWD Land (VTN, 3-25-2011).Abandoned Well, Canal, Approx. Groundwater level Array (URS, 2010). Aerial Imagery (NAIP, 2010). County Boundary, City, Roads (ESRI, 2010). Accounting Surface (USGS 2008). PVID Boundary, All Wells except Abandoned, Flood Plain (USBR 2010).

GROUNDWATER WELL LOCATION MAP
RIO MESA SOLAR
ELECTRIC GENERATING FACILITY

URS

2000 0 2000 4000 Feet

SCALE: 1" = 4000' (1:48,000)
SCALE CORRECT WHEN PRINTED AT 11X17

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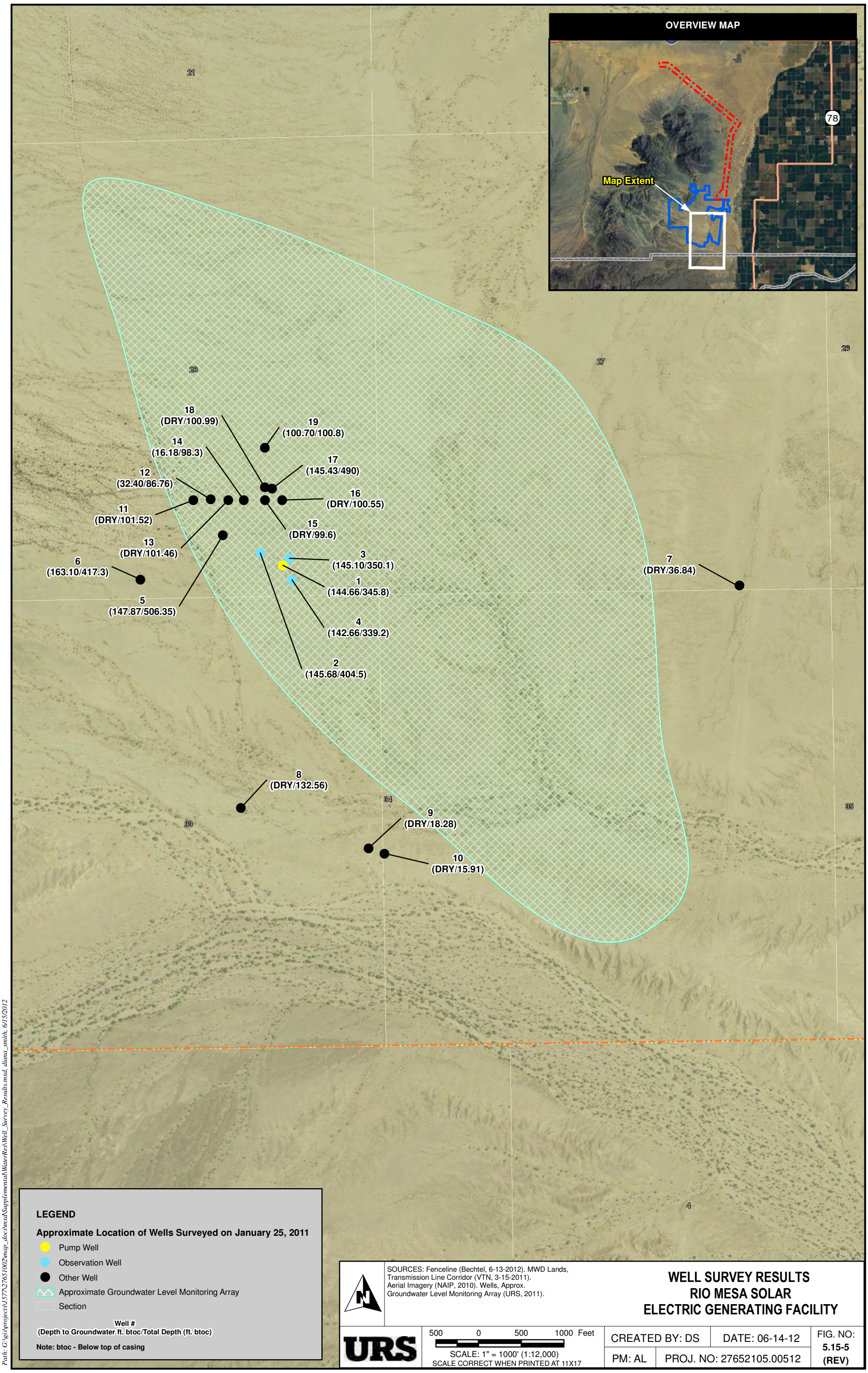
OVERVIEW MAP
Map Extent
78
21
28
27
26
33
34
35
4
18
(DRY/100.99)
19
(100.70/100.8)
14
(16.18/98.3)
17
(145.43/490)
12
(32.40/86.76)
16
(DRY/100.55)
11
(DRY/101.52)
15
(DRY/99.6)
13
(DRY/101.46)
3
(145.10/350.1)
6
(163.10/417.3)
7
(DRY/36.84)
1
(144.66/345.8)
5
(147.87/506.35)
4
(142.66/339.2)
2
(145.68/404.5)
8
(DRY/132.56)
9
(DRY/18.28)
10
(DRY/15.91)
LEGEND
Approximate Location of Wells Surveyed on January 25, 2011
Pump Well
Observation Well
Other Well
Approximate Groundwater Level Monitoring Array
Section
Well #
(Depth to Groundwater ft. btoc/Total Depth (ft. btoc)
Note: btoc - Below top of casing
N
SOURCES: Fenceline (Bechtel, 6-13-2012). MWD Lands, Transmission Line Corridor (VTN, 3-15-2011). Aerial Imagery (NAIP, 2010). Wells, Approx. Groundwater Level Monitoring Array (URS, 2011).
WELL SURVEY RESULTS
RIO MESA SOLAR
ELECTRIC GENERATING FACILITY
URS
500 0 500 1000 Feet
SCALE: 1" = 1000' (1:12,000)
SCALE CORRECT WHEN PRINTED AT 11X17
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DATE: 06-14-12
PM: AL
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5.15-5
(REV)
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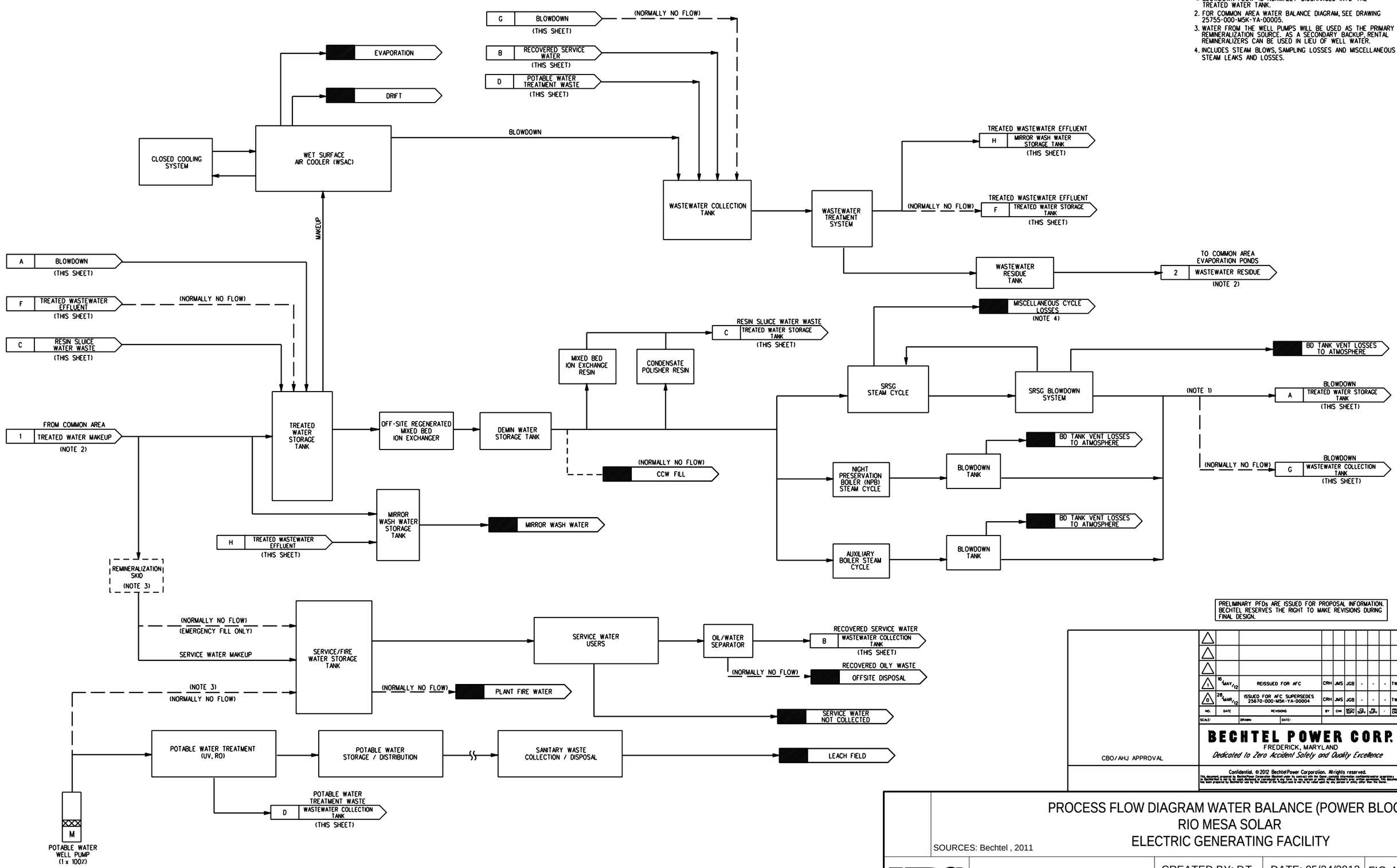
NOTES:
1. BLOWDOWN FLOW IS NORMALLY DISCHARGED INTO THE TREATED WATER TANK.
2. FOR COMMON AREA WATER BALANCE DIAGRAM, SEE DRAWING 25755-000-M5K-YA-00005.
3. WATER FROM THE WELL PUMPS WILL BE USED AS THE PRIMARY REMINERALIZATION SOURCE. AS A SECONDARY BACKUP, RENTAL REMINERALIZERS CAN BE USED IN LIEU OF WELL WATER.
4. INCLUDES STEAM BLOWS, SAMPLING LOSSES AND MISCELLANEOUS STEAM LEAKS AND LOSSES.



PRELIMINARY PFDs ARE ISSUED FOR PROPOSAL INFORMATION. BECHTEL RESERVES THE RIGHT TO MAKE REVISIONS DURING FINAL DESIGN.

NO.	DATE	REVISIONS	BY	CHK	REVIEW	CSA	PM	PROJ ENGR
1	16 MAY 12	REISSUED FOR AFC	CRH	JMS	JGB	-	-	- TWA
0	28 MAR 12	ISSUED FOR AFC SUPERSEDES 25670-000-M5K-YA-00004	CRH	JMS	JGB	-	-	- TWA

SCALE: DRAWN: DATE:

CBO/AHJ APPROVAL

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

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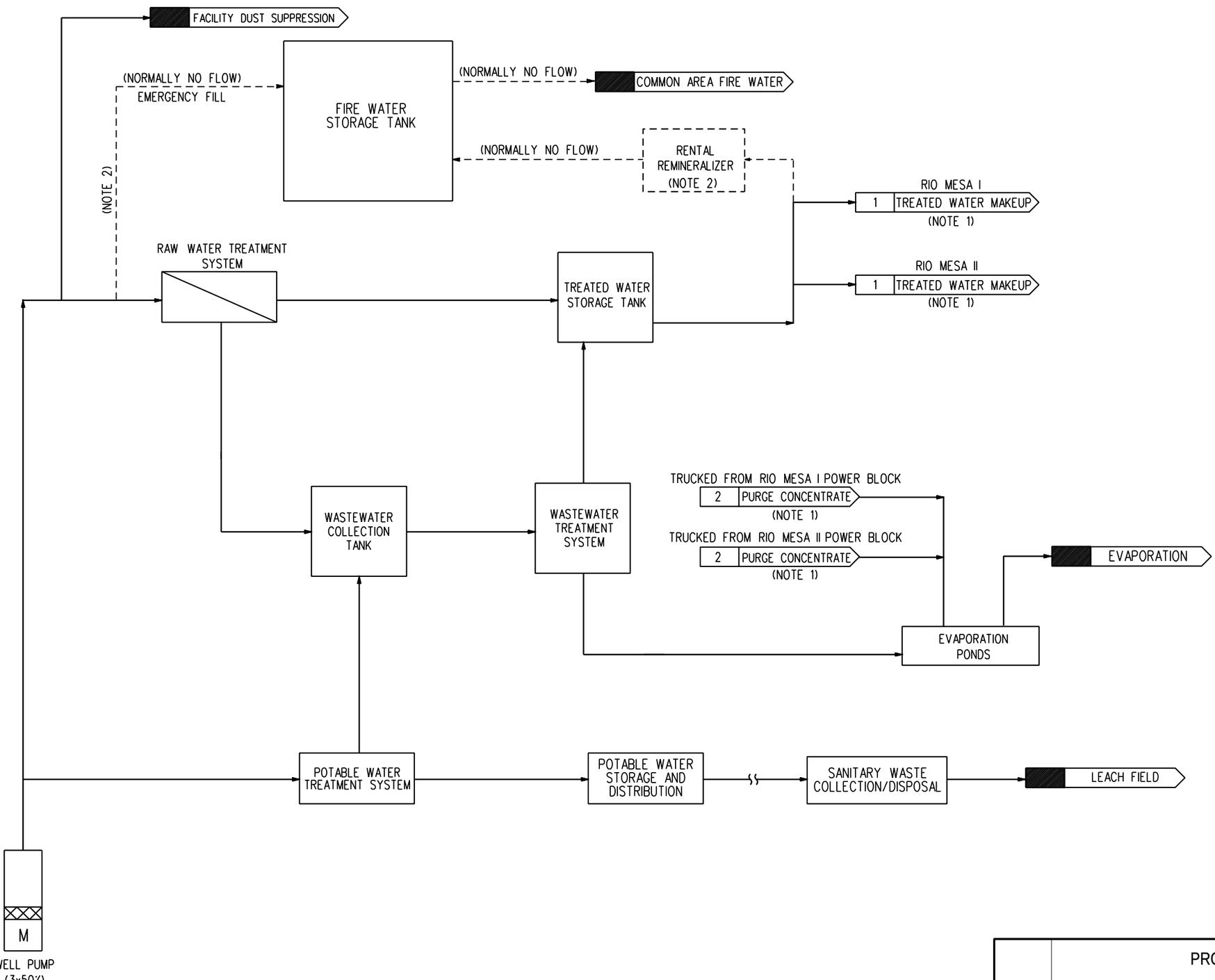
SOURCES: Bechtel , 2011

PROCESS FLOW DIAGRAM WATER BALANCE (POWER BLOCK)
RIO MESA SOLAR
ELECTRIC GENERATING FACILITY

URS

CREATED BY: DT	DATE: 05/24/2012	FIG. NO: 5.15-9 (REV)
PM: AL	PROJ. NO: 27651006.50505	

NOTES:
1. FOR POWER BLOCK WATER BALANCE, SEE PROCESS FLOW DIAGRAM 25755-000-M5K-YA-00004.
2. WATER FROM THE WELL PUMPS WILL BE USED AS THE PRIMARY REMINERALIZATION SOURCE. AS A SECONDARY BACKUP, RENTAL REMINERALIZERS CAN BE USED IN LIEU OF WELL WATER.



PRELIMINARY PFDs ARE ISSUED FOR PROPOSAL INFORMATION. BECHTEL RESERVES THE RIGHT TO MAKE REVISIONS DURING FINAL DESIGN.

NO.	DATE	REVISIONS	BY	CHK						
1	16 MAY 12	REISSUED FOR AFC	CRH	JMS	JGB	-	-	-	TWA	
0	28 MAR 12	ISSUED FOR AFC SUPERSEDES 25670-000-M5K-YA-00005	CRH	JMS	JGB	-	-	-	TWA	

SCALE: DRAWN: DATE:

BECHTEL POWER CORP.
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CBO/AHJ APPROVAL

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PROCESS FLOW DIAGRAM WATER BALANCE (COMMON AREA)
RIO MESA SOLAR
ELECTRIC GENERATING FACILITY

SOURCES: Bechtel , 2011

URS

CREATED BY: DT | DATE: 05/24/2012 | FIG. NO: 5.15-10 (REV)
PM: AL | PROJ. NO: 27651006.50505

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INTRODUCTION

This application package constitutes a Report of Waste Discharge (ROWD) pursuant to California Water Code Section 13260. Section 13260 states that persons discharging or proposing to discharge waste that could affect the quality of the waters of the State, other than into a community sewer system, shall file a ROWD containing information which may be required by the appropriate Regional Water Quality Control Board (RWQCB).

This package is to be used to start the application process for all waste discharge requirements (WDRs) and National Pollutant Discharge Elimination System (NPDES) permits* issued by a RWQCB except:

a) Those landfill facilities that must use a joint Solid Waste Facility Permit Application Form, California Integrated Waste Management Board Form E-1-77; and
b) General WDRs or general NPDES permits that use a Notice of Intent to comply or specify the use of an alternative application form designed for that permit.

This application package contains:

1. Application/General Information Form for WDRs and NPDES Permits [Form 200 (10/97)].
2. Application/General Information Instructions.

Instructions

Instructions are provided to assist you with completion of the application. If you are unable to find the answers to your questions or need assistance with the completion of the application package, please contact your RWQCB representative. *The RWQCBs strongly recommend that you make initial telephone or personal contact with RWQCB regulatory staff to discuss a proposed new discharge before submitting your application.* The RWQCB representative will be able to answer procedural and annual fee related questions that you may have. (See map and telephone numbers inside of application cover.)

All dischargers regulated under WDRs and NPDES permits must pay an annual fee, except dairies, which pay a filing fee only. The RWQCB will notify you of your annual fee based on an evaluation of your proposed discharge. Please do NOT submit a check for your first annual fee or filing fee until requested to do so by a RWQCB representative. Dischargers applying for reissuance (renewal) of an existing NPDES permit or update of an existing WDR will be billed through the annual fee billing system and are therefore requested NOT to submit a check with their application. Checks should be made payable to the State Water Resources Control Board.

Additional Information Requirements

A RWQCB representative will notify you within 30 days of receipt of the application form and any supplemental documents whether your application is complete. If your application is incomplete, the RWQCB representative will send you a detailed list of discharge specific information necessary to complete the application process. The completion date of your application is normally the date when all required information, including the correct fee, is received by the RWQCB.

*** NPDES PERMITS:** If you are applying for a permit to discharge to surface water, you will need an NPDES permit which is issued under both State and Federal law and may be required to complete one or more of the following Federal NPDES permit application forms: Short Form A, Standard Form A, Forms 1, 2B, 2C, 2D, 2E, and 2F. These forms may be obtained at a RWQCB office or can be ordered from the National Center for Environmental Publications and Information at (513) 891-6561.

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

State of California
Regional Water Quality Control Board

APPLICATION/REPORT OF WASTE DISCHARGE
GENERAL INFORMATION FORM FOR
WASTE DISCHARGE REQUIREMENTS OR NPDES PERMIT

INSTRUCTIONS

FOR COMPLETING THE APPLICATION/REPORT OF WASTE DISCHARGE GENERAL INFORMATION FORM FOR: WASTE DISCHARGE REQUIREMENTS/NPDES PERMIT

If you have any questions on the completion of any part of the application, please contact your RWQCB representative. A map of RWQCB locations, addresses, and telephone numbers is located on the reverse side of the application cover.

I. FACILITY INFORMATION

You must provide the factual information listed below for ALL owners, operators, and locations and, where appropriate, for ALL general partners and lease holders.

A. FACILITY:
Legal name, physical address including the county, person to contact, and phone number at the facility. (**NO P.O. Box numbers!** If no address exists, use street and nearest cross street.)

B. FACILITY OWNER:
Legal owner, address, person to contact, and phone number. Also include the owner's Federal Tax Identification Number.

OWNER TYPE:
Check the appropriate Owner Type. The legal owner will be named in the WDRs/NPDES permit.

C. FACILITY OPERATOR (The agency or business, not the person):
If applicable, the name, address, person to contact, and telephone number for the facility operator. Check the appropriate Operator Type. If identical to B. above, enter "same as owner".

D. OWNER OF THE LAND:
Legal owner of the land(s) where the facility is located, address, person to contact, and phone number. Check the appropriate Owner Type. If identical to B. above, enter "same as owner".

E. ADDRESS WHERE LEGAL NOTICE MAY BE SERVED:
Address where legal notice may be served, person to contact, and phone number. If identical to B. above, enter "same as owner".

F. BILLING ADDRESS
Address where annual fee invoices should be sent, person to contact, and phone number. If identical to B. above, enter "same as owner".

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

State of California
Regional Water Quality Control Board

APPLICATION/REPORT OF WASTE DISCHARGE GENERAL INFORMATION FORM FOR WASTE DISCHARGE REQUIREMENTS OR NPDES PERMIT

II. TYPE OF DISCHARGE

Check the appropriate box to describe whether the waste will be discharged to: A. Land, or B. Surface Water.

Check the appropriate box(es) which best describe the activities at your facility.

Hazardous Waste - **If you check the Hazardous Waste box,** STOP **and contact a representative of the RWQCB for further instructions.**

Landfills - **A separate form, APPLICATION FOR SOLID WASTE FACILITY PERMIT/WASTE DISCHARGE REQUIREMENTS, California Integrated Waste Management Board Form E-1-77, may be required. Contact a RWQCB representative to help determine the appropriate form for your discharge.**

III. LOCATION OF THE FACILITY

1. Enter the Assessor's Parcel Number(s) (APN), which is located on the property tax bill. The number can also be obtained from the County Assessor's Office. Indicate the APN for both the facility and the discharge point.

2. Enter the Latitude of the entrance to the proposed/existing facility and of the discharge point. Latitude and longitude information can be obtained from a U.S. Geological Survey quadrangle topographic map. Other maps may also contain this information.

3. Enter the Longitude of the entrance to the proposed/existing facility and of the discharge point.

IV. REASON FOR FILING

NEW DISCHARGE OR FACILITY:
A discharge or facility that is proposed but does not now exist, or that does not yet have WDRs or an NPDES permit.

CHANGE IN DESIGN OR OPERATION:
A material change in design or operation from existing discharge requirements. Final determination of whether the reported change is material will be made by the RWQCB.

CHANGE IN QUANTITY/TYPE OF DISCHARGE:
A material change in characteristics of the waste from existing discharge requirements. Final determination of whether the reported change would have a significant effect will be made by the RWQCB.

CHANGE IN OWNERSHIP/OPERATOR:
Change of legal owner of the facility. Complete Parts I, III, and IV only and contact the RWQCB to determine if additional information is required.

WASTE DISCHARGE REQUIREMENTS UPDATE OR NPDES PERMIT REISSUANCE:
WDRs must be updated periodically to reflect changing technology standards and conditions. A new application is required to reissue an NPDES permit which has expired.

OTHER:
If there is a reason other than the ones listed, please describe the reason on the space provided. (If more space is needed, attach a separate sheet.)

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

State of California
Regional Water Quality Control Board

APPLICATION/REPORT OF WASTE DISCHARGE GENERAL INFORMATION FORM FOR WASTE DISCHARGE REQUIREMENTS OR NPDES PERMIT

V. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

It should be emphasized that communication with the appropriate RWQCB staff is vital before starting the CEQA documentation, and is recommended before completing this application. There are Basin Plan issues which may complicate the CEQA effort, and RWQCB staff may be able to help in providing the needed information to complete the CEQA documentation.

Name the Lead Agency responsible for completion of CEQA requirements for the project, i.e., completion and certification of CEQA documentation.

Check YES or NO. Has a public agency determined that the proposed project is exempt from CEQA?
If the answer is YES, state the basis for the exemption and the name of the agency supplying the exemption on the space provided. (Remember that, if extra space is needed, use an extra sheet of paper, but be sure to indicate the attached sheet under Section VII. Other.)

Check YES or NO. Has the "Notice of Determination" been filed under CEQA? If YES, give the date the notice was filed and enclose a copy of the Notice of Determination and the Initial Study, Environmental Impact Report, or Negative Declaration. If NO, check the box of the expected type of CEQA document for this project, and include the expected date of completion using the timelines given under CEQA. The date of completion should be taken as the date that the Notice of Determination will be submitted. (If not known, write "Unknown")

VI. OTHER REQUIRED INFORMATION

To be approved, your application MUST include a COMPLETE characterization of the discharge. If the characterization is found to be incomplete, RWQCB staff will contact you and request that additional specific information be submitted.

This application MUST be accompanied by a site map. A USGS 7.5' Quadrangle map or a street map, if more appropriate, is sufficient for most applications.

VII. OTHER

If any of the answers on your application form need further explanation, attach a separate sheet. Please list any attachments with the titles and dates on the space provided.

VIII. CERTIFICATION

Certification by the owner of the facility or the operator of the facility, if the operator is different from the owner, is required. The appropriate person must sign the application form.
Acceptable signatures are:

1. **for a corporation,** a principal executive officer of at least the level of senior vice-president;
2. **for a partnership or individual (sole proprietorship),** a general partner or the proprietor;
3. **for a governmental or public agency,** either a principal executive officer or ranking elected/appointed official.

DISCHARGE SPECIFIC INFORMATION

In most cases, a request to supply additional discharge specific information will be sent to you by a representative of the RWQCB. If the RWQCB determines that additional discharge specific information is not needed to process your application, you will be so notified.

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

State of California
Regional Water Quality Control Board

APPLICATION/REPORT OF WASTE DISCHARGE GENERAL INFORMATION FORM FOR WASTE DISCHARGE REQUIREMENTS OR NPDES PERMIT

I. FACILITY INFORMATION

A. Facility:

Name: Rio Mesa Solar Electric Generating Facility (Rio Mesa SEGF)			
Address: North of Imperial County Boundary, south of Bradshaw Trail, East of Mule Mountains, West of SR-78			
City:	County: Riverside	State: CA	Zip Code:
Contact Person: Todd Stewart, Brightsource Energy, Inc.		Telephone Number: 510-550-8460	

B. Facility Owner:

Name: Rio Mesa Solar I, LLC and Rio Mesa Solar II			Owner Type (Check One) 1. ☐ Individual 2. ☐ Corporation
Address: 1999 Harrison Street, Suite 2150			3. ☐ Governmental Agency 4. ☑ Partnership
City: Oakland	State: CA	Zip Code: 92612	5. ☐ Other:
Contact Person: Todd Stewart, Daniel T. Judge		Telephone Number: 510-550-8460	Federal Tax ID:

C. Facility Operator (The agency or business, not the person):

Name: TBD			Operator Type (Check One) 1. ☐ Individual 2. ☐ Corporation
Address: TBD			3. ☐ Governmental Agency 4. ☑ Partnership
City: TBD	State:	Zip Code:	5. ☐ Other:
Contact Person: TBD		Telephone Number: TBD	

D. Owner of the Land:

Name: Los Angeles County Metropolitan Water District and US BLM			Owner Type (Check One) 1. ☐ Individual 2. ☐ Corporation
Address: 700 North Alameda Street			3. ☐ Governmental Agency 4. ☐ Partnership
City: Los Angeles	State: CA	Zip Code: 90012	5. ☑ Other: MWD, US BLM
Contact Person: Ralph T. Hicks (MWD), Cedric Perry (BLM)		Telephone Number: (213) 217-6183 (MWD), (951) 697-5200 (BLM)	

E. Address Where Legal Notice May Be Served:

Address: Rio Mesa Solar Holdings, LLC, 1999 Harrison Street, Suite 2150		
City: Oakland	State: CA	Zip Code: 92612
Contact Person: Todd Stewart, Daniel T. Judge		Telephone Number: 510-550-8460

F. Billing Address:

Address: Rio Mesa Solar Holdings, LLC, 1999 Harrison Street, Suite 2150		
City: Oakland	State: CA	Zip Code: 92612
Contact Person: Todd Stewart, Daniel T. Judge		Telephone Number: 510-550-8460

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

State of California
Regional Water Quality Control Board

APPLICATION/REPORT OF WASTE DISCHARGE GENERAL INFORMATION FORM FOR WASTE DISCHARGE REQUIREMENTS OR NPDES PERMIT

II. TYPE OF DISCHARGE

Check Type of Discharge(s) Described in this Application (A or B):

☑ **A. WASTE DISCHARGE TO LAND** ☐ **B. WASTE DISCHARGE TO SURFACE WATER**

Check all that apply:

- ☐ Domestic/Municipal Wastewater Treatment and Disposal
- ☐ Cooling Water
- ☐ Mining
- ☐ Waste Pile
- ☐ Wastewater Reclamation
- ☐ Animal Waste Solids
- ☐ Land Treatment Unit
- ☐ Dredge Material Disposal
- ☐ Surface Impoundment
- ☑ Industrial Process Wastewater
- ☐ Animal or Aquacultural Wastewater
- ☐ Biosolids/Residual
- ☐ Hazardous Waste (see instructions)
- ☐ Landfill (see instructions)
- ☐ Storm Water
- ☐ Other, please describe: Groundwater treatment process wastewater discharged to evaporation ponds

III. LOCATION OF THE FACILITY

Describe the physical location of the facility.

1. Assessor's Parcel Number(s)	2. Latitude	3. Longitude
Facility: See Attached Figure	**Facility:** 33.488	**Facility:** -114.749
Discharge Point: Evaporation Ponds	**Discharge Point:** Evap. Ponds	**Discharge Point:** Evap Ponds

IV. REASON FOR FILING

- ☑ New Discharge or Facility
- ☐ Change in Design or Operation
- ☐ Change in Quantity/Type of Discharge
- ☐ Changes in Ownership/Operator (see instructions)
- ☐ Waste Discharge Requirements Update or NPDES Permit Reissuance
- ☐ Other: _____

V. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

Name of Lead Agency: California Energy Commission (CEC) and U.S. Bureau of Land Management (BLM)

Has a public agency determined that the proposed project is exempt from CEQA? ☐ **Yes** ☑ **No**

If Yes, state the basis for the exemption and the name of the agency supplying the exemption on the line below.

Basis for Exemption/Agency: _____

Has a "Notice of Determination" been filed under CEQA? ☐ **Yes** ☑ **No**

If Yes, enclose a copy of the CEQA document, Environmental Impact Report, or Negative Declaration. If no, identify the expected type of CEQA document and expected date of completion.

Expected CEQA Documents:

☑ **EIR** ☐ **Negative Declaration**

Expected CEQA Completion Date: EIR equivalent thru CEC

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

State of California
Regional Water Quality Control Board

APPLICATION/REPORT OF WASTE DISCHARGE
GENERAL INFORMATION FORM FOR
WASTE DISCHARGE REQUIREMENTS OR NPDES PERMIT

VI. OTHER REQUIRED INFORMATION

Please provide a COMPLETE characterization of your discharge. A complete characterization includes, but is not limited to, design and actual flows, a list of constituents and the discharge concentration of each constituent, a list of other appropriate waste discharge characteristics, a description and schematic drawing of all treatment processes, a description of any Best Management Practices (BMPs) used, and a description of disposal methods.

Also include a site map showing the location of the facility and, if you are submitting this application for an NPDES permit, identify the surface water to which you propose to discharge. Please try to limit your maps to a scale of 1:24,000 (7.5' USGS Quadrangle) or a street map, if more appropriate.

VII. OTHER

Attach additional sheets to explain any responses which need clarification. List attachments with titles and dates below:

Please see characterization of the proposed discharge and facilities in the ROWD.

You will be notified by a representative of the RWQCB within 30 days of receipt of your application. The notice will state if your application is complete or if there is additional information you must submit to complete your Application/Report of Waste Discharge, pursuant to Division 7, Section 13260 of the California Water Code.

VIII. CERTIFICATION

"I certify under penalty of law that this document, including all attachments and supplemental information, were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

Print Name: Todd Stewart **Title:** Sr. Director - Project Development

Signature: **Date:** June 29, 2012

FOR OFFICE USE ONLY

Date Form 200 Received:	Letter to Discharger:	Fee Amount Received:	Check #:

California Environmental Protection Agency
Bill of Rights for Environmental
Permit Applicants

California Environmental Protection Agency (Cal/EPA) recognizes that many complex issues must be addressed when pursuing reforms of environmental permits and that significant challenges remain. We have initiated reforms and intend to continue the effort to make environmental permitting more efficient, less costly, and to ensure that those seeking permits receive timely responses from the boards and departments of the Cal/EPA. To further this goal, Cal/EPA endorses the following precepts that form the basis of a permit applicant's "Bill of Rights."

1. Permit applicants have the right to assistance in understanding regulatory and permit requirements. All Cal/EPA programs maintain an Ombudsman to work directly with applicants. Permit Assistance Centers located throughout California have permit specialists from all the State, regional, and local agencies to identify permit requirements and assist in permit processing.

2. Permit applicants have the right to know the projected fees for review of applications, how any costs will be determined and billed, and procedures for resolving any disputes over fee billings.

3. Permit applicants have the right of access to complete and clearly written guidance documents that explain the regulatory requirements. Agencies must publish a list of all information required in a permit application and of criteria used to determine whether the submitted information is adequate.

4. Permit applicants have the right of timely completeness determinations for their applications. In general, agencies notify the applicant within 30 days of any deficiencies or determine that the application is complete. California Environmental Quality Act (CEQA) and public hearing requests may require additional information.

5. Permit applicants have the right to know exactly how their applications are deficient and what further information is needed to make their applications complete. Pursuant to California Government code Section 65944, after an application is accepted as complete, an agency may not request any new or additional information that was not specified in the original application.

6. Permit applicants have the right of a timely decision on their permit application. The agencies are required to establish time limits for permit reviews.

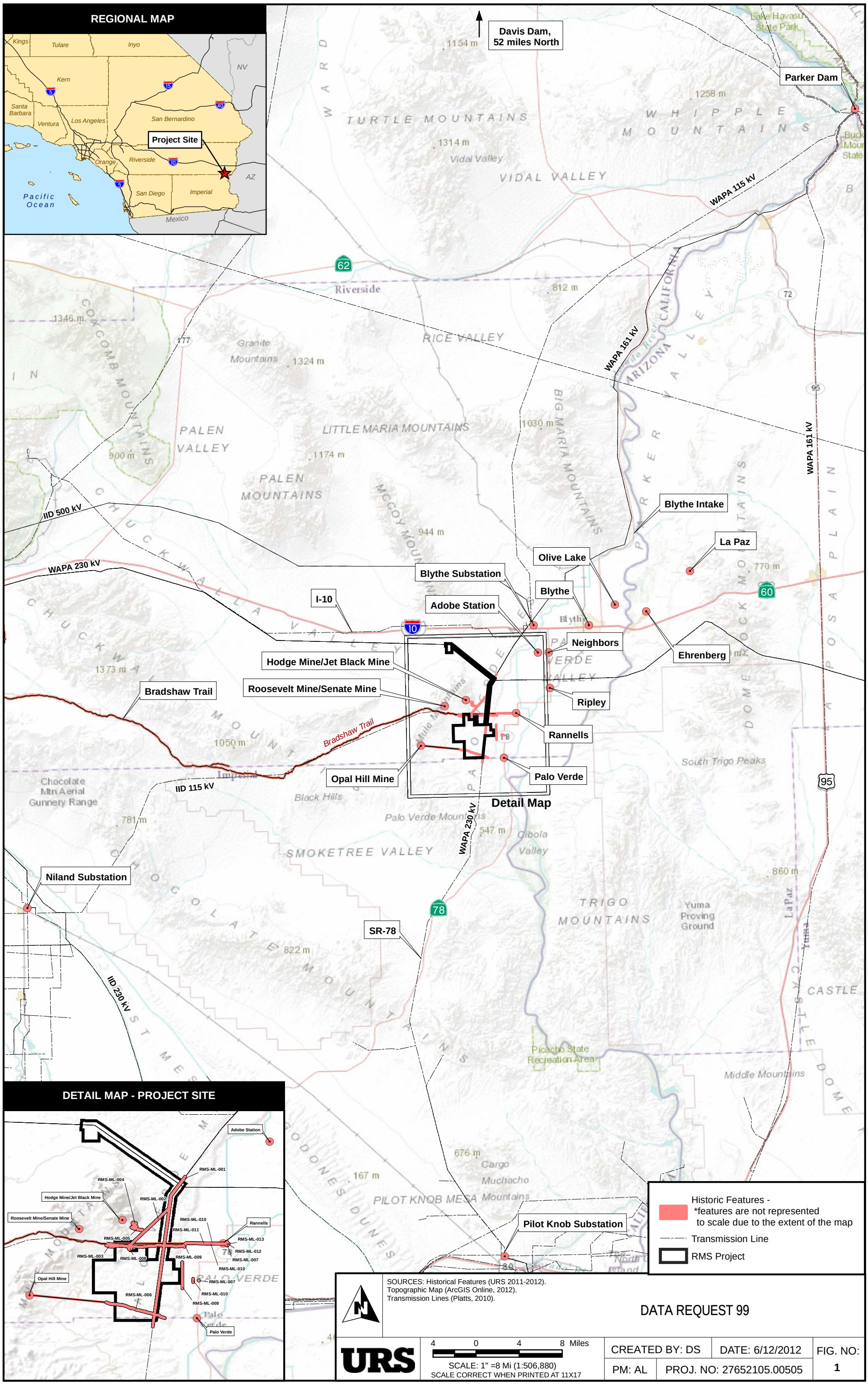
7. Permit applicants have the right to appeal permit review time limits by statute or administratively that have been violated without good cause. For state environmental agencies, appeals are made directly to the Cal/EPA Secretary or to a specific board. For local environmental agencies, appeals are generally made to the local governing board or, under certain circumstances, to Cal/EPA. Through this appeal, applicants may obtain a set date for a decision on their permit and, in some cases, a refund of all application fees (ask boards and departments for details).

8. Permit applicants have the right to work with a single lead agency where multiple environmental approvals are needed. For multiple permits, all agency actions can be consolidated under a lead agency. For site remediation, all applicable laws can be administered through a single agency.

9. Permit applicants have the right to know who will be reviewing their application and the time required to complete the full review process.

Data Request 99

Revised Figure 99-1



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NOTE: Locations are approximate and based on historic research reported in the Draft Final Cultural Resources Technical Report for the Rio Mesa Electric Generating Facility, Riverside County, California (September 2011).

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 7/11/12)

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*indicates change

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*indicates change

DECLARATION OF SERVICE

I, Darin Neufeld, declare that on August 1, 2012, I served and filed a copy of the attached document Applicant's Supplemental Data Response #5 to CEC Data Requests Set 1A, 1B, 2A, and 2B Dated August 1, 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-04
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.ca.gov

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
michael.levy@energy.ca.gov

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