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November 23, 2009

Commissioner Julia Levin, Presiding Member
Vice Chair James D. Boyd, Associate Member
Mr. Craig Hoffman, Project Manager
Abengoa Mojave Solar Project (09-AFC-5)
California Energy commission
1516 Ninth Street
Sacramento, CA 95814

Re: Abengoa Mojave Solar Project (09-AFC-5): Written Response to Data Request Set 1 (nos. 1-93)

Dear Commissioners Levin and Boyd:

Abengoa Solar Inc. (the "Applicant") hereby files these written responses to certain Data Requests in Set 1 promulgated by Staff on October 22, 2009. Reponses to the following Data Requests are included in this submittal: Data Request 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 50, 58A, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 70, 73, 74, 75, 76, 77, 82, 83, 85, 86, 87, 88, 89, 91, 92, and 93.

The Applicant requested additional time to respond or objected to the remaining Data Requests in Set 1 in a Notice filed on November 11, 2009. In addition, Applicant inadvertently left out Data Request 87 from the Notice as requiring additional time. Applicant may need additional time to respond to Data Request 87 because it requires additional vendor data that has already been requested, followed by analysis. Applicant will be able to complete analysis once the additional data is obtained. Based on the foregoing, Applicant estimates that it may need an additional 30 days to respond to Data Request 87. Applicant has discussed the need for additional time for Data Request 87 with Staff and Mr. Craig Hoffman, Project Manager. Both parties agreed with this request for an additional 30 days.

The Applicant appreciates Staff's time and efforts reviewing the enclosed materials. The Applicant looks forward to working with Staff to achieve complete and satisfactory resolution of all issues in a timely manner.

Thank you for your time and consideration of this matter.

Sincerely,

Christopher T. Ellison
Shane E. Conway
Ellison, Schneider & Harris, L.L.P.

Attorneys for Abengoa Solar Inc.

Attachment

STATE OF CALIFORNIA

Energy Resources Conservation
and Development Commission

Application for Certification for the ABENGOA MOJAVE SOLAR POWER PLANT	)	Docket No. 09-AFC-5

PROOF OF SERVICE

I, Eric Janssen, declare that on November 23, 2009, I served the attached *Abengoa Mojave Solar Project (09-AFC-5): Written Response to Data Request Set 1 (nos. 1-93)* via electronic and U.S. mail to all parties on the attached service list.

I declare under the penalty of perjury that the foregoing is true and correct.

/s/
Eric Janssen

Table of Contents

Air Quality

Item 1:

Information Required:

Please describe the types of activities that currently emit combustion and fugitive dust emissions on the site and the quantities of those emissions that occur from those activities.

Response:

As stated in the AFC, the site is a combination of open desert land and sparsely used agricultural land, i.e., dry farming or circular irrigation fields. These activities would be expected to result in an undefined level of wind-blown dust from the desert land areas, and exhaust emissions and dust from the use of agricultural equipment on the farmed areas. The levels of these activities cannot be defined at this time.

Item 2:

Information Required:

Please describe whether those activities will be permanently discontinued when the project is completed and estimate the reductions from the current onsite baseline emissions.

Response:

For those portions of the site which are currently used for farming activities, the emissions of fugitive dust and farm equipment exhaust from these activities will cease upon start of the construction phase. Naturally occurring emissions, such as wind-blown dust will continue to occur for those portions of the site with non-stabilized surfaces. The applicant expects that the overall result from cessation of the farming activities, and soil stabilization (paving, graveling, and use of soil stabilizers) of a significant portion of the solar site will result in a decrease in wind-blown fugitive dust. (See response #4 below.)

Item 3

Information Required:

Please explain the MRI level 2 fugitive dust emission calculation approach and provide information that clearly shows that this emission estimation method does not significantly underestimate or overestimate emissions in comparison with a calculation approach for fugitive dust emissions based on a more detailed activity by activity analysis.

Response:

We are not aware of any guidance provided by the South Coast AQMD that indicates that the MRI Study is not appropriate for use. The South Coast Air Quality Management District (SCAQMD) CEQA Handbook is undergoing revisions, but to date we have not seen any proposed or revised text which changes the existing handbook sections, methods, or procedures regarding fugitive dust emissions estimations from construction projects. Notwithstanding the foregoing, although the SCAQMD may no longer use the method or approach, this does not mean that it is invalid or barred from use by others in producing construction emissions estimates. The proposed project is in San Bernardino County (within Mojave Desert Air Quality Management District (MDAQMD)), so the application of the method is not subject to any policy decisions made within and for the SCAQMD. We do note that all of the Fugitive Emissions Mitigations tables currently available from the SCAQMD rely upon the WRAP Fugitive Dust Handbook dated 9-7-06 (which we believe is the most recent version of this document), and that the WRAP Handbook (Chapter 3-Construction and Demolition) specifically relies upon the MRI study procedures and conclusions used in our analysis, i.e., (1) Improvement of Specific Emissions Factors-BACM #1, MRI, 3/96, (2) Estimating Particulate Matter Emissions from Construction Operations, USEPA, MRI, 9/99, and (3) MRI Report of 2005 which updates the PM2.5/PM10 ratios developed for WRAP. Additionally, we note that the current version of Urbemis (Ver 9.2.4), as well as earlier versions also rely solely upon the MRI BACM (3/96) report for calculating fugitive dust emissions. Urbemis is used, not only statewide in California, but in other states as well, and in numerous CEQA guidelines published by both planning and air quality jurisdictions within California, Urbemis is either required or strongly recommended for computing/estimating project construction fugitive dust emissions and other construction related emissions estimates.

Furthermore, we note the following:

1. A search of the SCAQMD website shows a total of 12 guidance documents available, none of which address any new guidance on fugitive dust emissions calculations.
2. The AQMD prepared the CEQA Air Quality Handbook in April 1993, and made minor revisions in November 1993. Copies of this handbook can be obtained by contacting AQMD's Subscription Services.

The SCAQMD states:

“While the Handbook is under revision, it is recommended that the lead agency follow the calculation methodologies in Chapter 9 and the Appendix to Chapter 9 in the Handbook. Other methodologies can be used as long as documentation is provided regarding the source and applicability to the project.”

Obsolete sections of the current Handbook are as follows:

“Lead agencies should also be aware that the on-road mobile source emission factors in Table A9-5-J1 through A9-5-L are obsolete. The most current on-road mobile source emission factors can be found at the California Air Resources Board (CARB) website.

The AQMD also recommends that the lead agency avoid using the screening tables in the Handbook's Chapter 6 for the following reasons:

a. The tables were derived using an obsolete version of CARB's mobile source emission factors inventory (EMFAC7E) instead of the currently approved version (EMFAC2007), and,
b. The trip generation characteristics of the land uses identified in the Chapter 6 screening tables were based on the fifth edition of the ITE Trip Generation Manual. The most current version of this manual is the sixth edition."

3. CEC staff indicates that the MRI BACM method is no longer supported by SCAQMD, but yet the exact language from the SCAQMD website (see below, obtained on 11-18-09) clearly recommends the use of Urbemis, which is based upon the MRI BACM methodology, as noted in our earlier comments.

"In conjunction with the Handbook, the AQMD developed the Mobile Assessment for Air Quality Impacts (MAAQI) to calculate emissions from land use projects. The AQMD recommends against using the MAAQI model for the same two reasons identified above. The AQMD recommends using other approved models for this purpose, such as the URBEMIS 2007[1] model.

The screening tables should no longer be used under any circumstances because they are based on obsolete mobile source emission factors and trip generation data. The reader should use the methodologies in the Appendix to Chapter 9 of the CEQA Air Quality Handbook or use a land use model, such as URBEMIS[2]. Other air quality analysis methodologies not in the CEQA Air Quality Handbook are acceptable as long as they are well documented, including source(s), assumptions, equations used, calculations, etc."

Therefore the method approach is considered to be both sound and widely accepted.

The MRI Level 2 analysis procedure was used to "estimate" fugitive particulate emissions from general construction activities. Per the WRAP Handbook, general construction activities include land clearing, drilling, blasting, ground excavation, cut and fill operations, as well as demolition and debris removal, site preparation (earth moving) activities, and other general construction activities. The Level 2 procedure expands upon the Level 1 analysis by further refining the emissions factor for general construction activities and adding an emissions factor and calculation procedure for cut and fill operations. These are exactly the types of construction activities proposed at the Abengoa Mojave Solar site. The emissions factors presented in the WRAP Handbook (Table 3-2) for the Level 2 analysis procedure are: 0.011tons PM10/acre-month for general construction (for each month of construction activity), and 0.059 tons

[1] http://www.aqmd.gov/ceqa/urbemis.html
[2] http://www.aqmd.gov/ceqa/faq.html#What is the URBEMIS model, and what is it used for?

PM10/1000 yd3 for cut and fill operations (onsite). Per the original BACM (MRI, 1996), the 0.011 tons/acre-month factor was based on an activity level of 168 hours per month. We note that the MRI report indicates that the SCAQMD uses a general Level 1 construction factor (worst-case) of 0.42 tons/acre-month, which is based upon detailed information developed in that air basin, and that CARB states this factor should be reduced to 0.11 tons PM10/acre-month for other areas of the state where the detailed data is not available. Per WRAP, the PM2.5/PM10 ratio for fugitive construction dust is 0.1, which results in the Level 2 factor of 0.011 tons PM10/acre-month. Therefore, the MRI Level 2 factors were used in the fugitive dust emissions estimates. The 0.011 ton PM10/acre-month value was linearly scaled up to a value of 0.0144 tons/PM10/acre-month to more accurately represent an emissions factor for the proposed project work period.

Neither the project proponent, nor anyone else to our knowledge, is able to conclusively show that any chosen method for the computation of fugitive dust emissions from construction activities significantly under or over-estimates such emissions. The method chosen is both technically justified and approved for use via a number of references as noted above.

Item 4:

Information Required:

Please indicate the increase or decrease in the acreage of non-stabilized disturbed land within the project site during operation and estimate the corresponding increase in wind erosion fugitive dust emissions at the site.

Response:

The existing site is vacant desert land and sparsely used agricultural land, and is therefore subject to anthropogenic and non-anthropogenic wind-blown dust generation. The proposed facility will result in a majority of the site being graded and compacted, with portions of the site surface being paved or graveled, or stabilized through the use of soil stabilizer treatments. This will essentially decrease the surface area available to wind-blown dust generation. The existing undeveloped site is approximately 1765 acres. Subsequent to construction, approximately 70 acres will be paved or graveled (power blocks, access roads, transmission substation, evaporation ponds, etc). In addition, a significant portion of the solar fields (mirror access ways) will be stabilized via compaction and soil treatments. This will result in a significant decrease in acres of non-stabilized land, which will result in an overall decrease in anthropogenic and non-anthropogenic wind-blown dust fugitive emissions.

Soil erosion rates were calculated and presented in the Data Adequacy response. Using Wind Erosion Prediction System (WEPS) model existing and operations estimates were made. Details, including worksheets were included and show that wind erosion drops from >100 Tons/Ac/Yr to 1.0 Tons/Ac/Yr. Please refer to Data Adequacy response Soils: Appendix B (g)(15)(B)(i) for full details.

Item 5:

Information Required:

Please identify if the applicant is willing to stipulate to graveling the onsite unpaved roads during construction before they are sealed to reduce the silt loading, or provide additional surface soils sieve data that shows that the 5.3 percent silt content assumption is representative of the site.

Response:

Per response to Item #4 above, the primary facility use roads (access roads and internal roads around the power block and HTF storage and distribution areas, administration and maintenance buildings) will either be paved or graveled, with the solar field/mirror access ways being stabilized via grading, compaction and soil stabilizer treatments (including watering if necessary). The unpaved road emissions estimate was made using an average soil silt content for the graveled roads as well as the mirror access ways. We believe this value is reasonable due to the following:

> Data presented in AP-42, Section 13.2.2, indicates that the average of the low end silt content data for the types of roads noted is 5.3% (un-graveled, untreated roads). We believe that this value reasonably represents the average silt content expected to occur on roads which have been either graveled, compacted, or stabilized, and which will experience only minor use due to mirror washing activities or maintenance activities (see revised Table C.1-7). Notwithstanding the foregoing, the emissions from operational onsite traffic on unpaved roads have been revised using a silt factor of 14%.
>
> Secondly, we are unable to make the connection between staff's comment to stipulate to graveling construction roads "before they are sealed", to how this relates to onsite unpaved road use during the operational phase. The use of, and emissions from, any unpaved roads onsite during construction is covered in the site fugitive dust emissions estimate as discussed in item #3 above.

Item 6:

Information Required:

Please revise the fugitive dust calculations to reflect the available on-site surface/near surface silt content data.

Response:

The fugitive dust emissions calculations which rely upon soil silt content have been reviewed and updated. Revised Tables C.5-5, C.5-6, C.5-7, and C.1-7 are provided electronically in the attached file "DR_1A_6_Tables.zip."

Item 7:

Information Required:

Please revise the fugitive dust emission calculations to reflect the operations mitigation measure of stabilizing the onsite unpaved roads using durable non-toxic soil binders.

Response:

The updated estimates as noted in response to Item 6 incorporate the operations mitigation measure. The proposed mitigation measures include the periodic use of durable non-toxic soil binders or stabilizers, watering, and speed control.

Item 8:

Information Required:

Please provide the electronic versions of the emission spreadsheets with the embedded calculations.

Response:

The printed versions of the data spreadsheets are sufficient and can be easily followed and confirmed. Electronic versions are the proprietary property of consultant staff and cannot be supplied.

Item 9:

Information Required:

Please identify the units for the values provided in the “Number Used Each Month” column in Table C.5-6. Please note that using the apparent meaning of the column staff cannot match the total horsepower hours calculated for each equipment type.

Response:

The “number used each month” is simply the number of category specific units anticipated to be on site each work day or each month for the period noted. For example, there will be six (6) 14M motor graders onsite for months 1 through 6. The total hp-hrs for the “14M motor grader” category is simply the result of multiplying the number of units, by the hours per day/per unit, by the days on site per month, by the unit hp. A cell reference (referring to the days per month of construction) in the calculation has been corrected and the correct “hp-hr” values are now displayed in the tables included with Data Request Item 6.

Item 10:

Information Required:

Please provide the original equipment usage estimates provided by the applicant to the applicant’s air quality consultant.

Response:

The original and recently updated equipment list and usage estimates provided by the Applicant to the consultant staff are delineated in revised tables included with Data Request Item 6.

Item 11:

Information Required:

Please indicate if a 20 hour/day construction schedule, as modeled, is feasible given potential noise impacts to the adjacent residences, and local noise standards/limits.

Response:

Heavy construction activities (such as earth works) are scheduled to primarily occur during daytime hours. When nighttime shifts are used, activities that do not generate high noise levels will be planned and executed. These relatively low-noise tasks would probably include the fabrication of solar collector array modules inside of a temporary fabrication shop, as well as welding operations, piping preparation, conduit bending, inspections, electrical trace-outs, and the like. Given the distances between the residential receptor locations and the SCA fabrication shop or power islands and the vast area of the solar field available to construct, these low-noise activities and their associated off-site noise emissions during the nighttime construction shift would not be considered as significant impacts over the construction period.

Methods to mitigate noise impacts to a level that is less-than-significant and compliance with any applicable LORS are addressed in the AFC Section 5.8.9.

Item 12:

Information Required:

Please re-evaluate the off-road equipment schedule to provide a corrected worst-case, not average case, daily onsite emissions estimate.

Response:

The Applicant has provided revised construction equipment data (tables included with Data Request Item 6). Table C.5-5 (Construction Equipment Exhaust Emissions, page 4) indicates the estimated average daily and estimated maximum daily exhaust emissions values, which provides that requested worst-case daily emissions estimate.

Item 13:

Information Required:

Please describe how the trip distance assumptions for construction were determined for each vehicle type/use.

Response:

Table C.5-7 (revised) (tables included with Data Request Item 6) indicates the types of vehicles, numbers of vehicles, and estimated mileages for vehicles proposed for construction support activities. Vehicle mileages are based on a one-way trip length of 40 miles from the Barstow urban area (which includes the Barstow rail yard site). One way distances were used due to the following:

- The delivery and site support vehicles will not be owned by the Applicant, nor will they be dedicated to the construction project.
- The Applicant has no control over the use of these vehicles in back-haul mode.
- The 40 mile one-way distance is conservative, since the Barstow urban area, as well as the Barstow rail yard, is less than 30 miles from the project site.

The Applicant is satisfied that the Barstow regional is a reasonable assumption and the majority of material can be supplied from this area given the rail facility and that there is a sufficient labor force in the general area to accommodate facility construction such that Barstow is a reasonable assumption.

Item 14:

Information Required:

For each of the construction materials delivery/waste removal truck trip types, please provide the following information:

A. The types and quantities of construction materials delivered to the site and wastes hauled from the site,
B. The types of delivery trucks that will be used to deliver these materials,
C. The number of delivery trucks on a daily basis for each of these materials, and
D. The number of miles traveled round trip daily for each vehicle used for project construction within the Mojave Desert Air Quality management District (MDAQMD) jurisdictional portion of San Bernardino County, for each of these materials.

Response:

(A) The Applicant is uncertain how the data request bears on the construction phase or resultant emissions. Nonetheless, materials commonly delivered during construction would generally include: (1) concrete for foundations, structure erection, and solar field supports, (2) building materials for structure construction, power block and solar field system components, (3) road paving or gravelling materials, etc. Any wastes hauled from the site during construction activities are discussed in detail in the Hazardous Materials and/or Waste Management sections of the AFC.

(B) Table C.5-7 (original and updated versions) (tables included with Data Request Item 6) clearly indicates the types of vehicles to be used to support construction, including site deliveries.

(C) Tables C.5-5 and C.5-7 (original and updated versions) (tables included with Data Request Item 6) clearly delineate the estimated numbers of delivery vehicles for any given month/day during the construction period.

(D) See response to data request Item 13. In addition, as previously stated, the Applicant does not control the support or delivery vehicles, limiting its ability to tabulate mileage and estimate emissions in the entirety of San Bernardino County (MDAQMD portion). The Applicant will purchase construction materials and supplies from the Barstow urban/regional area. How those supplies arrive at the businesses from which they are purchased is not the responsibility of the Applicant and the emissions from transport of wholesale or retail supplies to the various local or regional suppliers are not project emissions.

Item 15:

Information Required:

Please include the personal vehicle trip mileage, necessary for construction employees to get to the assumed construction employee busing locations, in the construction emission estimate.

A. Please estimate the on-site whole round trip travel including unpaved road travel and corresponding emissions for all on-road construction vehicles, including heavy duty delivery trucks, light service and delivery trucks, personal vehicles and buses, etc. necessary to complete the construction activities throughout the project site.
B. Please correct, based on revisions to the round-trip distance assumptions, the on-road (paved and unpaved) vehicle tailpipe and fugitive dust emissions.

Response:

The Applicant does not control personal vehicles used by workers to access the bussing yard limiting its ability to tabulate mileage and estimate emissions. Notwithstanding that limitation, in order to be responsive, the Applicant has included this mileage in the worker travel VMT (Table C.5-5) (tables included with Data Request Item 6), based upon the following assumptions:

- Average number of workers on site per day = 830
- Average number of workers bussed per day = 576
- Assumed round trip distance to the bus yard = 30 miles (15 mile radius around the bus yard encompasses the entire Barstow urban and non-urban area) (per Figure 5.13-1, Traffic and Transportation).
- Total daily VMT ~= 17,280
- Total period VMT ~= 9,659,520

(A) The emissions from on-site unpaved road use during construction is included in the overall site fugitive dust and equipment exhaust calculations presented in Table C.5-5 (tables included with Data Request Item 6) for the various phases of project construction, i.e., rough grading and site preparation, finish grading, power block erection, and solar field erection (See response to data request #3). Emissions from delivery vehicles, light duty support vehicles, worker vehicles, and buses are also included in Table C.5-5 (tables included with Data Request Item 6).

(B) The emissions for construction activities (fugitive dust and equipment exhaust) have been revised (see Tables C.5-5, C.5-6, and C.5-7) (tables included with Data Request Item 6).

Item 16:

Information Required:

Based on any revisions in the calculations of vehicle types, number of vehicles and vehicle miles traveled within the MDAQMD jurisdictional portion of San Bernardino County completed for the above data requests, please provide the revised criteria pollutant and Greenhouse Gas (GHG) emissions associated with these vehicle emissions.

Response:

GHG emissions for all phases of construction have been estimated and are presented in Table C.5-5 (tables included with Data Request Item 6).

The following table presents a summary of the revised construction emissions per the data responses above.

Construction Related Emissions Summary

Parameter / Onsite Construction Emissions	Units	NOx	CO	VOC	SOX	PM10	PM2.5	CO2e
Fugitive Dust-Phase I	Lbs/day	-	-	-	-	883.9	185.6	n/a
	Tons/Period	-	-	-	-	56.8	11.9	-
Fugitive Dust-Phase II	Lbs/day	-	-	-	-	2.9	0.6	n/a
	Tons/Period	-	-	-	-	0.6	0.1	-
Fugitive Dust-Phase III	Lbs/day	-	-	-	-	11.8	2.5	n/a
	Tons/Period	-	-	-	-	2.8	0.6	-
Fugitive Dust-Phase IV	Lbs/day	-	-	-	-	106.1	22.3	n/a
	Tons/Period	-	-	-	-	27.2	5.7	-
Equipment Exhaust-Phase I	Lbs/day	1222.2	403.8	137.3	1.34	55.5	55.5	n/a
	Tons/Period	78.8	26.0	8.9	0.09	3.6	3.6	14736
Equipment Exhaust-Phase II	Lbs/day	28.3	9.1	3.1	0.034	1.16	1.15	n/a
	Tons/Period	6.1	2.0	0.7	0.007	0.25	0.25	1516
Equipment Exhaust-Phase III	Lbs/day	522.5	315.2	101.9	0.55	34.9	34.6	n/a
	Tons/Period	134.8	81.3	26.3	0.14	9.0	8.9	31845
Equipment Exhaust-Phase IV	Lbs/day	1270.6	822.0	257.5	1.31	92.44	91.6	n/a
	Tons/Period	355.1	229.7	72.0	0.37	25.8	25.6	83387
Offsite Construction Emissions	Averages							
Paved Road Dust	Lbs/day	-	-	-	-	9.41	0.2	n/a
	Tons/Period	-	-	-	-	2.41	0.05	-
Track-out Dust	Lbs/day	-	-	-	-	5.46	0.92	n/a
	Tons/Period	-	-	-	-	1.4	0.24	-
Delivery/Hauling Exhaust	Lbs/day	86.5	26.1	6.2	0.1	3.92	3.86	n/a
	Tons/Period	19.6	5.9	1.4	0.024	0.9	0.89	2370
Worker Travel-Exhaust	Lbs/day	31.2	311.1	25.8	0.28	2.53	2.52	n/a
	Tons/Period	8.7	86.9	7.2	0.1	0.7	0.7	7149

Notes:
1. Daily maximum emissions for equipment exhaust can be found on Table C.5-5. Daily average emissions are presented here as they represent site activity and emissions levels over the course of the project.
2. CO2e emissions are calculated and totaled on Table C.5-5.

Based upon the applicant's best estimate, the maximum daily onsite emissions will occur as follows:

1. Fugitive dust emissions will be the greatest during the Phase I grading and site preparation period.
2. Exhaust emissions will peak during Phases II-IV (month 15 or 16).

Estimated Maximum Daily Onsite Emissions (lbs/day)

Phase	Category	NOx	CO	VOC	SOx	PM10	PM2.5
I	Fugitive Dust	-	-	-	-	883.9	185.6
	Exhaust	1222.2	403.8	137.3	1.34	55.5	55.5
Total Phase I		*1222.2*	*403.8*	*137.3*	*1.34*	*939.4*	*241.1*
II-IV	Fugitive Dust	-	-	-	-	120.8	25.4
	Exhaust	1821.3	1146.3	362.5	1.9	128.5	127.4
Total Phases II-IV		*1821.3*	*1146.3*	*362.5*	*1.9*	*249.3*	*152.8*

Item 17:

Please refer to the letter “Abengoa Mojave Solar Project (09-AFC-5): Notice Pursuant to 20 CCR 1716(f): Data Request Set 1 (nos. 1-93)” dated November 11, 2009 and docketed regarding this request.

Item 18:

Information Required:

Please describe the assumptions used to determine the number of operating maintenance vehicles, maintenance schedule and their daily paved and unpaved vehicle miles traveled.

Response:

Table C.1-7 (tables included with Data Request Item 6) and the support table which accompanies it clearly delineate the numbers, types, use areas, mileages, and fuels to be used in the on-site operations vehicles. This data was supplied by the Applicant based upon their judgment and knowledge of anticipated site operations. These tables have been revised and are included as attachments to this response.

Item 19:

Information Required:

A. Please describe in detail the specific design of the diesel-fueled trucks which will be used for cleaning the SCAs.
B. Describe whether water will be towed behind the vehicle, or whether the trucks will carry the water and the cleaning apparatus equipment will be attached to the water tanks on the vehicles.

Response:

(A) The diesel-fueled trucks which will be used to spray-wash the SCAs are typical 4000-gallon water trucks normally used in grading operations that have been modified to spray water transverse to the direction of travel. Spray bars are mounted to the side of the leading portion of the trucks and water emanates from nozzles aligned to uniformly spray the mirrored surface of the SCAs.

The trucks (used for normal washes) are presently anticipated to be diesel powered, 2-3 axles depending upon the wash-water tank capacity. The tractors with water wagons (used for mechanical washes) are anticipated to be small diesel tractors as noted on the Table C.1-7 (tables included with Data Request Item 6) and the support table. The support table for Table C.1-7(tables included with Data Request Item 6) presents the use rate, mileages, fuel type, etc., for these trucks. Table C.1-7 (tables included with Data Request Item 6) presents the estimated emissions for these, and all other anticipated on-site operations vehicles.

(B) The diesel-fueled trucks will carry the water required to spray. However, a different unit is used to mechanically scrub the surface of the mirrors. This unit is a small diesel tractor towing a trailer that carries water and a scrubbing apparatus.

At present, the Applicant believes that the trucks used for the SCA cleaning (normal wash) activities will be integrated vehicles, i.e., the truck frame will incorporate the water storage tank and cleaning assemblies, etc. For mechanical washes, a small tractor pulling a water wagon and wash equipment will be used.

Item 20:

Information Required:

Please describe the SCA washing requirements including:

A. How the SCAs are washed, both for normal and mechanical washes;
B. Time of day for washing;
C. How the washing frequency is determined;
D. How long it takes each SCA row, or other specified length of SCA, to be washed;
E. The amount of SCAs that can be washed per hour or shift for each mirror washing tanker truck crew;
F. The size of each wash crew; The assumed frequency for SCA washing over the course of a month and year, and
G. The basis for this frequency including assumptions for seasonal weather variation.

Response:

(A) Two types of washes are used to clean the SCAs. A water spray from a traveling truck and a mechanical brush from a towed trailer are utilized. Details of these cleaning methods are presented in response to Item 20 above.

(B) Washing typically occurs during the night to avoid disruption of the project output.SCA washing will occur during non-power production hours. It is presently anticipated that washing will occur during the night-time hours (most likely between the hours of 9:00 pm and 7:00 am).

(C) The proposed washing frequency was determined by prior operating experience. However, a reflectivity monitoring program will be used to optimize the wash types and schedule to arrive at the most efficient use of the washing equipment. The washing frequency will be curtailed if it is not expected to improve the performance of the plant. Some washing may also be required to keep the mechanical equipment free of excess dirt that could negatively impact equipment longevity.

(D) It is expected that the truck and tractor travel at approximately 2 miles per hour, equating to approximately 0.9 meters of SCA length cleaned every second by truck. The tractor/brush apparatus requires two passes to clean the entire mirrored surface of the SCA and thus equates to approximately 0.45 meters of SCA length cleaned every second.

(E) Each crew can cover approximately 3% to 4% of the site per shift for the truck and 1% to 2% of the site per shift for the tractor/trailer.

(F) The size of each wash crew involves either one truck or one tractor/trailer. The truck typically involves one person and the tractor/trailer two people. It is assumed that 20 spray washes and 10 mechanical brush washes will be used each year.

(G) The basis for washing is not highly weather dependant since the area is largely dry and without significant rainfall. The current assumption is based on prior operating experience and will be tailored to fit depending on the reflectivity monitoring program and the time of year to optimize annual output.

Item 21:

Information Required:

Please revise the emissions calculations for the onsite dedicated vehicle exhaust emissions assuming only new model year vehicles are used.

Response:

The Applicant notes that the maintenance vehicles will meet all applicable on- and off-road emissions standards as imposed by the California Air Resources Board (CARB) and the Environmental Protection Agency (EPA). The total emissions from onsite (on-road and off-road) vehicles used to support operations and maintenance are conservatively estimated as follows (based on the current vehicle mix and composite emissions factors):

- Less than 2 tpy of NOx
- Less than 1.5 tpy of CO
- Less than 0.5 tpy of VOC
- Less than 0.2 tpy of $PM_{10/2.5}$
- Less than 0.005 tpy of SOx
- Less than 165 tpy of CO2e

The Applicant concludes that these emissions levels generated by operational and maintenance support vehicles are insignificant. In the context of a 250 MW generation facility, when compared to the operational emissions of a similar sized gas-fired thermal power plant, using these emissions results in a significant decrease in operational emissions (on a total operational facility basis).

Notwithstanding the above, emissions have been revised for the on-road and off-road gasoline and diesel vehicles, model year 2013-2014. VMT for offroad equipment (forklifts, tractors, backhoes) were not adjusted for the new model year since the mileage from these vehicles accounts for less than 20% of the total operational mileage, and the existing emissions factors are for scenario year 2014. The revised onsite operational vehicle emissions are as follows:

- Less than 1.7 tpy of NOx
- Less than 1.1 tpy of CO
- Less than 0.31 tpy of VOC
- Less than 0.15 tpy of $PM_{10/2.5}$
- Less than 0.0031 tpy of SOx
- Less than 140 tpy of CO2e

Item 22:

Information Required:

A. Please identify if the applicant would be willing to stipulate to a condition of certification that would require a review of available alternative low-emission vehicle technologies, including electric and hydrogen fueled vehicles.
B. Discuss the feasibility (i.e., availability and cost) of using the above, or other low emissions technologies to replace the diesel and gasoline fueled vehicles proposed for operations maintenance if lower emission alternative technology vehicles become available.
C. If the alternative vehicles are used, please indicate the associated fueling logistics.

Response:

(A) The Applicant has already considered the use of low-emission vehicles and intends to use electric carts, electric forklifts, and perhaps Segway personal transportation in the Power Island area and in maintenance buildings where appropriate paved or concrete surfaces exist.

The Applicant has no objection to a condition of certification that would require a “review of available alternative low-emission vehicle technologies, including electric and hydrogen fueled vehicles”. Presently the Applicant believes that there are no such vehicles which could be used to replace a majority of the proposed onsite on and off-road vehicles.

(B) The Applicant does not currently consider hydrogen or electric technologies as feasible for large trucks, heavy equipment or other maintenance vehicles proposed to

use gas or diesel as fuel due to the large size or capacity needed (e.g. 4000-gallon water trucks, heavy-duty trucks, mobile construction equipment). Additionally, for worker safety reasons, full-time air-conditioning of smaller vehicles is required due to climate conditions negating the use of many current low-emission electric or hybrid vehicles. Lower emission alternative technology vehicles for operations maintenance that are not limited by the above considerations will be considered in the future assuming reasonable cost parameters.

The Applicant cannot adequately discuss the feasibility of using alternative vehicle technologies until the review of such technologies and availability of such vehicles is concluded per response to Item 21A. Should such vehicles become available in the future, the Applicant would evaluate the vehicles to ascertain the following information:

- Can the alternative vehicle replace the present vehicle design in function, capital cost, maintenance costs, fuel costs, reliability, safety of use, etc.

(C) The project will have the capability of charging Segways, forklifts, and electric carts from either station service power during off-line operations or from house power during online operations.

Item 23:

Information Required:

Please estimate the whole round trip travel including any onsite unpaved road travel.

Response:

Table C.1-7 and the Support table which accompanies it (tables included with Data Request Item 6), provides detailed estimates of onsite vehicle use, annual mileage rates, and a breakdown of onsite travel on paved versus unpaved roads.

As provided in the Traffic and Transportation section of the AFC (Section 5.13), the Applicant estimates that the facility during the operations phase will have up to 38 deliveries per month, or 1.26 deliveries per day. These deliveries and hauls will be made by vehicles and service providers not under the control of the facility. It is estimated and assumed that deliveries to the site will be part of a normal or day specific delivery route that is controlled by the service provider, and as such the Applicant has no way of breaking out any mileage values beyond the nearby region of the site, which is the mileage that would be specifically allocated to the project site. In addition, the Applicant notes that these emissions are not included in an applicability analysis for imposition of NSR or PSD, nor are they included in the stationary source emissions tabulation for purposes of determining offset requirements per the MDAQMD rules, etc. Emissions for this category of vehicle use are based on the following assumptions:

- 38 deliveries per average operations month

- Roundtrip distance of 12 miles assuming use of Harper Lake Road for all delivery ingress and egress. The Applicant, as stated above, cannot estimate any further mileage distances due to the following; (1) the Applicant does not own or control the delivery vehicle, (2) the Applicant does not control the daily delivery vehicle route either before or after it leaves the facility, (3) the applicant has no control over the vehicle back-haul schedule, and (4) the delivery vehicles will not be owned by or dedicated to the site. Therefore, the 12 mile trip distance is the most reasonable and defendable value at the present time.

- Annual mileage for these deliveries will be 5472 VMT. It is assumed that 50% or 2736 VMT will be allocated to gasoline vehicles, and 50% or 2736 VMT will be allocated to diesel vehicles. This mileage has been added to the onsite mileage values in Table C.1-7 (tables included with Data Request Item 6).

- Employee commute emissions and assumptions are provided on the Support table to Table C.1-7 (tables included with Data Request Item 6).

Item 24:

Information Required:

Provide an itemized list indicating the type, number, and purpose of offsite vehicles expected to be used.

Response:

The applicant has no information, nor are we aware of any information, that would allow us to predict the types, number by type, or the purpose by type, of vehicles involved in providing delivery or haul services to the site by outside contractors or service providers. The applicant believes that a majority of such deliveries or hauls will, in all likelihood, be made by light to medium duty gasoline vehicles (trucks), with the remaining fraction of the deliveries of hauls performed by medium to heavy duty diesel vehicles. For purposes of emissions estimation we have assumed that 50% of the VMT from these deliveries is derived from diesel powered vehicles, and 50% is derived from gasoline powered vehicles. See response to Item 23.

Item 25:

Information Required:

Provide corresponding criteria pollutant and GHG emissions for all offsite operational vehicle trips, including heavy duty delivery and waste haul trucks, light service and delivery trucks, and employee personal vehicles.

Response:

The VMT has been added to the operations VMT in Table C.1-7 (tables included with Data Request Item 6), with emissions estimates presented therein.

Item 26:

Information Required:

Please provide rationale for the round trip distances selected for each trip type.

Response:

See response to Item 23.

Item 27:

Information Required:

Please recalculate the cooling tower particulate emissions using the mist eliminator drift guarantee of 0.0005 percent of recirculating water flow, and with the assumption for worst-case emission impacts estimating purpose that all particulate emissions are both PM10 and PM2.5.

Response:

Cooling tower emissions have been revised. See the attached revised Table C.1-5 (tables included with Data Request Item 6).

Item 28:

Information Required:

Please identify any changes in MDAQMD rule applicability and rule compliance based on the revised cooling tower particulate emission levels.

Response:

The revised emissions do not affect the LORS analysis, rule applicability, or rule compliance.

Items 29-31:

Please refer to the letter “Abengoa Mojave Solar Project (09-AFC-5): Notice Pursuant to 20 CCR 1716(f): Data Request Set 1 (nos. 1-93)” dated November 11, 2009 and docketed regarding this request.

Item 32:

Information Required:

Please provide an estimate of the SF6 onsite inventory and leakage emissions both in operation and construction phases to complete the GHG emission estimates.

Response:

The Applicant originally requested additional time for this item but was able to obtain the necessary vendor information in time to respond with this filing.

The Applicant estimates that there will be no SF_6 storage on site during construction. Based upon a review of the operational phase electrical system by the applicant's engineer, the system is anticipated to have a total of ten (10) breakers. The switchyard breakers (4) will each have an SF_6 capacity of 97 lbs, and the substation breakers (6) will each have a capacity of 97 lbs of SF_6. Per NEMA (National Electrical Manufacturers Association) SF_6 management guidelines, the leak rate will not exceed 5% over a 50 year lifetime, or a leak rate of 0.1% per year. One manufacturer (Mitsubishi), indicates that there will be no leakage for the first 20 years of the life of the breaker. Breaker lifetimes vary widely, i.e., Siemens states the design lifetime of their units is 20 years, while Mitsubishi states an 80 year design life.

Total storage capacity of the system will be 970 lbs. Assuming a loss rate of 0.1% per year results in a total estimated SF_6 emissions rate of 0.97 lbs per year. The equivalent CO2e emissions rate will be 23183 lbs/year, or 11.6 tons/yr.

References: California Climate Action Registry General Reporting Protocol, January 2009, Version 3.1.(IPCC 2nd and 3rd Assessment Report GWP value for SF_6 is 23,900.)

SF_6 Leak Rates from High Voltage Circuit Breakers-U.S. EPA Investigates Potential Greenhouse Gas Emissions Source, J. Blackman, et.al.,USEPA, 2005.

Item 33:

Information Required:

A footnote to AFC Table 5.2-1 notes that the annual boiler fuel use in that table is based on 4,380 hours of operation at 50 percent load. Please confirm that the footnote is incorrect and the fuel use basis is in fact, consistent with the emission calculations, based on full load operation.

Response:

The footnote concerning the boiler operation is correct. The anticipated operation of each of the two boilers is as follows: (1) each boiler may be operated at full load up to a maximum of 24 hours per day, but the annual use will be limited to 4380 hours per year per boiler at 50% of rated load. Hourly and daily emissions are based on full load operation, while annual operational emissions are based on a fuel use value equivalent to 4380 hours at 50% load firing. These calculations are consistent with the fuel firing scenario as stated in Table 5.2-1 as well as the emissions calculations in Appendix C.1, Table C.1-1.

Item 34:

Information Required:

Table 5.2-10 notes that propane will be the fuel used in the boiler while in other areas, such as Sections 2.1 and 2.5, it seems clear that natural gas will be the boiler fuel.

Please confirm the primary fuel type proposed for the boiler. Please also indicate if there will be a backup fuel source and the expected frequency of backup fuel use.

Response:

Natural gas is the only fuel supply. No backup fuel supply is expected to be needed. Any reference to propane is erroneous.

The reference in Table 5.2-10 to "propane" is incorrect.

Item 35:

Information Required:

Table 5.6-3 indicates that there will be 5,000 gallons of propane storage at the facility.

A. Please indicate all of the equipment that will use propane;
B. The annual estimate of propane use; and
C. Estimate the criteria pollutant and GHG emissions from propane use.

Response:

Propane storage is NOT anticipated for the site. The reference to propane storage in Section 5.6, Table 5.6-3 is incorrect.

Item 36:

Information Required:

Please confirm that there will be no gasoline storage at the site and that either fuel/lube trucks will be used for onsite refueling or vehicles will have to drive to the nearest gasoline station, which is over 30 miles from the site, to refuel. If gas storage is used at the site, please provide information for any proposed onsite gasoline storage including throughput information and permitting requirements.

Response:

The Applicant considered the impact of driving offsite to refuel maintenance vehicles, i.e., a distance of approximately 19 miles to refueling facilities located at Kramer Junction, not 30 miles as noted by staff. Given that it is likely not cost effective to fuel vehicles offsite due to the remoteness of the site, the Applicant proposes to store gasoline and diesel onsite.

Gasoline and diesel storage tanks for maintenance vehicles are expected to be pre-fabricated above-ground units with the required secondary containment either built-in or constructed as part of a catch basin. Permitting of these storage tanks is expect to be part of the CEC permitting process.

Presently, the size and throughput of the tanks is not known, and the anticipated configuration (above or below ground) is also not known. The anticipated tank size is

1000-2000 gallons capacity each, with Phase I vapor recovery installed on the gasoline tank. Throughput of the storage tanks will be based on the final sizing selection.

As soon as this data is finalized, the applicant will provide the data and the emissions calculations to the CEC staff and the MDAQMD staff. If a gasoline tank is proposed, the appropriate permit application forms will be filed with the MDAQMD.

Item 37:

Information Required:

Please indicate if the additional fuel/lube truck mileage or gasoline vehicle mileage required for refueling is considered in the total vehicle miles estimates and emissions estimates, or please correct the estimates accordingly.

Response:

See response to Item 36 above. The maintenance vehicle mile estimates are correct since they do not contemplate the offsite mileage for refueling.

Item 38:

Information Required:

Please provide a cumulative air quality impacts analysis, or information from the MDAQMD that indicates that there are no other proposed projects within six miles of the proposed project site which have received construction permits but are not yet operational, or are in the permitting process.

Response:

The MDAQMD has provided the following responses (per Chris Anderson, MDAQMD, 11-12-09):

1. There are no other proposed projects within six miles of the proposed project site which have received construction permits but are not yet operational, and,

2. There are no other proposed projects within six miles of the proposed project site which are in the permitting process, but not yet operational.

Based on the above noted responses, we conclude that a cumulative analysis is not warranted at this time.

Item 39:

Information Required:

Please provide copies of any official submittals and correspondence to or from the District within 5 days of their submittal to or their receipt from the District.

Response:

The applicant will provide CEC Docket Unit any submittals of official correspondence to and from the MDAQMD within 5 days of submittal or receipt.

Alternatives

Item 40:

Information Required:

In order to facilitate preparation of the SA document and allow further analysis and comparison of the project site with alternative sites, please provide the exact locations of the six alternative sites (Township/Range/Section and/or parcel numbers).

Response:

The alternative site areas were in the vicinity of the locations listed in the Table 1. The selection of a Site Area to develop and refine the site selection did not include exact sites but included identifying potential site areas to aggregate land. Multiple configurations were considered at several locations in each site area but each site area considered was rejected for future study as presented in the Application for Certification (AFC) Table 4-2. Further site layout alternative analysis was provided in the AFC to refine the exact site as detailed in Section 4.4.3 of the AFC.

Table 1. Alternative Site Area Locations

Site Area	Latitude	Longitude
Imperial Valley East	32°49'8.79"N	115° 5'47.40"W
Imperial Valley	32°44'38.09"N	115°42'10.84"W
Northwest of Blythe	33°41'4.06"N	114°42'13.98"W
Bristol Dry Lake	34°29'31.19"N	115°38'49.54"W
Superior Dry Lake	35°15'17.86"N	117° 3'49.32"W
Coyote Dry Lake	35° 1'22.04"N	116°43'31.58"W

Item 41:

Information Required:

Please identify the size (total acreage) and dimensions of each alternative site.

Response:

The target size for each site area investigated was 1600 acres. The dimensions investigated were 2.5 miles from east to west and 1.0 miles north to south.

Subsequent refinements in size and shape were made on the selected site based on the constraints identified in the Application for Certification.

Item 42:

Information Required:

Please indicate the number of individual landowners comprising ownership of the Superior Dry Lake, Coyote Dry Lake, and Imperial Valley East sites, and the acreage of each separate parcel and landowner.

Response:

As described in Item 40 above, the initial site area screening is generalized and multiple configurations were possible at each site making an exact tally of the number of individual landowners comprising ownership of each possible site impractical. The majority of the land needed to secure the Mojave Solar Project site at Harper Lake was acquired from a single private owner.

Item 43:

Information Required:

For BLM-administered land, please indicate if the BLM has received a right-of-way application for use of any of the alternative sites on BLM land.

Response:

Neither Abengoa Solar Inc. (ASI) nor any company of ASI's filed a right-of-way (ROW) application on any BLM land located around the alternate site study areas.

A review of the BLM's data[3] was conducted to identify if other developers have filed ROW applications on land considered in the alternatives analysis. The available information is general in nature. Applicant reviewed the available information and identified the following potential applications in the same site area as the alternative site areas.

> Serial Number CACA 50552: Located in the Bristol Dry Lake alternative site area.
> Serial Numbers CACA 48728 and CACA 48811: Located in the Bristol Dry Lake alternative site area.

The above BLM ROW applications have a high probability of conflicting with sites that the Applicant was considering since much of the same criteria would have been used by other developers.

Item 44:

Information Required:

[3] http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/pa/energy/solar.Par.45875.File.dat/Renew_Energy_2_09_solar.pdf accessed on November 11, 2009.

Please provide information on the biological, cultural, paleontological, water resource, traffic and transportation and visual resource attributes/impacts of each alternative site and how this information was used as a basis for alternatives screening.

Response:

As presented in the AFC the proposed project site considered a range of possible impacts as discussed in Section 4.2.2 of the AFC.

The Applicant considered biological, cultural, and paleontological resources by considering if a site was previously disturbed and to what extent. Each of these aspects can be considered together qualitatively for screening purposes since the existence of extensive site disturbance, especially mechanical disturbance from agricultural activities reduces the chances for biological issues and likely would have uncovered surface or near surface cultural and paleontological resources due to the activities. It is for this reason that the Applicant finds site disturbance to be a significant and relevant measure when screening for site selection.

Regarding water resources, several considerations were made. First, a site that has supported extensive agricultural activities has a higher likelihood of being able to support the required water to operate the selected technology. However and as discussed in the AFC, a solar facility will use approximately 4 to 5 times less water than agricultural activities that cover the same area. Additionally, areas that are at the bottom of a basin and that have few other nearby users are less likely to impact other parties. Lastly, areas that do not have significant surface drainage features are desired.

Regarding traffic and transportation, several considerations were made. First, a site near a major population area is desired so that existing infrastructure could be used for employee and equipment traffic. Second, areas that have existing rail facilities nearby allow for favorable logistics given the large quantity of materials and equipment needed for construction. Lastly, areas that are served by local roads offer a reduced impact since new roads would not be required to extend from a project site to major roadways.

Regarding visual resources, areas that were not readily visible from major highways, parks or vistas was considered. This investigation was done by considering topography in the alternative site areas and relative distances of relevant observers.

Table 2 is provided to amplify the alternative site area selection process for the alternative site areas considered as described above.

Table 2. Alternative Site Area Screening

Alternatives Screening	Proposed Project Site	Superior Dry Lake Site	Coyote Dry Lake Site	Bristol Dry Lake Site	Imperial Valley Site	Imperial Valley East Site	Northwest of Blythe Site
Biological, Cultural and Paleontological	Mechanically Disturbed	Partial Disturbance	Partial Disturbance	Not Disturbed	Mechanically Disturbed	Not Disturbed	Partial Disturbance
Water Resource	Supports groundwater use, not likely to impact other water users, adjudicated water, brackish water and doesn't impact natural drainage features	Water supply unknown and surface features suggest natural drainages would be impacted	Water supply unknown and surface features suggest natural drainages would be impacted	Water supply unknown but likely doesn't impact natural drainage features	Likely supports ground water use and likely doesn't impact natural drainage features	Water supply unknown but likely doesn't impact natural drainage features	Water supply unknown and surface features suggest natural drainages would be impacted
Traffic and Transportation	Is supported by existing local roads from major highway infrastructure, nearby rail facilities support logistics, similar development next door was completed on existing roads.	Needs roads, proximate to rail facilities	Needs roads, proximate to rail facilities	Needs roads, proximate to rail facilities	Existing roads, rail nearby but unknown unloading facilities	Needs roads, rail nearby but unknown unloading facilities	Needs roads, rail nearby but unknown unloading facilities
Visual Resources	Is located in a low area that is not well visible from most locations. Was able to confirm prior to purchase given the existing facilities next door.	Is located in a low area that is not well visible from most locations.	Is located in a low area that is not well visible from most locations.	Is located in a low area that is not well visible from most locations.	Near major highway, likely very visible	Elevation supports more prominent views from highway	Elevation supports more prominent views from the southeast

Item 45:

Information Required:

Please fill in [Table 3] below to compare the alternative sites with the proposed project.

Response:

Table 3 is filled in to the extent that the California Desert Conservation Area data is readily available for the alternative sites areas studied. The recommended criterion was not available to the developer when the site selection occurred in 2007. However, because "…the criteria gives preference to disturbed lands, steering development away from lands with high environmental values, and avoiding the deserts' undeveloped cores" this methodology is consistent with the method used to site the Project as described in the AFC.

Table 3. California Desert Conservation Area Review

Environmental Criteria	Proposed Project Site	Superior Dry Lake Site	Coyote Dry Lake Site	Bristol Dry Lake Site	Imperial Valley Site	Imperial Valley East Site	Northwest of Blythe Site
Is site mechanically disturbed?	Yes	No	Partial	No	Yes	No	No
Is site located adjacent to degraded and impacted private lands?	No	No	No	No	No	No	No
Is site a Brownfield?	No	No	No	No	No	No	No
Is site located adjacent to urbanized areas (indicate distance, miles)?	No (18)	No (25)	No (19)	No (82)	No (9)	No (27)	No (8)
Does site require the building of new roads (indicate length)?	No	Yes (25)	Yes (3)	Yes (5)	No	Yes (7)	Yes (5)
Could site be served by existing substations (indicate name and distance)?	No	No	No	No	No	No	No
Is site located proximate to sources of municipal wastewater (indicate name and distance)?	No (18)	No (25)	No (19)	Unknown	Unknown	Unknown	Unknown
Is site located proximate to sources of municipal wastewater (indicate name and distance)?	No	No	No	No	Unknown	No	Unknown
Is site located proximate to load centers (indicate name and distance?)	Los Angeles (82)	Los Angeles (104)	Los Angeles (107)	Los Angeles (149)	San Diego (84)	San Diego (118)	San Diego (155)
Is site located adjacent to federally designated corridors with existing transmission lines?	Yes	No	Yes	No	No	No	No

Environmental Criteria	Proposed Project Site	Superior Dry Lake Site	Coyote Dry Lake Site	Bristol Dry Lake Site	Imperial Valley Site	Imperial Valley East Site	Northwest of Blythe Site
Does site support sensitive biological resources, including federally designated and proposed critical habitat; significant populations of federal or state threatened and endangered species, significant populations of sensitive, rare and special status species and rare or unique plant communities?	Refer to AFC	Likely	Likely	Likely	Not Likely	Likely	Likely
Is site within an Area of Critical Environmental Concern, Wildlife Habitat Management Area, proposed HCP and NCCP Conservation Reserves?	No	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Does site contain land purchased for conservation including those conveyed to BLM?	No	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Does site contain landscape-level biological linkage areas required for the continued functioning of biological and ecological processes?	No	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Is the site within Proposed Wilderness Area, proposed National Monuments,	No	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown

Environmental Criteria	Proposed Project Site	Superior Dry Lake Site	Coyote Dry Lake Site	Bristol Dry Lake Site	Imperial Valley Site	Imperial Valley East Site	Northwest of Blythe Site
and Citizens' Wilderness Inventory Areas?							
Does the site contain wetlands and riparian areas, including the upland habitat and groundwater resources required to protect the integrity of seeps, springs, streams or wetlands?	Refer to AFC	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Is the site a National Historic Register eligible site and does it contain other known cultural resources?	Refer to AFC	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Is the site located directly adjacent to National or State Park units?	No	No	No	No	No	No	No

Item 46:

Information Required:

Please identify the solar insolation for each of the six alternative sites, as well as for the proposed site.

Response:

The solar insolation is shown in the Table 4 and was taken from NREL's Solar Power Prospector website, http://mercator.nrel.gov/csp/.

Table 4. Alternative and Proposed Site Area Insolation

Site Area	Annual Insolation ($kWh/m^2/day$)
Imperial Valley East	7.246
Imperial Valley	7.086
Northwest of Blythe	7.337
Bristol Dry Lake	7.164
Superior Dry Lake	7.675
Coyote Dry Lake	7.359
Harper Dry Lake	7.740 (proposed site)

Item 47:

Information Required:

Please provide the results of a California Natural Diversity Data Base (CNDDB) search for the Imperial Valley alternative site.

Response:

Please refer to included mapping titled CNDDB Species Inventory submitted electronically as “DR_1A_47_CNDDB_Inventory.zip.”

Biological Resources

Item 48:

Information Required:

Please provide the jurisdictional delineation report, referenced in the AFC as EDAW 2009d, Mojave Solar Project Jurisdictional Letter Report. June 2009.

Response:

Please refer to the attached Jurisdictional Delineation Letter Report, dated August 26, 2009, attached in file "DR_1A_48_Jurisdictional_Letter.zip." The document referenced in the AFC and in Data Request 48, above, was a preliminary draft which was not completed and submitted to the USACE until August 2009, after the completion of the AFC.

Item 49:

Please refer to the letter "Abengoa Mojave Solar Project (09-AFC-5): Notice Pursuant to 20 CCR 1716(f): Data Request Set 1 (nos. 1-93)" dated November 11, 2009 and docketed regarding this request.

Item 50:

Information Required:

Please provide the following communications between or submittals to permitting agencies regarding waters of the U.S. and State:

A. Any records of conversation with the U.S. Army Corps of Engineers (USACE), California Department of Fish and Game (CDFG), and Regional Water Quality Control Board (RWQCB), as applicable, regarding wetlands/waters permitting;
B. Letter of concurrence from USACE that a Clean Water Act (CWA) Section 404 permit is not required (as stated in AFC Table 5.3-11), or the projected date of its receipt by the applicant; and
C. Draft Streambed Alteration Notification(s) as submitted to CDFG, or the projected date of submittal.

Response:

(A) Discussions between the Mojave Solar Project team and the resource agencies regarding wetlands/waters issues can be summarized as follows:

July 22, 2009: REAT Meeting with the California Energy Commission. Natural resource agency attendees at the meeting included Ashley Blackford, USFWS (by phone); Tonya Moore, CDFG (by phone); Misa Milliron (CEC); Brian McCullough (CEC); Dennis Beck (CEC Senior Staff Counsel); Christine Hammond (CEC Office of Counsel). Lyndon Quon, EDAW/AECOM biologist retained by Abengoa described the existing site

conditions as being absent of any natural drainages, and that surface water moves across the site via sheet flow action. Mr. Quon stated that the team would continue to coordinate with resource agency staff to determine the appropriate steps to address any potential issues regarding wetlands/waters permitting.

July 30, 2009: Telephone conversation between Joshua Zinn (EDAW/AECOM wetlands ecologist/permitting specialist) and Aaron Allen, Ph.D. (USACE Regulatory Branch). Mr. Zinn explained to Dr. Allen that a preliminary jurisdictional delineation was conducted that outlined all potential waters of the U.S. at the project site, and that no activity would be taking place within potentially jurisdictional waters of the U.S. Mr. Zinn also informed Dr. Allen that a Jurisdictional Delineation Letter Report would be submitted and that the project would be seeking concurrence from the USACE that no permit is required under Clean Water Act (CWA) Section 404. Dr. Allen indicated that this would likely be the position of the USACE, if no activity would be taking place that would be construed as dredged or fill activities in aquatic features.

August 28, 2009: Joshua Corona-Bennett (EDAW/AECOM staff biologist) submitted the Jurisdictional Delineation Letter Report to Dr. Allen, via email, on behalf of Joshua Zinn and Abengoa.

August 30, 2009: Dr. Allen contacted Mr. Corona-Bennett via email to inform him that he had conducted a quick review of the Jurisdictional Delineation Letter Report, and determined that the full review needed to be conducted out of the USACE South Coast Branch, since the project was located in San Bernardino County. Dr. Allen informed Mr. Corona-Bennett that the project was forwarded to South Coast Branch Chief, Mark Durham, for his review.

September 29, 2009: Mr. Zinn contacted the USACE to determine the status of their review. Dr. Allen informed Mr. Zinn that Mr. Durham was currently out of the office, and had not been able to complete the review of the Jurisdictional Delineation Letter Report.

(B) It is anticipated that the USACE will complete review of the Jurisdictional Delineation Letter Report, and respond with a letter of concurrence that a CWA Section 404 permit is not required, by January 15, 2010.

(C) A tentative pre-application meeting has been scheduled with CDFG staff for late November 2009. The pre-application meeting will better define what needs to be included in the Draft Streambed Alteration Notification, which is anticipated to be submitted to CDFG by December 23rd, 2009.

Items 51-57

Please refer to the letter “Abengoa Mojave Solar Project (09-AFC-5): Notice Pursuant to 20 CCR 1716(f): Data Request Set 1 (nos. 1-93)” dated November 11, 2009 and docketed regarding this request.

Item 58:

Information Required:

Please identify the federal permit process for incidental take (e.g., Section 7 or Section 10), the steps the applicant has taken, and the schedule for obtaining the federal incidental take permit. To this end, please also provide:

A. Any supporting documents (letter or record of conversation) that result from communication with USFWS regarding Endangered Species Act permitting; and

Response:

Abengoa has submitted an application to the U.S. Department of Energy (DOE) for a federal loan guarantee for the Mojave Solar Project (MSP). DOE is required to consult with the U.S. Fish and Wildlife Service (USFWS) pursuant to Section 7 of the federal Endangered Species Act (ESA) to ensure that the proposed issuance of the loan guarantee will not jeopardize the continued existence of any listed species or result in the adverse modification or destruction of designated critical habitat. At the conclusion of the consultation, USFWS will issue a Biological Opinion addressing those issues and also providing incidental take coverage for any incidental take of listed species that may result from issuance of the DOE loan for the MSP. The ESA Section 7 process thus will satisfy ESA compliance for the MSP because the loan guarantee is necessary for construction and operation of the MSP.

On November 6, 2009, the DOE contacted Abengoa requesting Part II of the loan guarantee application, including an environmental report to be used by DOE to determine compliance with the National Environmental Policy Act (NEPA). The due date for Part II of the application is December 3, 2009. Abengoa anticipates an invitation to negotiate a term sheet with DOE shortly thereafter, and that DOE will initiate consultation with USFWS under Section 7 of the ESA at that time.

A. Abengoa has engaged in several discussions with USFWS and CEC regarding ESA compliance for MSP. Those discussions included:

April 8, 2009: REAT Meeting with the California Energy Commission. Natural resource agency attendees at the meeting included Ashley Blackford (USFWS) (by phone); Tonya Moore (CDFG) (by phone); and Rick York (CEC). Bill Graham, a biological consultant with EDAW retained by Abengoa, provided an overview of the MSP with respect to biology, a copy of which is attached hereto electronically in file "DR_1A_58_Documentation.zip." During the meeting, Mr. York stated the CEC would work with DOE with respect to the ESA Section 7 process and ESA compliance, and Ms. Blackford stated that if the ESA Section 7 process was not available for the project, USFWS would consider using a Low Effect Habitat Conservation Plan (LEHCP) process for MSP ESA compliance.

April 28, 2009: Telephone conversation between Chris Ellison and Shane Conway, legal counsel representing Abengoa on the MSP and Paul Richins (CEC), regarding ESA

compliance and DOE involvement with MSP through the federal loan guarantee program. Mr. Richins was in agreement that an ESA Section 7 consultation between DOE and USFWS was a desirable means of ESA compliance for the MSP and that CEC would work with DOE to facilitate coordination between the CEC permitting process and DOE permitting process.

July 2, 2009: Telephone conversation and email correspondence between Chris Ellison, Shane Conway, Kim McCormick, Dennis Beck (CEC Senior Staff Counsel) and Christine Hammond (CEC Office of Counsel) regarding coordination of CEC permitting process with DOE loan guarantee process and DOE ESA Section 7 consultation with USFWS. A copy of a proposed joint permitting timeline was sent to Mr. Beck and Ms. Hammond via email at the conclusion of the call. A copy of the email with attachment is attached in file "DR_1A_58_Documentation".

July 22, 2009: REAT Meeting with the California Energy Commission. Natural resource agency attendees at the meeting included Ashley Blackford (USFWS) (by phone); Tonya Moore (CDFG) (by phone); Misa Milliron (CEC); Brian McCullough (CEC); Dennis Beck (CEC Senior Staff Counsel); Christine Hammond (CEC Office of Counsel). Abengoa provided an overview of the MSP with respect to biology, a copy of which is attached hereto electronically in file "DR_1A_58_Documentation.zip." This meeting focused on biology, with presentations by Dr. Alice Karl, desert tortoise expert retained by Abengoa; Dr. Phil Leitner, Mohave ground squirrel expert retained by Abengoa; and Lyndon Quon, EDAW biologist retained by Abengoa.

Mr. Quon provided an overview of biological surveys conducted for the MSP, potential impacts to sensitive habitat, proposed avoidance, minimization and mitigation measures; a proposed compensation ratio for impacts of approximately 0.5:1 acre; and the location and characteristics of potential compensation lands owned by Abengoa and located west of and adjacent to the MSP site. Dr. Karl and Dr. Leitner discussed each of these topics in specific detail for desert tortoise and Mohave ground squirrel, respectively.

With respect to federal ESA compliance, Mr. Beck and Ms. Hammond stated that they had spoken with Vicky Campbell (USFWS) and Matthew McMillan (DOE) with respect to applicability and availability of the ESA Section 7 consultation process for the project, and that a concurrent process between CEC, DOE and USFWS was being worked out.

Ms. Moore stated that she would evaluate the compensation ratio proposal in more detail and would provide her response to the proposal to the applicant within one week. Ms. Blackford did not express any concerns with the compensation ratio proposal.

October 8, 2009: Email from Fred Redell to Craig Hoffman (CEC Project Manager for MSP) and others, explaining DOE permitting process and ESA Section consultation process and providing proposed timeline for coordinated permitting. A copy of the email is attached electronically in file "DR_1A_58_Documentation.zip."

For response to Item 58B: Please refer to the letter “Abengoa Mojave Solar Project (09-AFC-5): Notice Pursuant to 20 CCR 1716(f): Data Request Set 1 (nos. 1-93)” dated November 11, 2009 and docketed regarding this request.

Item 59:

Information Required:

Please provide a copy of the Abengoa Mojave Solar Section 2081 incidental take permit application as submitted to CDFG, or the projected date of its submittal.

Response:

The Abengoa Mojave Solar Section 2081 incidental take permit application is currently being prepared. The previously mentioned pre-application meeting with CDFG staff in late November 2009 is necessary to finalize the application, which is anticipated to be finalized and submitted to CDFG by December 23rd, 2009.

Item 60:

Information Required:

Please provide any supporting documents (letter or record of conversation) that result from communication with USFWS and/or CDFG regarding compensatory mitigation, including identified lands potentially suitable/acceptable as mitigation for impacts to desert tortoise, Mohave ground squirrel, and western burrowing owl.

Response:

Please see Response to Item 58, which describes meeting that have been held to date with the resources agencies. On July 29, 2009, Tonya Moore (CDFG), provided confirmation by email to Kimberly McCormick, counsel for Abengoa on the MSP, Eric Weiss (CDFG) and Misa Milliron (CEC), regarding the proposed compensation and mitigation requirements for the project. That email is attached in file “DR_1A_60_Documentation”. Abengoa has proposed to provide compensation lands from a parcel owned by Abengoa located directly west of the proposed project site. Abengoa is continuing to work with the resource agencies to identify compensation lands for the project.

Item 61:

Information Required:

Please provide an anticipated daily construction schedule (e.g., projected start and stop times).

Response:

The day shift is expected to begin between 7:00 am and 9:00 am and the night shift is expected to begin between 4:00 pm and 6:00 pm. Each shift is expected to last approximately 10 hours. Some shift staggering is expected due to the large number of

employees and the logistics of transporting and coordinating a large construction workforce.

Item 62:

Information Required:

If construction at night is required, please describe during what time of year night lighting would occur, expected duration, and any measures to avoid or minimize impacts to nocturnal animals or other sensitive wildlife associated with the marsh.

Response:

Construction at night is required to meet the project timeline. The majority of night construction occurs inside the Solar Collector Array buildings. However, some activities will occur during the night and outdoors and will require lighting. To the maximum extent practical the Applicant will avoid external disturbance during night time construction. These measures include using localized lighting and selecting appropriate areas to construct at night that are away from the site boundaries.

Item 63:

Information Required:

Please provide ambient noise levels along the southern shoreline of Harper Dry Lake (in A-weighted decibels [dBA]) between 35°02'22.35" N/ 117°19'31.63" W and 35°00'48.36" N/ 117°16'14.20" W. The data set should include ambient noise levels at the Harper Dry Lake marsh habitat, northeast of the Beta site.

Response:

Based on the Project Team's experience and the observations of the noise survey field engineer, the daytime, evening, and nighttime ambient noise environment in and around the MSP Project Site are quite uniform and consistent with each other for any given period. These results, coupled with the observations of there being very few to no area-wide noise sources, indicates that additional ambient data would not deviate noticeably from the data already taken at the residential receptor locations. Thus, since representative and typical data have already been taken near the Project Site and reported in the AFC (please see Table 5.8-7 and Figures 5.8-3 and 5.8-4), no supplemental ambient data are believed to yield additional insights into the area's ambient noise environment (including the dry lake bed and marsh habitat). The Applicant suggests that the results for ambient locations ST-1 and LT-1 be used as short-term and long-term representations, respectively, for the biological areas of concern in the Data Request.

Please also see response to Item 64A, below.

Item 64:

Information Required:

A. Please provide estimated worst-case construction and operation noise levels (in dBA) along the southern shoreline of Harper Dry Lake between 35°02'22.35" N/ 117°19'31.63" W and 35°00'48.36" N/ 117°16'14.20" W. The data set should include estimated worst-case construction and operation noise levels at the Harper Dry Lake marsh habitat, northeast of the proposed Beta site.
B. Provide a map of noise contours extending from the project noise source to Harper Dry Lake marsh and into the Harper Dry Lake bed.

Response:

A. The request for additional noise measurement data for ambient conditions and modeled construction and operational noise levels suggests that the CEC is trying to analyze potential adverse effects based upon exceeding a threshold value. Although a noise threshold has been established by some regulatory agencies for certain breeding or nesting avian species (e.g., the federally listed endangered least Bell's vireo), there are no currently adopted LORS that apply noise thresholds to non-threatened or endangered species. Since no threatened or endangered avian species have been documented as nesting on or adjacent to the project area, the applicant feels that this additional analysis is unwarranted. Additionally, the modeled construction and operational noise levels do not exceed 60 dBA at the outer edge of the migratory bird habitat associated with Harper Dry Lake (Table DR 1A-64a and Table DR 1A-64b), and in the vast majority of the cases, the predicted construction and operational noise levels are well below 60 dBA, and would not constitute an adverse effect even if threatened or endangered avian species were nesting or breeding on Harper Dry Lake.

Notwithstanding the above, please refer to the Figure 1 below for a depiction of supplemental noise analyses locations along the edge of the dry lake bed (and the marsh area). Please also refer to the Table 5 below which provides construction noise results at selected, representative locations along the edge of the dry lake bed. This supplemental table is an extension of and in the same format as the AFC Table 5.8-9.

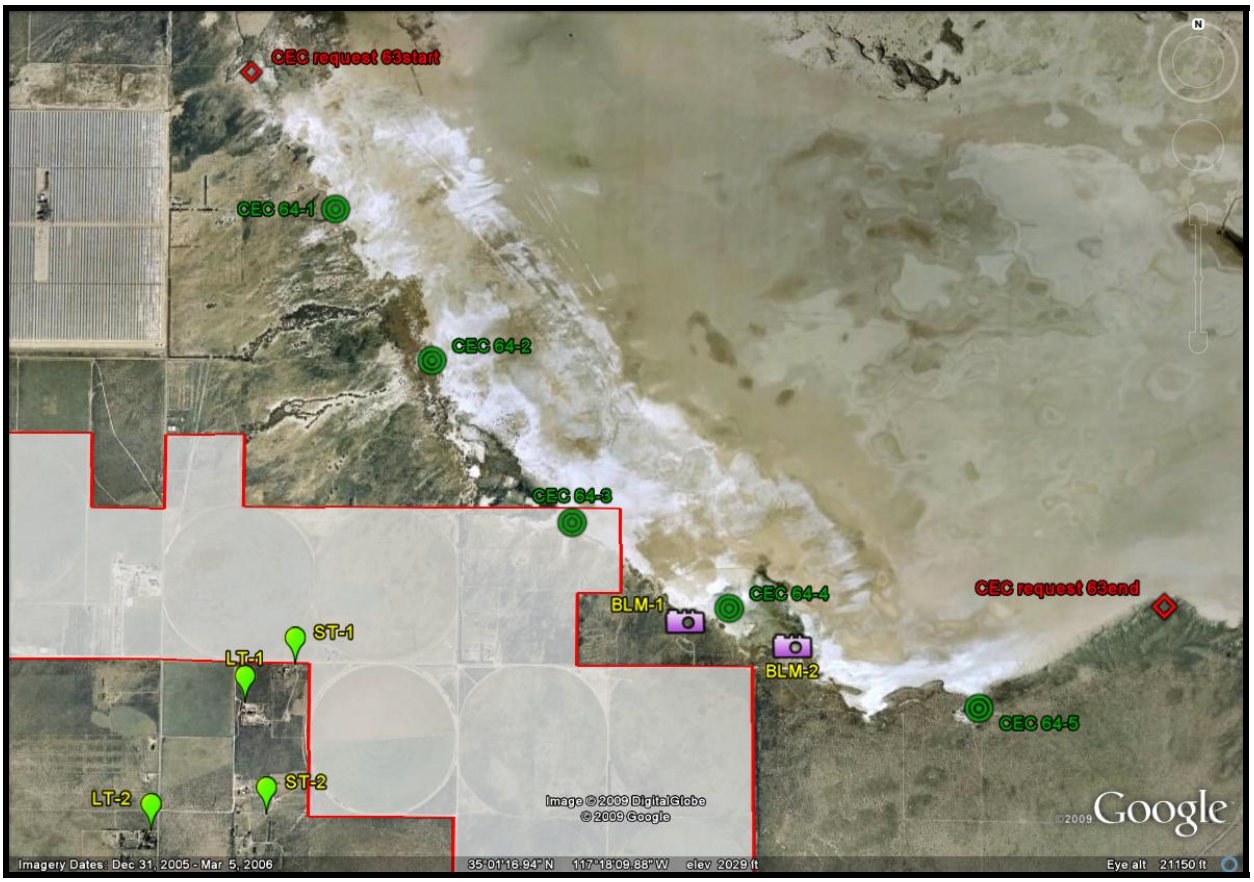

Figure 1. Supplemental Noise Analyses Locations along the Edge of the Dry Lake Bed

Table 5. Predicted Construction Noise Levels

Construction Activity Phase	Aggregate Construction Noise Level at 50 feet, dBA	Construction Noise Levels at Pertinent Bio-related Locations, dBA[4,5,6]								
		63_{start}[7]	63-1	63-2	63-3	BLM-1[8]	63-4 (marsh)	BLM-2[9]	63-5	63_{end}[10]
Site Clearing/ Grading	91	49	51	54	59	60	58	57	52	48
Excavation	90	45	47	48	49	53	51	51	47	44
Foundation	93	48	50	51	52	56	54	54	50	47
Building & Erection	93	48	50	51	52	56	54	54	50	47
Finishing	90	48	50	53	58	59	57	56	51	47

Source: USEPA, 1971; Alliance Acoustical Consultants, Inc., 2009

B. While AFC Figures 5.8-6a and 5.8-6b depict some of the area of concern addressed in this Data Request, they do not cover the entire area between the noted points (given by the lat/long coordinates in the DR), nor do they show the edge of the dry lake bed. Therefore, please refer to the attached Figures DR 1A-64b1 and DR 1A-64b2 (please refer to electronically attached file "DR_1A_64_Figures.zip") for a re-plotted depiction of the AFC information for the predicted daytime and nighttime Project operations noise contours, respectively. As can be seen by these figures, predicted daytime operations noise levels along the edge of the dry lake bed are in the range of 34 to 49 dBA, while predicted nighttime operations noise levels are in the range of 1 to 17 dBA. These predicted noise environments, summarized in Table 6 below, are below the thresholds for impacts to human sensitive receptors and are also not seen as being significant on wildlife species associated with the lake bed edge and/or marsh areas. Please also see response to Item 64-A.

[4] The aggregated noise levels, using the USEPA methodology, were propagated over the various distances to each receptor using only spreading loss attenuation (6 dB/DD).
[5] The choice of representative sub-areas for any given construction phase will result in different distances to each receptor and, thus, different summed noise levels.
[6] Since the construction noise analysis employs averaged emissions levels, time-weighted usage factors, and spatial representations, it is important to bear in mind that noise levels at a particular location may be higher or may be lower than the tabled values on any given day and at any given time. For example, grading work on the proposed drainage channel outlet (NE corner of the site) will yield higher noise levels than shown at (arbitrary) location 63-3.
[7] At DR 1A-63 (start) coordinates 35°02'22.35" N / 117°19'31.63" W.
[8] At ACEC visitor building (north end of access loop road).
[9] At viewing area visitor gazebo (near end of Lockhart Road).
[10] At DR 1A-63 (end) coordinates 35°00'48.36" N / 117°16'14.20" W.

Table 6. Predicted Project Operations Noise Levels

Location	Name	Predicted DAYTIME Project noise level, (dBA)	Predicted NIGHTTIME Project noise level, (dBA)
LT-1	Ramirez Residence	53	22
LT-2	Grieder Residence	40	7
ST-1	Holmes Residence	52	21
ST-2	Lucy & others Residences	46	15
ST-3[11]	Boy's Oasis (abandoned/uninhabited)	35	0
DR-64$_{start}$[12]	*35°02'22.35" N 117°19'31.63" W*	35	3
64-1[12]	East of existing SEGS pwr blk	39	7
64-2[12]	East ext'n of Hoffman Rd.	42	10
64-3[12]	Near drainage channel outlet	44	12
BLM-1[11]	ACEC visitor building	49	17
64.4[12]	Marsh area	45	14
BLM-2[11]	Viewing kiosk/gazebo	45	14
64-5[12]	ENE of Mojave Beta Pwr Blk	40	8
DR-64$_{end}$ [12]12	*35°00'48.36" N 117°16'14.20" W*	34	1

Source: Alliance Acoustical Consultants, Inc., 2009

Item 65:

Information Required:

A. Provide the expected schedule for the loudest construction activities;
B. Indicate the resultant worst-case noise levels at the Harper Dry Lake marsh; and
C. Note any measures that would be implemented to limit these elevated noise levels.

Response:

A. As discussed in the AFC, the construction periods with the most equipment items and the most intense activities were used for the construction noise source definitions. Specifically, the equipment mixes for months, 4, 15, and 16 were used to define the aggregate noise emissions for site grading, power block construction, and solar field build-out, respectively. These months and their related activities are seen to be the representative worst-case conditions for construction noise during the planned 26 month schedule. Please refer to AFC Section 5.8.5.3.3 and 5.8.5.3.4 for additional details on construction noise and the assessment thereof.

[11] Data provided for information only as these locations are not subject to impact assessment.
[12] New data points for Data Request 1A-64 related to biological resources.

B. Please refer to the response to Item 64-A.

C. Please refer to the response to Item 64-A.

Item 66:

Information Required:

Please provide proposed evaporation pond design specifications, including but not limited to, surface area, minimum and maximum operational capacity depth, expected maximum depth, and slope of banks.

Response:

The evaporation ponds are typical industry standard and will comply with Lahontan Regional Water Quality Control Board requirements. There are four (4) ponds, each with a nominal surface area of five (5) acres. The minimum operational capacity depth is zero (empty). The maximum operational capacity depth is six (6) feet. The expected maximum depth is eight (8) feet (six (6) feet operational and two (2) feet of freeboard).

Item 67:

Information Required:

Please provide specific design, construction, and operation elements (e.g., netting) to be implemented that would discourage wildlife use of the evaporation ponds.

Response:

The Applicant will consider a variety of measures to discourage wildlife use of the evaporation ponds, including Netting, Chemical Deterrent, Human Hazing, Mechanical Hazing, Radar Controlled Hazing, and Computer Aided Radar Controlled Hazing. The Applicant will work with CEC staff to find the most cost effective measure that produces the desired results.

Item 68:

Information Required:

Please quantify the expected concentrations (in mg/L) of water quality constituents (to include selenium, sodium, arsenic, boron) proposed for discharge to the evaporation ponds.

Response:

As described in Sections 2.4.4.4 and 5.3 of the AFC, multiple processes in the Circulating Water Treatment system are designed to remove solids (e.g. clarifier to precipitate hardness and alkalinity from the cooling tower blowdown water, thickener, and filter press), where minerals, and metals such as selenium and chromium, are

expected to be removed prior to the evaporation ponds, and properly disposed of as a solid waste.

The expected concentrations of water quality constituents proposed for discharge to the evaporation ponds are as follows:

Selenium: 0.25 mg/L*

Sodium: 31,614.47 mg/L

Arsenic: 0.45 mg/L

Boron: 78.23 mg/L

* Selenium is assumed to co-precipitate with iron and/or calcium complexes for removal in the clarifier and filter processes and for removal offsite. However, should this process be 0% efficient, the selenium concentration will be as shown above. If the process is 100% efficient no selenium will be present in the discharge to the evaporation ponds.

Item 69:

Please refer to the letter "Abengoa Mojave Solar Project (09-AFC-5): Notice Pursuant to 20 CCR 1716(f): Data Request Set 1 (nos. 1-93)" dated November 11, 2009 and docketed regarding this request.

Item 70:

Information Required:

Please provide a feasibility assessment of alternatives to the use of evaporation ponds (e.g., zero liquid discharge system).

Response:

Please refer to Section 4.7.3 of the AFC.

Items 71-72:

Please refer to the letter "Abengoa Mojave Solar Project (09-AFC-5): Notice Pursuant to 20 CCR 1716(f): Data Request Set 1 (nos. 1-93)" dated November 11, 2009 and docketed regarding this request.

Item 73:

Information Required:

Please identify any plants in the proposed project area that are regulated under the California Desert Native Plants Act (California Food and Agricultural Code § 80071-80075) and San Bernardino County Development Code (§88.01.060).

Response:

The California Desert Native Plants Act (California Food and Agricultural Code § 80071-80075) identifies several species of trees, cacti, and succulents that can only be "harvested" for scientific or educational purposes under a permit issued by the County Commissioner. None of these plants occur within the proposed Mojave Solar Project development site.

The San Bernardino County Development Code (§ 88.01.060) does not specifically identify any regulated plant species.

Item 74:

Information Required:

Provide a description of the proposed project's conformance with the California Desert Native Plants Act and the San Bernardino County Development Code, including a plot plan for removal of regulated native plants, expected impacts, and specific mitigation, as necessary.

Response:

Since regulated plant species, as defined under the California Desert Native Plants Act (California Food and Agricultural Code § 80071-80075) and the San Bernardino County Development Code (§ 88.01.060) were not detected within the proposed Mojave Solar Project development footprint during any of the multiple rare plant/botanical surveys (2007, 2008, and 2009), the proposed project is in conformance with these regulations. No impacts to regulated plants under the aforementioned code sections will occur. Therefore, a plot plan for removal of regulated plants is not required, and mitigation is not necessary.

Geology and Paleontology

Item 75:

Information Required:

Please provide a copy of the archival records search reports prepared by the San Bernardino County Museum and the Los Angeles County Natural History Museum.

Response:

This response has been filed separately under confidential cover.

Hazardous Materials Management

Item 76:

Information Required:

Please provide a list of all hazardous materials proposed to be used on-site and include their CAS numbers, quantities and concentrations used, and the listed RQ, if any. Some small quantity hazardous materials can be described as a group such as “paint and paint thinners”, “lab reagents”, “lab gases”, or “cleaning chemicals”.

Response:

Table 7 and Table 8 list the small and large quantity hazardous substances, respectively, to be onsite during construction; and Table 9 and Table 10 list the small and large quantity hazardous substances expected to be onsite during operations. These lists are as complete as currently possible given the level of detailed engineering and planning available. Please note that no substances out of the ordinary for construction and operation of a conventional thermal power plant are planned to be used except for Heat Transfer Fluid.

For all substances listed in Tables 7 and 8, there is no applicable Reportable Quantity (RQ).

Table 7. Small Quantity Hazardous Substances Onsite during Construction

Materials	CAS No.	Relative Toxicity and Hazard Class	Permissible Exposure Limit	Storage Description; Capacity	Storage Practices and Special Handling Precautions
Concrete Curing Compound	64742-95-6 95-63-6 8052-41-3 64742-82-1 1330-20-7 98-82-8 103-65-1	Moderate Toxicity; Hazard Class - NFPA 2 flammability	PEL of 8052-41-3 = 2900 mg/m^3, 500 ppm REL of 95-63-6 = 125 mg/m^3 150 ppm PEL for 1330-20-7 = 435 mg/m^3, 100 ppm	Steel drum (qty-1) - 55 gallons	Construction inventory management

Materials	CAS No.	Relative Toxicity and Hazard Class	Permissible Exposure Limit	Storage Description; Capacity	Storage Practices and Special Handling Precautions
Krylon or similar - Fluorescent Paint 13% Propane 12% Butane 1% Hexane 9% V. M. & P. Naphtha 1% Toluene 2% Ethylbenzene 12% Xylene 15% Acetone 17% Calcium Carbonate	74-98-6 106-97-8 110-54-3 64742-89-8 108-88-3 100-41-4 1330-20-7 67-64-1 471-34-1			2 cases of 12 steel containers = 288 ounces	Inventory management per manufacturer recommendations
Hand Soap	64-17-5	Non-toxic; Hazard class - NA	None established	Plastic containers: quantity up to 45 gallons	Storage within portable wash facility locations
Herbicide Roundup® or equivalent	38641-94-0	Low toxicity; Hazard class- Irritant	Isopropylamine salt of glyphosphate = no specific occupational exposure has been established	No onsite storage, brought on site by licensed contractor, used immediately	No excess inventory stored onsite
Paint & Enamel (Rust Preventive Enamel)	74-98-6, 106-97-8, 64742-89-8, 108-88-3, 100-41-4, 1330-20-7, 67-64-1, 108-10-1			2 cases of 6 containers = 12lbs	Inventory management
Pipe Thread Compound	109-99-9 78-93-3 67-64-1 9002-86-2 108-94-1 112945-52-5			1 case = 384 ounces on site at any given time contained inside of original steel container	Contractor inventory management practices
Primer for PVC Pipe	78-93-3 67-64-1 109-99-9 108-94-1			1 case = 384 ounces on site at any given time contained inside of original steel container	Contractor inventory management practices

Materials	CAS No.	Relative Toxicity and Hazard Class	Permissible Exposure Limit	Storage Description; Capacity	Storage Practices and Special Handling Precautions
Super Butyl Concentrate	111-76-2 6834-92-0	Low toxicity Hazard class - NA	None established	< 1 gallon plastic container	Stored inside plastic container per manufacture recommendations
Tap matic - Gold / Metal cutting fluid	64742-52-5 124-38-9			Case of 6 contained in plastic containers = 192 ounces	Contractor inventory management
WD-40	64742-47-8 64742-48-9 64742-88-7 64742-65-0 64742-47-8 124-38-9	Moderate toxicity-Hazard class - Flammable aerosol	64742-47-8 PEL = 100 ppm 64742-88-7 PEL = 100 ppm 64742-65-0 PEL = 5 mg/m³ 64742-47-8 PEL= 1200mg/m³ 124-38-9 = 5,000 ppm	1 case of 6 in steel containers or 72 ounces	Inventory management methods per manufacture recommendations
Welding Rods / Filler Wire	7439-89-6	Low toxicity Hazard class - NA	None established	4- 50 lb boxes to equal 200 pounds; filler wire 316L 30 lbs	Construction inventory management methods

Table 8. Large Quantity Hazardous Substances Onsite during Construction

Materials	CAS No.	Relative Toxicity and Hazard Class	Permissible Exposure Limit	Storage Description; Capacity	Storage Practices and Special Handling Precautions
Diesel Fuel	#1-8008-20-6 #2-68476-34-6	Low toxicity; Hazard class-Combustible liquid	PEL: none established LV: 100 mg/m^3	Carbon steel tank transported to site (2,000 gallons)	Stored only in transport vehicle
Blue Chemical Destroyer	50-00-0 87-56-1	Low toxicity Hazard class - NA	None established	Plastic containment within portable toilets: 1 part blue chemical to 20 parts water	Construction inventory management methods
Carbon Dioxide BOC Gases	124-38-9	Low toxicity; Hazard class - Non flammable gas	TLV: 5,000 ppm (9,000 mg/m^3) TWA	Steel Cylinder (qty-1) on-site	Used for small welding operations: Mig guns

Materials	CAS No.	Relative Toxicity and Hazard Class	Permissible Exposure Limit	Storage Description; Capacity	Storage Practices and Special Handling Precautions
Form Oil	530-000	Low toxicity Hazard class - NA	None established	55-gallon steel drums 1-2 drums	Contractor Inventory management for concrete formwork
Hydraulic Fluid	64742-58-1	Low to moderate toxicity; Hazard class - Class IIIB combustible liquid	TWA (oil mist): 5 mg/m^3 STEL: 10 mg/m^3	Carbon steel tanks and sumps; 500 gallons in equipment, maintenance inventory of 110 gallons in 55-gallon steel drums	Found only in equipment with a small maintenance inventory. Maintenance inventory stored within secondary containment.
Lube Oil	64742-55-8	Low toxicity Hazard class - NA	None established	2 cases of 10W 40 in plastic containers	Construction inventory containment in plastic containers and/or contained within transport maintenance vehicle to support equipment i.e. such as earth moving equipment.
Mineral Insulating Oil	64742-11-6	Low toxicity Hazard class - NA	None established	Carbon steel transformers, 64,000 gal (within transformers)	Used only in transformers, secondary containment for each transformer
Natural Gas (methane)	74-82-8	Low toxicity; Hazard class - Non flammable gas	None established	No on site storage, up to 140 pounds of natural gas in equipment and piping; pressurized carbon steel pipeline for delivery to site	No storage on site. Piping will be designed to U.S. Department of Transportation (DOT) specifications; onsite facilities (gas metering) will be designed and operated to industry standards.
Nitrogen	7727-37-9	Low toxicity; Hazard class - Non flammable gas	None established	Carbon steel tank; 7,500 pounds total inventory	Carbon steel tank with crash posts

Materials	CAS No.	Relative Toxicity and Hazard Class	Permissible Exposure Limit	Storage Description; Capacity	Storage Practices and Special Handling Precautions
Soil stabilizer (Coherex)	64742-11-6	Non-toxic; Hazard class - NA	None established	No onsite storage, supplied in 55-gallon drums or 400-gallon totes, used immediately	No excess inventory stored onsite
Praxair Stargon Gas or similar (blend of Argon, Carbon Dioxide, and Nitrogen)	74440-37-1 7782-44-7 124-38-9	Low toxicity; Hazard class- Nonflammable gas	PEL: none established besides Carbon Dioxide - 5,000 ppm	Steel cylinders; 230 cubic foot each, 3,000 cubic foot total on site	Inventory management
Therminol VP1 Diphenyl ether (73.5%) Biphenyl (26.5%)	101-84-8 92-52-4	Moderate toxicity; Hazard class - Irritant; Combustible Liquid (Class III-B)	Biphenyl= PEL: 0.2ml/m^3 (8-hr TWA) TLV: 0.2 ml/m^3 (1mg/m^3) (8-hr TWA) Diphenyl ether= TLV: 1 ml/m^3 (8-hr TWA) TLV: 2 ml/m^3 (15-min TWA) PEL: 1 ml/m^3 (7 mg/m^3) (15-min TWA)	Qty: 2,292,000 gallons	Continuous monitoring of pressure in piping network; routine inspections (sight, sound, smell) by operations staff; isolation valves throughout piping network to minimize fluid loss in the event of a leak; prompt clean up and repair. Area containment shall be in place for bulk storage.
Welding gas Acetylene	74-86-2	Moderate toxicity; Hazard class - Toxic	PEL: none established	Steel cylinders; 145 cubic foot each, 4,000 cubic foot total on site	Inventory management, isolated from incompatible chemicals
Welding gas Oxygen	7782-44-7	Low toxicity; Hazard class- Oxidizer	PEL: none established	Steel cylinders; 251 cubic foot each, 4,000 cubic foot total on site	Inventory management, isolated from incompatible cylinders and chemicals
Welding gas Argon	7440-37-1	Low toxicity; Hazard class- Nonflammable gas	PEL: none established	Steel cylinders; 248 cubic foot each, 11,904 cubic foot total on site	Inventory management

Table 9. Small Quantity Hazardous Substances Onsite during Operations

Hazardous Material Name	Concentration	CAS No.	Quantity to be used Onsite	Reportable Quantity
Paint and paint thinners	–	–	50 gal	–
Lab reagents	–	–	10 gal	–
Lab gases	–	–	150 CF	–
Cleaning chemicals (Janitorial supplies)	–	–	20 gal	–
Welding rods	–	7439-89-6	100 lbs	–
Air Conditioning fluids	–	–	40 lbs	–
Herbicides and pesticides	–	–	5 gal	–
Office Supplies (batteries, etc)	–	–	1 cubic foot	–
Bathroom supplies – liquid soap	–	–	25 gal	–

Table 10. Large Quantity Hazardous Substances Onsite during Operations

Hazardous Material Name	Concentration	CAS No.	Quantity to be used Onsite	Reportable Quantity
Heat Transfer Fluid: Diphenyl ether (73.5%) Biphenyl (26.5%)	 73.5% 26.5%	 101-84-8 92-52-4	2,292,000 gal	Diphenyl ether (N/A) Biphenyl (CERCLA) RQ = 100 lbs (=377 lbs, or 42 gal of Therminol)
Sodium Hydroxide	50% solution	1310-73-2	2,000 gal (2 tanks x 1,000 gal)	1,000 lbs
Sodium Hypochlorite	12.5% solution	7681-52-9 10022-70-5	12,000 gal (2 tanks x 6,000 gal)	100 lbs
Sulfuric Acid	29.5% solution	7664-93-9 8014-95-7	2,000 gal (in batteries)	1,000 lbs
Sulfuric Acid	93% solution	7664-93-9 8014-95-7	1,600 gal (4 x 400 gal)	1,000 lbs
ChemTreat, Inc. BL-1558 or similar 3-Methoxyproplyamine Cyclohexlyamine Diethydroxylamine	 10 – 30% 10 – 30% 1 – 5%	 5332−73−0 108−91−8 3710−84−7	totes, 4 x 300 gal	 N/A 10,000 lbs N/A
ChemTreat, Inc. BL-1260 or similar Carbohydrazide	 5 -10%	 497-18-7	totes, 4 x 300 gal	 N/A
ChemTreat, Inc. CL-1432 or similar Potassium phosphate, tribasic 1-Hydroxyethylidene-1,1-diphosphonic acid, tetrapotassium salt Tetrapotassium pyrophosphate	 5 − 10% 0.5 − 1.5% 1 − 5% 5 − 10%	 7778−53−2 14860−53−8 7320−34−5 1310−58−3	totes, 2 x 1,000 gal	 N/A N/A N/A 1000 lbs

Hazardous Material Name	Concentration	CAS No.	Quantity to be used Onsite	Reportable Quantity
Potassium hydroxide Tolyltriazole, sodium salt	1 – 5%	64665–57–2		N/A
ChemTreat, Inc. BL-124 or similar Sodium bisulfite	15 – 40%	7631-90-5	totes, 2 x 300 gal	5000 lbs
ChemTreat, Inc. BL-1794 or similar Trisodium phosphate		7601-54-9	Plastic totes, 2 x 300 gal	N/A
ChemTreat, Inc. BL-180 or similar Nitrous acid, sodium salt Sodium tetraborate pentahydrate	10 – 30% 1 – 5%	7632-00-0 12179-04-3	totes, 2 x 300 gal	100 lbs N/A
Natural Gas (methane)		74-82-8	No on-site storage, natural gas in equipment and piping; pressurized carbon steel pipeline for delivery to site	N/A
Gasoline	100%	86290-81-5	1,000 – 2,000 gal (See also response to Item 36)	N/A
Water treatment chemical ChemTreat, Inc. CT-9004 or similar 1-Hydroxyethylidene-1,1-diphosphonic acid	3-7%	2809-21-4	totes, 2 x 300 gallons	N/A
Water treatment chemical ChemTreat, Inc. P-813 E or similar Petroleum distillate hydrotreated light	10-30%	64742–47–8	totes 2 x 275 gallons	N/A
Water treatment chemical			totes 2 x 300 gallons	

Hazardous Material Name	Concentration	CAS No.	Quantity to be used Onsite	Reportable Quantity
ChemTreat, Inc. CL-2156 or similar 5−chloro−2−methyl−4−isothiazolin−3−one 2−methyl−4−isothiazolin−3−one Magnesium nitrate Magnesium chloride	 1.11% 0.39% 1.61% 0.96%	 26172−55−4 2682−20−4 10377−60−3 7786−30−3		 N/A N/A N/A N/A
Lube Oil		64742-55-8	5,000 gal in equipment and piping, additional maintenance inventory of up to 550 gallons in 55-gallon steel drums.	N/A
Mineral Insulating Oil		64742-53-6 68037-01-4	total onsite inventory of 64,000 gal (in transformers)	N/A
Diesel Fuel, No. 2		68476-34-6	6,500 gal tank/power island and two small Day tanks per power island 600 gal (2 x 300). Total 14,200 gal inventory.	N/A
Nitrogen		7727-37-9	37,200 gal total inventory (2 tanks x 18,600 gal)	N/A
Hydraulic fluid		64742-58-1	6,400 gallons in equipment, maintenance inventory of 220 gallons in 4 x 55-gallon steel drums	N/A
Welding gas Acetylene		74-86-2	Steel cylinders; 8 x 200 cubic foot each, 1,600 cubic foot total on site	N/A
Welding gas		7782-44-7	Steel cylinders; 16 x 200 cubic foot each, 3,200	N/A

Hazardous Material Name	Concentration	CAS No.	Quantity to be used Onsite	Reportable Quantity
Oxygen			cubic foot total on site	
Welding gas Argon		7440-37-1	Steel cylinders; 8 x 200 cubic foot each, 1,600 cubic foot total on site	N/A
Fertilizer (Bioremediation) Urea		57-13-6 1317-25-5	Stored in bags (dry pellets), 6 x 50-pound, 300 pound total inventory	N/A
Fertilizer (Bioremediation) Monopotassium phosphate		7778-77-0	Used in two x 1,000-lb canisters, 2,000 pounds total inventory, no additional storage	N/A
Herbicide Roundup® or equivalent (Glyphosate, isopropylamine salt)	0.96 – 50.2 wt%	38641-94-0	No onsite storage, brought on site by licensed contractor, used immediately	N/A
Soil stabilizer Coherex or similar	50-70%	64742-11-6	No onsite storage, supplied in 400-gallon totes, used immediately	N/A

The Relative Toxicity and Hazard Class, Permissible Exposure Limit, Storage Description/Capacity, and Storage Practices and Special Handling Precautions for the hazardous substances listed in Table 10 were provided previously in Section 5.6.3.3 of the AFC.

Item 77:

Information Required:

A. Please provide the frequency of delivery of the HTF in trips per month and per year.
B. Discuss whether the HTF will be transported in barrels, totes, or tankers.
C. Discuss the type of vehicle used to transport the HTF if transported in a tanker truck. In that one of the Air Quality data requests addresses the number and type of trucks to be used for deliveries during the Operations phase, the response to this item may be incorporated by reference in the Air Quality response.

Response:

(A) 374 HTF deliveries evenly distributed over the last nine months of construction are estimated.

(B) The HTF is expected to be transported from the rail facility to the site in tanker trucks.

(C) It is expected that the tanker truck will be similar to a standard petroleum semi-tractor and tanker trailer.

Land Use

Items 78-80:

Please refer to the letter "Abengoa Mojave Solar Project (09-AFC-5): Notice Pursuant to 20 CCR 1716(f): Data Request Set 1 (nos. 1-93)" dated November 11, 2009 and docketed regarding this request.

Item 81:

Information Required:

Please submit a request to San Bernardino County regarding the General Plan Amendment (GPA) required for the Project.

Response:

Applicant submitted an objection to this data request in the letter "Abengoa Mojave Solar Project (09-AFC-5): Notice Pursuant to 20 CCR 1716(f): Data Request Set 1 (nos. 1-93)" dated November 11, 2009 and docketed because this request is based on the incorrect assumption that a General Plan Amendment is required for the project. Without waiving this objection, Applicant notes that the County of San Bernardino submitted a letter to the Commission on November 10, 2009, concurring that no General Plan Amendment is required for this project.

Item 82:

Information Required:

Energy Commission's staff will be sending a letter to San Bernardino County requesting detailed information regarding the proposed project's compliance with county LORS and the conditions the county would attach to this Project, were it the permitting agency. Please provide Project information to San Bernardino in order to facilitate the county's input regarding LORS conformance, conditions, and the required GPA.

Response:

Applicant noted the Commission Staff's letter to San Bernardino County dated November 10, 2009, requesting the County's input.

Applicant has contacted San Bernardino County planning staff regarding preliminary design of the proposed Project. In addition, Applicant's counsel sent a letter to the San Bernardino County Advanced Planning Division on November 4, 2009 regarding Project information and requesting the County's input on Data Requests 79-82. The Applicant and the County have scheduled a meeting on December 15, 2009 to coordinate this effort. Applicant will provide the information necessary to facilitate the County's input.

Public Health

Item 83:

Information Required:

Please describe and discuss the potential for all toxic thermal degradation products of HTF.

Response:

According to the MSDS for both Therminol-VP1 and Dowtherm-A as provided in Appendix C.1 of the AFC, note the following:

1. Both fluids are stable under normal conditions of handling and storage.
2. Neither fluid has the potential to undergo hazardous polymerization.
3. Both fluids have compound characteristics similar to the RCRA class of chemicals identified as category D018 (benzene).
4. Both fluids can decompose at elevated temperatures.
5. Decomposition products may include "trace" amounts of benzene, toluene, and phenol.

According to data provided by the HTF manufacturer, as analyzed by the project engineering staff, the amounts of benzene, toluene, and phenol in the decomposition offgas would be as follows:

- Benzene %wt of total VOC = 28%
- Toluene %wt of total VOC = 2.7%
- Phenol %wt of total VOC = 26%
- Other VOCs %wt = 43.3%

These %wt values have been used to speciate VOC emissions from the various HTF subsystems, i.e., ullage and tank venting, fugitive components, and waste unloading.

Item 84:

Please refer to the letter "Abengoa Mojave Solar Project (09-AFC-5): Notice Pursuant to 20 CCR 1716(f): Data Request Set 1 (nos. 1-93)" dated November 11, 2009 and docketed regarding this request.

Item 85:

Information Required:

Please provide DPM emission factors from construction activities and a health risk assessment for diesel construction equipment emissions.

Response:

The Applicant originally requested additional time for this item but was able to obtain the necessary vendor information in time to respond with this filing.

The emissions factors for DPM from construction activities are clearly presented in Table C.5-5 of the AFC. Exhaust DPM data for the majority of the construction related equipment is presented on page 3 of the Construction Equipment Exhaust Emissions (titled 2010 Equipment Emissions Factors). In addition, DPM emissions factors are presented in Table C.5-5 of the AFC at the following sheet locations: (1) Truck Delivery and Site Support Vehicle Emissions, and (2) Worker Travel Emissions.
The construction screening HRA requested by CEC staff was performed using the following assumptions as follows:

- The three highest construction offsite MIR receptors were chosen based upon the construction modeling as revised per the data requests in the Air Quality section above.
- Cancer risk and chronic hazard indices were computed using the screening methodology as outlined in the South Coast AQMD (Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Emissions, December 2002, and HRA guidance for Analyzing Cancer Risks from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis, August 2003).
- A cancer inhalation unit risk value of 0.0003 $(ug/m^3)^{-1}$ was used.
- A cancer chronic inhalation REL of 5.0 $(ug/m^3)^{-1}$ was used.
- No acute inhalation REL exists for diesel PM.
- The adjustment factor applied to the final risk and hazard index values was based upon a construction work schedule of 10 hrs/day, 6 days/week, 50 weeks/year, for 26 months (2.167 yrs), i.e., lifetime exposure adjustment (LEA) factor value of 0.0106.

With respect to emissions from diesel fueled engines, use of the diesel PM exposure factors noted above are approved by CARB for the characterization of diesel engine exhaust and subsequent risk exposures. The diesel PM factor includes the range of fuel bound, and potentially emitted metals, PAHs, and a wide variety of other semi-volatile

substances. CARB notes the following in Appendix K of the current HARP Users Manual:

- The surrogate for whole diesel exhaust is diesel PM. PM10 is the basis for the potential risk calculations.
- When conducting an HRA, the potential cancer risk from inhalation exposure to diesel PM will outweigh the potential non-cancer health effects.
- When comparing whole diesel exhaust to speciated diesel exhaust, potential cancer risk from inhalation exposure to whole diesel exhaust will outweigh the multi-pathway cancer risk from the speciated compounds. For this reason, there will be few situations where an analysis of multi-pathway risk is necessary.

With respect to diesel particulate related risk values, the following should be noted:

- The US Department of Energy (DOE) as well as the US Environmental Protection Agency (EPA) have disagreed with the CARB/OEHHA and South Coast AQMD positions on the relative threat and relative contribution of diesel exhaust to "toxic" air pollution, and neither of the agencies, including the EPA's prestigious Health Effects Institute identify diesel exhaust as a "known" carcinogen, since the scientific studies show only "weak" cancer links. EPA and DOE believe that the studies relied upon by CARB and SCAQMD are flawed in that they use a problematic elemental carbon surrogate for ambient diesel particulate matter and ignored a significant portion of PM2.5 captured at the SCAQMD's own monitoring stations. In view of these conflicting studies, we suggest that caution be used in the decision making process regarding diesel PM and its associated risks, i.e., the actual risks may be much lower than those calculated by screening method herein. For these reasons, the risk table below reports the construction risk values using DPM only, and the inhalation pathway.

The following table presents the results of the screening level assessment of health risks from the construction phase.

Construction Screening HRA Summary					
MIR #	Annual, ug/m^3 (met year)	UTM E	UTM N	Cancer Risk	Chronic HI
Phase I					
1	0.48412 (2003)	470329.33	3875250.00	1.54 E-6	0.001
2	0.46946 (2004)	470329.33	3875250.00	1.49 E-6	0.001
3	0.46336 (2002)	470329.33	3875250.00	1.47 E-6	0.001
Phase II-IV					

1	0.72114 (2003)	470329.33	3875250.00	2.29 E-6	0.0015
2	0.69931 (2004)	470329.33	3875250.00	2.22 E-6	0.0015
3	0.69022 (2002)	470329.33	3875250.00	2.19 E-6	0.0015

Item 86:

Information Required:

Please provide DPM emission factors for on-site solar field and equipment maintenance activities in pounds per day and tons per year. This value can be submitted as a single number estimate of total emissions from all vehicular sources used on-site.

Response:

Table C.1-7, provided in Appendix C.1 of the AFC, has been slightly revised and is attached (tables included with Data Request Item 6). This table indicates the DPM emissions and emissions factors used to estimate on-site facility operations and maintenance emissions. DPM emissions values presented in the original table, as well as the revised table, are given in terms of lbs/VMT, lbs/hp-hr, lbs/avg day, lbs/year, and tons/yr. DPM emissions in terms of lbs/day, although given, are not used in the HRA since an acute REL has not been established for DPM.

Item 87:

This item is linked to the items 84 and 85 and the Applicant has requested an extension of this item in connection to the letter “Abengoa Mojave Solar Project (09-AFC-5): Notice Pursuant to 20 CCR 1716(f): Data Request Set 1 (nos. 1-93)” dated November 11, 2009 and docketed regarding this item. The Applicant mistakenly omitted this item from the aforementioned letter.

Item 88:

Information Required:

Please provide a cumulative PM2.5 emissions estimate on a daily and yearly basis when fugitive dust emissions are added to the DPM emissions from the above stationary and mobile sources, assuming that all DPM from diesel engines are PM2.5.

Response:

Please see Response to Item 29 above.

Reliability – Power Plant

Item 89:

Information Required:

Please describe the quality control program that would be utilized for the project, including examples of appropriate controls that would be applied to each of the stages of project development.

Response:

To ensure the desired project reliability and availability is achieved, the Applicant will use an Engineering, Procurement and Construction (EPC) firm with an appropriate Quality Control (QC) program. An appropriate QC program designates specific personnel responsible for implementation, oversight, and execution of the plan. The EPC firm shall be ultimately responsible for the establishment, implementation, and maintenance of the Project QC program, with responsibility and necessary authority delegated to specific personnel, as appropriate.

The Project QC System is applied to all of the EPC firm's Project activities including overall Project management and control, planning, engineering, design, purchasing, expediting, and construction services.

Throughout the project, QC is achieved through Project Management quality controls. These activities include developing plans for project execution, the project schedule, a manpower plan ensuring a competent team is assigned to the project, and a QC plan subject to internal and Owner audits and Owner approval, utilizing the established document management system to monitor document issuance, managing communication, change management using the established Project Coordination Procedures with formal documentation and letters of change, and providing the final project documents in Project Data Books.

During project design and development, engineering activities are quality-controlled through the review of design drawings, equipment, vessel, piping, and instrumentation lists and specifications, material requisitions, and technical bid evaluations by key disciplines and the project engineer prior to issuance for Owner's review. The approved vendor list is reviewed by both the project team and Owner. An Operating Manual for the project will be prepared and reviewed.

During the construction phase, the primary method the QC program employs is monitoring of construction activities by the construction superintendent or his delegate, reporting to the EPC firm's project manager any issues related to schedule, costs, risks, scope, safety, and quality, ultimately with the work subject to Owner's approval.

Monitoring of system operation during commissioning and Start-up per the process/mechanical project specifications and operating manual will enable identification and resolution of any performance issues and ensure that project performance guarantees are met.

Additionally, all phases of the project are subject to non-conformance procedures for supply and construction, change management, and QC program compliance audits.

Operations and Maintenance QC methods to ensure plant reliability include involving experienced operations personnel in the design review process, proper selection and training of operations and maintenance personnel, preparation and use of an Operations and Maintenance Manual, managing an inventory of spare parts to minimize downtime in case of equipment breakdown, scheduled and documented equipment and system inspections, and preventive regular maintenance and planned outages.

Plant operational reliability will further be secured with its operation by the Owner's Operations & Maintenance Company, headed by individuals experienced in the solar power industry. The Owner's O&M Company will develop, implement and continuously improve a customized Quality Management System (QMS) based on internationally recognized standards such as ISO9001:2000 and ISO 14000.

Transmission System Engineering

Item 90:

Please refer to the letter “Abengoa Mojave Solar Project (09-AFC-5): Notice Pursuant to 20 CCR 1716(f): Data Request Set 1 (nos. 1-93)” dated November 11, 2009 and docketed regarding this request.

Item 91:

Information Required:

Provide a complete short circuit duty analysis for three-phase-to-ground and single-phase-to-ground faults for interconnection of the proposed MSP and include proposed mitigation measures for any short circuit duty criteria violations. Provide the study results in a table format with pre and post-project fault currents at selected substations with the existing breaker fault interrupting current duties.

Response:

In December 2008 Southern California Edison (SCE) completed a Technical Assessment (TA) for the Mojave Solar Project (then known as the Harper Lake Solar Plant Project) to assess how changes to the generation interconnection queue in the Project area affected the results of the Project System Impact Study (SIS) which was completed in June 2008. The TA presented information on the pre- and post-Project three-phase and single-phase short-circuit duties at numerous 500-kV, 230-kV, and 115-kV substations on the SCE system. The results of these studies are summarized in Table 11 below.

Table 11. Short-Circuit Duty Study Results

THREE-PHASE SHORT-CIRCUIT DUTY STUDY RESULTS						
Substation	Bus Voltage	Pre-Project		Post-Project		Change Ka (Post-Pre)
		X/R	kA	X/R	kA	
Antelope	500	21.0	32.1	21.1	32.2	0.1
Lugo	500	22.7	49.4	23.0	50.1	0.7
Mira Loma	500	24.4	39.0	24.5	39.2	0.2
Pisgah	500	17.9	20.0	17.9	20.1	0.1
Rancho Vista	500	29.1	27.7	29.3	27.8	0.1
Serrano	500	25.6	33.1	25.7	33.2	0.1
Vincent	500	18.7	44.3	18.8	44.4	0.1
Cool Water	230	29.2	10.6	28.0	15.2	4.6
El Segundo	230	22.4	37.3	22.4	37.4	0.1
Etiwanda	230	26.7	58.6	26.8	58.7	0.1
Hinson	230	18.8	42.0	18.8	42.1	0.1

Kramer	230	14.7	16.1	15.6	18.7	2.6
Laguna Bell	230	17.5	42.9	17.5	43.0	0.1
Lugo	230	37.1	48.0	37.4	50.4	2.4
Mira Loma East	230	23.8	64.1	23.9	64.2	0.1
Mira Loma West	230	20.0	52.4	20.1	52.5	0.1
Rancho Vista	230	27.1	59.7	27.2	59.8	0.1
San Bernardino	230	22.7	39.2	22.7	39.3	0.1
Saugus	230	12.9	39.7	12.9	39.8	0.1
Serrano	230	26.2	55.1	26.3	55.2	0.1
Victor	230	19.3	33.2	18.9	34.0	0.8
Vincent	230	23.9	60.6	23.9	60.7	0.1
Walnut	230	17.0	35.7	17.0	35.8	0.1
Inyokern	230	3.7	7.3	3.7	7.4	0.1
Kramer	115	11.1	23.2	11.7	23.9	0.7
Sungen	115	8.3	13.5	8.4	13.7	0.2
Victor	115	18.4	19.4	18.3	19.6	0.2
SINGLE-PHASE SHORT-CIRCUIT DUTY STUDY RESULTS						
Substation	**Bus Voltage**	**Pre-Project**		**Post-Project**		**Change kA (Post-Pre)**
		X/R	**kA**	**X/R**	**kA**	
Lugo	500	12.8	41.1	12.8	41.5	0.4
Mira Loma	500	10.9	36.0	10.9	36.1	0.1
Pisgah	500	16.3	14.8	16.2	14.9	0.1
Rancho Vista	500	8.4	25.1	8.4	25.2	0.1
Serrano	500	13.1	29.0	13.1	29.1	0.1
Cool Water	230	31.4	11.6	28.5	15.5	3.9
Etiwanda	230	17.5	57.0	17.6	57.1	0.1
Kramer	230	10.9	13.4	10.8	15.6	2.2
Lugo	230	24.6	50.1	24.5	52.2	2.1
Mira Loma East	230	11.6	63.0	11.6	63.1	0.1
Rancho Vista	230	16.5	60.5	16.5	60.6	0.1
Victor	230	12.3	29.7	12.1	30.1	0.4
Villa Park	230	15.8	44.1	15.8	44.2	0.1
Vincent	230	18.0	57.8	18.1	57.9	0.1
Victor	115	19.1	23.2	19.0	23.3	0.1

The approach used by SCE in the TA was to identify locations where the addition of the Project increased the short-circuit duty by at least 0.1 KA and resulted in fault duties that were in excess of 60% of the minimum breaker nameplate at a given substation. The TA did not provide any information on the minimum breaker ratings at the substations listed in Tables 1 and 2 but notes that:

- Upon completion of a detailed circuit breaker review, circuit breakers exposed to fault currents in excess of 100% of their interrupting capacities will need to be replaced or upgraded, whichever is appropriate.
- The interrupting capabilities of the breakers will need to be reviewed as part of the Facilities Study.

A draft Interconnection Facilities Study (IFS) for the Project (dated October 30, 2009) was made available to the Project on November 2, 2009. With respect to short-circuit studies and potential breaker upgrades/replacements, the IFS states that circuit breaker evaluations concluded that the Project does not trigger any upgrades or replacements of circuit breakers but aggravates pre-Project conditions that identified the need to replace or upgrade a number of circuit breakers ranging from 500-kV to 115-kV at various locations. As a result the IFS identified certain "Case B" additions/upgrades that might be required by the Project if certain other projects in the queue ahead of the Project were to withdraw from the queue. These Case B circuit breaker replacements and upgrades presented in the IFS are summarized in Table 12 and Table 13 below.

Table 12. Potential Project-Related Breaker Replacements

TABLE 3 POTENTIAL PROJECT-RELATED BREAKER REPLACEMENTS			
Substation	**Number Of Breakers**	**Existing Rating (kA)**	**Proposed Rating (kA)**
Etiwanda 230-kV	3	45.6	63
Kramer 115-kV	10	22	40
Laguna Bell 230-kV	2	40	50
Lugo 230-kV	3	50	63
Mira Loma 230-kV	12	63	80
Victor 115-kV	2	22	40
Vincent 230-kV	20	63	80

Table 13. Potential Project Related Breaker Upgrades

TABLE 4 POTENTIAL PROJECT-RELATED BREAKER UPGRADES			
Substation	**Number Of Breakers**	**Existing Rating (kA)**	**Proposed Rating (kA)**
El Segundo 230-kV	6	34	45.6
Etiwanda 230-kV	17	50	63
Laguna Bell 230-kV	10	34	45.6
Lugo 500-kV	3	50	63
Lugo 230-kV	2	50	63

Mira Loma 500-kV	6	40	50
Vincent 500-kV	4	40	50

Worker Safety/Fire Protection

Item 92:

Information Required:

Please provide clarification of the AFC's description above and identify all access points, whether for vehicles or personnel.

Response:

The site has several proposed access points. The electronically attached drawing located in file "DR_1A_92_Access_Map.zip" illustrates the locations of drainage crossings and access points described in Table 14. All access points will be wide enough and positioned to allow emergency vehicle access. There are four (4) fenced areas for the Project including east and west portions of the Alpha and Beta solar fields. Authorized personnel and vehicles can enter at any point; however the main personnel access points are Access 3 and Access 6.

Table 14. Site Access Points and Drainage Crossings

	Description	Control	Style	Location Detail
Crossing A	Drainage Crossing	Not Applicable	All-weather	Crosses in East-West Direction
Crossing B	Drainage Crossing	Not Applicable	Fair-weather	Crosses in North-South Direction
Crossing C	Drainage Crossing	Not Applicable	All-weather	Crosses in North-South Direction
Crossing D	Drainage Crossing	Not Applicable	Fair-weather	Crosses in East-West Direction
Access 1	Gated Access	Manual Lock	Swing Gate, dirt road to access	Alpha solar field (west), west side
Access 2	Gated Access	Key Card	Rolling Gate, paved road and Crossing C to access	Alpha solar field (west), east side
Access 3	Gated Access	Key Card	Rolling Gate, paved road and Crossing C to access	Main Gate Alpha Power Island
Access 4	Gated Access	Manual Lock	Swing Gate, paved road to access	Beta solar field (west), north side
Access 5	Gated Access	Manual Lock	Swing Gate, paved road and Crossing B to access	Alpha solar field (east), east side
Access 6	Gated Access	Key Card	Rolling Gate, paved road and Crossing A to access	Main Gate Beta Power Island
Access 7	Gated Access	Manual Lock	Swing Gate, dirt road to access	Beta solar field (east), east side

Access 8	Gated Access	Key Card	Rolling Gate, dirt road and Crossing D to access	Beta solar field (west), south side

Item 93:

Information Required:

Include the method of gate opening and securing and whether the access roads are paved, gravel, or dirt.

Response:

The response to Item 93 is combined with the response to Item 92 above.

Average Vehicle Weight Estimate for Construction Period

Vehicle Type	Weight tons	# Vehicles per day	Frac. of total vehicles
Passenger Cars	2	214	0.613
LD Pickups	3	17	0.049
MD Pickups	4	4	0.011
HD Loaded*	40	51	0.146
HD Unloaded*	20	51	0.146
Buses	20	12	0.034
		349	0.966

Weighted Avg Vehicle Weight, tons : **10.9**

Average Vehicle Weight Estimate for Operations Period

Vehicle Type	Weight tons	# Vehicles per day	Frac. of total vehicles
Passenger Cars	1	2	0.041
LD Pickups	2	21	0.429
MD Pickups	2.5	5	0.102
MD Trucks	4	2	0.041
HD Trucks	10	4	0.082
Maint Eq	5	15	0.306
		49	1.000

Weighted Avg Vehicle Weight, tons : **3.7**

UNPAVED ROAD FUGITIVE DUST

Length of Unpaved Road used for/by Construction Access:		0	miles			
Avg weight of vehicular equipment on road:		10.9	tons (range 2 - 42 tons)			
Road surface silt content:		0	% (range 1.8 - 35%)			
Road surface material moisture content:		0	% (range 0.03 - 13%)			
		k	a	c	d	
Particle size multiplier factors:	PM10	1.8	1	0.2	0.5	
	PM2.5	0.18	1	0.2	0.5	
C factors (brake and tire wear):	PM10	0.00047	lb/VMT			
	PM2.5	0.00036	lb/VMT			
Avg vehicle speed on road:		15	mph (range 10-55 mph)			
Number of vehicles per day:		0		VMT/day:	0	
				VMT/month:	0	
Number of construction work days per month:		21.5		VMT/period:	0	
Total vehicles per month:		0				
Number of construction work months:		23.83	after wet season adjustment*			
Total vehicles per const period:		0				

	PM10	PM2.5
Calc 1	0.000	0.000
Calc 2	0.707	0.707
Calc 3	0.000	0.000
Calc 4	#DIV/0!	#DIV/0!
Calc 5	#DIV/0!	#DIV/0!

Emissions	PM10	PM2.5
lbs/day	#DIV/0!	#DIV/0!
lbs/month	#DIV/0!	#DIV/0!
lbs/period	#DIV/0!	#DIV/0!
tons/period	#DIV/0!	#DIV/0!

Unpaved roads onsite are included in the emissions calcs on the Main Const Site sheets (4 phases of construction).

* see Main Const Dust Site page for this value

EPA, AP-42, Section 13.2.2, March 2006

CONSTRUCTION PHASE - Trackout Emissions

Paved Road Length (miles):	0.1	estimated roundtrip trackout distance				
Daily # of Vehicles:	349					
Avg Vehicle Weight (tons):	10.9			PM10	PM2.5*	
Total Unadjusted VMT/day	34.9			0.207		
Particle Size Multipliers	PM10			2.807		
lb/VMT	0.023			0.001	0.0002	lb/VMT
C factor, lb/VMT	0.00047			**5.457**	0.9223	**lbs/day**
Road Sfc Silt Loading (g/m^2):	0.28			**0.059**	0.0099	**tons/month**
# of Active Trackout Points:	2			**1.40**	0.2363	**tons/period**
Added Trackout Miles:	PM10					
Trackout VMT/day:	4188		*Default Silt Load Values for Paved Road Types*			
Final Adjusted VMT/day	4223			Freeway	0.02 g/m2	
Final Adjusted VMT/month	90792			Arterial	0.036 g/m2	
Final Adjusted VMT/period	2163582			Collector	0.036 g/m2	
Construction days/month:	21.5			Local	0.28 g/m2	
Construction months/period:	23.8			Rural	1.6 g/m2	
Control Applied to Trackout:	Sweeping and Cleaning (Water washing)					
Control Efficiency, %	90	0.9	Release Factor =		0.1	

* PM2.5 fraction of PM10 assumed to be 0.169 (CARB CEIDARS updated fraction values) for paved roads.

EPA, AP-42, Section 13.2.1, Proposed revisions dated 9/2008.
Use silt loading factor from default values for road type if no site specific data is available.
Trackout effects approximately 260 ft of roadway arriving and departing from the site access point.
See the mileage note on the paved road calculation sheet.

CONSTRUCTION PHASE - Truck Hauling/Delivery and Site Support Vehicle Emissions

Ref: MDAB, Emfac 2007, V2.3, Nov 2006
On-Road Heavy Duty Diesels (1966-2010)
On Road Medium Duty Gas (1996-2010)

			Emissions Factors (lbs/vmt)							
Delivery/Hauling Vehicle Use Rates			NOx	CO	VOC	SOx	PM10	CO2		
Const Days per Period:	559		0.03422	0.009532	0.002411	0.00004	0.001556	4.04823	Diesel	
Max Deliveries per Day:	67		0.00202	0.01296	0.001125	0.000015	0.000098	1.4488	MD Gas	
Fraction of Deliveries-Diesel:	0.94		Max Daily Emissions (lbs)							
Fraction of Deliveries-Gas:	0.06		**NOx**	**CO**	**VOC**	**SOx**	**PM10**	**CO2**	**PM2.5**	
One Way Delivery Mileage:	40		**86.207**	**24.013**	**6.074**	**0.101**	**3.920**	**10198.301**	**3.885**	Diesel
Total Daily VMT-Diesel	2519.2		0.325	2.084	0.181	0.002	0.016	232.967	0.016	MD Gas
Total Daily VMT-Gasoline	160.8		Tons per Const Period							
Total Period VMT-Diesel	1143800	Table C.5-7	19.570	5.451	1.379	0.023	0.890	2315.183	0.882	Diesel
Total Period VMT-Gasoline	75680	Table C.5-7	0.076	0.490	0.043	0.001	0.004	54.823	0.004	MD Gas

Site Support Vehicle Use Rates (these emissions estimates are inlcuded in the construction equipment exhaust calculations)

Gasoline Vehicle VMT Period:	0		**NOx**	**CO**	**VOC**	**SOx**	**PM10**	**CO2**			**PM2.5**
Avg Daily Gasoline VMT:	0		0.000791	0.008821	0.000769	0.000009	0.000075	0.825741	lbs/vmt*	gasoline	
Diesel Vehicle VMT Period:	0		0.000006	0.000003	0.000001	0.000001	0.000001	0.001446	lbs/vmt*	diesel	
Avg Daily Diesel VMT:	0		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**lbs/day**	**gasoline**	**0.0000**
			0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**lbs/day**	**diesel**	**0.0000**
			0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	**tons/period**	**gasoline**	0.0000
			0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	**tons/period**	**diesel**	0.0000

Notes ***

VMT for delivery/hauling for diesel vehicles includes: (1) materials deliveries to site, (2) materials removal from site, other VMT as specified below.
Other VMT: Period VMT from Table C.5-7
VMT for site support vehicle use includes: (1) all VMT for site support vehicles not classified in the Delivery/Hauling VMT as noted below.
(1) const management, engineering, and supervisory staff vehicles, etc.
Other VMT:
CARB-CEIDARS, Updated Fractions for PM Profiles: PM2.5 = 0.991 of PM10 for Diesel Exhaust, and 0.998 for Gasoline Vehicles.
Haul mileage: is the one way distance from Barstow railyard and/or Barstow urban supply area, 30-40 miles, used 40 miles as upper estimate.
It should be noted that these emissions are not necessarily new emissions to the regional air shed. A significant portion of the truck services will be derived from the existing regional truck services vehicle pool, and as such these truck emissions would most likely be involved in deliveries in the area regardless of whether or not the proposed facility is constructed. As such, a major portion of the above estimated emissions would not be considered as additions to the air shed.

Ref: MDAB, Emfac 2007, V2.3, Nov 2006
LDPs (gas and diesel), 1966-2010

PAVED ROAD FUGITIVE DUST EMISSIONS
(associated with construction traffic)

Length of Paved Road used for/by Construction Access:		12	miles, roundtrip distance***
Avg weight of vehicular equipment on road:		10.9	tons (range 2 - 42 tons)
Road surface silt loading factor:		0.06	g/m2 (range 0.03 - 400 g/m2)
Particle size multiplier factors:	PM10	0.016	lb/VMT
	PM2.5	0.0024	lb/VMT
C factors (brake and tire wear):	PM10	0.00047	lb/VMT
	PM2.5	0.00036	lb/VMT
Avg vehicle speed on road:		25	mph (range 10-55 mph)
Number of vehicles per day:		349	VMT/day: 4188
			VMT/month: 90042
Number of construction work days per month:		21.5	VMT/period: 2145701
	Total vehicles per month:	7503.5	
Number of construction work months:		23.83	after wet season adjustment*
	Total vehicles per const period:	178808.4	

	PM10	PM2.5	
Calc 1	0.060	0.060	
Calc 2	2.807	2.807	
Calc 3	0.002	0.0000	lb/VMT

Emissions	PM10	PM2.5
lbs/day	9.41	0.20
lbs/month	202.31	4.28
lbs/period	4821.01	101.97
tons/period	2.41	0.05

* see main const dust site page for this value
EPA, AP-42, Section 13.2.1, March 2006, updated 9/2008.

*** Note: fugitive roadway emissions from construction traffic are based on the use of Harper Lake Road which runs north from Hwy 58. Distance from Hwy 58 to the approximate site entrance is ~6 miles one way.

Table C.1-7 Operational Emissions from Dedicated On-Site Vehicles

Composite Emissions Factors for Gasoline On-Road Fueled Vehicles

lbs/VMT

NOx	CO	VOC	SOx	PM10	CO2
0.00006	0.00086	0.00004	0.00001	0.00005	0.926

Ref: Statewide, Emfac 2007, V2.3, Nov 2006
On Road Vehicles (2013-2014)
LDP/LDT Gasoline Vehicles

Composite Emissions Factors for Diesel On-Road Fueled Vehicles

lbs/VMT

NOx	CO	VOC	SOx	PM10	CO2
0.0038	0.00193	0.00036	0.000038	0.00024	3.943

Ref: Statewide, Emfac 2007, V2.3, Nov 2006
On-Road HD Diesels (2013-2014)

Average Emissions Factors for Diesel Off-Road Fueled Vehicles

EFs from Exhaust-Main Sheet

lbs/Hp-Hr

NOx	CO	VOC	SOx	PM10
0.0061	0.0035	0.0011	0.000007	0.0004

CO2 EF Data from SCAQMD EMFAC 2007, Version 2.3
Heavy-Heavy Duty Diesel Truck Values, Rev 03/07
AQMD Website, 3-2-09
Scenario Year 2014

Avg onsite equipment speed (mph): 5
Avg HP of proposed onsite off-road equipment: 100
Estimated onsite off-road equipment mileage per year: 27000

lbs/hr

0.61	0.35	0.11	0.0007	0.04

lbs/VMT

					CO2	Methane
0.122	0.070	0.022	0.00014	0.008	4.213	0.000093

See site support vehicle data supplied by Applicant (next page).
Estimated number of gasoline on-road fueled vehicles dedicated to site operations: 30
Estimated total annual mileage for gasoline fueled on-road vehicles: 104776 *

Estimated number of diesel fueled on-road vehicles dedicated to site operations: 6
Estimated total annual mileage for diesel fueled on-road vehicles: 15736 *

Avg OPS VMT/day: 404
% VMT on Unpaved Roads: 77

Estimated Onsite On-Road Gasoline Vehicle Emissions

	NOx	CO	VOC	SOx	PM10	PM2.5	CO2	Methane	N2O	CO2e
lbs/yr	6.3	90.1	4.2	1.0	5.2	5.2	97022.6	20.7	11.0	100855.3
tons/yr	0.003	0.045	0.002	0.0005	0.0026	0.0026	48.511	0.010	0.005	50.428
lbs/avg day	0.017	0.247	0.011	0.0029	0.0144	0.0143	265.815	0.057	0.030	276.316

Estimated Onsite On-Road Diesel Vehicle Emissions

	NOx	CO	VOC	SOx	PM10	PM2.5	CO2	Methane	N2O	CO2e
lbs/yr	59.8	30.4	5.7	0.598	3.78	3.74	62047.0	3.2	2.0	62729.0
tons/yr	0.030	0.015	0.003	0.0003	0.0019	0.0019	31.024	0.002	0.001	31.365
lbs/avg day	0.164	0.083	0.016	0.0016	0.0103	0.0103	169.992	0.009	0.005	171.860

Estimated Onsite Off-Road Diesel Equipment Emissions

	NOx	CO	VOC	SOx	PM10	PM2.5	CO2	Methane	N2O	CO2e
lbs/yr	3294.000	1890.000	594.000	3.780	216.000	216.0000	113751.000	2.511	0.000	113803.7
tons/yr	1.647	0.945	0.297	0.0019	0.108	0.108	56.876	0.001	0.000	56.902
lbs/avg day	9.025	5.178	1.627	0.0104	0.592	0.592	311.647	0.007	0.000	311.791

Totals	***NOx***	***CO***	***VOC***	***SOx***	***PM10***	***PM2.5***	***CO2***	***Methane***	***N2O***	***CO2e***
tons/yr	***1.680***	***1.005***	***0.302***	***0.003***	***0.113***	***0.112***	***136.410***	***0.013***	***0.006***	***138.694***

Estimated Fugitive PM10/PM2.5 from Onsite Operations Unpaved Road Travel (General Site Operations)

Estimated Onsite Unpaved Road travel: 311 VMT/day
Estimated vehicle weight using onsite unpaved roads: 3.7 tons
Road surface silt content: 14 %

EPA AP-42, Section 13.2.2, Eq. 1a
Calc 1: 1.15
Calc 2: 1.10
EF PM10: 1.89 lb/VMT
EF PM2.5: 0.40 lb/VMT
Control Efficiency: 0.82
Emission Fraction: 0.18

	lbs/day	tons/yr
PM10	106.1	19.4
PM2.5	22.5	4.1

Controls	%Reduction	Fraction	
Watering	40	0.4	
Speed Limits	40	0.4	< 5 mph
Soil Stab	50	0.5	
***	0	0	

per South Coast AQMD Fugitive Dust Mitigation Tables, Rev 4/2007.

*includes VMT for offsite deliveries/hauling during operations.

Support Data for Table C.1-7 Onsite Operations Vehicle Data

Diesel Vehicles		each	total annual	Vehicle
Type	# on site	VMT/yr	VMT	Road Use
SCA Cleaning Truck	4	3000	12000	On Road
Evacuation Truck	2	500	1000	On Road*
Crane	2	500	1000	Off Road*
Boom Forklift	2	500	1000	Off Road*
Small Tractor	5	3200	16000	Off Road
Backhoe/Loader	2	500	1000	Off Road*
Skip Loader	2	2500	5000	Off Road
Forklift	2	1500	3000	Off Road
		Total VMT	40000	

Gasoline Vehicles		each	total annual	
Type	# on site	VMT/yr	VMT	
Stakebed Truck	2	3000	6000	On Road
Ranger Truck	17	2120	36040	On Road
Ford F-150	4	4500	18000	On Road
SUV Hybrid	2	10000	20000	On Road**
Welding Truck	2	3000	6000	On Road
Ford F-350	3	12000	36000	On Road
		Total VMT	102040	

	Diesel		Gasoline	
	On Road	Off Road	On Road	Off Road
	VMT/Yr	VMT/Yr	VMT/Yr	VMT/Yr
	13000	27000	102040	0
% miles on unpaved	90	95	70	0
	11700	25650	71428	0
Total Miles	142040			
Unpaved	108778			
% Unpaved	77			

	HP	#	Total HP
Crane	190.4	2	380.8
Boom Forklift	83	2	166
Small Tractor	79.5	5	397.5
Backhoe/Loader	79.5	2	159
Skip Loader	79.5	2	159
Forklift	79.5	2	159
		15	1421.3
		avg HP	95
		(use 100 hp in analysis)	

All data supplied by HLSGS Project Team
* Emergency use only.
** Emissions assumed to be insignificant (not included in mileage totals)

Employee Commuting Emissions		
Winter-Off Season Employee #	63	
Summer-Peak Season Employee #	73	
Annual average employee #	68	
Average roundtrip distance, miles	50	Barstow
VMT/day	3400	
VMT/year	1241000	

Ref: MDAB, Emfac 2007, V2.3, Nov 2006
On Road Vehicles (1966-2010)
LDP/LDT Weighted Avg Efs

			Lbs/VMT			
NOx	CO	VOC	SOx	PM10	CO2	
0.00111	0.01108	0.00092	0.00001	0.00009	0.91102	
		Avg Daily Emissions, lbs				PM2.5
3.77	37.67	3.13	0.03	0.31	3097.47	0.30
		Avg Annual Emissions, tons				PM2.5
0.69	6.88	0.57	0.01	0.06	565.3	0.055

CONSTRUCTION EQUIPMENT EXHAUST EMISSIONS

Project: Mojave Solar One **Solar Field Erection Phase**

Assumptions:

1. The average diesel engine employed in construction equipment use consumes fuel at a rate of: 0.06 gal/hp-hr

Ref: EPA, NR-009b Publication, November 2002.
Ref: Sacramento County APCD Const. Program Data, V. 6.0.3, 3/2007.
Ref: EPA, NR-009c Publication, EPA 420-P-04-009, April 2004.
Ref: Niland Energy Project, IID, AFC Vol 2, App A.
Ref: South Coast AQMD PR XXI, Draft Staff Report, 3-15-95, and SCAQMD CEQA Manual, 11/03.
The above noted references present fuel consumption values which range from 0.050 to 0.064 gal/hp-hr for diesel engines used in construction related equipment. The value of 0.060 gal/hp-hr was chosen as a reasonable upper mid-range value for construction emissions calculations.

2. Construction equipment exhaust emissions will be calculated on an annual basis using the site specific equipment list, HP ratings, hours of use, days of use, etc. Annual emissions will be apportioned to daily values based on the estimated construction period time on site.

3. The equipment list derived from the South Coast AQMD (12/2006) will be used to establish the various equipment categories. Data produced by the Sacramento APCD was used to establish the average HP ratings for each equipment category. HP rating data was supplemented by data from SCAQMD CEQA Handbook (Table A9-8-C) if not available from Sacramento APCD.

4. Construction Schedule:

20	hrs/day	Construction Totals:	430	hrs/month
6	days/week		11180	hrs/const period
21.5	days/month		559	days/const period
26	months			

5. Anticipated Construction Start Year: 2010

Project supplied equipment list and use rates were consolidated into the following categories:
See Tables C.5-6 and C.5-7 for estimated HP values, use rates, etc.

Equipment Category**	Avg HP	# of Units Used for Project	Avg Use Rate Hrs/day	# of Days On Site (each)	Total Hrs/Day	Total Hp-Hrs per Day	Total Hrs per Const Period	Total Hp-Hrs per Const Period
Bore/Drill Rigs/Pile Drivers	0	0	0	0	0	0	0	0
Cement Mixers	0	0	0	0	0	0	0	4506830
Industrial/Concrete Saws	0	0	0	0	0	0	0	0
Cranes	0	0	0	0	0	0	0	0
Crawler Tractors/Dozers	0	0	0	0	0	0	0	0
Crushing/Processing Eq.	0	0	0	0	0	0	0	0
Dump and Tender Trucks	0	0	0	0	0	0	0	4343000
Excavators	0	0	0	0	0	0	0	0

Forklifts/Aerial Lifts/Booms	0	0	0	0	0	0	0	37541580
Generators/Compressors	0	0	0	0	0	0	0	5572800
Graders	0	0	0	0	0	0	0	0
Off Highway Tractors	0	0	0	0	0	0	0	12280800
Off Highway Trucks	0	0	0	0	0	0	0	0
Other Const. Eq.-Diesel	0	0	0	0	0	0	0	25104800
Pavers	0	0	0	0	0	0	0	86000
Paving Eq./Surfacing Eq.	0	0	0	0	0	0	0	0
Plate Compactors	0	0	0	0	0	0	0	26574
Rollers/Compactors	0	0	0	0	0	0	0	0
Rough Terrain Forklifts	0	0	0	0	0	0	0	0
Rubber Tired Dozers	0	0	0	0	0	0	0	0
Rubber Tired Loaders	0	0	0	0	0	0	0	0
Scrapers	0	0	0	0	0	0	0	0
Signal Boards/Light Sets	0	0	0	0	0	0	0	0
Skid Steer Loaders	0	0	0	0	0	0	0	0
Tractors/Loaders/Backhoes	0	0	0	0	0	0	0	0
Trenchers	0	0	0	0	0	0	0	0
Welders	0	0	0	0	0	0	0	5643750
Other Const. Eq.-Gasoline	0	0	0	0	0	0	0	31467400

*includes equipment and use rates for proposed offsite linears.
** diesel equipment unless otherwise specified.

Estimated Const Period Hp-Hrs = 126573534

Estimated Const Period Fuel Use = 7594412 gals

2010 Equipment Emissions Factors

Equip. Type	HP	lbs/hp-hr CO	lbs/hp-hr VOC	lbs/hp-hr NOx	lbs/hp-hr SOx	lbs/hp-hr PM10
Bore/Drill Rigs/Pile Drivers	0	0.001400	0.000400	0.004700	0.000008	0.000200
Cement Mixers	0	0.003800	0.001400	0.006500	0.000009	0.000400
Industrial/Concrete Saws	0	0.006400	0.002500	0.006100	0.000008	0.000600
Cranes	0	0.001400	0.000500	0.004900	0.000005	0.000200
Crawler Tractors/Dozers	0	0.004300	0.001100	0.008500	0.000008	0.000500
Crushing/Processing Eq.	0	0.002500	0.000900	0.010200	0.000011	0.000300
Dump and Tender Trucks	0	0.001300	0.000400	0.002600	0.000004	0.000100
Excavators	0	0.003800	0.000800	0.006400	0.000007	0.000400
Forklifts/Aerial Lifts/Booms	0	0.002100	0.000600	0.003800	0.000004	0.000300
Generators/Compressors	0	0.005800	0.002200	0.006100	0.000008	0.000600

Graders	0	0.002000	0.000700	0.007200	0.000008	0.000300
Off Highway Tractors	0	0.004900	0.001300	0.010100	0.000008	0.000600
Off Highway Trucks	0	0.001500	0.000500	0.004600	0.000005	0.000200
Other Const. Eq.-Diesel	0	0.005900	0.002100	0.005600	0.000007	0.000500
Pavers	0	0.004400	0.001400	0.008100	0.000007	0.000700
Paving Eq./Surfacing Eq.	0	0.006600	0.002800	0.005300	0.000006	0.000600
Plate Compactors	0	0.001800	0.000300	0.002100	0.000004	0.000100
Rollers/Compactors	0	0.003500	0.001000	0.006200	0.000006	0.000500
Rough Terrain Forklifts	0	0.004200	0.000900	0.007400	0.000008	0.000400
Rubber Tired Dozers	0	0.003500	0.000700	0.006400	0.000005	0.000300
Rubber Tired Loaders	0	0.003600	0.000800	0.006600	0.000007	0.000400
Scrapers	0	0.002900	0.001000	0.009900	0.000009	0.000400
Signal Boards/Light Sets	0	0.002500	0.000500	0.003000	0.000006	0.000100
Skid Steer Loaders	0	0.005000	0.001600	0.004900	0.000007	0.000400
Tractors/Loaders/Backhoes	0	0.003000	0.000800	0.004700	0.000005	0.000400
Trenchers	0	0.004000	0.001300	0.007600	0.000006	0.000600
Welders	0	0.002300	0.000700	0.004100	0.000004	0.000400
Other Const. Eq.-Gasoline	0.0	0.003300	0.000900	0.006500	0.000006	0.000400
Avg Offroad Diesel Efs		0.0035	0.0011	0.0061	0.000007	0.0004

SCAQMD off-road emissions factor database, website, 12/2006. Load factor adjustments incorporated.
EFs are for equipment inventory year 2010.

Construction Period Emissions, lbs

Equip. Type	CO	VOC	NOx	SOx	PM10
Bore/Drill Rigs/Pile Drivers	0	0	0	0	0
Cement Mixers	17126	6310	29294	41	1803
Industrial/Concrete Saws	0	0	0	0	0
Cranes	0	0	0	0	0
Crawler Tractors/Dozers	0	0	0	0	0
Crushing/Processing Eq.	0	0	0	0	0
Dump and Tender Trucks	5646	1737	11292	17	434
Excavators	0	0	0	0	0
Forklifts/Aerial Lifts/Booms	78837	22525	142658	150	11262
Generators/Compressors	32322	12260	33994	44	3344
Graders	0	0	0	0	0
Off Highway Tractors	60176	15965	124036	98	7368
Off Highway Trucks	0	0	0	0	0
Other Const. Eq.-Diesel	148118	52720	140587	172	12552
Pavers	378	120	697	1	60
Paving Eq./Surfacing Eq.	0	0	0	0	0
Plate Compactors	48	8	56	0	3
Rollers/Compactors	0	0	0	0	0
Rough Terrain Forklifts	0	0	0	0	0

Rubber Tired Dozers	0	0	0	0	0	
Rubber Tired Loaders	0	0	0	0	0	
Scrapers	0	0	0	0	0	
Signal Boards/Light Sets	0	0	0	0	0	
Skid Steer Loaders	0	0	0	0	0	
Tractors/Loaders/Backhoes	0	0	0	0	0	
Trenchers	0	0	0	0	0	
Welders	12981	3951	23139	23	2258	
Other Const. Eq.-Gasoline	103842	28321	204538	189	12587	

Totals	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**	
lbs per const. period	459475	143917	710291	734	51671	51206.34	
tons per const. period	229.7	72.0	355.1	0.367	25.84	25.60	
Average lbs/day =	822.0	257.5	1270.6	1.314	92.44	91.60	
Estimated Maximum lbs/day =	*986.4*	*308.9*	*1524.8*	*1.6*	*110.9*	*109.9*	*note 3*
Average lbs/month =	17672.1	5535.3	27318.9	28.2	1987.36	1969.47	
Average tons/year =	106.03	33.21	163.91	0.17	11.92	11.82	

CARB-CEIDARS, Updated Size Fractions for PM Profiles: PM2.5 = 0.991 of PM10 : Diesel Vehicle Exhaust
CO2 EF: CCAR General Protocol, June 2006, for CA-Low Sulfur Diesel combustion.

	CO2
lbs per const period	166773288
tons per const period	83387

Other Assumptions and References:

1. Trench construction times per: Southern Regional Water Pipeline Alliance, 3/08.
   Optimum trench construction progress rate is 80m (260ft) per day.
   Non-optimum trench construction progress rate is 30m (100 ft) per day.
   An average progress of 180 ft/day is used where applicable.
2. Paving speeds can range from 3 to 15 m/min depending on asphalt delivery rates and required compaction thickness.
   A minium paving speed of 3 m/min (10 ft/min or 600 ft/hr) I used where applicable.
   The minimum speed is based upon a 3" compacted layer, 12 ft lane width, with an asphalt delivery rate of ~ 140 tons/hr.
   Ref: Asphalt Paving Speed, Pavement Worktip No. 31, AAPA, 11/2001.
3. Estimation of maximum daily emissions is extremely variable. Some projects provide estimated manpower and equipment use schedules, but even this data usually leads to a wide range of assumptions being made in order to estimate equipment exhaust emissions for a maximum work day. The methodology used in this analysis assumes that the estimated maximum day represents the ratio of the number of pieces of equipment on site on any day during the maximum month as compared to the number of pieces of equipment on site on any day during an average month.

CONSTRUCTION EQUIPMENT EXHAUST EMISSIONS

Project: Mojave Solar One **Grading/Solar Field Finish Work**

Assumptions:

1. The average diesel engine employed in construction equipment use consumes fuel at a rate of: 0.06 gal/hp-hr

Ref: EPA, NR-009b Publication, November 2002.
Ref: Sacramento County APCD Const. Program Data, V. 6.0.3, 3/2007.
Ref: EPA, NR-009c Publication, EPA 420-P-04-009, April 2004.
Ref: Niland Energy Project, IID, AFC Vol 2, App A.
Ref: South Coast AQMD PR XXI, Draft Staff Report, 3-15-95, and SCAQMD CEQA Manual, 11/03.
The above noted references present fuel consumption values which range from 0.050 to 0.064 gal/hp-hr for diesel engines used in construction related equipment. The value of 0.060 gal/hp-hr was chosen as a reasonable upper mid-range value for construction emissions calculations.

2. Construction equipment exhaust emissions will be calculated on an annual basis using the site specific equipment list, HP ratings, hours of use, days of use, etc. Annual emissions will be apportioned to daily values based on the estimated construction period time on site.

3. The equipment list derived from the South Coast AQMD (12/2006) will be used to establish the various equipment categories. Data produced by the Sacramento APCD was used to establish the average HP ratings for each equipment category. HP rating data was supplemented by data from SCAQMD CEQA Handbook (Table A9-8-C) if not available from Sacramento APCD.

4. Construction Schedule:

10	hrs/day	Construction Totals:	215	hrs/month
6	days/week		4300	hrs/const period
21.5	days/month		430	days/const period
20	months			

5. Anticipated Construction Start Year: 2010

Project supplied equipment list and use rates were consolidated into the following categories:
See Tables C.5-6 and C.5-7 for estimated HP values, use rates, etc.

Equipment Category**	Avg HP	# of Units Used for Project	Avg Use Rate Hrs/day	# of Days On Site (each)	Total Hrs/Day	Total Hp-Hrs per Day	Total Hrs per Const Period	Total Hp-Hrs per Const Period
Bore/Drill Rigs/Pile Drivers	0	0	0	0	0	0	0	0
Cement Mixers	0	0	0	0	0	0	0	0
Industrial/Concrete Saws	0	0	0	0	0	0	0	0
Cranes	0	0	0	0	0	0	0	0
Crawler Tractors/Dozers	0	0	0	0	0	0	0	0
Crushing/Processing Eq.	0	0	0	0	0	0	0	0
Dump and Tender Trucks	0	0	0	0	0	0	0	958900
Excavators	0	0	0	0	0	0	0	0

Forklifts/Aerial Lifts/Booms	0	0	0	0	0	0	0	0
Generators/Compressors	0	0	0	0	0	0	0	0
Graders	0	0	0	0	0	0	0	1341600
Off Highway Tractors	0	0	0	0	0	0	0	0
Off Highway Trucks	0	0	0	0	0	0	0	0
Other Const. Eq.-Diesel	0	0	0	0	0	0	0	0
Pavers	0	0	0	0	0	0	0	0
Paving Eq./Surfacing Eq.	0	0	0	0	0	0	0	0
Plate Compactors	0	0	0	0	0	0	0	0
Rollers/Compactors	0	0	0	0	0	0	0	0
Rough Terrain Forklifts	0	0	0	0	0	0	0	0
Rubber Tired Dozers	0	0	0	0	0	0	0	0
Rubber Tired Loaders	0	0	0	0	0	0	0	0
Scrapers	0	0	0	0	0	0	0	0
Signal Boards/Light Sets	0	0	0	0	0	0	0	0
Skid Steer Loaders	0	0	0	0	0	0	0	0
Tractors/Loaders/Backhoes	0	0	0	0	0	0	0	0
Trenchers	0	0	0	0	0	0	0	0
Welders	0	0	0	0	0	0	0	0
Other Const. Eq.-Gasoline	0	0	0	0	0	0	0	0

*includes equipment and use rates for proposed offsite linears.
** diesel equipment unless otherwise specified.

Estimated Const Period Hp-Hrs = 2300500

Estimated Const Period Fuel Use = 138030 gals

2010 Equipment Emissions Factors

Equip. Type	HP	lbs/hp-hr CO	lbs/hp-hr VOC	lbs/hp-hr NOx	lbs/hp-hr SOx	lbs/hp-hr PM10
Bore/Drill Rigs/Pile Drivers	0	0.001400	0.000400	0.004700	0.000008	0.000200
Cement Mixers	0	0.003800	0.001400	0.006500	0.000009	0.000400
Industrial/Concrete Saws	0	0.006400	0.002500	0.006100	0.000008	0.000600
Cranes	0	0.001400	0.000500	0.004900	0.000005	0.000200
Crawler Tractors/Dozers	0	0.004300	0.001100	0.008500	0.000008	0.000500
Crushing/Processing Eq.	0	0.002500	0.000900	0.010200	0.000011	0.000300
Dump and Tender Trucks	0	0.001300	0.000400	0.002600	0.000004	0.000100
Excavators	0	0.003800	0.000800	0.006400	0.000007	0.000400
Forklifts/Aerial Lifts/Booms	0	0.002100	0.000600	0.003800	0.000004	0.000300
Generators/Compressors	0	0.005800	0.002200	0.006100	0.000008	0.000600

Graders	0	0.002000	0.000700	0.007200	0.000008	0.000300
Off Highway Tractors	0	0.004900	0.001300	0.010100	0.000008	0.000600
Off Highway Trucks	0	0.001500	0.000500	0.004600	0.000005	0.000200
Other Const. Eq.-Diesel	0	0.005900	0.002100	0.005600	0.000007	0.000500
Pavers	0	0.004400	0.001400	0.008100	0.000007	0.000700
Paving Eq./Surfacing Eq.	0	0.006600	0.002800	0.005300	0.000006	0.000600
Plate Compactors	0	0.001800	0.000300	0.002100	0.000004	0.000100
Rollers/Compactors	0	0.003500	0.001000	0.006200	0.000006	0.000500
Rough Terrain Forklifts	0	0.004200	0.000900	0.007400	0.000008	0.000400
Rubber Tired Dozers	0	0.003500	0.000700	0.006400	0.000005	0.000300
Rubber Tired Loaders	0	0.003600	0.000800	0.006600	0.000007	0.000400
Scrapers	0	0.002900	0.001000	0.009900	0.000009	0.000400
Signal Boards/Light Sets	0	0.002500	0.000500	0.003000	0.000006	0.000100
Skid Steer Loaders	0	0.005000	0.001600	0.004900	0.000007	0.000400
Tractors/Loaders/Backhoes	0	0.003000	0.000800	0.004700	0.000005	0.000400
Trenchers	0	0.004000	0.001300	0.007600	0.000006	0.000600
Welders	0	0.002300	0.000700	0.004100	0.000004	0.000400
Other Const. Eq.-Gasoline	0.0	0.003300	0.000900	0.006500	0.000006	0.000400
Avg Offroad Diesel Efs		0.0035	0.0011	0.0061	0.000007	0.0004

SCAQMD off-road emissions factor database, website, 12/2006. Load factor adjustments incorporated.
EFs are for equipment inventory year 2010.

Construction Period Emissions, lbs

Equip. Type	CO	VOC	NOx	SOx	PM10
Bore/Drill Rigs/Pile Drivers	0	0	0	0	0
Cement Mixers	0	0	0	0	0
Industrial/Concrete Saws	0	0	0	0	0
Cranes	0	0	0	0	0
Crawler Tractors/Dozers	0	0	0	0	0
Crushing/Processing Eq.	0	0	0	0	0
Dump and Tender Trucks	1247	384	2493	4	96
Excavators	0	0	0	0	0
Forklifts/Aerial Lifts/Booms	0	0	0	0	0
Generators/Compressors	0	0	0	0	0
Graders	2683	939	9660	11	402
Off Highway Tractors	0	0	0	0	0
Off Highway Trucks	0	0	0	0	0
Other Const. Eq.-Diesel	0	0	0	0	0
Pavers	0	0	0	0	0
Paving Eq./Surfacing Eq.	0	0	0	0	0
Plate Compactors	0	0	0	0	0
Rollers/Compactors	0	0	0	0	0
Rough Terrain Forklifts	0	0	0	0	0

Rubber Tired Dozers	0	0	0	0	0	
Rubber Tired Loaders	0	0	0	0	0	
Scrapers	0	0	0	0	0	
Signal Boards/Light Sets	0	0	0	0	0	
Skid Steer Loaders	0	0	0	0	0	
Tractors/Loaders/Backhoes	0	0	0	0	0	
Trenchers	0	0	0	0	0	
Welders	0	0	0	0	0	
Other Const. Eq.-Gasoline	0	0	0	0	0	

Totals	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**	
lbs per const. period	3930	1323	12153	15	498	493.88	
tons per const. period	2.0	0.7	6.1	0.007	0.25	0.25	
Average lbs/day =	9.1	3.1	28.3	0.034	1.16	1.15	
Estimated Maximum lbs/day =	*9.1*	*3.1*	*28.3*	*0.0*	*1.2*	*1.1*	*note 3*
Average lbs/month =	196.5	66.1	607.6	0.7	24.92	24.69	
Average tons/year =	1.18	0.40	3.65	0.00	0.15	0.15	

CARB-CEIDARS, Updated Size Fractions for PM Profiles: PM2.5 = 0.991 of PM10 : Diesel Vehicle Exhaust
CO2 EF: CCAR General Protocol, June 2006, for CA-Low Sulfur Diesel combustion.

	CO2
lbs per const period	3031139
tons per const period	1516

Other Assumptions and References:

1. Trench construction times per: Southern Regional Water Pipeline Alliance, 3/08.
   Optimum trench construction progress rate is 80m (260ft) per day.
   Non-optimum trench construction progress rate is 30m (100 ft) per day.
   An average progress of 180 ft/day is used where applicable.
2. Paving speeds can range from 3 to 15 m/min depending on asphalt delivery rates and required compaction thickness.
   A minium paving speed of 3 m/min (10 ft/min or 600 ft/hr) I used where applicable.
   The minimum speed is based upon a 3" compacted layer, 12 ft lane width, with an asphalt delivery rate of ~ 140 tons/hr.
   Ref: Asphalt Paving Speed, Pavement Worktip No. 31, AAPA, 11/2001.
3. Estimation of maximum daily emissions is extremely variable. Some projects provide estimated manpower and equipment use schedules, but even this data usually leads to a wide range of assumptions being made in order to estimate equipment exhaust emissions for a maximum work day. The methodology used in this analysis assumes that the estimated maximum day represents the ratio of the number of pieces of equipment on site on any day during the maximum month as compared to the number of pieces of equipment on site on any day during an average month.

CONSTRUCTION EQUIPMENT EXHAUST EMISSIONS TABLE C.5-5

Project: Mojave Solar One **Grading/Site Preparation Phase**

Assumptions:

1. The average diesel engine employed in construction equipment use consumes fuel at a rate of: 0.06 gal/hp-hr

Ref: EPA, NR-009b Publication, November 2002.
Ref: Sacramento County APCD Const. Program Data, V. 6.0.3, 3/2007.
Ref: EPA, NR-009c Publication, EPA 420-P-04-009, April 2004.
Ref: Niland Energy Project, IID, AFC Vol 2, App A.
Ref: South Coast AQMD PR XXI, Draft Staff Report, 3-15-95, and SCAQMD CEQA Manual, 11/03.
The above noted references present fuel consumption values which range from 0.050 to 0.064 gal/hp-hr for diesel engines used in construction related equipment. The value of 0.060 gal/hp-hr was chosen as a reasonable upper mid-range value for construction emissions calculations.

2. Construction equipment exhaust emissions will be calculated on an annual basis using the site specific equipment list, HP ratings, hours of use, days of use, etc. Annual emissions will be apportioned to daily values based on the estimated construction period time on site.

3. The equipment list derived from the South Coast AQMD (12/2006) will be used to establish the various equipment categories. Data produced by the Sacramento APCD was used to establish the average HP ratings for each equipment category. HP rating data was supplemented by data from SCAQMD CEQA Handbook (Table A9-8-C) if not available from Sacramento APCD.

4. Construction Schedule:

10	hrs/day	
6	days/week	
	days/month	
6	months	

Construction Totals:

#VALUE!	hrs/month
#VALUE!	hrs/const period
#VALUE!	days/const period

5. Anticipated Construction Start Year: 2010

Project supplied equipment list and use rates were consolidated into the following categories:
See Tables C.5-6 and C.5-7 for estimated HP values, use rates, etc.

Equipment Category**	Avg HP	# of Units Used for Project	Avg Use Rate Hrs/day	# of Days On Site (each)	Total Hrs/Day	Total Hp-Hrs per Day	Total Hrs per Const Period	Total Hp-Hrs per Const Period
Bore/Drill Rigs/Pile Drivers	0	0	0	0	0	0	0	0
Cement Mixers	0	0	0	0	0	0	0	0
Industrial/Concrete Saws	0	0	0	0	0	0	0	0
Cranes	0	0	0	0	0	0	0	0
Crawler Tractors/Dozers	0	0	0	0	0	0	0	0
Crushing/Processing Eq.	0	0	0	0	0	0	0	0
Dump and Tender Trucks	0	0	0	0	0	0	0	0
Excavators	0	0	0	0	0	0	0	0
Forklifts/Aerial Lifts/Booms	0	0	0	0	0	0	0	0
Generators/Compressors	0	0	0	0	0	0	0	0
Graders	0	0	0	0	0	0	0	19010730
Off Highway Tractors	0	0	0	0	0	0	0	0
Off Highway Trucks	0	0	0	0	0	0	0	0
Other Const. Eq.-Diesel	0	0	0	0	0	0	0	1150680

Pavers	0	0	0	0	0	0	0	0
Paving Eq./Surfacing Eq.	0	0	0	0	0	0	0	0
Plate Compactors	0	0	0	0	0	0	0	0
Rollers/Compactors	0	0	0	0	0	0	0	0
Rough Terrain Forklifts	0	0	0	0	0	0	0	0
Rubber Tired Dozers	0	0	0	0	0	0	0	0
Rubber Tired Loaders	0	0	0	0	0	0	0	0
Scrapers	0	0	0	0	0	0	0	0
Signal Boards/Light Sets	0	0	0	0	0	0	0	0
Skid Steer Loaders	0	0	0	0	0	0	0	0
Tractors/Loaders/Backhoes	0	0	0	0	0	0	0	0
Trenchers	0	0	0	0	0	0	0	0
Welders	0	0	0	0	0	0	0	0
Other Const. Eq.-Gasoline	0	0	0	0	0	0	0	2205900

*includes equipment and use rates for proposed offsite linears.
** diesel equipment unless otherwise specified.

Estimated Const Period Hp-Hrs = 22367310

Estimated Const Period Fuel Use = 1342039 gals

2010 Equipment Emissions Factors

Equip. Type	HP	lbs/hp-hr CO	lbs/hp-hr VOC	lbs/hp-hr NOx	lbs/hp-hr SOx	lbs/hp-hr PM10
Bore/Drill Rigs/Pile Drivers	0	0.001400	0.000400	0.004700	0.000008	0.000200
Cement Mixers	0	0.003800	0.001400	0.006500	0.000009	0.000400
Industrial/Concrete Saws	0	0.006400	0.002500	0.006100	0.000008	0.000600
Cranes	0	0.001400	0.000500	0.004900	0.000005	0.000200
Crawler Tractors/Dozers	0	0.004300	0.001100	0.008500	0.000008	0.000500
Crushing/Processing Eq.	0	0.002500	0.000900	0.010200	0.000011	0.000300
Dump and Tender Trucks	0	0.001300	0.000400	0.002600	0.000004	0.000100
Excavators	0	0.003800	0.000800	0.006400	0.000007	0.000400
Forklifts/Aerial Lifts/Booms	0	0.002100	0.000600	0.003800	0.000004	0.000300
Generators/Compressors	0	0.005800	0.002200	0.006100	0.000008	0.000600
Graders	0	0.002000	0.000700	0.007200	0.000008	0.000300
Off Highway Tractors	0	0.004900	0.001300	0.010100	0.000008	0.000600
Off Highway Trucks	0	0.001500	0.000500	0.004600	0.000005	0.000200
Other Const. Eq.-Diesel	0	0.005900	0.002100	0.005600	0.000007	0.000500
Pavers	0	0.004400	0.001400	0.008100	0.000007	0.000700
Paving Eq./Surfacing Eq.	0	0.006600	0.002800	0.005300	0.000006	0.000600
Plate Compactors	0	0.001800	0.000300	0.002100	0.000004	0.000100
Rollers/Compactors	0	0.003500	0.001000	0.006200	0.000006	0.000500
Rough Terrain Forklifts	0	0.004200	0.000900	0.007400	0.000008	0.000400
Rubber Tired Dozers	0	0.003500	0.000700	0.006400	0.000005	0.000300
Rubber Tired Loaders	0	0.003600	0.000800	0.006600	0.000007	0.000400
Scrapers	0	0.002900	0.001000	0.009900	0.000009	0.000400

Signal Boards/Light Sets	0	0.002500	0.000500	0.003000	0.000006	0.000100
Skid Steer Loaders	0	0.005000	0.001600	0.004900	0.000007	0.000400
Tractors/Loaders/Backhoes	0	0.003000	0.000800	0.004700	0.000005	0.000400
Trenchers	0	0.004000	0.001300	0.007600	0.000006	0.000600
Welders	0	0.002300	0.000700	0.004100	0.000004	0.000400
Other Const. Eq.-Gasoline	0.0	0.003300	0.000900	0.006500	0.000006	0.000400
Avg Offroad Diesel Efs		0.0035	0.0011	0.0061	0.000007	0.0004

SCAQMD off-road emissions factor database, website, 12/2006. Load factor adjustments incorporated.
EFs are for equipment inventory year 2010.

Construction Period Emissions, lbs

Equip. Type	CO	VOC	NOx	SOx	PM10
Bore/Drill Rigs/Pile Drivers	0	0	0	0	0
Cement Mixers	0	0	0	0	0
Industrial/Concrete Saws	0	0	0	0	0
Cranes	0	0	0	0	0
Crawler Tractors/Dozers	0	0	0	0	0
Crushing/Processing Eq.	0	0	0	0	0
Dump and Tender Trucks	0	0	0	0	0
Excavators	0	0	0	0	0
Forklifts/Aerial Lifts/Booms	0	0	0	0	0
Generators/Compressors	0	0	0	0	0
Graders	38021	13308	136877	151	5703
Off Highway Tractors	0	0	0	0	0
Off Highway Trucks	0	0	0	0	0
Other Const. Eq.-Diesel	6789	2416	6444	8	575
Pavers	0	0	0	0	0
Paving Eq./Surfacing Eq.	0	0	0	0	0
Plate Compactors	0	0	0	0	0
Rollers/Compactors	0	0	0	0	0
Rough Terrain Forklifts	0	0	0	0	0
Rubber Tired Dozers	0	0	0	0	0
Rubber Tired Loaders	0	0	0	0	0
Scrapers	0	0	0	0	0
Signal Boards/Light Sets	0	0	0	0	0
Skid Steer Loaders	0	0	0	0	0
Tractors/Loaders/Backhoes	0	0	0	0	0
Trenchers	0	0	0	0	0
Welders	0	0	0	0	0
Other Const. Eq.-Gasoline	7279	1985	14338	13	882

Totals	CO	VOC	NOx	SOx	PM10	PM2.5	
lbs per const. period	52090	17709	157659	173	7161	7096.47	
tons per const. period	26.0	8.9	78.8	0.086	3.58	3.55	
Average lbs/day =	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	
Estimated Maximum lbs/day =	*#VALUE!*	*#VALUE!*	*#VALUE!*	*#VALUE!*	*#VALUE!*	*#VALUE!*	*note 3*
Average lbs/month =	8681.7	2951.5	26276.6	28.8	1193.49	1182.75	
Average tons/year =	52.09	17.71	157.66	0.17	7.16	7.10	

CARB-CEIDARS, Updated Size Fractions for PM Profiles: PM2.5 = 0.991 of PM10 : Diesel Vehicle Exhaust
CO2 EF: CCAR General Protocol, June 2006, for CA-Low Sulfur Diesel combustion.

	CO2
lbs per const period	29471168
tons per const period	14736

Other Assumptions and References:

1. Trench construction times per: Southern Regional Water Pipeline Alliance, 3/08.
   Optimum trench construction progress rate is 80m (260ft) per day.
   Non-optimum trench construction progress rate is 30m (100 ft) per day.
   An average progress of 180 ft/day is used where applicable.
2. Paving speeds can range from 3 to 15 m/min depending on asphalt delivery rates and required compaction thickness.
   A minium paving speed of 3 m/min (10 ft/min or 600 ft/hr) I used where applicable.
   The minimum speed is based upon a 3" compacted layer, 12 ft lane width, with an asphalt delivery rate of ~ 140 tons/hr.
   Ref: Asphalt Paving Speed, Pavement Worktip No. 31, AAPA, 11/2001.
3. Estimation of maximum daily emissions is extremely variable. Some projects provide estimated manpower and equipment use schedules, but even this data usually leads to a wide range of assumptions being made in order to estimate equipment exhaust emissions for a maximum work day. The methodology used in this analysis assumes that the estimated maximum day represents the ratio of the number of pieces of equipment on site on any day during the maximum month as compared to the number of pieces of equipment on site on any day during an average month.

CONSTRUCTION EQUIPMENT EXHAUST EMISSIONS

Project: Mojave Solar One **Power Block Erection Phase**

Assumptions:

1. The average diesel engine employed in construction equipment use consumes fuel at a rate of: 0.06 gal/hp-hr

Ref: EPA, NR-009b Publication, November 2002.
Ref: Sacramento County APCD Const. Program Data, V. 6.0.3, 3/2007.
Ref: EPA, NR-009c Publication, EPA 420-P-04-009, April 2004.
Ref: Niland Energy Project, IID, AFC Vol 2, App A.
Ref: South Coast AQMD PR XXI, Draft Staff Report, 3-15-95, and SCAQMD CEQA Manual, 11/03.
The above noted references present fuel consumption values which range from 0.050 to 0.064 gal/hp-hr for diesel engines used in construction related equipment. The value of 0.060 gal/hp-hr was chosen as a reasonable upper mid-range value for construction emissions calculations.

2. Construction equipment exhaust emissions will be calculated on an annual basis using the site specific equipment list, HP ratings, hours of use, days of use, etc. Annual emissions will be apportioned to daily values based on the estimated construction period time on site.

3. The equipment list derived from the South Coast AQMD (12/2006) will be used to establish the various equipment categories. Data produced by the Sacramento APCD was used to establish the average HP ratings for each equipment category. HP rating data was supplemented by data from SCAQMD CEQA Handbook (Table A9-8-C) if not available from Sacramento APCD.

4. Construction Schedule:

		Construction Totals:		
10	hrs/day		215	hrs/month
6	days/week		5160	hrs/const period
21.5	days/month		516	days/const period
24	months			

5. Anticipated Construction Start Year: 2010

Project supplied equipment list and use rates were consolidated into the following categories:
See Tables C.5-6 and C.5-7 for estimated HP values, use rates, etc.

Equipment Category**	Avg HP	# of Units Used for Project	Avg Use Rate Hrs/day	# of Days On Site (each)	Total Hrs/Day	Total Hp-Hrs per Day	Total Hrs per Const Period	Total Hp-Hrs per Const Period
Bore/Drill Rigs/Pile Drivers	0	0	0	0	0	0	0	187480
Cement Mixers	0	0	0	0	0	0	0	2481143
Industrial/Concrete Saws	0	0	0	0	0	0	0	0
Cranes	0	0	0	0	0	0	0	10215295
Crawler Tractors/Dozers	0	0	0	0	0	0	0	0
Crushing/Processing Eq.	0	0	0	0	0	0	0	0
Dump and Tender Trucks	0	0	0	0	0	0	0	1058900
Excavators	0	0	0	0	0	0	0	0

Forklifts/Aerial Lifts/Booms	0	0	0	0	0	0	0	6125350
Generators/Compressors	0	0	0	0	0	0	0	676175
Graders	0	0	0	0	0	0	0	0
Off Highway Tractors	0	0	0	0	0	0	0	2476800
Off Highway Trucks	0	0	0	0	0	0	0	311750
Other Const. Eq.-Diesel	0	0	0	0	0	0	0	10884375
Pavers	0	0	0	0	0	0	0	21500
Paving Eq./Surfacing Eq.	0	0	0	0	0	0	0	0
Plate Compactors	0	0	0	0	0	0	0	0
Rollers/Compactors	0	0	0	0	0	0	0	0
Rough Terrain Forklifts	0	0	0	0	0	0	0	0
Rubber Tired Dozers	0	0	0	0	0	0	0	0
Rubber Tired Loaders	0	0	0	0	0	0	0	0
Scrapers	0	0	0	0	0	0	0	0
Signal Boards/Light Sets	0	0	0	0	0	0	0	0
Skid Steer Loaders	0	0	0	0	0	0	0	0
Tractors/Loaders/Backhoes	0	0	0	0	0	0	0	0
Trenchers	0	0	0	0	0	0	0	0
Welders	0	0	0	0	0	0	0	2295125
Other Const. Eq.-Gasoline	0	0	0	0	0	0	0	11603550

*includes equipment and use rates for proposed offsite linears.
** diesel equipment unless otherwise specified.

Estimated Const Period Hp-Hrs = 48337443

Estimated Const Period Fuel Use = 2900247 gals

2010 Equipment Emissions Factors

Equip. Type	HP	lbs/hp-hr CO	lbs/hp-hr VOC	lbs/hp-hr NOx	lbs/hp-hr SOx	lbs/hp-hr PM10
Bore/Drill Rigs/Pile Drivers	0	0.001400	0.000400	0.004700	0.000008	0.000200
Cement Mixers	0	0.003800	0.001400	0.006500	0.000009	0.000400
Industrial/Concrete Saws	0	0.006400	0.002500	0.006100	0.000008	0.000600
Cranes	0	0.001400	0.000500	0.004900	0.000005	0.000200
Crawler Tractors/Dozers	0	0.004300	0.001100	0.008500	0.000008	0.000500
Crushing/Processing Eq.	0	0.002500	0.000900	0.010200	0.000011	0.000300
Dump and Tender Trucks	0	0.001300	0.000400	0.002600	0.000004	0.000100
Excavators	0	0.003800	0.000800	0.006400	0.000007	0.000400
Forklifts/Aerial Lifts/Booms	0	0.002100	0.000600	0.003800	0.000004	0.000300
Generators/Compressors	0	0.005800	0.002200	0.006100	0.000008	0.000600

Graders	0	0.002000	0.000700	0.007200	0.000008	0.000300
Off Highway Tractors	0	0.004900	0.001300	0.010100	0.000008	0.000600
Off Highway Trucks	0	0.001500	0.000500	0.004600	0.000005	0.000200
Other Const. Eq.-Diesel	0	0.005900	0.002100	0.005600	0.000007	0.000500
Pavers	0	0.004400	0.001400	0.008100	0.000007	0.000700
Paving Eq./Surfacing Eq.	0	0.006600	0.002800	0.005300	0.000006	0.000600
Plate Compactors	0	0.001800	0.000300	0.002100	0.000004	0.000100
Rollers/Compactors	0	0.003500	0.001000	0.006200	0.000006	0.000500
Rough Terrain Forklifts	0	0.004200	0.000900	0.007400	0.000008	0.000400
Rubber Tired Dozers	0	0.003500	0.000700	0.006400	0.000005	0.000300
Rubber Tired Loaders	0	0.003600	0.000800	0.006600	0.000007	0.000400
Scrapers	0	0.002900	0.001000	0.009900	0.000009	0.000400
Signal Boards/Light Sets	0	0.002500	0.000500	0.003000	0.000006	0.000100
Skid Steer Loaders	0	0.005000	0.001600	0.004900	0.000007	0.000400
Tractors/Loaders/Backhoes	0	0.003000	0.000800	0.004700	0.000005	0.000400
Trenchers	0	0.004000	0.001300	0.007600	0.000006	0.000600
Welders	0	0.002300	0.000700	0.004100	0.000004	0.000400
Other Const. Eq.-Gasoline	0.0	0.003300	0.000900	0.006500	0.000006	0.000400
Avg Offroad Diesel Efs		0.0035	0.0011	0.0061	0.000007	0.0004

SCAQMD off-road emissions factor database, website, 12/2006. Load factor adjustments incorporated.
EFs are for equipment inventory year 2010.

Construction Period Emissions, lbs

Equip. Type	CO	VOC	NOx	SOx	PM10
Bore/Drill Rigs/Pile Drivers	262	75	881	1	37
Cement Mixers	9428	3474	16127	22	992
Industrial/Concrete Saws	0	0	0	0	0
Cranes	14301	5108	50055	51	2043
Crawler Tractors/Dozers	0	0	0	0	0
Crushing/Processing Eq.	0	0	0	0	0
Dump and Tender Trucks	1377	424	2753	4	106
Excavators	0	0	0	0	0
Forklifts/Aerial Lifts/Booms	12863	3675	23276	25	1838
Generators/Compressors	3922	1488	4125	5	406
Graders	0	0	0	0	0
Off Highway Tractors	12136	3220	25016	20	1486
Off Highway Trucks	468	156	1434	2	62
Other Const. Eq.-Diesel	64218	22857	60953	75	5442
Pavers	95	30	174	0	15
Paving Eq./Surfacing Eq.	0	0	0	0	0
Plate Compactors	0	0	0	0	0
Rollers/Compactors	0	0	0	0	0
Rough Terrain Forklifts	0	0	0	0	0

Rubber Tired Dozers	0	0	0	0	0		
Rubber Tired Loaders	0	0	0	0	0		
Scrapers	0	0	0	0	0		
Signal Boards/Light Sets	0	0	0	0	0		
Skid Steer Loaders	0	0	0	0	0		
Tractors/Loaders/Backhoes	0	0	0	0	0		
Trenchers	0	0	0	0	0		
Welders	5279	1607	9410	9	918		
Other Const. Eq.-Gasoline	38292	10443	75423	70	4641		

Totals	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**	
lbs per const. period	162641	52555	269627	284	17987	17825.46	
tons per const. period	81.3	26.3	134.8	0.142	8.99	8.91	
Average lbs/day =	315.2	101.9	522.5	0.550	34.86	34.55	
Estimated Maximum lbs/day =	*466.5*	*150.7*	*773.3*	*0.8*	*51.6*	*51.1*	*note 3*
Average lbs/month =	6776.7	2189.8	11234.5	11.8	749.47	742.73	
Average tons/year =	40.66	13.14	67.41	0.07	4.50	4.46	

CARB-CEIDARS, Updated Size Fractions for PM Profiles: PM2.5 = 0.991 of PM10 : Diesel Vehicle Exhaust
CO2 EF: CCAR General Protocol, June 2006, for CA-Low Sulfur Diesel combustion.

	CO2
lbs per const period	63689415
tons per const period	31845

Other Assumptions and References:

1. Trench construction times per: Southern Regional Water Pipeline Alliance, 3/08.
   Optimum trench construction progress rate is 80m (260ft) per day.
   Non-optimum trench construction progress rate is 30m (100 ft) per day.
   An average progress of 180 ft/day is used where applicable.
2. Paving speeds can range from 3 to 15 m/min depending on asphalt delivery rates and required compaction thickness.
   A minium paving speed of 3 m/min (10 ft/min or 600 ft/hr) I used where applicable.
   The minimum speed is based upon a 3" compacted layer, 12 ft lane width, with an asphalt delivery rate of ~ 140 tons/hr.
   Ref: Asphalt Paving Speed, Pavement Worktip No. 31, AAPA, 11/2001.
3. Estimation of maximum daily emissions is extremely variable. Some projects provide estimated manpower and equipment use schedules, but even this data usually leads to a wide range of assumptions being made in order to estimate equipment exhaust emissions for a maximum work day. The methodology used in this analysis assumes that the estimated maximum day represents the ratio of the number of pieces of equipment on site on any day during the maximum month as compared to the number of pieces of equipment on site on any day during an average month.

CONSTRUCTION PHASE-Solar Field Phase
MRI Level 2 Analysis

Acres Subject to Construction Disturbance Activites:		1725		
Max Acres Subject to Construction Disturbance Activites on any day:		360	***	
Emissions Factor for PM10 Uncontrolled, tons/acre/month:		0.0144		
PM2.5 fraction of PM10 (per CARB CEIDARS Profiles):		0.21		
Activity Levels:	Hrs/Day:	20		
	Days/Wk:	6		
	Days/Month:	21.5		
	Const Period, Months:	26		2.2 years
	Const Period, Days:	559		
Wet Season Adjustment:	(Per AP-42, Section 13.2.2, Figure 13.2.2-1, 12/03)			
	Mean # days/year with rain >= 0.01 inch:	30		
	Mean # months/yr with rain >= 0.01 inch:	1		
	Adjusted Const Period, Months:	23.83		
	Adjusted Const Period, Days:	494		
Controls for Fugitive Dust:				
	Proposed watering schedule is every:	3.2	Hours	

SCAQMD Mitigation Measures, Table XI-A, 4/07
3.2 hour watering interval yields 61% control of PM10/PM2.5
Speed control of onsite const traffic to <=15 mph = 44% control

Calculated % control based on mitigations proposed:	78	% control	
Conservative control % used for emissions estimates:	78	% control	
	0.22	release fraction	

Emissions: Controlled	PM10	PM2.5
tons/month	1.140	0.240
tons/period	27.181	5.708
Max lbs/day	106.1	22.279

Cut and Fill Data:

Total cu/yds:		0	***
10^3 cu/yds:		0	
MRI PM10 emissions factor, tons/1000 cu.yds:		0.059	
PM10 uncontrolled emissions, tons/period:		0.00	
Cut and Fill Activity Period, months:		26.0	
Cut and Fill Activity Period, days:		559.0	
PM10 Controlled Emissions:	tons/period	0.00	
PM2.5 Controlled Emisisons:	tons/period	0.00	
PM10 Controlled Emissions:	tons/month	0.00	
PM2.5 Controlled Emisisons:	tons/month	0.00	
PM10 Controlled Emissions:	max lbs/day	0.0	
PM2.5 Controlled Emisisons:	max lbs/day	0.0	

Emissions Totals:	**PM10**	**PM2.5**
tons/period	**27.2**	**5.7**
tons/month	**1.1**	**0.2**
max lbs/day	**106.1**	**22.3**

Ref: MRI Report, South Coast AQMD Project No. 95040, March 1996, Level 2 Analysis Procedure.
MRI Report factor of 0.011 tons/acre/month is based on 168 hours per month of const activity.
For an activity rate of 220 hrs/month, the adjusted EF would be 0.0144 tons/acre/month.
*** includes surface area and trench cut and fill for proposed offsite linears.

CONSTRUCTION PHASE-Finish Grading/Solar Field Prep
MRI Level 2 Analysis

Acres Subject to Construction Disturbance Activites:		1725	
Max Acres Subject to Construction Disturbance Activites on any day:		10	***
Emissions Factor for PM10 Uncontrolled, tons/acre/month:		0.0144	
PM2.5 fraction of PM10 (per CARB CEIDARS Profiles):		0.21	
Activity Levels:	Hrs/Day:	10	
	Days/Wk:	6	
	Days/Month:	21.5	
Const Period, Months:		20	1.7 years
Const Period, Days:		430	
Wet Season Adjustment:	(Per AP-42, Section 13.2.2, Figure 13.2.2-1, 12/03)		
Mean # days/year with rain >= 0.01 inch:		30	
Mean # months/yr with rain >= 0.01 inch:		1	
Adjusted Const Period, Months:		18.33	
Adjusted Const Period, Days:		380	
Controls for Fugitive Dust:			
Proposed watering schedule is every:		3.2	Hours

SCAQMD Mitigation Measures, Table XI-A, 4/07
3.2 hour watering interval yields 61% control of PM10/PM2.5
Speed control of onsite const traffic to <=15 mph = 44% control

Calculated % control based on mitigations proposed:	78	% control
Conservative control % used for emissions estimates:	78	% control
	0.22	release fraction

Emissions: Controlled	PM10	PM2.5
tons/month	0.032	0.007
tons/period	0.581	0.122
Max lbs/day	2.9	0.619

Cut and Fill Data:

Total cu/yds:		0	***
10^3 cu/yds:		0	
MRI PM10 emissions factor, tons/1000 cu.yds:		0.059	
PM10 uncontrolled emissions, tons/period:		0.00	
Cut and Fill Activity Period, months:		20.0	
Cut and Fill Activity Period, days:		430.0	
PM10 Controlled Emissions:	tons/period	0.00	
PM2.5 Controlled Emisisons:	tons/period	0.00	
PM10 Controlled Emissions:	tons/month	0.00	
PM2.5 Controlled Emisisons:	tons/month	0.00	
PM10 Controlled Emissions:	max lbs/day	0.0	
PM2.5 Controlled Emisisons:	max lbs/day	0.0	

Emissions Totals:	**PM10**	**PM2.5**
tons/period	**0.6**	**0.1**
tons/month	**0.0**	**0.0**
max lbs/day	**2.9**	**0.6**

Ref: MRI Report, South Coast AQMD Project No. 95040, March 1996, Level 2 Analysis Procedure.
MRI Report factor of 0.011 tons/acre/month is based on 168 hours per month of const activity.
For an activity rate of 220 hrs/month, the adjusted EF would be 0.0144 tons/acre/month.
*** includes surface area and trench cut and fill for proposed offsite linears.

CONSTRUCTION PHASE- Rough Grading/Site Preparation Phase
MRI Level 2 Analysis

Acres Subject to Construction Disturbance Activites:			1765	
Max Acres Subject to Construction Disturbance Activites on any day:			160	***
Emissions Factor for PM10 Uncontrolled, tons/acre/month:			0.0144	
PM2.5 fraction of PM10 (per CARB CEIDARS Profiles):			0.21	
Activity Levels:	Hrs/Day:		10	
	Days/Wk:		6	
	Days/Month:		21.5	
	Const Period, Months:		6	0.5 years
	Const Period, Days:		129	
Wet Season Adjustment:	(Per AP-42, Section 13.2.2, Figure 13.2.2-1, 12/03)			
	Mean # days/year with rain >= 0.01 inch:		30	
	Mean # months/yr with rain >= 0.01 inch:		1	
	Adjusted Const Period, Months:		5.50	
	Adjusted Const Period, Days:		114	
Controls for Fugitive Dust:				
	Proposed watering schedule is every:		3.2	Hours

SCAQMD Mitigation Measures, Table XI-A, 4/07
3.2 hour watering interval yields 61% control of PM10/PM2.5
Speed control of onsite const traffic to <=15 mph = 44% control

Calculated % control based on mitigations proposed:	78	% control	
Conservative control % used for emissions estimates:	78	% control	
	0.22	release fraction	

Emissions: Controlled	PM10	PM2.5
tons/month	0.507	0.106
tons/period	2.788	0.585
Max lbs/day	47.2	9.902

Cut and Fill Data:

Total cu/yds:		4158000	***
10^3 cu/yds:		4158	
MRI PM10 emissions factor, tons/1000 cu.yds:		0.059	
PM10 uncontrolled emissions, tons/period:		245.32	
Cut and Fill Activity Period, months:		6.0	
Cut and Fill Activity Period, days:		129.0	
PM10 Controlled Emissions:	tons/period	53.97	
PM2.5 Controlled Emisisons:	tons/period	11.33	
PM10 Controlled Emissions:	tons/month	9.00	
PM2.5 Controlled Emisisons:	tons/month	1.89	
PM10 Controlled Emissions:	max lbs/day	836.8	
PM2.5 Controlled Emisisons:	max lbs/day	175.7	

Emissions Totals:	**PM10**	**PM2.5**
tons/period	**56.8**	**11.9**
tons/month	**9.5**	**2.0**
max lbs/day	**883.9**	**185.6**

Ref: MRI Report, South Coast AQMD Project No. 95040, March 1996, Level 2 Analysis Procedure.
MRI Report factor of 0.011 tons/acre/month is based on 168 hours per month of const activity.
For an activity rate of 220 hrs/month, the adjusted EF would be 0.0144 tons/acre/month.
*** includes surface area and trench cut and fill for proposed offsite linears.

CONSTRUCTION PHASE-Power Block Phase
MRI Level 2 Analysis

Acres Subject to Construction Disturbance Activites:		40		
Max Acres Subject to Construction Disturbance Activites on any day:		40	***	
Emissions Factor for PM10 Uncontrolled, tons/acre/month:		0.0144		
PM2.5 fraction of PM10 (per CARB CEIDARS Profiles):		0.21		
Activity Levels:	Hrs/Day:	10		
	Days/Wk:	6		
	Days/Month:	21.5		
Const Period, Months:		24		2.0 years
Const Period, Days:		516		
Wet Season Adjustment:	(Per AP-42, Section 13.2.2, Figure 13.2.2-1, 12/03)			
Mean # days/year with rain >= 0.01 inch:		30		
Mean # months/yr with rain >= 0.01 inch:		1		
Adjusted Const Period, Months:		22.00		
Adjusted Const Period, Days:		456		
Controls for Fugitive Dust:				
Proposed watering schedule is every:		3.2	Hours	

SCAQMD Mitigation Measures, Table XI-A, 4/07
3.2 hour watering interval yields 61% control of PM10/PM2.5
Speed control of onsite const traffic to <=15 mph = 44% control

Calculated % control based on mitigations proposed:	78	% control	
Conservative control % used for emissions estimates:	78	% control	
	0.22	release fraction	

Emissions: Controlled	PM10	PM2.5
tons/month	0.127	0.027
tons/period	2.788	0.585
Max lbs/day	11.8	2.475

Cut and Fill Data:

Total cu/yds:		0	***
10^3 cu/yds:		0	
MRI PM10 emissions factor, tons/1000 cu.yds:		0.059	
PM10 uncontrolled emissions, tons/period:		0.00	
Cut and Fill Activity Period, months:		24.0	
Cut and Fill Activity Period, days:		516.0	
PM10 Controlled Emissions:	tons/period	0.00	
PM2.5 Controlled Emisisons:	tons/period	0.00	
PM10 Controlled Emissions:	tons/month	0.00	
PM2.5 Controlled Emisisons:	tons/month	0.00	
PM10 Controlled Emissions:	max lbs/day	0.0	
PM2.5 Controlled Emisisons:	max lbs/day	0.0	

Emissions Totals:	**PM10**	**PM2.5**
tons/period	**2.8**	**0.6**
tons/month	**0.1**	**0.0**
max lbs/day	**11.8**	**2.5**

Ref: MRI Report, South Coast AQMD Project No. 95040, March 1996, Level 2 Analysis Procedure.
MRI Report factor of 0.011 tons/acre/month is based on 168 hours per month of const activity.
For an activity rate of 220 hrs/month, the adjusted EF would be 0.0144 tons/acre/month.
*** includes surface area and trench cut and fill for proposed offsite linears.

CO2e Emissions Estimates

Estimated CO2 emisisons from diesel combustion:	266040	tons/period
Estimated CO2 emissions from gasoline combustion:	7204	tons/period
Approximate methane fraction of CO2 for diesel combustion:		0.000051
Approximate N2O fraction of CO2 for diesel combustion:		0.000032
Approximate methane fraction of CO2 for gasoline combustion:		0.000213
Approximate N2O fraction of CO2 for gasoline combustion:		0.000113
Estimated methane from diesel combustion:	13.56804	tons/period
Estimated N2O from diesel combustion:	8.51328	tons/period
Estimated methane from gasoline combustion:	1.534452	tons/period
Estimated N2O from diesel combustion:	0.814052	tons/period
Estimated methane CO2e from diesel combustion:	284.9288	tons/period
Estimated N2O CO2e from diesel combustion:	2639.117	tons/period
Estimated methane CO2e from gasoline combustion:	32.22349	tons/period
Estimated N2O CO2e from gasoline combustion:	252.3561	tons/period
Estimated CO2e emissions from construction:	**276453**	**tons/period**
	248807	*metric tons/period*

CCAR General Protocol, January 2009, Version 3.1.
IPCC SAR values for methane and N2O.

CONSTRUCTION PHASE - Worker Travel - Emissions

Ref: MDAB, Emfac 2007, V2.3, Nov 2006
On Road Vehicles (1966-2010)
LDP/LDT Weighted Avg Efs

Worker Travel to Site by Private Vehicles

Max # of Workers/Day:*	394	non-bussed									
Avg # of Workers/Day:*	254	non-bussed			Emissions Factors (lbs/VMT)						
Avg Occupancy/Vehicle:	1.2			NOx	CO	VOC	SOx	PM10	CO2		
Avg. Round Trips/Day:	212			0.00111	0.01108	0.00092	0.00001	0.00009	0.91102		
Max Round Trips/Day:	328										
						Daily Emissions (lbs)					
Avg Roundtrip Distance:	51	miles		**NOx**	**CO**	**VOC**	**SOx**	**PM10**		**PM2.5**	
Avg. VMT/Day:	28075	**	**Avg**	**31.16**	**311.07**	**25.83**	**0.28**	**2.53**	**25576.89**	**2.52**	
Max VMT/Day:	24425		Max	27.11	270.63	22.47	0.24	2.20	22251.66	2.19	
Avg. VMT/Const Period:	15693925	**				Tons per Const Period					
Total Const Days:	559			**8.7**	**86.9**	**7.2**	**0.1**	**0.7**	**7148.7**	**0.7**	

Worker Travel to Site by Busing from Barstow Staging Area

Total Bus VMT/Const Period:	393658	Bus Round Trips/Day:	16	max	Ref: MDAB, Emfac 2007, V2.3, Nov 2006
Avg Bus VMT/Const Day:	552	Bus Occupancy/Trip:	48		On Road Vehicles (1966-2010)
Max Bus VMT/Const Day:	736				Bus Carriers
Distance to site from Bus staging area:	46	miles (roundtrip)			

(AFC Section 5.13, Traffic and Transportation)
Table C.5-7 for busing and worker travel data.

	Emissions Factors (lbs/VMT)					
NOx	CO	VOC	SOx	PM10	CO2	
0.013846	0.016154	0.002308	0.000077	0.000077	3.846	

*Estimated totals minus Bus worker values.
** Includes VMT for worker vehicle travel to bus area.

		Avg. Daily Emissions (lbs)				
NOx	**CO**	**VOC**	**SOx**	**PM10**	**CO2**	**PM2.5**
7.64	8.92	1.27	0.04	0.04	2122.99	0.04
		Tons per Const Period				
2.7	3.2	0.5	0.015	0.015	757.0	0.015

It should be noted that these emissions are not necessarily new emissions to the regional air shed. A significant portion of the workers will be derived from the existing work force pool in the urban regional area, and as such these workers would most likely be involved in projects in the area regardless of whether or not the proposed facility is constructed. As such, a major portion of the above estimated emissions would not be considered as additions to the air shed.

EDAW | AECOM

EDAW Inc
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August 26, 2009

Dr. Aaron Allen, Ph.D., Branch Chief
U.S. Army Corps of Engineers
Los Angeles District, North Coast Branch
2151 Alessandro Drive, Suite 110
Ventura, CA 93001

Re: Request for Concurrence of 'No Clean Water Act Section 404 Permit Required'

Dear Dr. Allen:

The Mojave Solar Project (Project) is a proposed renewable energy project that would develop a 250-megawatt (MW) solar thermal power plant adjacent to Harper Dry Lake. The Project will not have any permanent or temporary impacts to potential jurisdictional waters of the U.S. (including wetlands). Please refer to the attached jurisdictional delineation letter report (Attachment 1).

Based on the information provided in the jurisdictional delineation letter report, including figures and the Project plans, we hereby request concurrence from the U.S. Army Corps of Engineers that a permit is not required for the Project under Section 404 of the Clean Water Act.

Please contact me with any questions or requests concerning this matter.

Sincerely,

Joshua Zinn
Project Ecologist

Attachment 1 – Jurisdictional Delineation Letter Report

08080191 04 MS No 404 Permit Cover Letter.doc

ATTACHMENT 1

JURISDICTIONAL DELINEATION LETTER REPORT

EDAW Inc
1420 Kettner Boulevard, Suite 500, San Diego, California 92101
T 619.233.1454 F 619.233.0952 www.edaw.com

August 26, 2009

Dr. Aaron Allen, Ph.D., Branch Chief
U.S. Army Corps of Engineers
Los Angeles District, North Coast Branch
2151 Alessandro Drive, Suite 110
Ventura, CA 93001

Re: Mojave Solar Project Jurisdictional Delineation Letter Report

Dear Dr. Allen:

Mojave Solar, LLC (MSLLC) proposes to develop the 250-megawatt (MW) Mojave Solar Project (MSP or Project) located near Lockhart, California, and Harper Dry Lake (Attachment A, Figures 1 and 2). The approximately 1,765-acre plant site includes the primary solar energy facilities—solar array field, steam turbine generator, cooling tower, and a variety of ancillary equipment and facilities—and associated construction and operations footprint (hereinafter referred to as Project Area) (Attachment A, Figure 3). This jurisdictional delineation letter report discusses the type and amount of aquatic resources occurring within the Project Area. The Project will not result in permanent or temporary impacts to federally defined/regulated aquatic resources (i.e., waters of the U.S.). Complete avoidance of potential waters of the U.S. has been achieved through the incorporation of Project Design Features (PDFs) so that Project construction and operation do not result in impacts to waters of the U.S.

This jurisdictional delineation letter report summarizes the methodologies employed in conducting a formal jurisdictional delineation of waters of the U.S. and State of California, the results of the fieldwork, and existing conditions in the Project Area (also synonymous with the delineation survey area) where potential jurisdictional waters occur. For this Project, it has been determined that there are 1.32 acres of potential jurisdictional waters of the U.S.[1] and an additional area of 11.18 acres that would be considered jurisdictional waters of the State exclusively,[2] which occur within the Project Area.

MSLLC contracted with EDAW, Inc. (EDAW) to perform environmental services in support of preparation of an Application for Certification (AFC), which is required by the California Energy Commission (CEC) for power-generating plants that produce an excess of 50 MW of energy. As a component of environmental services, a jurisdictional delineation was conducted to obtain baseline information for jurisdictional waters of the U.S. and State in support of the CEC's environmental review and permitting process. The purpose of this jurisdictional delineation is to identify boundaries and acreages of potential jurisdictional waters of the U.S. and State (including wetlands) occurring within the Project Area for verification by USACE and the California Department of Fish and Game (CDFG).

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[1] Jurisdictional waters of the U.S. are relevant to both USACE and CDFG regulatory permitting. Final acreages of jurisdictional waters of the U.S. are based on the jurisdictional determination (JD) process per the March 30, 2007, U.S. Army Corps of Engineers Jurisdictional Determination Form Guidebook; the June 5, 2007, Approved JD Form; the June 5, 2007, Joint Guidance Memorandum, the December 2, 2008, Guidance Memorandum; and Regulatory Guidance Letter (RGL) 08-02 (if RGL 08-02 is deemed applicable and appropriate [i.e., the permit applicant, or other "affected party" can decline to request and obtain an Approved JD and elect to use a Preliminary JD instead] for this jurisdictional determination).

[2] Relevant to CDFG permitting only.

Project Location and Description

The Project site is located immediately southwest of Harper Dry Lake and near the town of Lockhart in San Bernardino County, California. (Attachment A, Figures 2 and 3). The Project will use parabolic trough solar thermal technology to produce electrical power, which uses a steam turbine generator fed from a solar steam generator (SSG). SSGs receive heat transfer fluid (HTF) from solar thermal equipment composed of arrays of parabolic mirrors that collect energy from the sun. This is based on the technology that has been successfully used for nearly 20 years at nine existing solar energy generating systems (SEGS) facilities located at Harper Lake, Kramer Junction, and Daggett in the Mojave Desert. This technology involves a modular solar array field composed of many parallel rows of solar collectors normally aligned in a north-south horizontal axis. Each solar collector has a linear parabolic-shaped reflector that focuses the sun's radiation on a receiver located at the focal point of the parabola. The solar collectors track the sun from east to west during the day to ensure that the sun is continuously focused on the linear receiver. The linear receiver contains an HTF, a synthetic oil that heats up to approximately 740 degrees Fahrenheit (°F) as it circulates through the receiver, and returns to a series of heat exchangers where the HTF is used to generate steam that drives a turbine, which generates electrical power.

The Project will have a combined nominal electrical output of 250 MW from twin 125-MW power blocks. The power blocks are joined at the transmission line to form one full-output transmission interconnection. Start of commercial operation is subject to timing of regulatory approvals and applicant achievement of equipment procurement and construction milestones. The solar thermal technology will provide 100 percent of the power generated by the plant; no supplementary energy source (e.g., natural gas to generate electricity at night) is proposed to be used for electric energy production. Each power block will have an auxiliary boiler fueled by natural gas to reduce startup time and for HTF freeze protection. The auxiliary boiler will supply steam to the HTF freeze protection heat exchangers as required during nighttime hours to keep the HTF in a liquid state when ambient temperatures are not sufficient to keep the HTF above its relatively high freezing point (54°F). Each power block will also have a diesel-fueled firewater pump for fire protection and a diesel-driven backup generator for power plant essentials.

The Project interconnection is proposed to connect to the Southern California Edison (SCE)-owned Kramer-Coolwater 230-kilovolt transmission line located adjacent to the southern border of the Project Area. SCE will lead the permitting effort for the transmission improvements past the Project-specific interconnection to the statewide system as a separate process. All Project-related transmission facilities are located within the Project Area.

The Project proposes to use wet cooling towers for power plant cooling. Water for cooling tower makeup, process water makeup, and other industrial uses such as mirror washing will be supplied from onsite groundwater wells, which also will be used to supply water for employee use (e.g., drinking, showers, sinks, and toilets). A package water treatment system will be used to treat the water to meet potable standards. A sanitary septic system and onsite leach field will be used to dispose of sanitary wastewater.

Project cooling water blowdown will be piped to lined, onsite evaporation ponds in the Project Area. The ponds will be sized to retain all solids generated during the life of the Project. However, if required for maintenance, dewatered residues from the ponds will be sent to an appropriate offsite landfill as nonhazardous waste. No offsite backup cooling water supply is planned at this time; the use of multiple onsite water supply wells and redundancy in the well equipment will provide an inherent backup in the event of outages affecting one of the onsite supply wells. Natural gas for the Project's ancillary purposes will be supplied by an existing Southwest Gas Corporation-owned pipeline that runs to the boundary of the Project Area. No offsite pipeline facilities are proposed as a part of this Project.

Project Location and Directions

The Project Site is located immediately southwest of Harper Dry Lake, and adjacent to the town of Lockhart, San Bernardino County, California. From Interstate 15 (north or south) go west on Highway 58 for 16.4 miles. Turn right (north) onto Harper Lake Road. Drive for 5.9 miles then make a right (east) onto Lockhart Road (a dirt access road). Continue for one mile along Lockhart Road then turn left (north) onto Edie Road along the western portion of the vacant farm buildings. Continue north for approximately 0.35 mile where the road will fork; stay to the right and continue straight until the road bends and eventually heads east (approximately 720 feet). Take this road until it terminates at the eastern portion of the Project boundary (Figures 2 and 3).

Regulatory Framework

Wetlands and other aquatic environments/habitats occurring within California are regulated under the following Federal and State laws, as applicable to the Project.

Federal Regulations

Pursuant to Section 404 of the Clean Water Act (CWA), USACE is authorized to regulate any activity that would result in the discharge of dredged or fill material into jurisdictional waters of the U.S., which include those waters listed in 33 Code of Federal Regulations (CFR) 328.3 (Definitions). USACE, with oversight by the U.S. Environmental Protection Agency (USEPA), has the principal authority to issue CWA Section 404 Permits.

Pursuant to Section 401 of the CWA, the Regional Water Quality Control Board (RWQCB) certifies that any discharge into jurisdictional waters of the U.S. will comply with State water quality standards. RWQCB, as delegated by USEPA, has the principal authority to issue a CWA Section 401 water quality certification or waiver.

State Regulations

Pursuant to Section 1600 *et seq*. of the California Fish and Game Code, CDFG is authorized to regulate any activity that would alter the flow, bed, channel, or bank of streams and lakes. Jurisdictional waters of the State include the channel, bed, or bank of a lake, river, or stream. In practice, CDFG usually extends its jurisdictional limit to the top of the bank of a stream or lake, or to the continuous outer edge of its riparian extent, whichever is wider.

Pursuant to Section 13000 *et seq*. of the California Water Code (the 1969 Porter-Cologne Water Quality Control Act), RWQCB is authorized to regulate activity that would result in discharges of waste and fill material to waters of the State, including "isolated" waters and wetlands. Waters of the State include any surface or groundwater within the boundaries of the State (CA Water Code § 13050[e]).

Jurisdictional Delineation Methodology

Presurvey Investigations

Prior to conducting field investigation, EDAW reviewed historical land use and climactic data. EDAW also identified areas with topographical configurations in the Project Area and previously mapped riparian areas, wetlands, waters, and/or hydric soils that may suggest the potential or presence of jurisdictional waters of the U.S. and State at the time of the field survey.

Field Survey for Waters of the U.S.

Jurisdictional waters of the U.S. include those waters listed in 33 CFR 328.3. All waters of the U.S. were delineated to their jurisdictional limits as defined by 33 CFR 328.4. On April 14, 2009, a formal jurisdictional delineation and assessment of potentially regulated waters (including wetlands) was conducted within the Project Area by an EDAW ecologist. Jurisdictional waters of the U.S. were delineated pursuant to the criteria outlined in and in accordance with:

- The *Corps of Engineers Wetlands Delineation* (Manual) (Environmental Laboratory 1987).
- The *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Version 2.0) (Regional Supplement) (Environmental Laboratory 2008).[3]
- *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States: A Delineation Manual* (USACE 2008).[4]

Although the entire Project Area was surveyed and assessed for jurisdictional waters of the U.S. and State (including wetlands), it was determined through field reconnaissance and assessment that only the portion of the Project Area that contains Harper Dry Lake has the potential to include federally regulated waters. The two types of Federal waters potentially present in Harper Dry Lake warranted field assessments composed of formal wetland delineations based on the three-parameter method outlined in the USACE Manual and the Regional Supplement (the simultaneous presence of wetland hydrology, hydric soil, and hydrophytic vegetation) to define the presence and jurisdictional extent of regulated waters in the form of wetlands defined by these procedural manuals; and formal surveys for

[3] It should be noted that the Manual and Regional Supplement are guidance documents for delineating waters in the form of wetlands only. The portion of Harper Dry Lake (as a playa lake) delineated within the survey area utilized 2008 Supplement Data Forms to document the presence/absence of wetland but not the presence of *jurisdictional waters* in the form of wetland and/or OHWM or "other waters" of the U.S.

[4] Datasheets from this field delineation manual were utilized as guidance documents for this delineation and are not included in this Jurisdictional Delineation Report.

field indicators of drainage features and unvegetated waters to define the jurisdictional lateral extent by utilizing indicators of OHWM.[5]

All potential nonwetland waters of the U.S. (e.g., the lakeshore and/or drainage features) were delineated within the Project Area utilizing the definition of OHWM (33 CFR 238.3[e]) and relevant guidance and procedural documents (e.g., Regulatory Guidance Letter [RGL] 88-06, RGL 05-05 and *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States: A Delineation Manual* [USACE 2008]). A positive determination for nonwetland jurisdictional waters of the U.S. would be made only for areas that did not meet all three wetland parameters outlined within the Manual and 2008 Supplement guidance but were within the lateral extent of established OHWM.

The jurisdictional delineations were conducted in accordance with Part IV (Methods), Section D (Routine Determinations), Subsection 2 (Onsite Inspection Necessary) of the Manual's "Routine Determinations for Areas Greater Than Five Acres in Size." The Manual recommends that a baseline be established that parallels the major watercourse(s) through the area and that the maximum distance between transects (intervals) for linear delineations does not exceed 0.5 mile. For this delineation, transect intervals for major and significant watercourses occurring within the Project Area did not exceed 0.25 mile. Obvious upland areas were not mapped as part of this analysis as they did not represent wetland and/or riparian communities that warranted a formal jurisdictional delineation.

Where feasible, the baseline for establishing the transect (and field data point) locations was situated in nonjurisdictional (i.e., upland and/or nonriparian) habitat so that the initial observation points of each transect were likely outside wetland boundaries or on either side of the potential jurisdictional waters (OHWM and/or wetland), and extended across the jurisdictional features to nonjurisdictional habitat on the opposite side. This baseline placement ensured that the outer observation point for each transect was also located in nonwetland habitat, allowing for accurate demarcation of the limits of potentially jurisdictional areas. Two transects, providing a cumulative total of four data points, were completed throughout the Project Area for the field delineation and this report (see Figure 7). In most instances, additional soil pits were dug between observation points to accurately determine the wetland boundary.

To determine the presence of hydric soils, subsurface soil taken from soil pits (field data points) was analyzed visually for redoximorphic features using *Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils* (USDA 2006). A field diagnostic test for determining the presence or absence of iron reduction and identifying aquic conditions using α, α' Dipyridyl was also applied in select areas. The soil test pits were also evaluated for the presence of subsurface wetland hydrology indicators such as soil saturation, oxidized root channels, and hydric soil indicators.

An area was determined to support hydrophytic vegetation if more than 50 percent of the dominant species were listed as Obligate Wetland (OBL), Facultative Wetland (FACW), or Facultative (FAC) species on the U.S. Fish and Wildlife Service *National List of Plant Species That Occur in Wetlands: California (Region 0)* (Reed 1988). Vegetation was assessed using the "50/20 Rule" to determine dominant species. By definition, dominant species are the most abundant plant species (when ranked in

[5] 33 CFR 328.3(e).

descending order of abundance and cumulatively totaled) that immediately exceed 50 percent of the total dominance measure (e.g., basal area or areal coverage) for the stratum, plus any additional species that individually comprise 20 percent or more of the total dominance measure for the stratum (Tiner 1999). All observation points were also surveyed for the presence of surface wetland hydrological field indicators, such as inundation, saturation, water marks, drift lines, drainage patterns, and sediment deposits occurring within a hydrophytic vegetation community.

All field data points and upland/jurisdictional waters boundaries were surveyed for the presence (including extents, types, and boundaries) of potential jurisdictional waters using Trimble XH sub-foot accuracy Global Positioning System (GPS) handheld units. All field data were post-field processed using Trimble GPS Analyst (Version 2.1) geographic information system (GIS) software. Post-field analysis to code, define, designate, and edit all acquired GPS field data representing jurisdictional waters occurring within the Project Area was conducted in tandem with an EDAW GIS specialist and the ecologist who performed the fieldwork. The Wetland Determination Data Forms — Arid West Region (Version 2.0) completed for the Project are included as Attachment B to this report.

Field Survey for Waters of the State

Jurisdictional waters of the State were delineated either to the head of the playa bank and/or to the edge of the scattered and limited riparian canopy composed of tamarisk (*Tamarix ramosissima*), abutting or in immediate proximity to Harper Dry Lake occurring within the Project Area. Riparian habitats do not always have identifiable hydric soils or clear evidence of wetland hydrology as defined by USACE. Therefore, CDFG wetland boundaries often extend beyond USACE wetland boundaries, which may include only portions of the riparian habitat adjacent to a river, stream, or lake. Jurisdictional boundaries for State waters may encompass an area that is greater than that under the jurisdiction of USACE. The findings for each potential jurisdictional water and wetland parameter(s) were recorded for each of the field datapoints taken within the Project Area (Table 1).

Table 1
Survey Results for Potential Jurisdictional Waters[a]
Occurring within the Project Area

Sample Point	Vegetation Community	Wetland Hydrology	Hydric Soils	Hydrophytic Vegetation	Potential Federal Waters	Potential State Waters	Comments
T1.1	Desert Sink Scrub		+		no	yes	Upland
T1.2	Dry Lake (Alkali Playa)	+	+		no	yes	Saline playa
T2.1	Dry Lake (Alkali Playa)	+	+		no	yes	Saline playa
T2.2	Tamarisk Scrub (with Relictual Marsh)	+	+	+	yes	yes	Federal status to be confirmed via jurisdictional determination process

[a] As defined by 33 FR 328.3(e), 33 CFR 328.3(b); 40 CFF 230.3(t); the Manual; and the 2008 Supplement.

Results

Vegetation and Other Cover Types

This formal jurisdictional delineation uses the Holland Code Classification System for vegetation communities (Holland 1986). Within the portion of the Project Area that contains Harper Dry Lake and supports potential jurisdictional waters, two vegetation communities occur (Figure 4), as described below. The dry lake land cover type is also described below.

1. Disturbed Desert Sink Scrub (Holland Code 36120)

Desert sink scrub is similar to desert saltbush scrub and characterized as being dominated by chenopod type plants that grow on poorly drained soils with high alkalinity and sometimes with a layer of salt crust at the soil surface (Holland 1986). Within the Project Area, this vegetation community has been altered by previous human activity including grading, repeated clearing, and vehicular damage, which over time has degraded "naturally" occurring desert sink scrub resulting in a lower shrub density and an increased abundance of nonnative plant species. Within the Project Area, disturbed desert sink scrub includes five-horn smother-weed (*Bassia hyssopifolia*) intermixed with desert saltbush scrub mainly dominated by allscale (*Atriplex polycarpa*) and spinescale (*Atriplex spinifera*), with an established understory of nonnative herbaceous plants.

2. Tamarisk Scrub (Holland Code 63810)

Tamarisk scrub is characterized by a weedy, virtual monoculture of any of several *Tamarix* species, usually supplanting native vegetation following major disturbance (Holland 1986). Within the Project

Area, this vegetation community is dominated by scattered stands, a planted windbreak, and a large stand intermixed with relictual alkali marsh.

3. Dry Lake (Alkali Playa)

Alkali playa is a low-growing vegetation community that typically occurs on poorly drained soils with high salinity. Alkali playa has a very low plant cover with wide spacing between shrubs. Alkali playas within the Project Area were mostly barren, with shadscale (*Atriplex confertifolia*) occurring along its margins.

Soils

Only those soils within the Project Area that are listed as hydric, have diagnostic hydric properties and/or features, have hydric inclusions, meet the criteria and/or definition for a hydric soil, or have the potential for being hydric by definition are addressed herein (Figure 5). Only those soils occurring within the Project Area that are listed on the National List of Hydric Soils (NRCS 2009a) are described below:

1. Dune Land

The Dune land soil unit consists of unstable hills and ridges of loose, wind-deposited sand. It is excessively drained and is barren. Typically, Dune land is sand that is blown and shifted by the wind. Dunes vary in size and shape. Generally, Dune lands are less than 15 feet high, but some can be up to 25 feet high, with 5 to 15 percent slopes. Included in this unit are small areas of Cajon sand and Halloran between dunes (USDA 1986).

2. Playas

The Playas soil unit consists of very poorly drained areas on flats in closed basins. It is essentially barren of vegetation. Playas consist of stratified sediment that has accumulated as a result of surface runoff from the higher surrounding areas. The sediment is dominantly clay, but ranges from silty clay to loamy sand. Areas of Playas are strongly saline-alkali. Salt commonly accumulates on the surface (USDA 1986).

3. Cajon Loamy Sand, Loamy Substratum, 0 to 2 percent slopes and Cajon Sand, Loamy 0 to 2 percent slopes

The Cajon soil series consists of very deep, somewhat excessively drained soils that formed in sandy alluvium from dominantly granitic bedrock. Cajon soils are common on alluvial fans, fan aprons, fan skirts, inset fans, and river terraces with slopes of 0 to 15 percent. The Cajon soil series is found in climates that average an annual precipitation of about 6 inches, and the mean annual temperature is about 65°F. This soil series is a mixed, thermic Typic Torripsamment-mesic. These soils are often found on stabilized dunes. Cajon soil is alkaline and the texture is single grained and loose, and presents little horizon development. Thin A horizons are the most apparent change from the parent material (stabilized dune sand) (USDA 1986; NRCS 2009b).

4. Norob-Halloran Complex, 0 to 5 percent slopes

The Norob soil series consists of very deep, moderately well-drained soils that formed from mixed alluvium, with many areas having eolian deposits on the soil surface. Norob soils are on alluvial plains and alluvial flats in the Mojave Desert with slopes of 0 to 5 percent. The Norob soil series is found in climates that average an annual precipitation of about 5 inches and the mean annual air temperature is about 65°F. This soil series is a fine-loamy, mixed, superactive, thermic Typic Natrargids-mesic. Narob soil is moderately alkaline and the texture is single grained and loose (USDA 1986; NRCS 2009b).

The Halloran soil series is deep, moderately well-drained soil that forms from mixed alluvium from granite bedrock. Halloran soils occur on old alluvial terraces and depressions with slopes of 0 to 2 percent. The Norob soil series is found in climates that average an annual precipitation of about 5 inches and the mean annual air temperature is about 65°F. This soil series is a mixed, thermic Typic Natrargids. The soils are usually associated with Cajon and Rosamond soils. Halloran soils have slow runoff and moderately low permeability, and pond after flooding. They support creosote bush scrub and four-wing saltbush vegetation. The Halloran soil series is moderately alkaline and the texture is coarse-loamy (USDA 1986; NRCS 2009b).

Hydrology

The Project Area is located within the southwest portion of the 1,829-square-mile Coyote-Cuddeback Lakes Watershed (HUC 18090207), which is part of the Mojave Desert region of California (Figure 6). The Mojave Desert is the driest desert in the continental U.S., with precipitation ranging from 2.23 to 2.5 inches a year, with much of the rain falling between October and March, and temperatures ranging from 40 to 110°F (SANBAG 2006). Perennial and intermittent rivers and streams are rare, and most water flow occurs in washes and flood-flow paths during major winter rain events that occur rarely (USGS 2004).

Hydrological inputs to Harper Dry Lake are from rainwater and approximately 35 acre-feet input of groundwater delivery administered by the U.S. Bureau of Land Management (BLM) to a designated area located approximately 2,000 feet southeast (and outside) of the Project Area. The nearest Relatively Permanent Water is the Mojave River, which flows indirectly to the south into the Pacific Ocean, a Traditionally Navigable Water. The Mojave River is located more than 10 miles south of Harper Dry Lake (Figures 1 and 6). The 100-year and 500-year floodplains adjacent to the Mojave River within the City of Barstow are generally confined to the floodplain adjacent to the river channel and do not exceed 0.25 and 0.5 mile lateral extent during 100- and 500-year events, respectively. Harper Dry Lake is a low point in the region; there are no drainages that flow out of Harper Lake. A dry wash flows northwest from the Mojave River through Hinkley Valley toward Harper Dry Lake, but only flows during extreme events and does not present itself as a relatively permanent connection between the Mojave River and Harper Lake.

Prior agricultural operations, which provided runoff that supported wetland development in the southwest portions of Harper Dry Lake during the mid- to late-20th century, began to decline after peaking in the late 1970s and early 1980s (BLM 2007a; Mundstock 1996). In 1997, agricultural

operations stopped entirely, cutting off a supplemental water supply (beyond occasional rain) to Harper Dry Lake (BLM 2007a). Between the years of 1998–2001, the remaining wetland area within the southwest portion of Harper Dry Lake became completely dry (BLM 2007a). This condition would likely be permanent, except for temporary and transitory wetland/marsh periods related to exceptional precipitation events (Kubly and Cole 1979).

Although BLM initiated deliberate groundwater transfers into the southern marsh area in Harper Dry Lake (south and outside of the Project Area) in 2001 and 2002 to reestablish the wetland habitat (after the water delivery system was built by BLM [BLM 2007b]), the first formal record of dedicated water input for the marsh (occurring south and outside of the Project Area) was in 2003 (by BLM administrative request). Agricultural runoff, the former primary source of water for the wetland area, which significantly expanded and maintained suitable marsh habitat for avian species for approximately 30 years, had essentially ceased to exist by 1997, and the marsh threatened to dry up and disappear by reverting to a dry playa lake bed with a disturbed aquifer limiting or restricting natural groundwater surface seepage.

The cessation of agricultural runoff and the lowering of the water table from decades of large-scale irrigation had compounding adverse effects on the large portions of wetlands occurring within Harper Dry Lake, now in a relictual form within the Project Area. These effects prevent groundwater from collecting at the surface (“daylighting”) through capillary action, and impact or destroy artesian wells/springs within the wetland area. Additionally, cessation of agricultural runoff removed effective wetland hydrology from the Project Area. However, the wetland hydrology indicator of “salt crust” remains and persists.

Jurisdictional Waters of the U.S.

The extent and distribution of the collective area of potential jurisdictional waters of the U.S. occurring within the Project Area is 1.32 acres (Figure 8, see also footnote 1 pertaining to the determination process). Jurisdictional waters of the U.S. are listed for each wetland habitat in Table 2. Wetlands (or in this case desert aquatic-related habitats) have been classified according to *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979). This classification system incorporates a hierarchical structure of systems, subsystems, and classes to identify wetland and habitat types. The vegetation occurring within the Project Area is vegetation typically associated with disturbed areas occurring within this vicinity of California. Photo locations and photos are included in Figures 9 through 12.

Table 2
Potential Jurisdictional Waters of the U.S. [a]
Occurring within the Project Area

Type of Jurisdictional Waters of the U.S.	Type of Habitat (Holland 1986)	Type of Habitat (Cowardin et al. 1979)	Regulatory Authority[a]	Area of Aquatic Resource (Acres)[b]
Wetland	Tamarisk Scrub (63810)	Palustrine; Scrub/Shrub, Needle-Leaved, Evergreen, Seasonally Flooded/Saturated, Mixosaline, Alkaline	USACE, CDFG	1.32
Total USACE Waters =				**1.32**

[a] Jurisdictional waters of the U.S. are also jurisdictional waters of the State, as discussed below.

[b] Jurisdictional waters acreage within the Project Area was determined by utilizing ArcGIS. All acreages are rounded to the nearest hundredth.

Jurisdictional Waters of the State

Areas under the jurisdiction and regulatory administration of CDFG include the 1.32 acres of potential jurisdictional waters of the U.S. composed of Tamarisk Scrub wetland provided in Table 2, as well as an additional 11.18 acres of non-USACE jurisdictional riparian habitat for a total area of approximately 12.5 acres of potential jurisdictional waters of the State. A summary of the additional potential jurisdictional waters of the State occurring within the Project Area is provided in Table 3.

Table 3
Potential Jurisdictional Waters of the State
Occurring within the Project Area

Type of Jurisdictional Waters of the U.S.	Type of Habitat (Holland 1986)	Type of Habitat (Cowardin et al. 1979)	Regulatory Authority	Area of Aquatic Resource (Acres)[a]
Lacustrine Riparian Extent	Tamarisk Scrub (63810)	Palustrine; Scrub/Shrub, Needle-Leaved, Evergreen, Seasonally Flooded/Saturated, Mixosaline, Alkaline	CDFG, RWQCB	1.74
Lakebed	Alkali Playa (46000)	Lacustrine, Littoral, Unconsolidated Bottom, Sand, Intermittently Flooded/Temporary, Hypersaline, Alkaline	CDFG, RWQCB	9.44
Total CDFG Waters				**12.5**[b]

[a] Jurisdictional waters acreage within the survey area was determined by utilizing ArcGIS. All acreages are rounded to the nearest hundredth.

[b] This total includes the 1.32 acres of potential Jurisdictional waters of the U.S. which are also potential jurisdictional waters of the State, as listed in Table 2 and discussed above.

Discussion

The MSP will not result in any impacts (either temporary or permanent) to potential jurisdictional waters of the U.S. through the incorporation of PDFs, such as temporary fencing and/or flagging to delineate the limits of grading and construction disturbance, thus avoiding all impacts to this area. A component of the MSP is a proposed drainage channel for conveying storm water away from the solar field (including ancillary equipment and other infrastructure) and toward Harper Dry Lake (Figure 13). This proposed drainage channel will not enter Harper Dry Lake or impact (either temporary or permanent) potential jurisdictional waters of the U.S. (Figure 14).[6]

Please contact me with any questions regarding this jurisdictional delineation letter report.

Sincerely,

Joshua Zinn
Project Ecologist

Attachment A – Figures:
- Figure 1 – Regional Map
- Figure 2 – Vicinity Map
- Figure 3 – Project Footprint
- Figure 4 – Vegetation Communities
- Figure 5 – Soils
- Figure 6 – Hydrologic Unit and Subarea
- Figure 7 – Delineation Data Points and Photopoints
- Figure 8 – Potential Jurisdictional Waters of the U.S. and State
- Figure 9 – Representative Photographs 1 and 2
- Figure 10 – Representative Photographs 3 and 4
- Figure 11 – Representative Photographs 5 and 6
- Figure 12 – Representative Photographs 7 and 8
- Figure 13 –Jurisdictional Delineation and Plant Site Details
- Figure 14 –Jurisdictional Delineation Details and Plant Site

Attachment B – Wetland Determination Data Forms – Arid West Region

08080191.04 MS1 JDR.doc

[6] If it is determined that the proposed drainage channel will alter fluvial geomorphology and/or speed up surface flows, attenuation and complying with the San Bernardino County Flood Control District National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements (NPDES NO. CAS618036, Order NO. R8-2002-0012) will be required.

References

California Department of Fish and Game (CDFG)
2008 California Wildlife Habitat Relationships System. California Interagency Wildlife Task Group. Available at http://www.dfg.ca.gov/biogeodata/cwhr/pdfs/DSW.pdf. Accessed March 2008.

Cowardin, L., V. Carter, F. Golet, and E. LaRoe
1979 *Classification of Wetlands and Deepwater Habitats of the United States.* U.S. Department of Interior. U.S. Fish and Wildlife Service. FWS/OBS-79/31. December 1979.

Environmental Laboratory
1987 *Corps of Engineers Wetlands Delineation Manual.* Technical Report Y-87-1. U.S. Army Engineer Waterways Experiment Station. Vicksburg, Mississippi.

2008 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)*. September.

Holland, R. F.
1986 *Preliminary Descriptions of the Terrestrial Natural Communities of California*. Prepared for California Department of Fish and Game.

Kubly, D. M., and G. A. Cole
1979 *Limnologic Studies on Desert Playas of Southern California*. U.S. Department of Interior, Bureau of Land Management, California Desert Plan Program, Riverside, California.

Mundstock, D.
1996 *Luz Engineering Corporation SEGS Project (Harper Dry Lake) Unit VIII (Luz 8, Luz SEGS 8, SEGS 8)*. Website: Luz Engineering Corporation SEGS Project (Harper Dry Lake) Unit VIII (Luz 8, Luz SEGS 8, SEGS 8). Accessed May 2009.

Natural Resource Conservation Service (NRCS)
2009a Natural Resource Conservation Service. National List of Hydric Soils. Available at http://soils.usda.gov/use/hydric/.

2009b NRCS 2006 Soils Website. Available at http://soils.usda.gov/.

Reed, P. B., Jr.
1988 *National List of Plant Species that Occur in Wetlands: California (Region 0).* U.S. Fish and Wildlife Service Biological Report 88(26.10).

San Bernardino Association of Governments (SANBAG)
2006 *San Bernardino General Plan Conservation Background Report*. Available at http://www.co.san-bernardino.ca.us/landuseservices/Background%20Reports/Default.asp. Accessed May, 2009.

Tiner, R.
1999 *Wetland Indicators. A Guide to Wetland Identification, Delineation, Classification, and Mapping*. Lewis Publishers. Boca Raton, Florida.

U.S. Army Corps of Engineers (USACE)
2008 *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States: A Delineation Manual*. Engineering Research and Development Center. August.

U.S. Department of Agriculture (USDA)
1986 Soil Conservation Service *Soil Survey of San Bernardino County California-Mojave River Area*.

2006 *Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils, Version 6.0*. Washington, D.C.

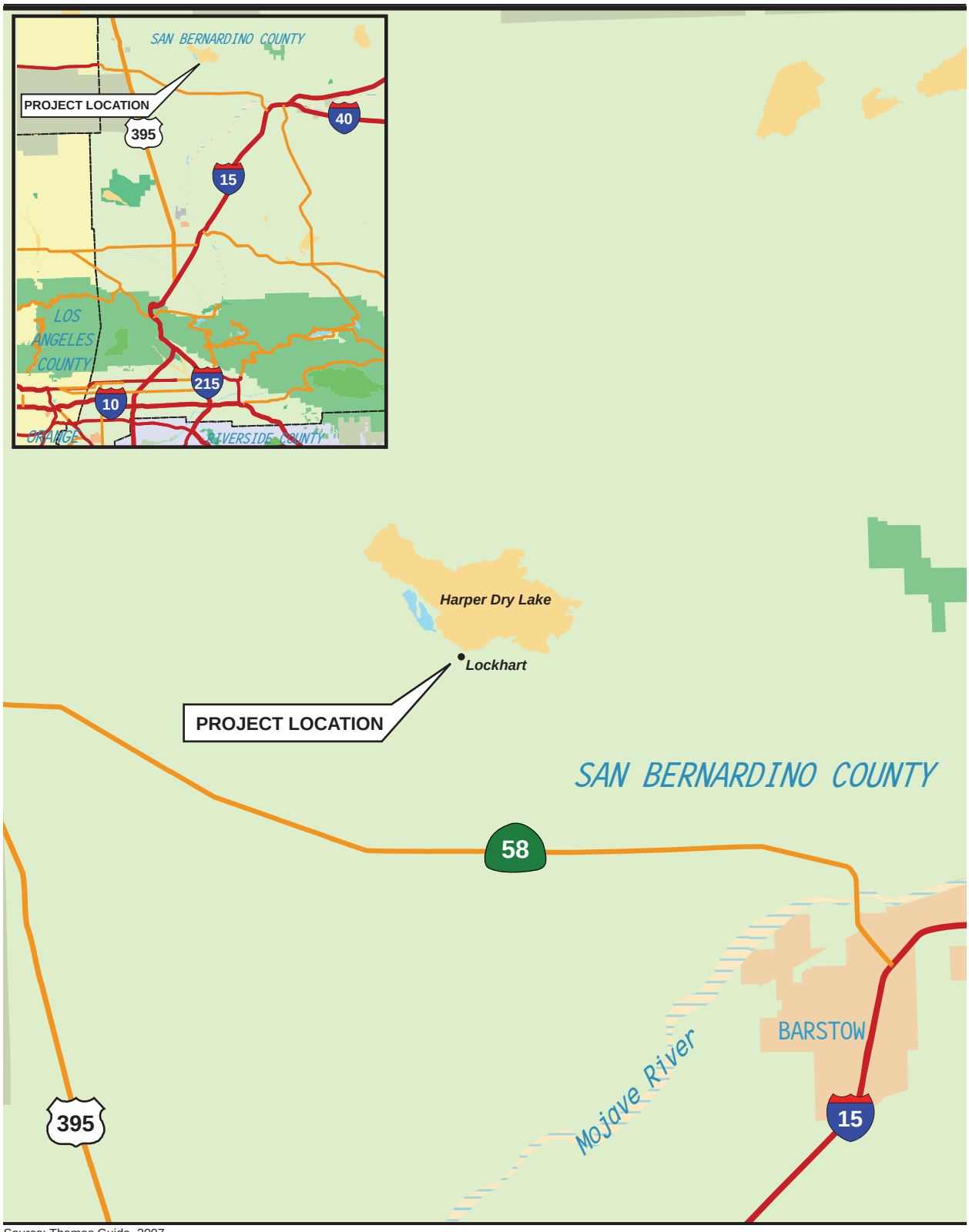
U.S. Department of the Interior, Bureau of Land Management (BLM)
2007a *Harper Dry Lake Area of Critical Environmental Concern Wetlands Restoration Project: Environmental Assessment*. Barstow Field Office.

2007b Personal communication with BLM personnel Larry Blaine, Lorenzo Encinas, and Brad Mastin (July 14, 2007). Barstow Field Office.

U.S. Geological Survey (USGS)
2004 Available at pubs.usgs.gov. Accessed July 2007.

ATTACHMENT A

FIGURES

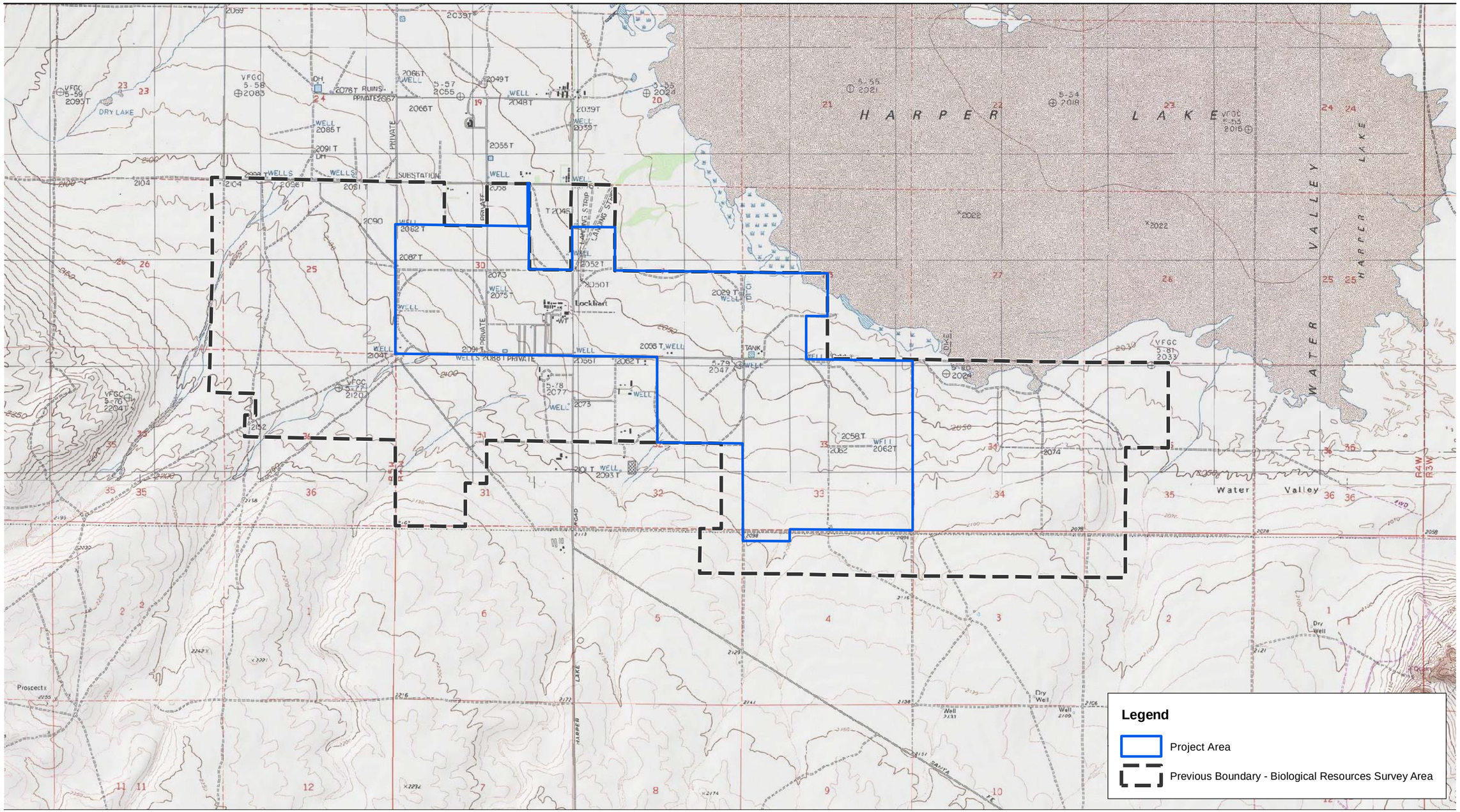


Source: Thomas Guide, 2007

4.5 2.25 0 4.5 Miles

Approximate Scale: 1 inch = 4.5 miles

Figure 1
Regional Map



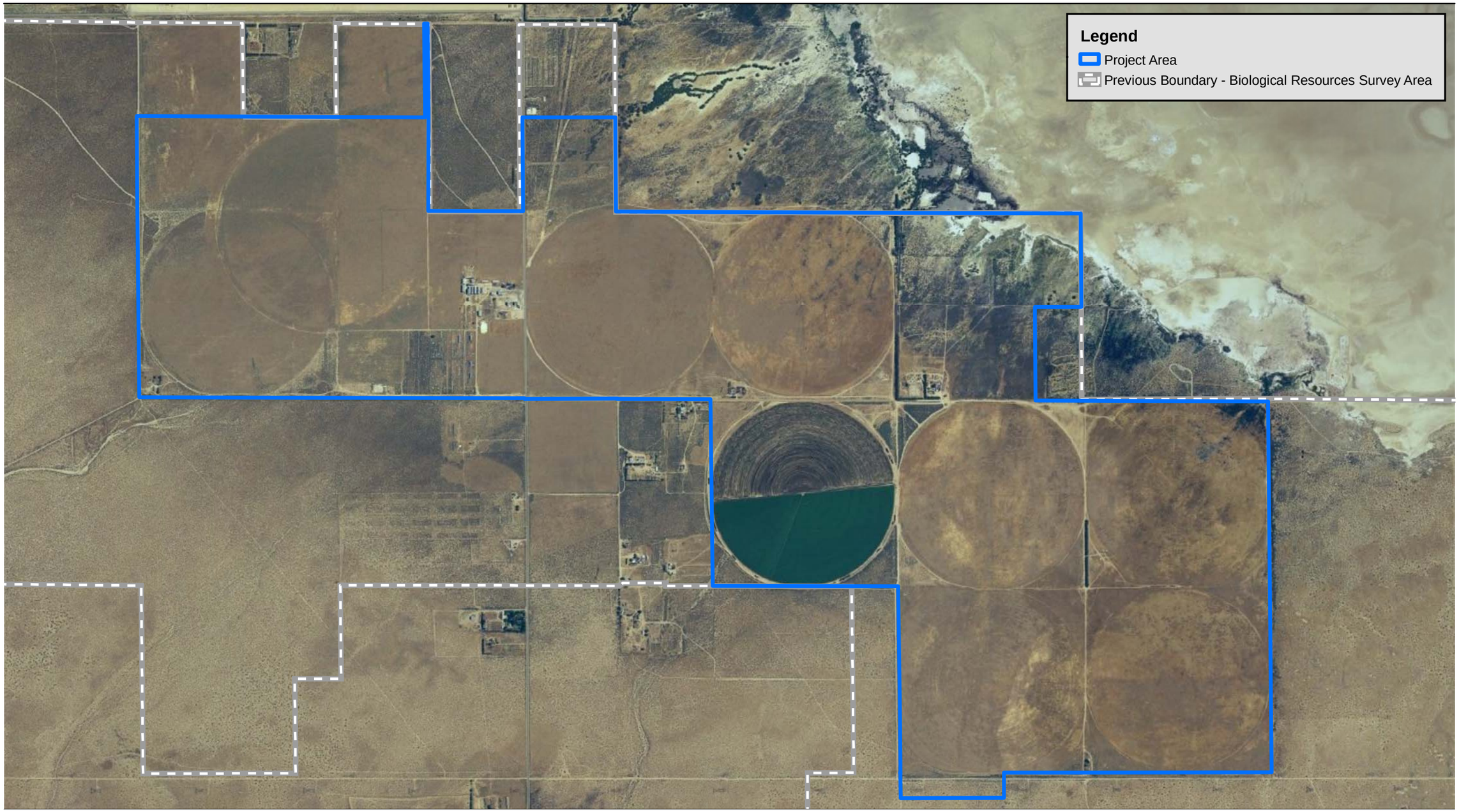
Source: USGS 7.5' Series Topo Quad Lockhart 1986; Twelve Gauge Lake 1973; Mojave Solar, LLC 2009

3,000 1,500 0 3,000 Feet

Scale: 1 = 36,000; 1 inch = 3,000 feet

Figure 2
Vicinity Map

Path: P:\2008\08080191 Harper Lake Abengoa AFC\6.0 GIS\6.2 Project Directory\6.2.5 Layout\BIO\WETLANDS\JDR_figures\Figure2_VicinityMap_JDR_11x17.mxd, 06/18/09, AugelloP



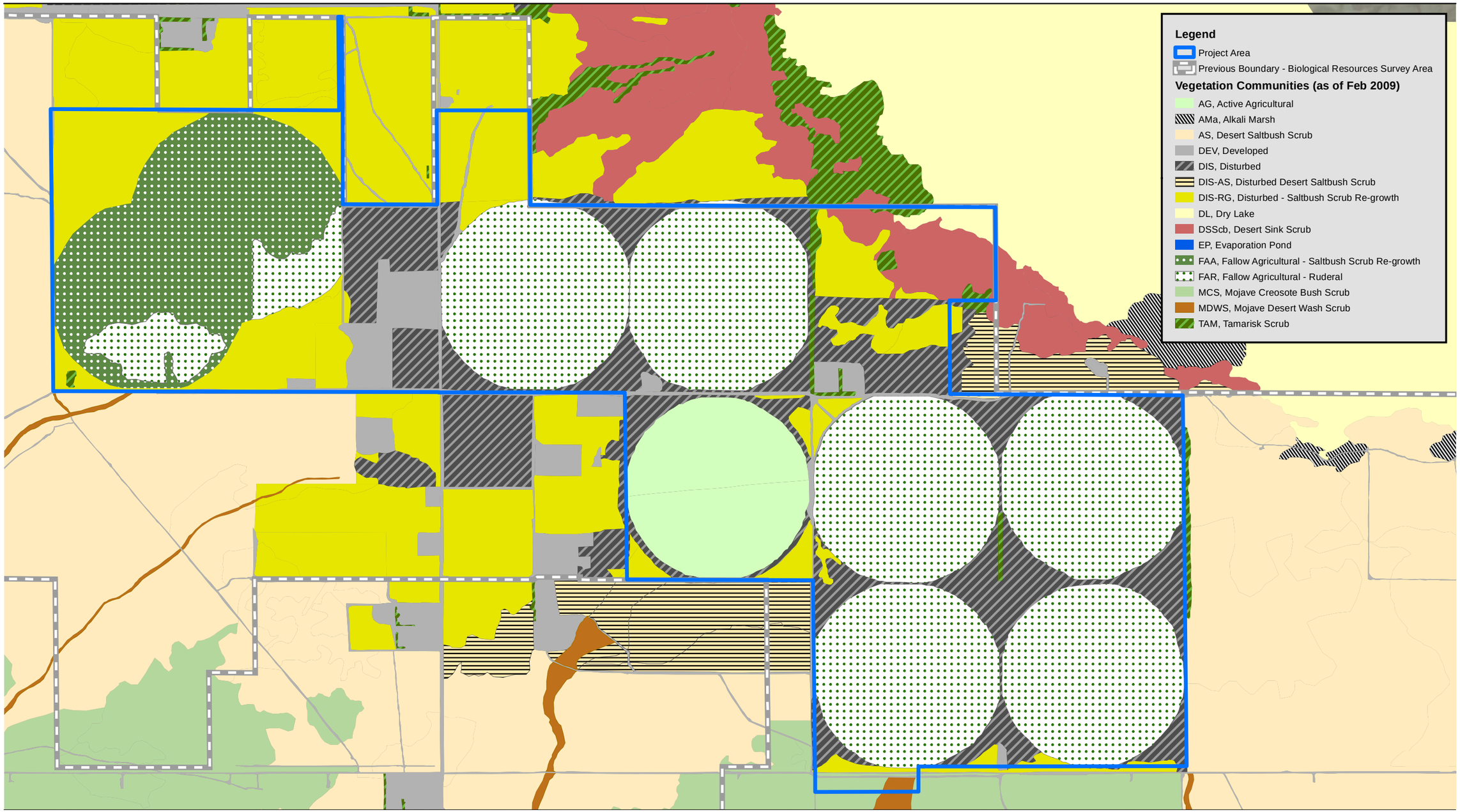
Source: EDAW 2008; NAIP 2005; Mojave Solar, LLC 2009

1,375 687.5 0 1,375 Feet

Scale: 1 = 16,500; 1 inch = 1,375 feet

Figure 3
Project Footprint

Path: P:\2008\08080191 Harper Lake Abengoa AFC\6.0 GIS\6.2 Project Directory\6.2.5 Layout\BIO\WETLANDS\JDR_figures\fig 3_Project_footprint.mxd, 06/19/09, AugelloP



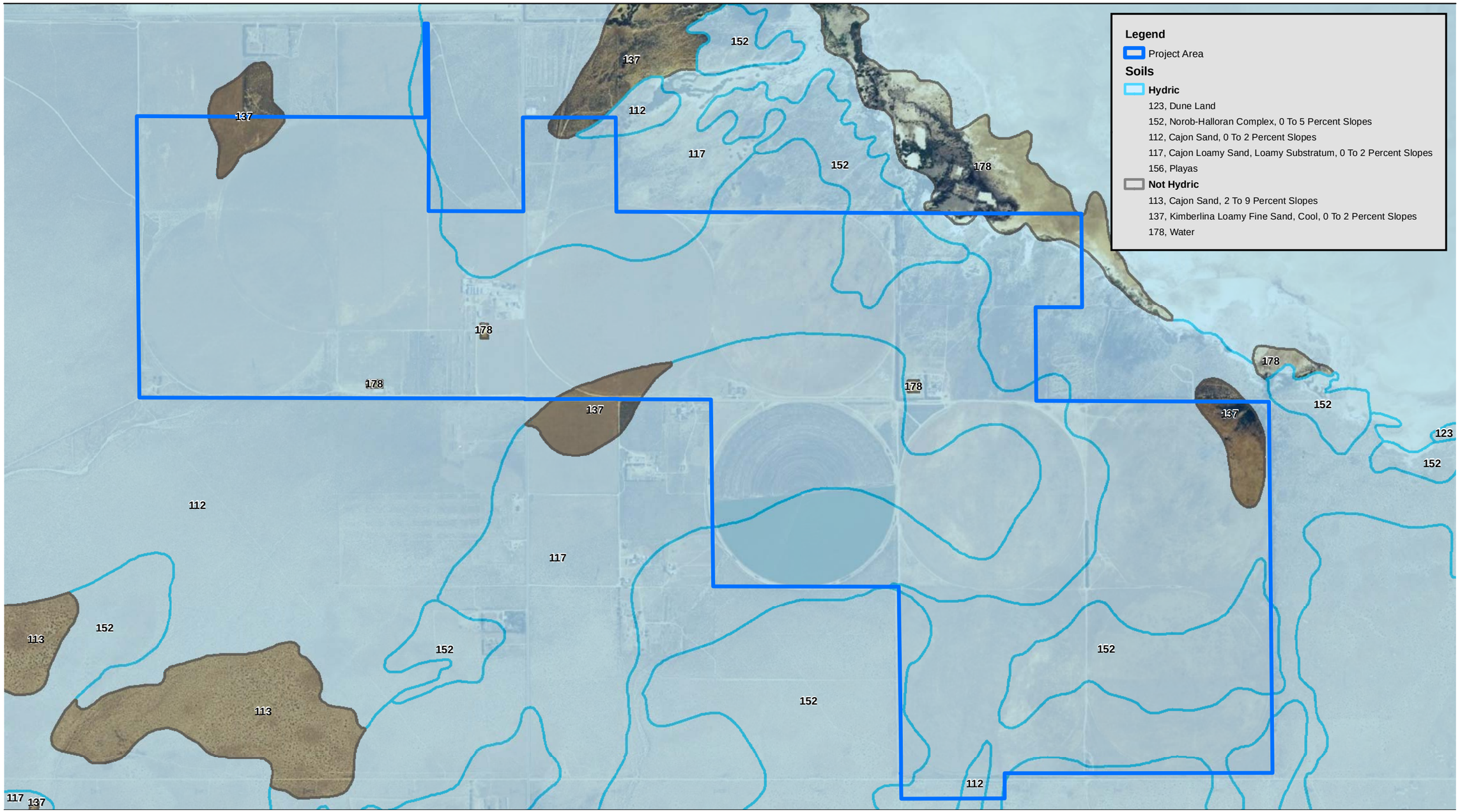
Source: EDAW 2008; NAIP 2005; Mojave Solar, LLC 2009

1,375 687.5 0 1,375 Feet

Scale: 1 = 16,500; 1 inch = 1,375 feet

Figure 4
Vegetation Communities

Path: P:\2008\08080191 Harper Lake Abengoa AFC\6.0 GIS\6.2 Project Directory\6.2.5 Layout\BIO\WETLANDS\JDR_figures\fig 4 VegCom_JDR.mxd, 06/23/09, AugelloP



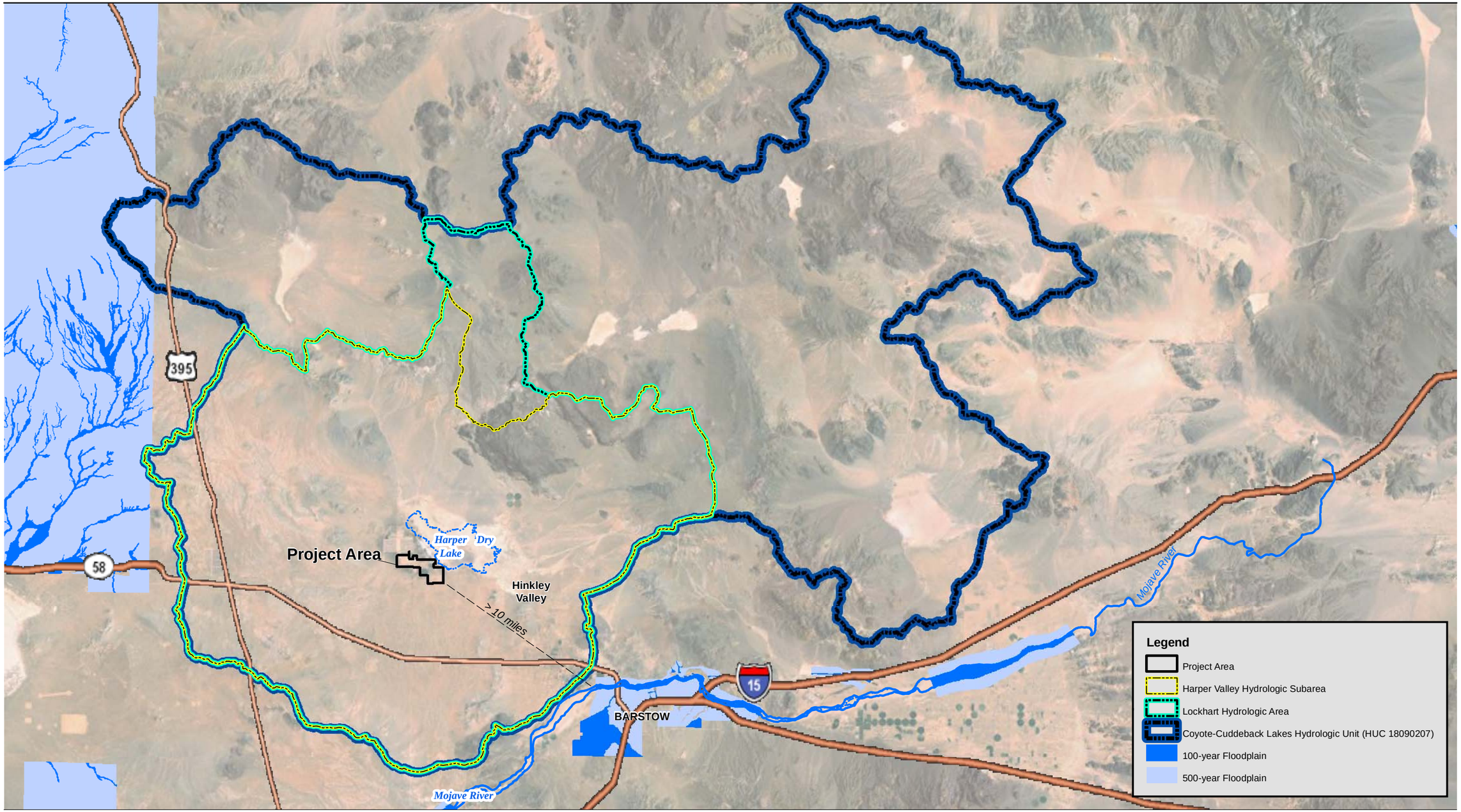
Source: EDAW 2008; NAIP 2005; Mojave Solar, LLC 2009; SSURGO 2007

1,375 687.5 0 1,375 Feet

Scale: 1 = 16,500; 1 inch = 1,375 feet

Figure 5
Soils

Path: P:\2008\08080191 Harper Lake Abengoa AFC\6.0 GIS\6.2 Project Directory\6.2.5 Layout\BIO\WETLANDS\JDR_figures\fig 5_Soils.mxd, 06/23/09, AugelloP



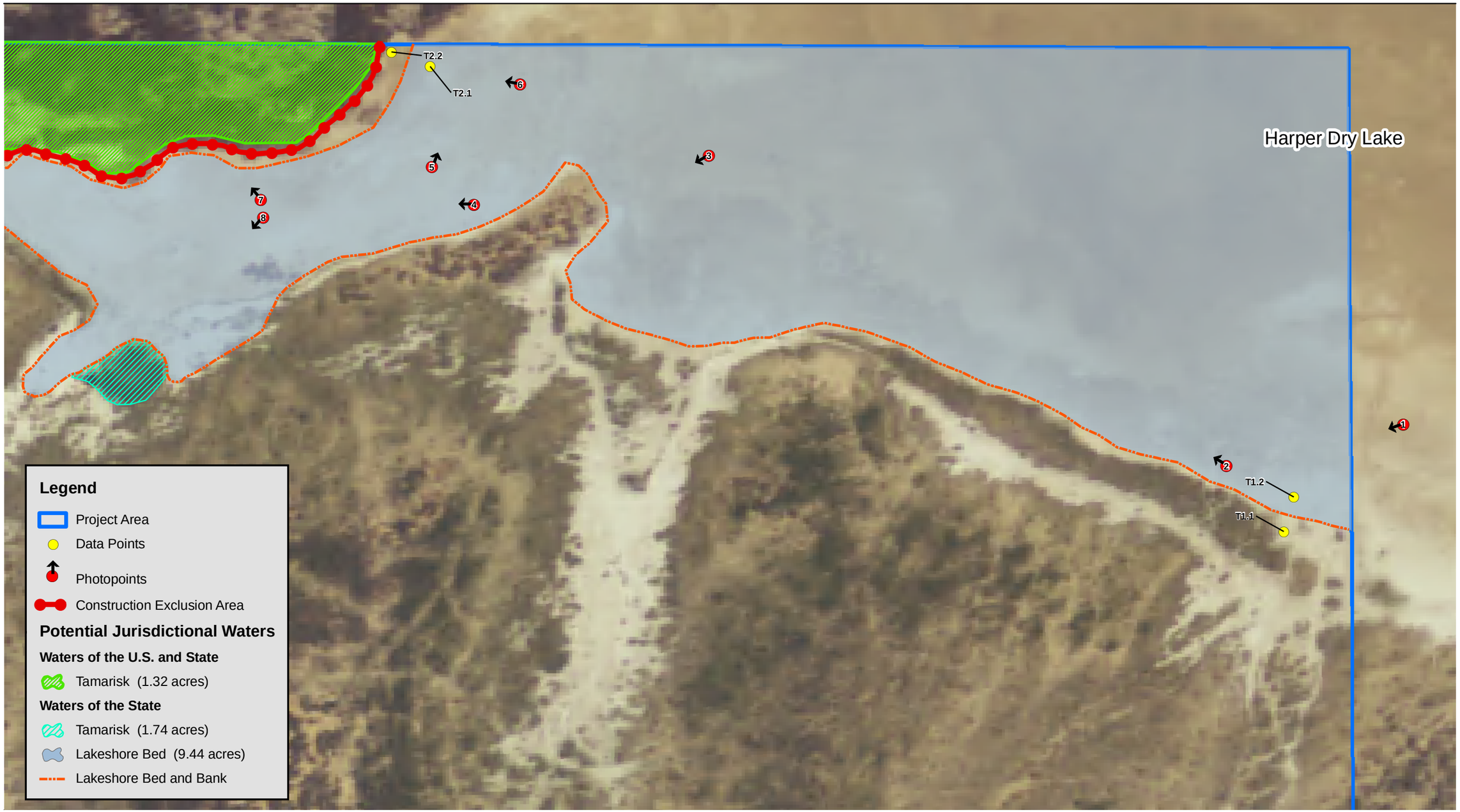
Source: ESRI 2009; NAIP 2005; California Interagency Watershed Mapping Committee 2007

6.3 3.15 0 6.3 Miles

Scale: 1 = 400,000; 1 inch = 6.3 mile(s)

Figure 6
Hydrologic Unit and Subarea

Path: P:\2008\08080191 Harper Lake Abengoa AFC\6.0 GIS\6.2 Project Directory\6.2.5 Layout\BIO\WETLANDS\JDR_figures\fig 6_HarperLake_JD.mxd, 06/23/09, AugelloP



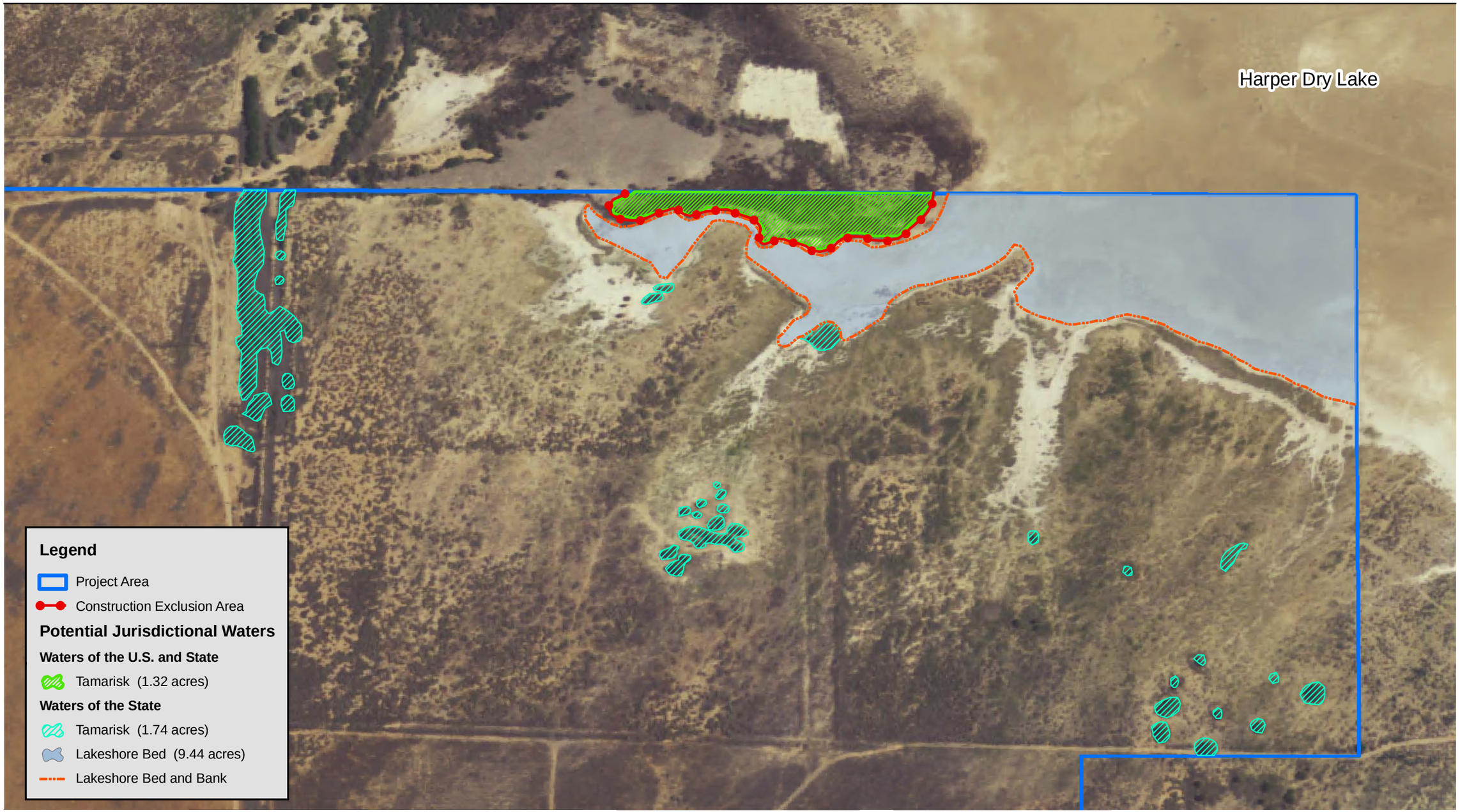
Source: NAIP 2005; Mojave Solar, LLC 2009

100 50 0 100 Feet

Scale: 1 = 1,200; 1 inch = 100 feet

Figure 7
Delineation Data Points and Photopoints

Path: P:\2008\08080191 Harper Lake Abengoa AFC\6.0 GIS\6.2 Project Directory\6.2.5 Layout\BIO\WETLANDS\JDR_figures\fig 9 Photopoints.mxd, 06/18/09, AugelloP



Source: NAIP 2005; Mojave Solar, LLC 2009

200 100 0 200 Feet

Scale: 1 = 2,400; 1 inch = 200 feet

Figure 8
Potential Jurisdictional Waters of the U.S. and State

Path: P:\2008\08080191 Harper Lake Abengoa AFC\6.0 GIS\6.2 Project Directory\6.2.5 Layout\BIO\WETLANDS\JDR_figures\fig 7 jurisdictional waters.mxd, 08/17/09, LeeJ

Photograph 1 - Looking southwest at an area adjacent to the shoreline, which supports desert saltbush scrub intermixed with desert sink scrub vegetation.

Photograph 2 - Looking northwest at the shoreline of Harper Dry Lake.

Figure 9
Representative Photographs 1 and 2

Photograph 3 - Looking southwest from lakebed toward upland desert sink scrub habitat. Note scattered tamarisk.

Photograph 4 - Looking west at shoreline boundary of Harper Dry Lake. Note desert saltbush scrub at shoreline intermixed with desert sink scrub.

Figure 10
Representative Photographs 3 and 4

Photograph 5 - Looking north toward the relictual marsh. Note the heavy salt crust evident within the lakebed.

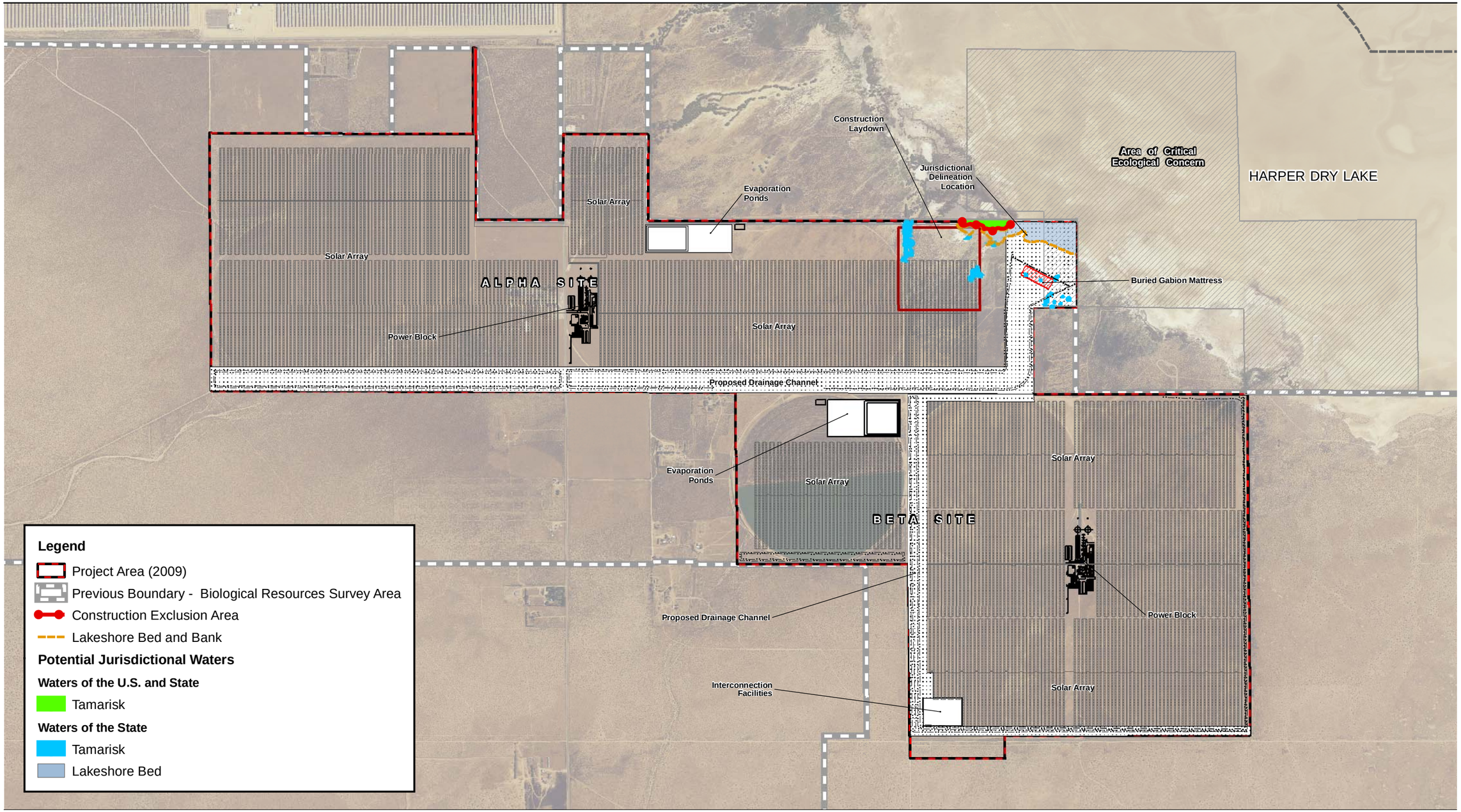
Photograph 6 - Looking west at datapoints T2.1 and T2.2 along the relict marsh boundary.

Figure 11
Representative Photographs 5 and 6

Photograph 7 - Looking west at the lakebed with relict freshwater marsh to the right. Note the few remaining living tamarisk.

Photograph 8 - Looking southwest across the lakebed toward the upland boundary. Note the living tamarisk in the background.

Figure 12
Representative Photographs 7 and 8



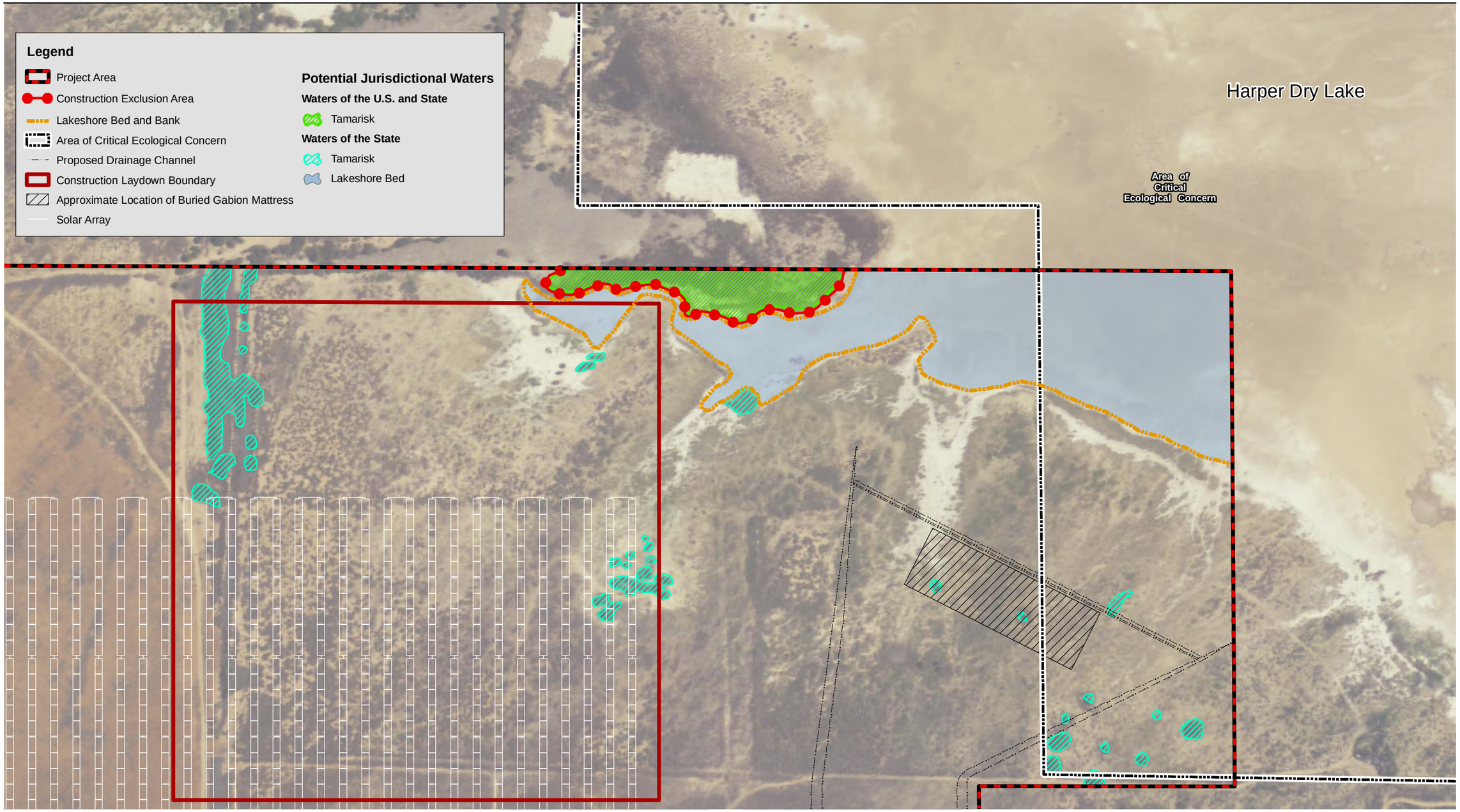
Source: NAIP 2005; Mojave Solar, LLC 2009

1,500 750 0 1,500 Feet

Scale: 1 = 18,000; 1 inch = 1,500 feet

Figure 13
Jurisdictional Delineaton and Plant Site Details

Path: P:\2008\08080191 Harper Lake Abengoa AFC\6.0 GIS\6.2 Project Directory\6.2.5 Layout\BIO\WETLANDS\JDR_figures\juris_delin_fac_details_full_11x17.mxd, 08/17/09, LeeJ



Source: NAIP 2005; Mojave Solar, LLC 2009

250 125 0 250 Feet

Scale: 1 = 3,000; 1 inch = 250 feet

Figure 14
Jurisdictional Delineation Detail and Plant Site

Path: P:\2008\08080191 Harper Lake Abengoa AFC\6.0 GIS\6.2 Project Directory\6.2.5 Layout\BIO\WETLANDS\JDR_figures\juris_delin_fac_details1.mxd, 08/17/09, LeeJ

ATTACHMENT B

WETLAND DETERMINATION
DATA FORMS – ARID WEST REGION

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Mojave Solar One | City/County: N/A/San Bernardino | Sampling Date: 04-14-09

Applicant/Owner: Mojave Solar, LLC | State: CA | Sampling Point: T1.1

Investigator(s): J. Zinn | Section, Township, Range: S28 11N 4W

Landform (hillslope, terrace, etc.): Desert lake/sink | Local relief (concave, convex, none): Convex | Slope (%): 0

Subregion (LRR): C - Mediterranean California | Lat: 35.017696 | Long: -117.307155 | Datum: NAD83

Soil Map Unit Name: Cajon Loamy Sand, Loamy Substratum, 0 To 2 Percent Slopes | NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation [X] Soil [ ] or Hydrology [X] significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ( )	No (●)
Hydric Soil Present?	Yes (●)	No ( )
Wetland Hydrology Present?	Yes ( )	No (●)

Is the Sampled Area within a Wetland? Yes ( ) No (●)

Remarks: Datapoint taken at edge of sparsely vegetated lakeshore. Refer to Figure 10, Photographs 1 and 2 in Jurisdictional Delineation Report to observe general area of investigation.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Bassia hyssopifolia*	15	Yes	FAC
2. *Suaeda moquinii*	10	Yes	Not Listed
3. *Atriplex confertifolia*	10	No	UPL
4. *Salsola tragus*	5	No	UPL
5. *Ambrosia acanthicarpa*	5	No	UPL
6.			
7.			
8.			
Total Cover:	45 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 55 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species	15	x 3 =	45
FACU species		x 4 =	0
UPL species	30	x 5 =	150
Column Totals:	45 (A)		195 (B)

Prevalence Index = B/A = 4.33

Hydrophytic Vegetation Indicators:

- (●) Dominance Test is >50%
- (●) Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ( ) No (●)

Remarks: Although not listed Suaeda moquinii equally likely to occur in wetlands or non wetlands (USFWS National Wetlands Inventory 1997). Desert sink scrub is heavily intermixed with desert saltbush scrub at edge of Harper Dry Lake.

SOIL

Sampling Point: T1.1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR 6/4	100					Loamy sand	Loose dune formation

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks: The mapped soil is Cajon Loamy Sand, Loamy Substratum, 0 To 2 Percent Slopes which listed as hydric by the NRCS National List of Hydric Soils. This soil presents no hydric field indicators present as outlined by the NTCHS Field Indicators of Hydric Soils in the United States. Guidance for soil lacking hydric indicators is found in the 2008 Arid West Region (Version 2.0) Supplement Chapter 3, page 27 and states that 'a soil that meets the definition of a hydric soil is hydric whether or not it exhibits indicators'.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Thin Muck Surface (C7)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ◉ No ○ Depth (inches): Unknown

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Agricultural operations (which provided surface water input from runoff) have ceased for over a decade. No wetland hydrology indicators are present at the point of investigation.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Mojave Solar One | City/County: N/A/San Bernardino | Sampling Date: 04-14-09

Applicant/Owner: Mojave Solar, LLC | State: CA | Sampling Point: T1.2

Investigator(s): J. Zinn | Section, Township, Range: S28 11N 4W

Landform (hillslope, terrace, etc.): Desert lake/sink | Local relief (concave, convex, none): Concave | Slope (%): 0

Subregion (LRR): C - Mediterranean California | Lat: 35.017696 | Long: -117.307155 | Datum: NAD83

Soil Map Unit Name: Cajon Loamy Sand, Loamy Substratum, 0 To 2 Percent Slopes | NWI classification: L2USA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation [X] Soil [ ] or Hydrology [X] significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ( )	No (●)	
Hydric Soil Present?	Yes (●)	No ( )	**Is the Sampled Area within a Wetland?** Yes ( ) No (●)
Wetland Hydrology Present?	Yes (●)	No ( )	

Remarks: Datapoint taken within unvegetaed bed of Harper Dry Lake. Refer to Figure 10, Photographs 2 and 3 in the Jurisdictional Delineation Report to observe general area of investigation.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	%		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 100% % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	(A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- [ ] Dominance Test is >50%
- [ ] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ( ) No (●)

Remarks: Point of investigation is devoid of vegetation.

SOIL

Sampling Point: T1.2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-2	N/C	100					Salt crust	Lake bed
2-4	10YR 6/6	100					Loamy sand	Lake bed
4-20	7.5 YR 6/8	100					Silty clay	Lake bed

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks: The mapped soil is Cajon Loamy Sand, Loamy Substratum, 0 To 2 Percent Slopes which listed as hydric by the NRCS National List of Hydric Soils. This soil presents no hydric field indicators present as outlined by the NTCHS Field Indicators of Hydric Soils in the United States and this data form. Guidance for soil lacking hydric indicators is found in the 2008 Arid West Region (Version 2.0) Supplement Chapter 3, page 27 and states that 'a soil that meets the definition of a hydric soil is hydric whether or not it exhibits indicators'.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☒ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Thin Muck Surface (C7)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ◉ No ○ Depth (inches): Unknown

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Agricultural operations (which provided surface water input from runoff) have ceased for over a decade. However, there is a developed salt crust observed throughout the point of investigation.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Mojave Solar One | City/County: N/A/San Bernardino | Sampling Date: 04-14-09

Applicant/Owner: Mojave Solar, LLC | State: CA | Sampling Point: T2.1

Investigator(s): J. Zinn | Section, Township, Range: S28 11N 4W

Landform (hillslope, terrace, etc.): Desert lake/sink | Local relief (concave, convex, none): Concave | Slope (%): 0

Subregion (LRR): C - Mediterranean California | Lat: 35.017793 | Long: -117.307107 | Datum: NAD 83

Soil Map Unit Name: Water | NWI classification: PEMF

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation [X] Soil [X] or Hydrology [X] significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ( )	No (●)	
Hydric Soil Present?	Yes (●)	No ( )	**Is the Sampled Area within a Wetland?** Yes (●) No ( )
Wetland Hydrology Present?	Yes (●)	No ( )	

Remarks: Refer to Figure 12, Photographs 5 and 6 and Figure 13, Photographs 7 and 8 in the Jurisdictional Delineation Report to observe datapoint and general area of investigation.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	%		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 100% | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	(A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- [ ] Dominance Test is >50%
- [ ] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ( ) No (●)

Remarks: Point of investigation is devoid of vegetation.

SOIL

Sampling Point: T2.1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	N/C	100					Salt crust	Lake bed
2-20	7.5YR 5/8	100					Silty clay	Lake bed

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks: Although at this point of investigation the soil unit is mapped as "Water" which is not listed as hydric by the NRCS National List of Hydric Soils this datapoint is not currently occupied by water and located next to Cajon Loamy Sand, Loamy Substratum, 0 To 2 Percent Slopes, which is listed as hydric by the NRCS. Guidance for using soil surveys in the arid west region is found in the 2008 Arid West Region (Version 2.0) Supplement: Chapter 3 (Hydric Soil Indicators), page 34, Use of existing soil data; soil surveys, which emphasizes ground-truthing to document the soil survey. It appears that the soil investigated at this point is composed of the Cajon soil series because it meets all characteristics of this soil series. Therefore this soil will be considered hydric by definition.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☒ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Thin Muck Surface (C7)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ◉ No ○ Depth (inches): Unknown

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Agricultural operations (which provided surface water input from runoff) have ceased for over a decade. However, there is a developed salt crust observed throughout the point of investigation.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Mojave Solar One | City/County: N/A/San Bernardino | Sampling Date: 04-14-09

Applicant/Owner: Mojave Solar, LLC | State: CA | Sampling Point: T2.2

Investigator(s): J. Zinn | Section, Township, Range: S28 11N 4W

Landform (hillslope, terrace, etc.): Desert lake/sink | Local relief (concave, convex, none): Convex | Slope (%): 0

Subregion (LRR): C - Mediterranean California | Lat: 35.017793 | Long: -117.307107 | Datum: NAD 83

Soil Map Unit Name: Water | NWI classification: PEMF

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation [X] Soil [X] or Hydrology [X] significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (●)	No ( )	
Hydric Soil Present?	Yes (●)	No ( )	**Is the Sampled Area within a Wetland?** Yes (●) No ( )
Wetland Hydrology Present?	Yes (●)	No ( )	

Remarks: Refer to Figure 12, Photographs 5 and 6 and Figure 13, Photographs 7 and 8 in the Jurisdictional Delineation Report to observe datapoint and general area of investigation.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Tamarix ramosissima*	20	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	20 %		
Herb Stratum			
1. *Schoenoplectus robustus*	60	Yes	OBL
2. *Bassia hyssopifolia*	10	No	FAC
3. *Salsola tragus*	5	No	UPL
4.			
5.			
6.			
7.			
8.			
Total Cover:	75 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 5 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	60	x 1 =	60
FACW species		x 2 =	0
FAC species	30	x 3 =	90
FACU species		x 4 =	0
UPL species	5	x 5 =	25
Column Totals:	95 (A)		175 (B)

Prevalence Index = B/A = 1.84

Hydrophytic Vegetation Indicators:

- [X] Dominance Test is >50%
- [X] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (●) No ( )

Remarks: Tamarisk appear to have established themselves during a wetter period. Tamarisk currently appear not be thriving and in dcline. The large patch of Schoenoplectus robustus is dead and relictual and should not be considered as a functioning marsh community. However, a heavy rain or planned water input would likely reestablish marsh.

SOIL

Sampling Point: T2.2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-20	2.5 YR /3	100					Loamy sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
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- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks: Although at this point of investigation the soil unit is mapped as "Water" which is not listed as hydric by the NRCS National List of Hydric Soils this datapoint is not currently occupied by water and located next to Cajon Loamy Sand, Loamy Substratum, 0 To 2 Percent Slopes, which is listed as hydric by the NRCS. Guidance for using soil surveys in the arid west region is found in the 2008 Arid West Region (Version 2.0) Supplement: Chapter 3 (Hydric Soil Indicators), page 34, Use of existing soil data; soil surveys, which emphasizes ground-truthing to document the soil survey. It appears that the soil investigated at this point is composed of the Cajon soil series because it meets all characteristics of this soil series. Therefore this soil will be considered hydric by definition. Additionally, the simultaneous presence of hydrophytic vegetation and wetland hydrology are present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☒ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Thin Muck Surface (C7)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

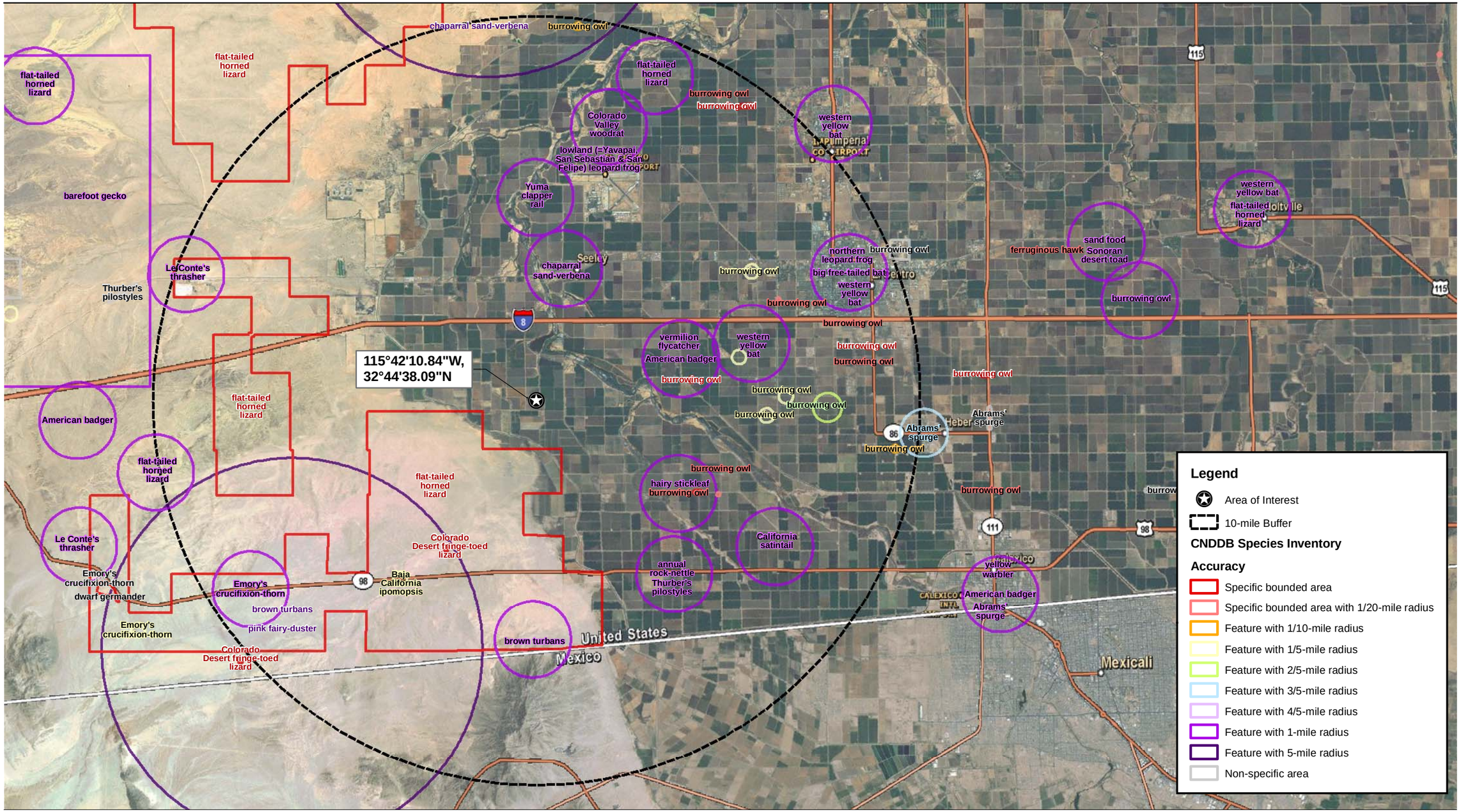
Water Table Present? Yes ◉ No ○ Depth (inches): Unknown

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Agricultural operations (which provided surface water input from runoff) have ceased for over a decade. However, there is a developed salt crust observed throughout the point of investigation.



Source: ESRI 2007; DFG 2009

2.5 1.25 0 2.5 Miles

Scale: 1 = 160,000; 1 inch = 2.5 mile(s)

CNDDB Species Inventory

Project Name

Path: P:\2008\08080191 Harper Lake Abengoa AFC\6.0 GIS\6.2 Project Directory\6.2.5 Layout\Imperial_Valley\CNDDB.mxd, 11/04/09, LeeJ

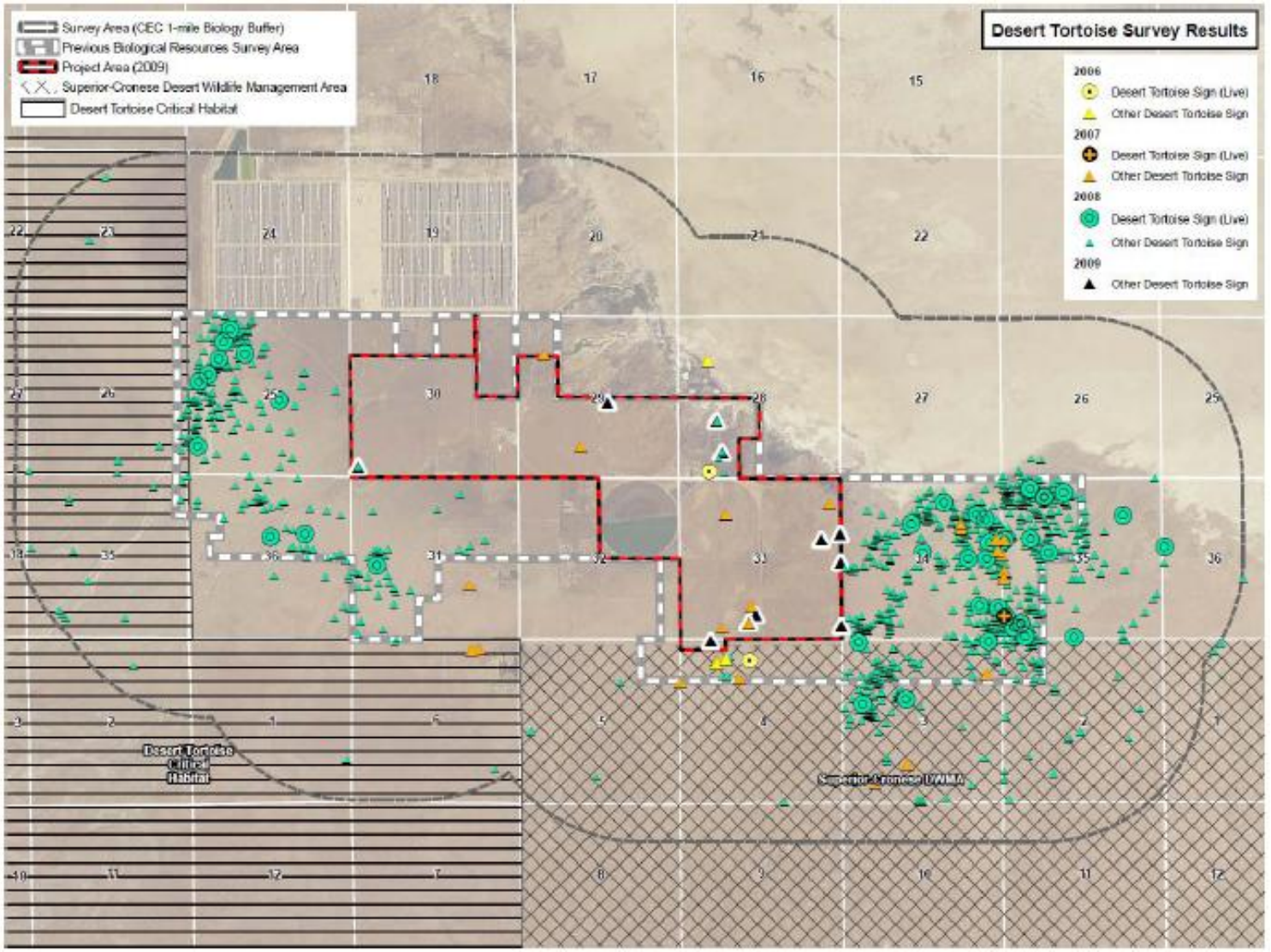
Mojave Solar Project

Mojave Solar Project

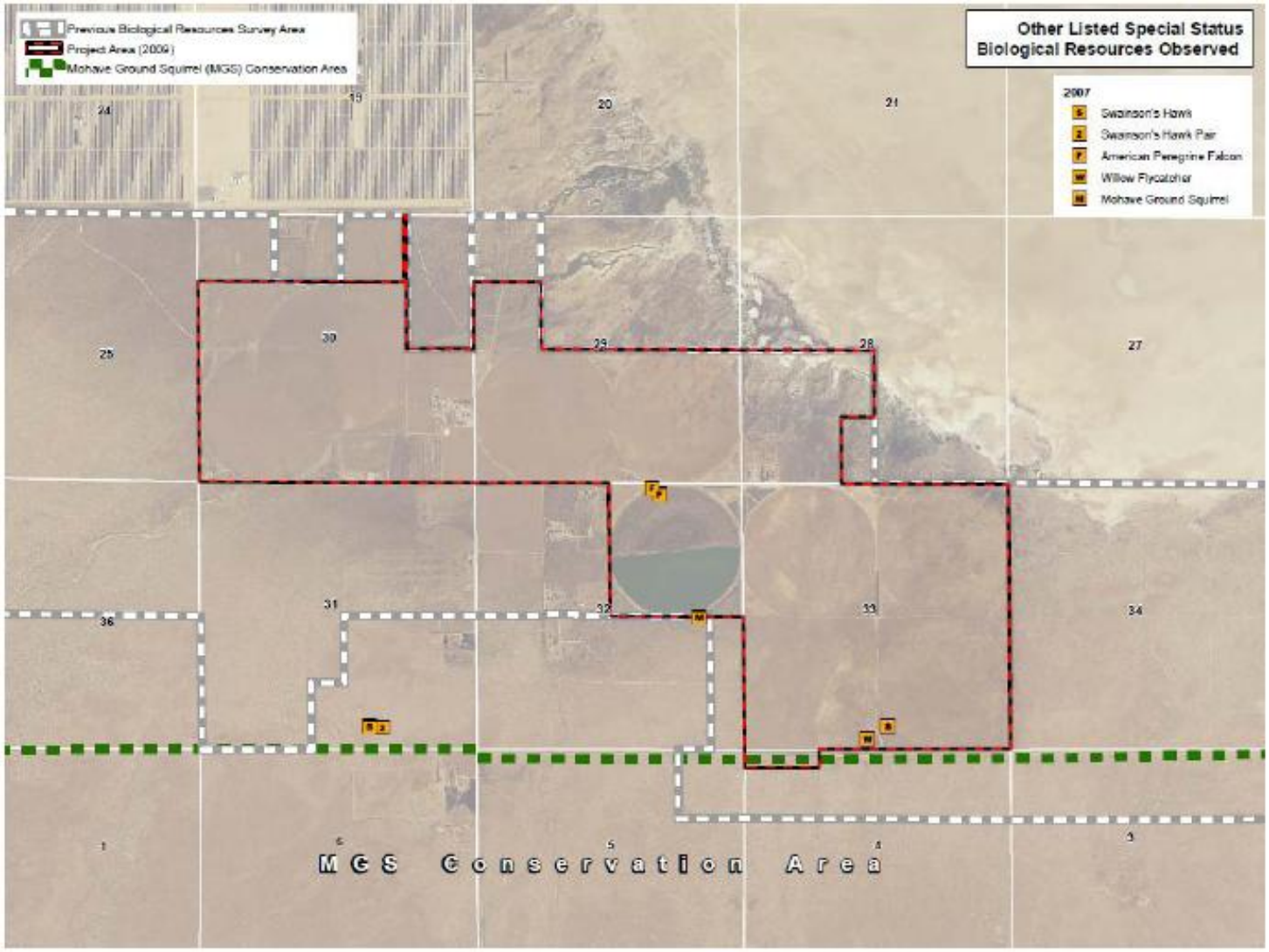
Biological Survey History

- Survey Years: 2006, 2007, 2008, and 2009
- Survey Types: Reconnaissance Level, Habitat Assessment, Focused, Protocol
- Survey Areas: CEC Buffer, Original Project Site, Current Project Site

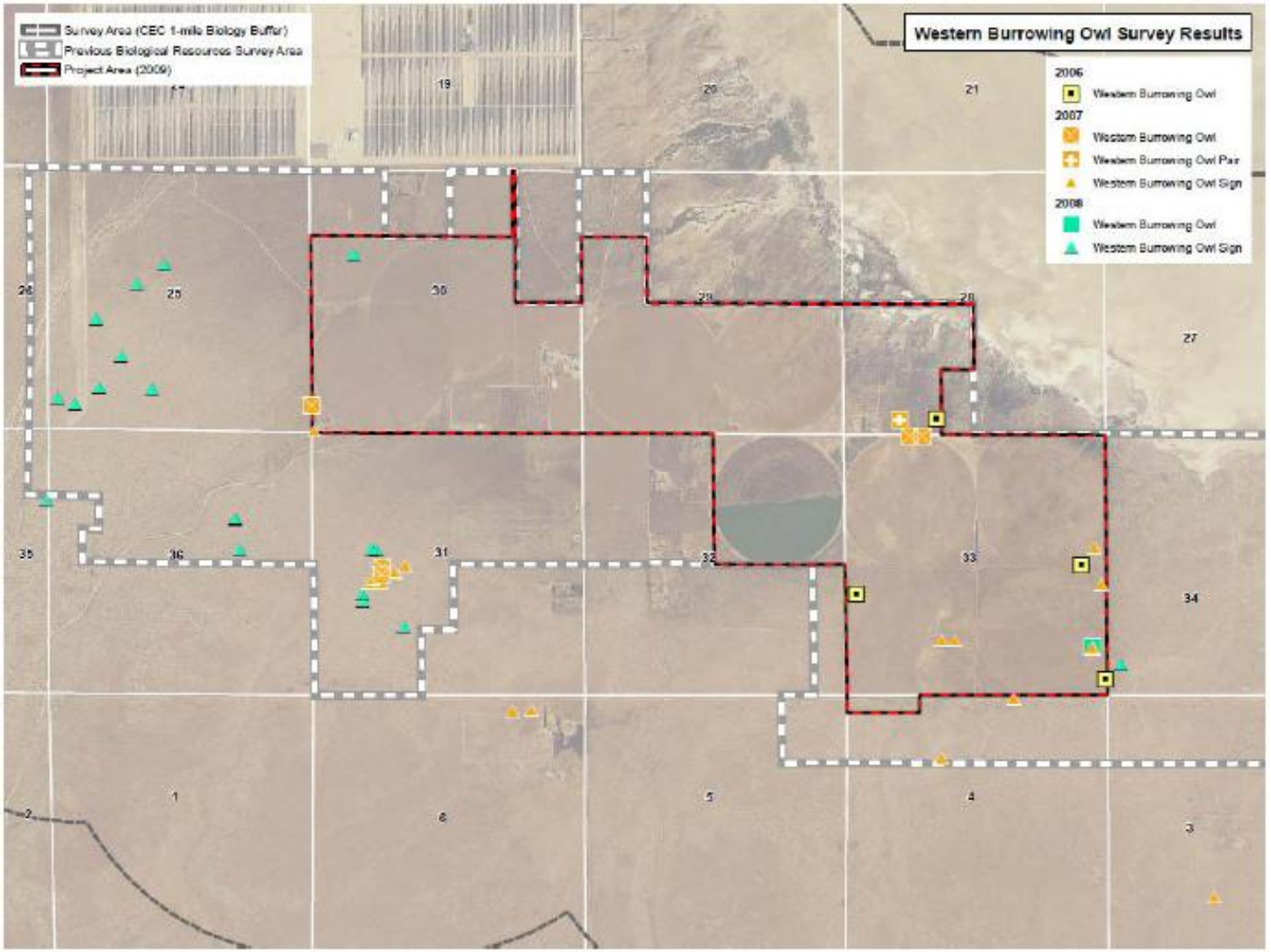
Mojave Solar Project – Desert Tortoise



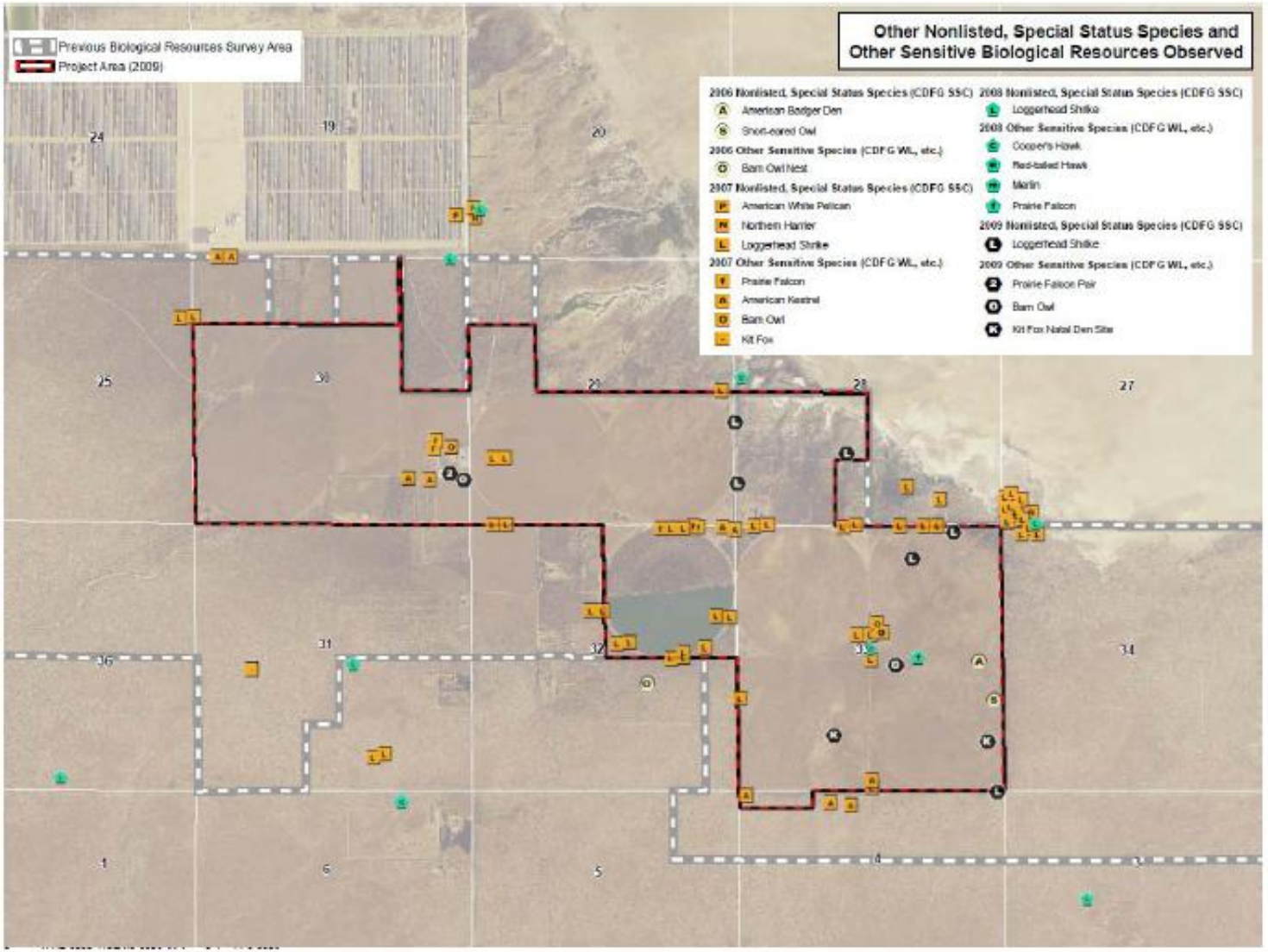
Mojave Solar Project – Other Listed Species



Mojave Solar Project – Western Burrowing Owl



Mojave Solar Project – Other Non-Listed Species

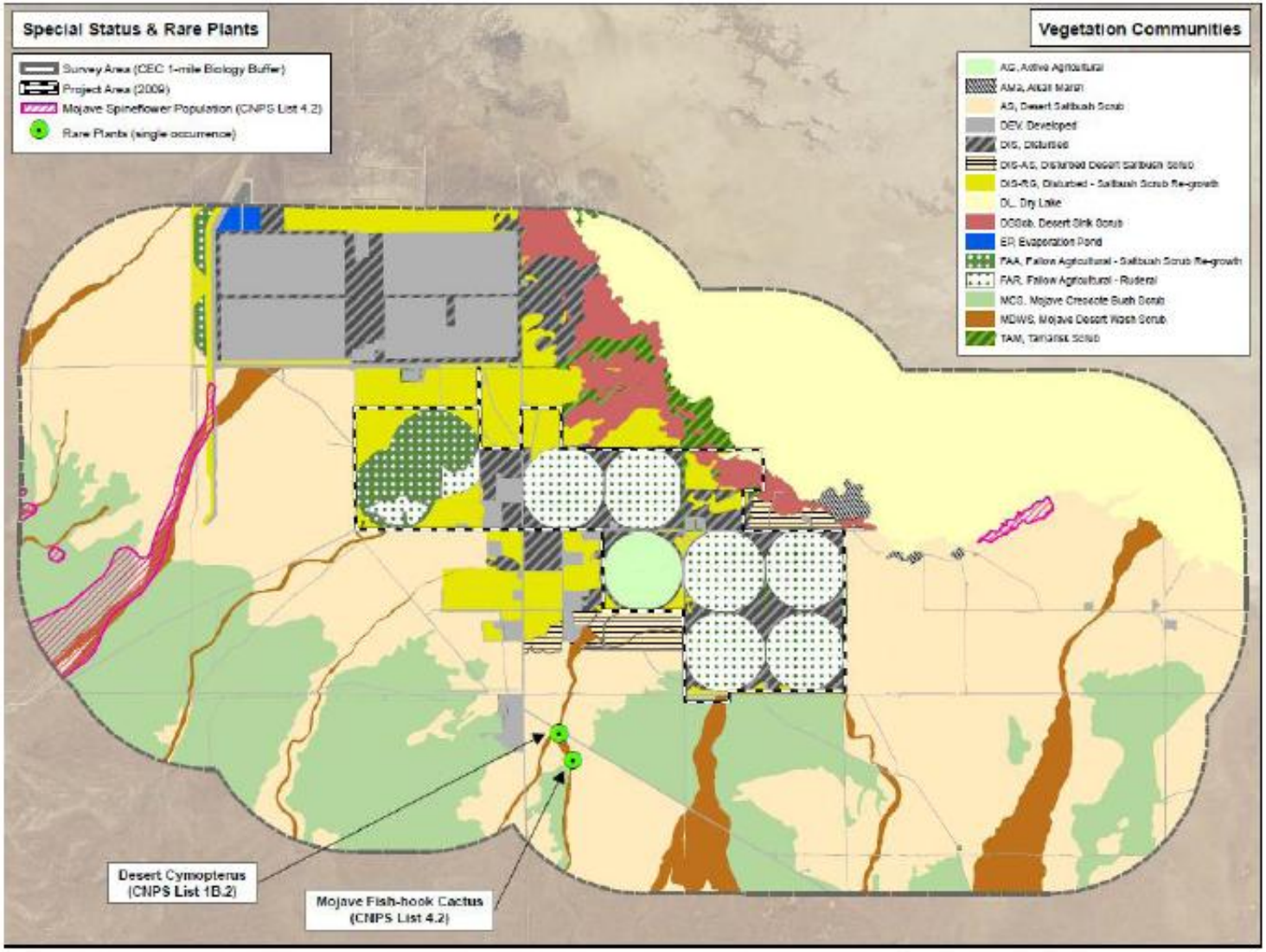


Mojave Solar Project

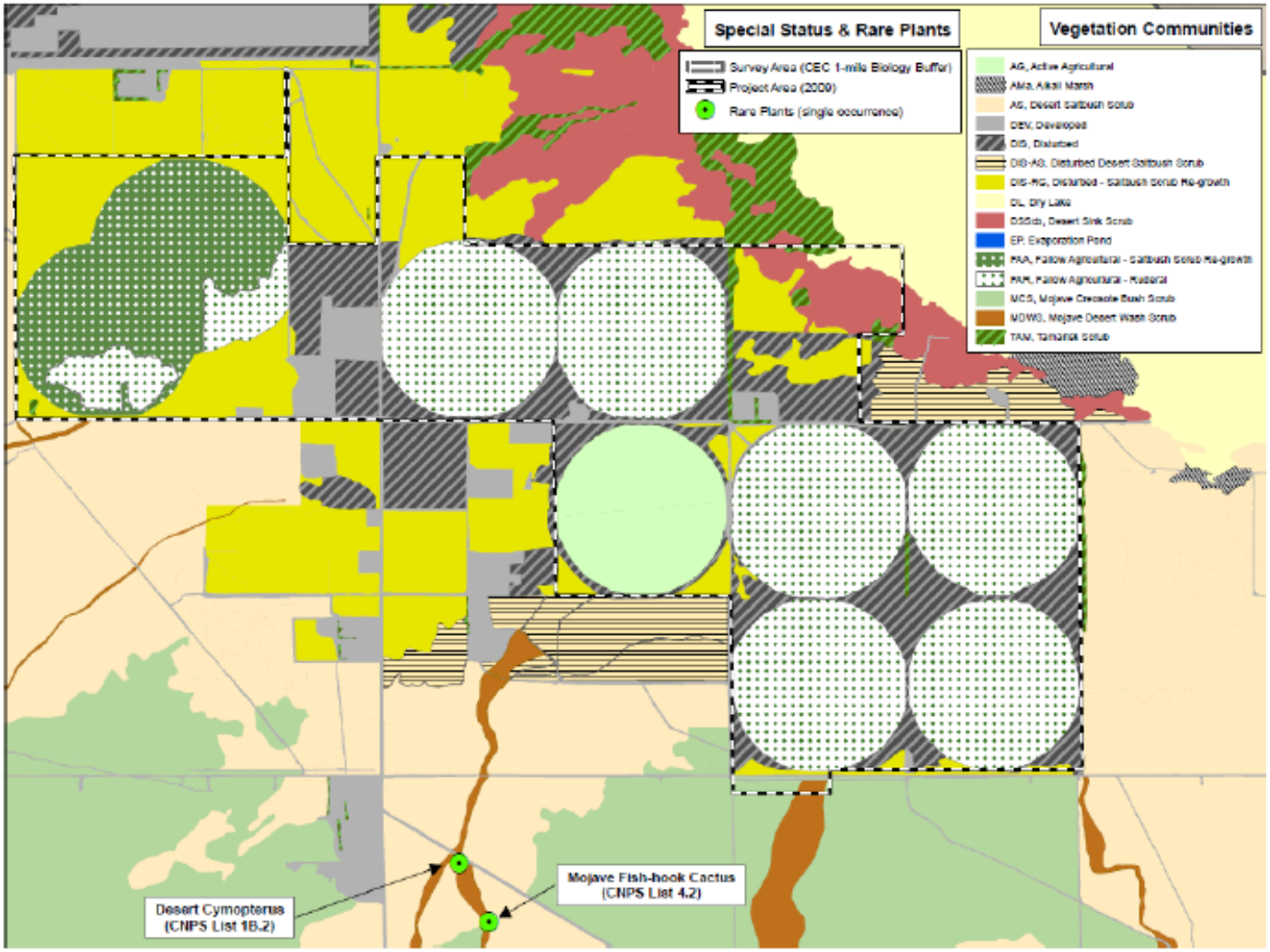
Minimizing Biological Effects

- Desert Tortoise Habitat Assessment
- Mohave Ground Squirrel Habitat Assessment
- Refining the Project Footprint

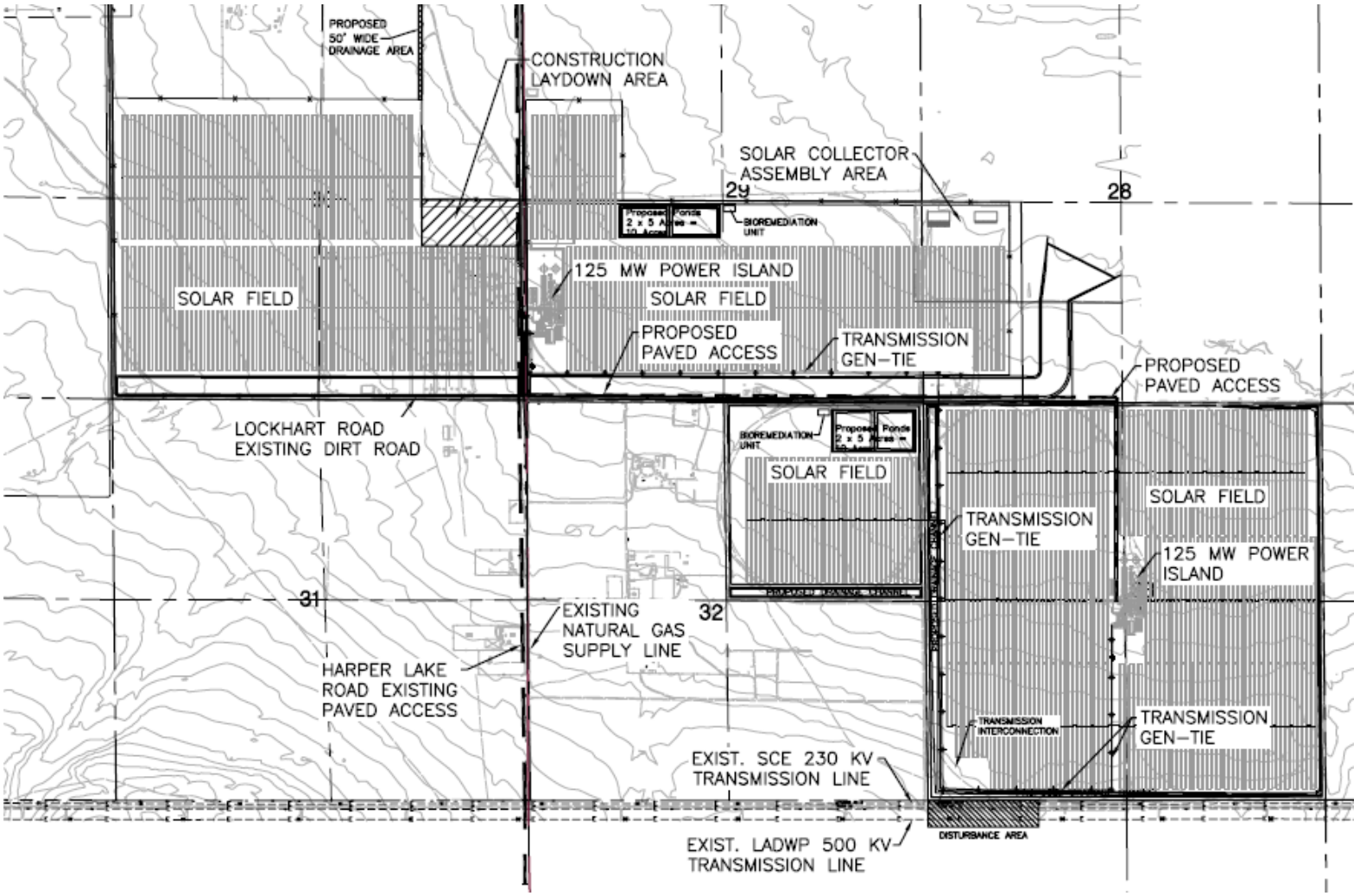
Mojave Solar Project – Vegetation Communities



Mojave Solar Project – Currently Proposed Site



Mojave Solar Project – Proposed Facility Layout



Mojave Solar Project

Potential Habitat Impacts

Desert Tortoise and Mohave Ground Squirrel Habitat

- Total Habitat Impact = 428.43 acres
- Breakdown
  - Desert Saltbush Scrub = 0.63 acre
  - Disturbed Desert Saltbush Scrub = 1.2 acres
  - Disturbed Saltbush Scrub Regrowth = 223.7 acres
  - Fallow Ag-Saltbush Scrub Regrowth = 202.9 acres

Mojave Solar Project

Proposed Impact Avoidance and Minimization Measures

General Measures

- Initial Site Selection and Design to Avoid Sensitive Habitat and Species
- Environmental Resource Protection Plans
- Construction Monitoring

Resource-Specific Measures

- Desert Tortoise Exclusion Fence
- Preconstruction and Clearance Surveys
- Construction Monitoring
- Passive Relocation (BUOW, Kit Fox)
- Raven Monitoring and Control Plan
- Evaporation Pond Management and Monitoring

Mojave Solar Project

Proposed Impact Mitigation and Compensation

Desert Tortoise and Mohave Ground Squirrel

- 0.5 to 1 acre mitigation ratio
- 428.4 acres impacted
- 214.2 acres of compensatory mitigation land to be protected

Western Burrowing Owl

- Per CDFG and CBOC Mitigation Guidance
- Mitigate at a rate of 6.5 to 19.5 acres per presumed pair

Mojave Solar Project

Rationale and Assumptions

Desert Tortoise

- Project area excluded from Designated Critical Habitat and DWMA by the Service and BLM
- Island of former agricultural operations
- Poor to no habitat quality
- 2006, 2007, 2008, and 2009 Surveys: almost no current use
- Project would not add any new type of raven subsidies and would remove existing subsidies
- Positive benefit in removing the existing desert tortoise mortality sink created by agricultural activities
- Connectivity within population not affected

Mojave Solar Project

Rationale and Assumptions

Mohave Ground Squirrel

- Project area outside MGS Conservation Area
- Low diversity of food resources, no resident population
- Species not detected in 2006 and 2007 protocol trapping
- Project will not affect connectivity in adjacent areas
- Occasional dispersal from nearby habitat shown by 2007 observation
- No evidence that occasional transient individuals persist
- Project does not add any new types of raven subsidies
- Positive benefit of removal of mortality sink created by agricultural activities

Mojave Solar Project

Rationale and Assumptions

Western Burrowing Owl

- CDFG and CBOC standardized guidelines
- All mitigation lands are assumed compatible for all species

Mojave Solar Project

Mitigation Site Selection

- Located within the western Mojave Desert
- Contiguous or close to conserved areas
- Contiguous or close to existing populations of DETO, MGS and BUOW that are stable, recovering, or likely to recover
- Provide moderate to good quality habitat for DETO, MGS and BUOW that is equal to or as good as habitat impacted
- Not have a history of intensive recreation, grazing or other uses/disturbances, or invasive species densities that make habitat recovery or restoration infeasible
- Not encumbered by easements or uses that would prevent fencing or management of the site for the benefit of target species
- Site selection coordinated with resource agencies
- Potential sites already identified (Abengoa-owned)

Mojave Solar Project

Questions?

FEDERAL PROCESS	ANTICIPATED TIMING
Applicant files loan application, including environmental report, with the DOE	9/14/09 (done)
DOE reviews loan application to determine if applicant is eligible and financially viable	Currently Ongoing
DOE invites applicant to negotiate the terms and conditions of the loan guarantee, triggering NEPA, FESA Section 7 and other federal processes, applicant submits draft biological assessment to DOE.	2/1/10 or sooner
DOE initiates consultation and coordination with other agencies, including U.S. Fish and Wildlife Service (USFWS)	2/15/10
USFWS formulates biological opinion and incidental take statement in conjunction with DOE (90 days)	5/15/10
Review of draft biological opinion by DOE, Project applicant	6/15/10
Delivery of final biological opinion and incidental take statement to DOE (45 days); end of formal consultation	8/1/10
DOE issues environmental assessment (EA) under NEPA	9/1/10
DOE issues finding of no significant impact (FONSI) under NEPA; DOE loan guarantee term sheet executed.	10/1/10

Mojave Solar Project

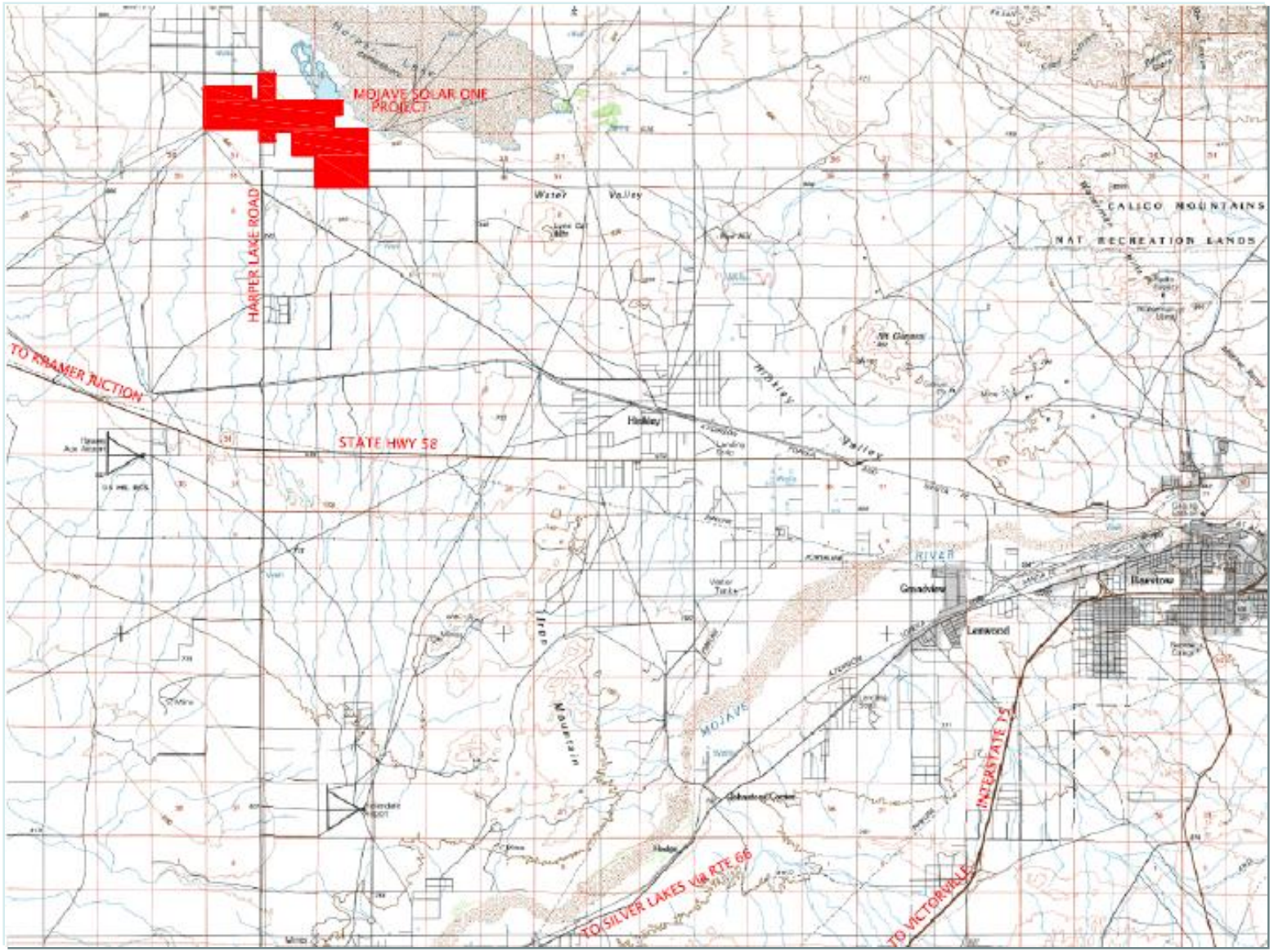
REAT Meeting

California Energy Commission

April 8, 2009

Location Map

Vicinity


MOJAVE SOLAR ONE PROJECT
HARPER LAKE ROAD
TO KRAMER JUNCTION
STATE HWY 58
Water Valley
Hodgey
Hodgey Valley
CALICO MOUNTAINS
NAT RECREATION LANDS
RIVER
Irwin Mountain
MOJAVE
INTERSTATE 15
TO SILVER LAKES VIA RTE 66
TO VICTORVILLE

Project Area Summary

- **Topography**:
  - Slope <1%
- **Solar Insolation:**
  - >7.7 kWh/m^2/day
- **Land:**
  - Privately owned and/or under option by Abengoa Solar
  - Previously disturbed/fallow agricultural land
  - One ¼ section of land still actively farmed
- **Access to Transmission:**
  - Two Major Transmission Lines Abut the Site
    - CAISO/SCE 230 kV Kramer-Coolwater line
    - LADWP Managed 500 kV Mead-Adelanto line
- **Land Use:**
  - Previous Solar Developments in Area
    - Property previously proposed as SEGS XII & XIII in 1990s
    - SEGS VIII & IX (80 MW each) are located just NW of the site

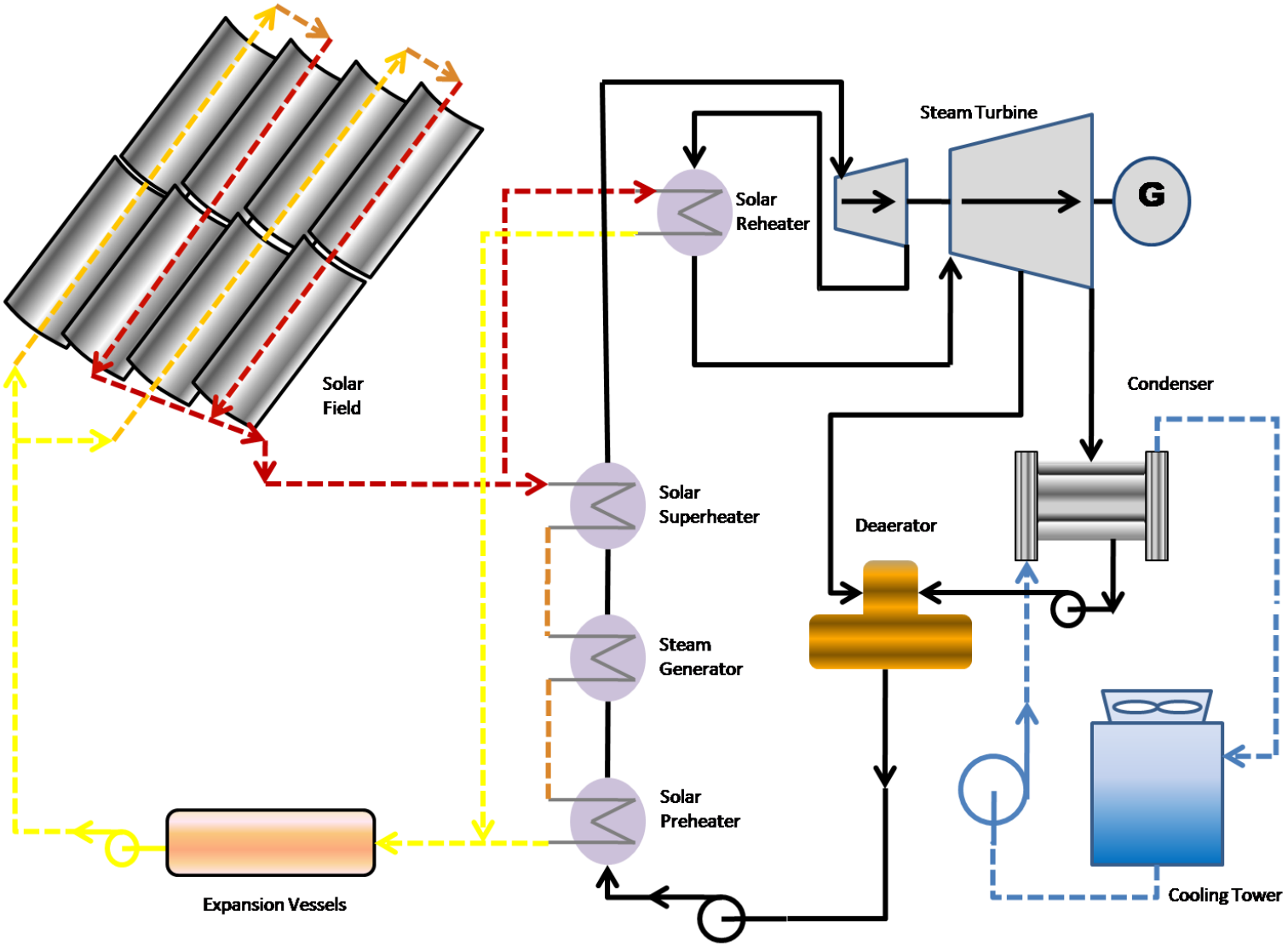
Technical Specifications

- **Land Size**:
  - Approximately 1820 acres for total development
- **Performance**:
  - 2 x 140 MW Steam Turbine Generators
  - 2 x 125 MW net nominal output (capable of 280 MW total output depending on parasitic loads)
  - Approximately 600 GWh net energy produced annually for entire project
- **Solar Equipment:**
  - 2 x 282 parabolic trough collector loops
  - 40 solar modules per loop
- **Cooling:**
  - Mechanical draft wet cooling towers
  - Water supply is adjudicated groundwater (TDS 3600 ppm /Chlorides 1500 ppm)
  - Annual demand is approximately 2,334 AF
- **Auxiliaries:**
  - Diesel driven firewater pump on each power island
  - Diesel driven backup/emergency generator on each power island
  - Natural gas-fired auxiliary boiler on each power island for freeze protection and equipment protection

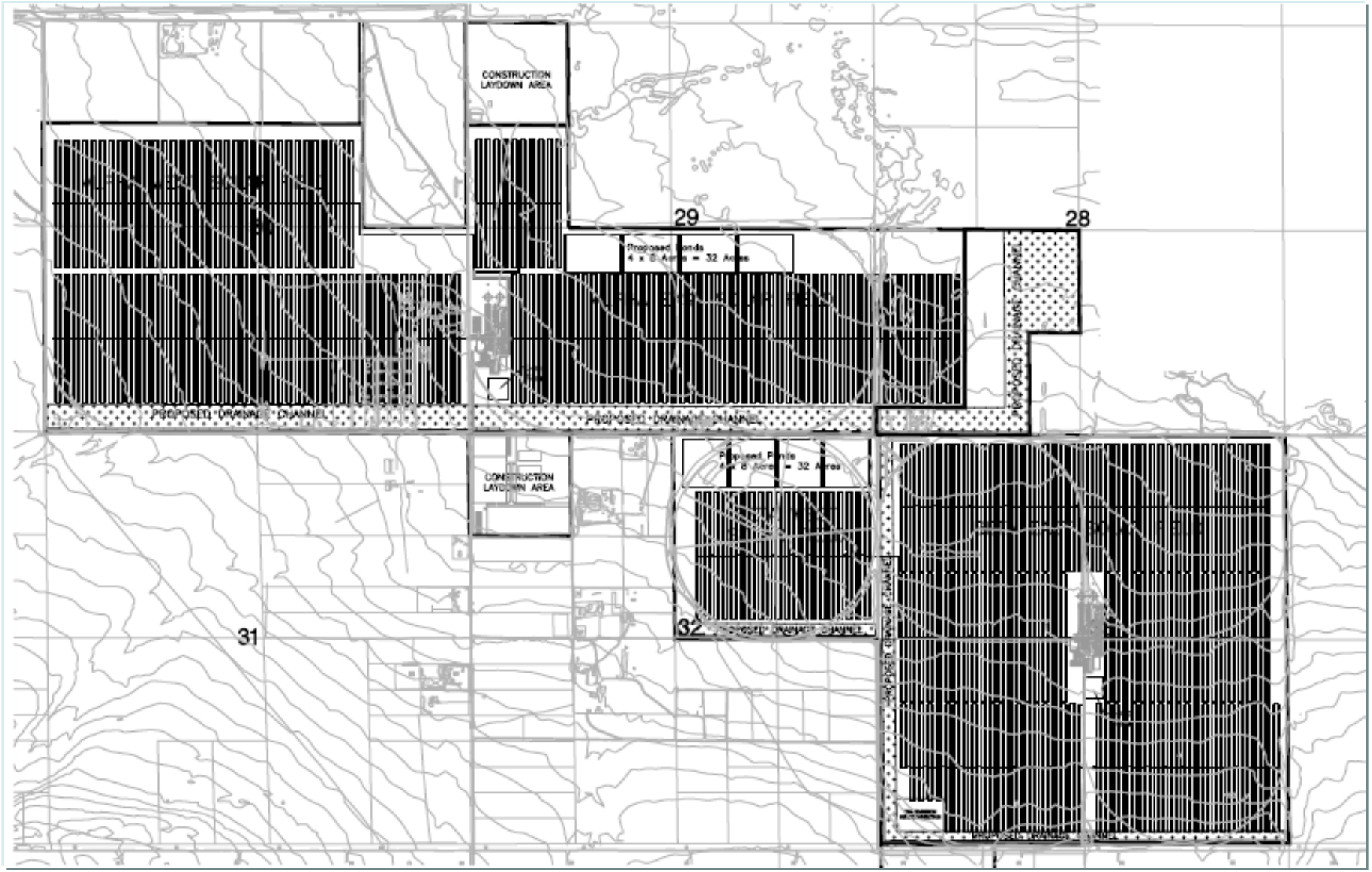
Transmission Status

- **SCE/CAISO (primary)**:
  - 230 kV Transmission line abuts the site
  - Interconnection System Impact Study complete
    - Minimum upgrades required include interconnection substation and gen-tie
    - For 100% deliverability, system-wide improvements are needed
  - Interconnection Facilities Study overdue and anticipated in two weeks
    - Negotiation of LGIA will commence upon receipt of Facilities Study
    - Coordination of engineering and SCE's system-wide permitting will commence with the LGIA
- **LADWP (alternate):**
  - 500 kV Transmission line abuts the site
  - Interconnection System Impact Study complete (draft)
    - Upgrades required include substation and gen-tie
  - Currently no system-wide improvements are needed
  - Interconnection Facilities Study to commence upon finalizing System Impact Study

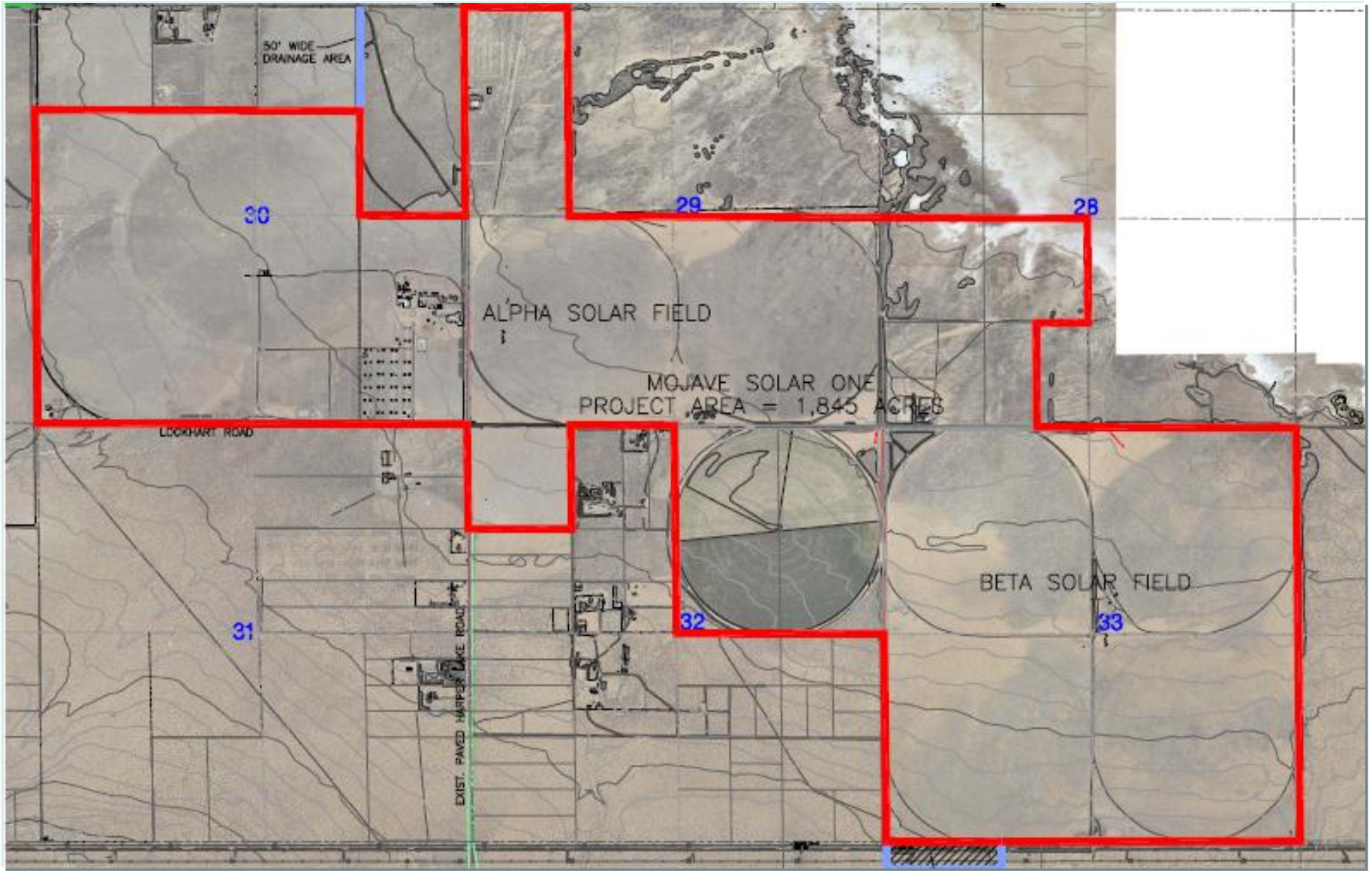
Solar Thermal Process



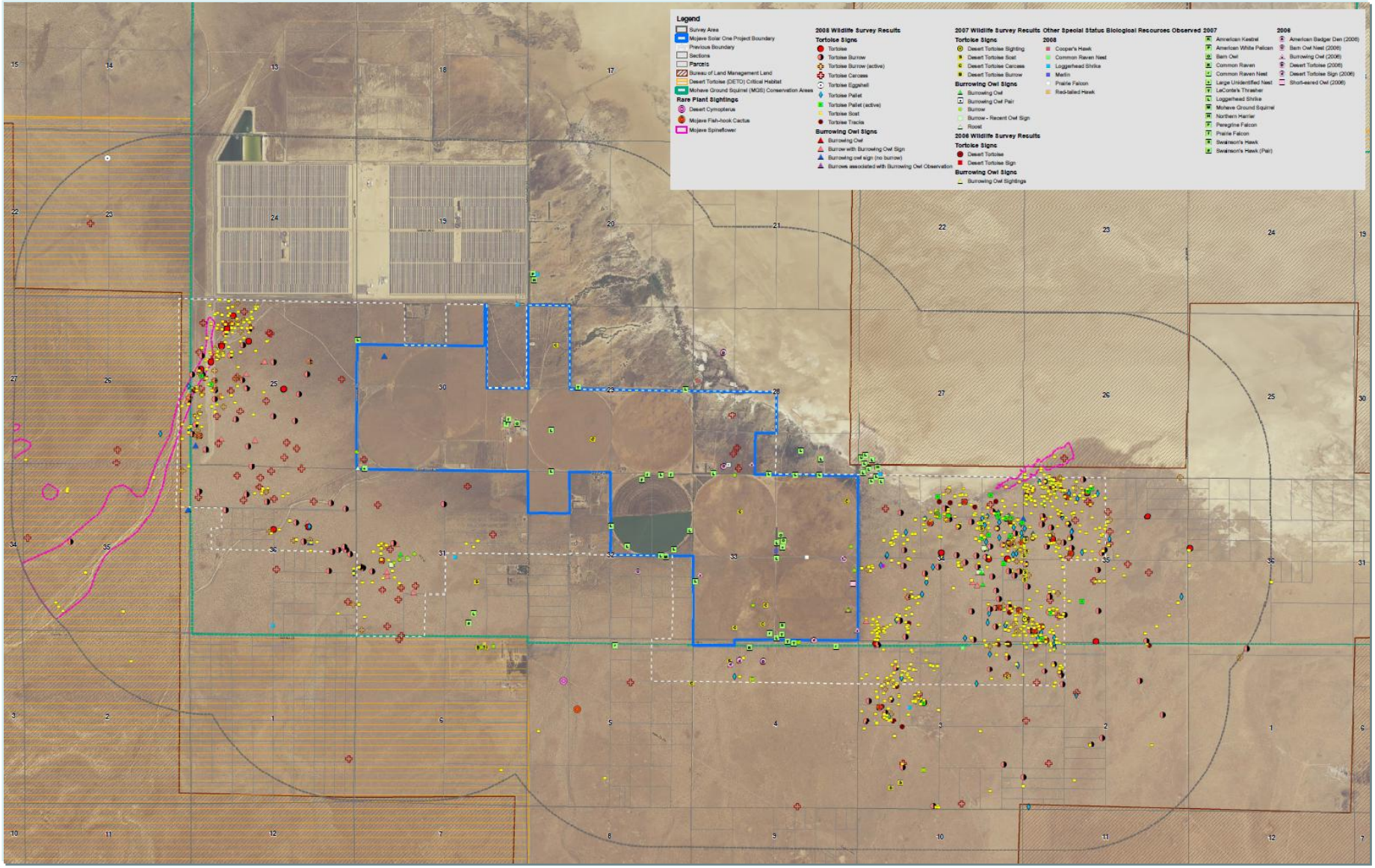
General Arrangement



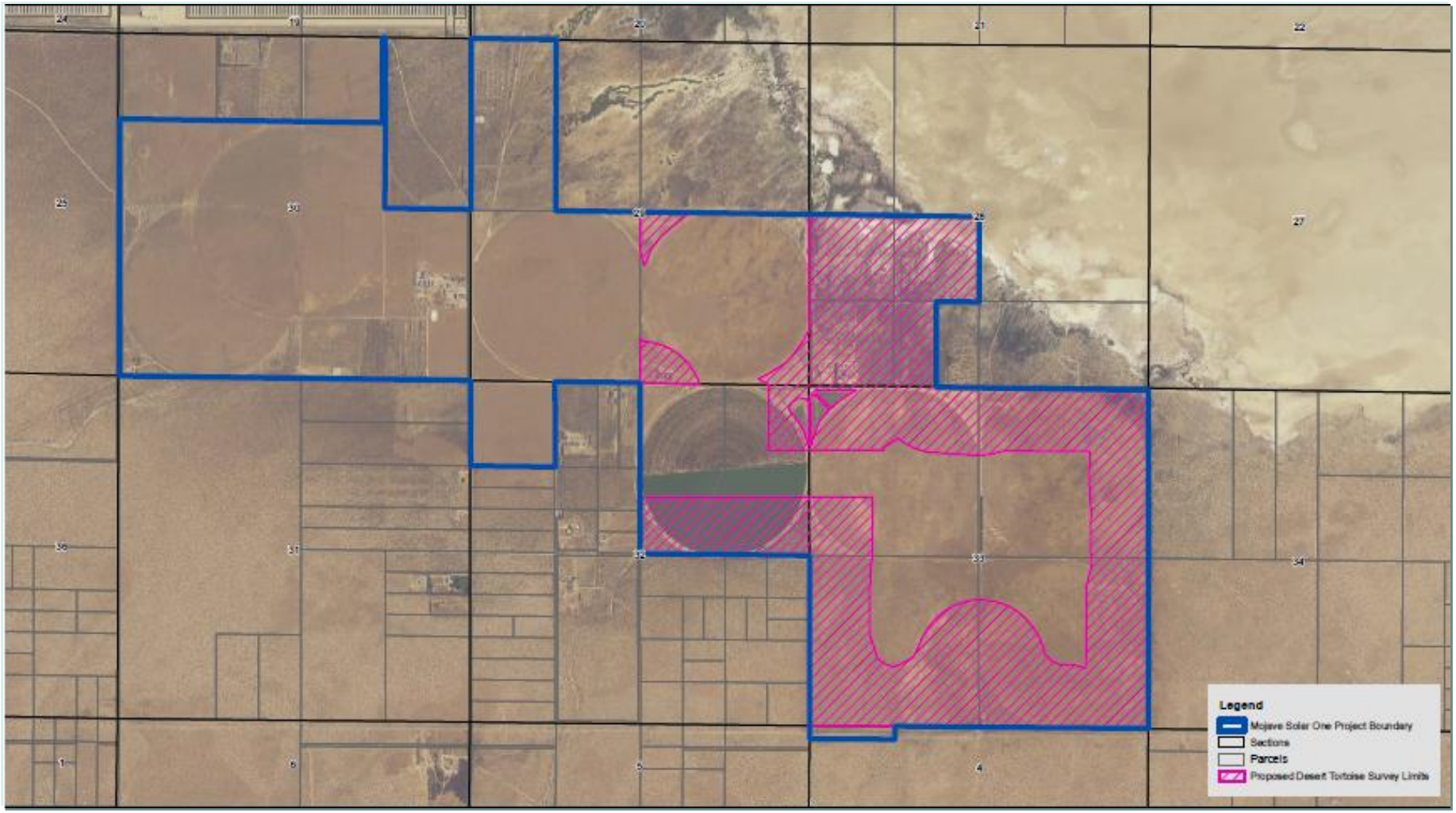
Project Aerial and Boundary



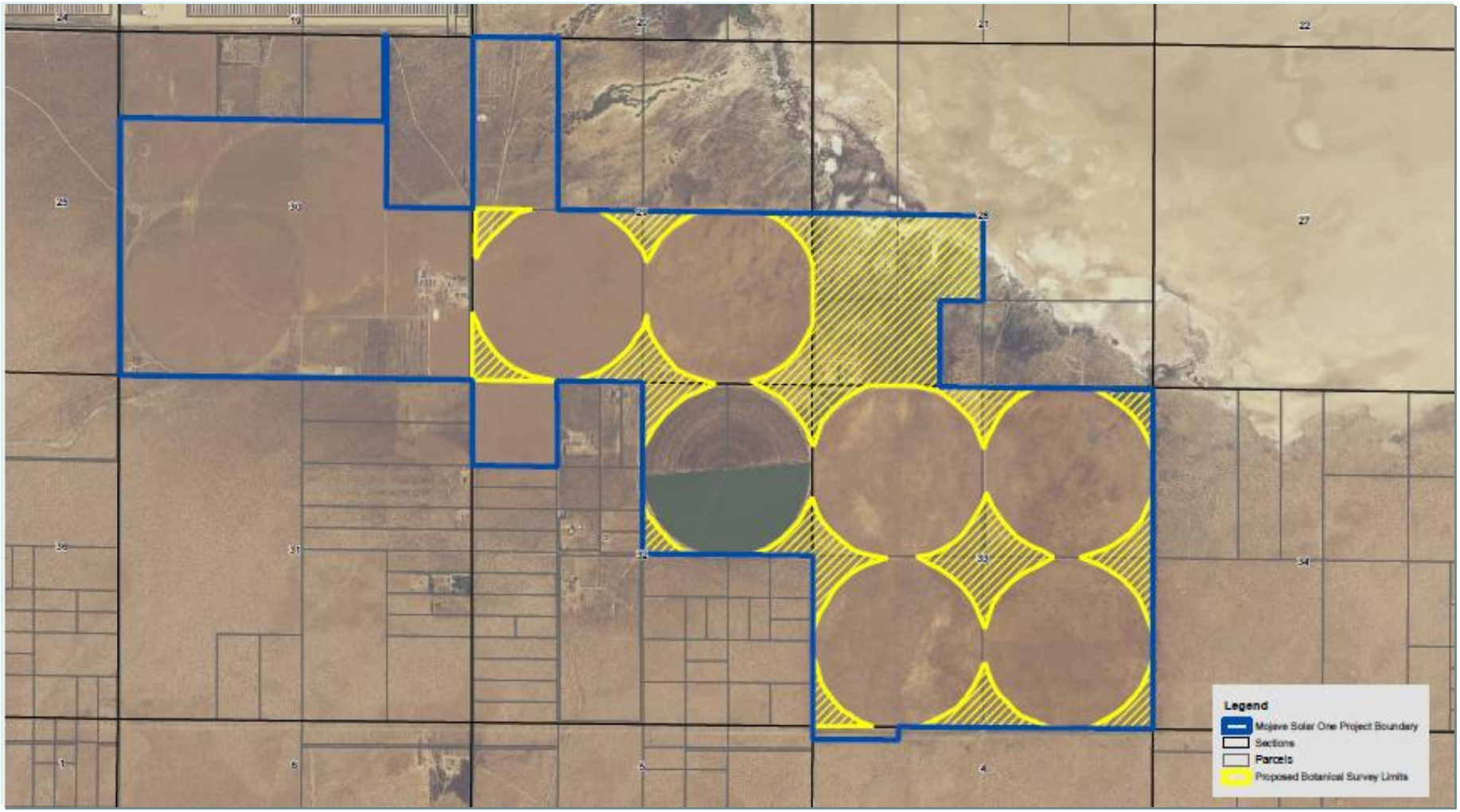
Multi-Year Biological Findings



2009 DT Survey Plans



2009 Botanical Survey Plans



1 Location

2 Site Characteristics

3 Project Description

4 Biology

5 Schedule

Development Timeline

- **Application for Certification Filing**:
  - Anticipated June 2009
- **Construction Start:**
  - September 2010
  - Project needs to be shovel-ready and begin construction before the end of 2010
- **Commercial Operation:**
  - November 2012 (26-month construction period)

From: Frederick Redell
Sent: Thursday, October 08, 2009 2:37 PM
To: 'Craig Hoffman'; kimberly.mccormick@comcast.net; Chris Ellison
Cc: Christine Hammond; Dennis Beck; Eileen Allen; Robert Worl; Rick York; 'Scott.Frier@solar.abengoa.com'; Tandy McMannes; Emiliano Garcia; Shane Conway
Subject: RE: Abengoa Mojave Solar (09-AFC-5) section 7 consultation
Attachments: DOE NEPA Outline.pdf

Craig,

Thank you for anticipating our next steps. We are working hard to bring the Mojave Solar Project (Project) over the finish line in a timely manner and the coordination of the Department of Energy (DOE) process, including review under the National Environmental Policy Act (NEPA) and consultation with the U.S. Fish and Wildlife Service (USFWS) under the Endangered Species Act (ESA), is an important part of this.

Abengoa Solar Inc. (Applicant) submitted an application to the DOE for a federal loan guarantee on September 14, 2009. The DOE is currently reviewing the loan guarantee application. It is anticipated that DOE will invite the Applicant to negotiate a term sheet within the next few months, triggering consultation under section 7 of the ESA. An outline of our anticipated timing is presented in the attached file.

The DOE is required to consult with the USFWS under Section 7 of the federal ESA to ensure that its issuance of a federal loan guarantee for the Project is not likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of designated critical habitat. DOE will initiate the consultation with USFWS once it has received a complete Biological Assessment (BA) from MSP. The consultation takes 135 days to complete from the date of initiation, and the USFWS will issue a Biological Opinion (BO) at its conclusion. The BO will make the required findings and also will include authorization of incidental take of any listed species as a result of the federal action.

Please let me know when we can have further discussions with your staff on this subject or if you need any additional information.

Best regards,
Fred

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-----Original Message-----
From: Craig Hoffman [mailto:CHoffman@energy.state.ca.us]
Sent: Wednesday, October 07, 2009 5:40 PM
To: kimberly.mccormick@comcast.net; Chris Ellison; Frederick Redell
Cc: Christine Hammond; Dennis Beck; Eileen Allen; Robert Worl; Rick York
Subject: Abengoa Mojave Solar (09-AFC-5) section 7 consultation

Fred, Chris and Kimberly.

The siting division would like a detailed understanding of how the project qualifies for a section 7 consultation and the time lines involved for consultation and application submittal with the federal agencies.

On page 5.3-60, the AFC indicates that the DOE loan guarantee program may be used as a federal nexus for ESA consultation.

Has this consultation taken place with the USFWS yet? What are your proposed timelines for consultation, application submittal and when do you expect some type of response.

Thank you for your help with this.

Craig Hoffman
Project Manager

California Energy Commission
Siting, Transmission and Environmental Protection Division
1516 Ninth Street, MS 15
Sacramento, CA 95814
phone: 916-654-4781
fax: 916-653-3882

From: Kimberly McCormick [kimberly.mccormick@comcast.net]
Sent: Sunday, November 22, 2009 9:56 PM
To: 'Frederick Redell'; Shane Conway
Subject: FW: Mitigation Mojave/Harper Lake Solar 1

Law Offices of Kim McCormick
3920 Southern Cross Road NE
Bainbridge Island, Washington 98110
(206) 780 9064 (tel.)
(206) 910 4772 (cel)
kimberly.mccormick@comcast.net

-----Original Message-----
From: Tonya Moore [mailto:TMMoore@dfg.ca.gov]
Sent: Wednesday, July 29, 2009 2:42 PM
To: Kimberly McCormick; Eric Weiss; Mward@energy.state.ca.us
Subject: Mitigation Mojave/Harper Lake Solar 1

Howdy,

(Misa, if you know, can you forward to whomever will be working on this project.)

Here is the mitigation breakdown for the Mojave Solar 1 project. I fought back and forth as if I should just take the 214.2 acres offered, however; I decided to evaluate the project as if I had never seen the proposal and see what I came up with. Although this is in a high density area for desert tortoise and a known location for MGS, this project was scaled back enough to avoid a potentially significant impact on species.

The group of biologists and project managers did a good job on this project, as far as protecting listed species. They surveyed beyond the site and using good science they went about deciding how to avoid, then minimize and then mitigate for the species. This project has also proposed up front mitigation areas that are of much higher quality than the any habitat on the project site. The mitigation that I propose is taking into count that the minimization measures will all be implemented and burrowing owl will be mitigated as outlined in the guidance separate from mitigation proposed below. However, if the entire 214 acres are actually used for mitigation then no additional mitigation for BUOW would be required.

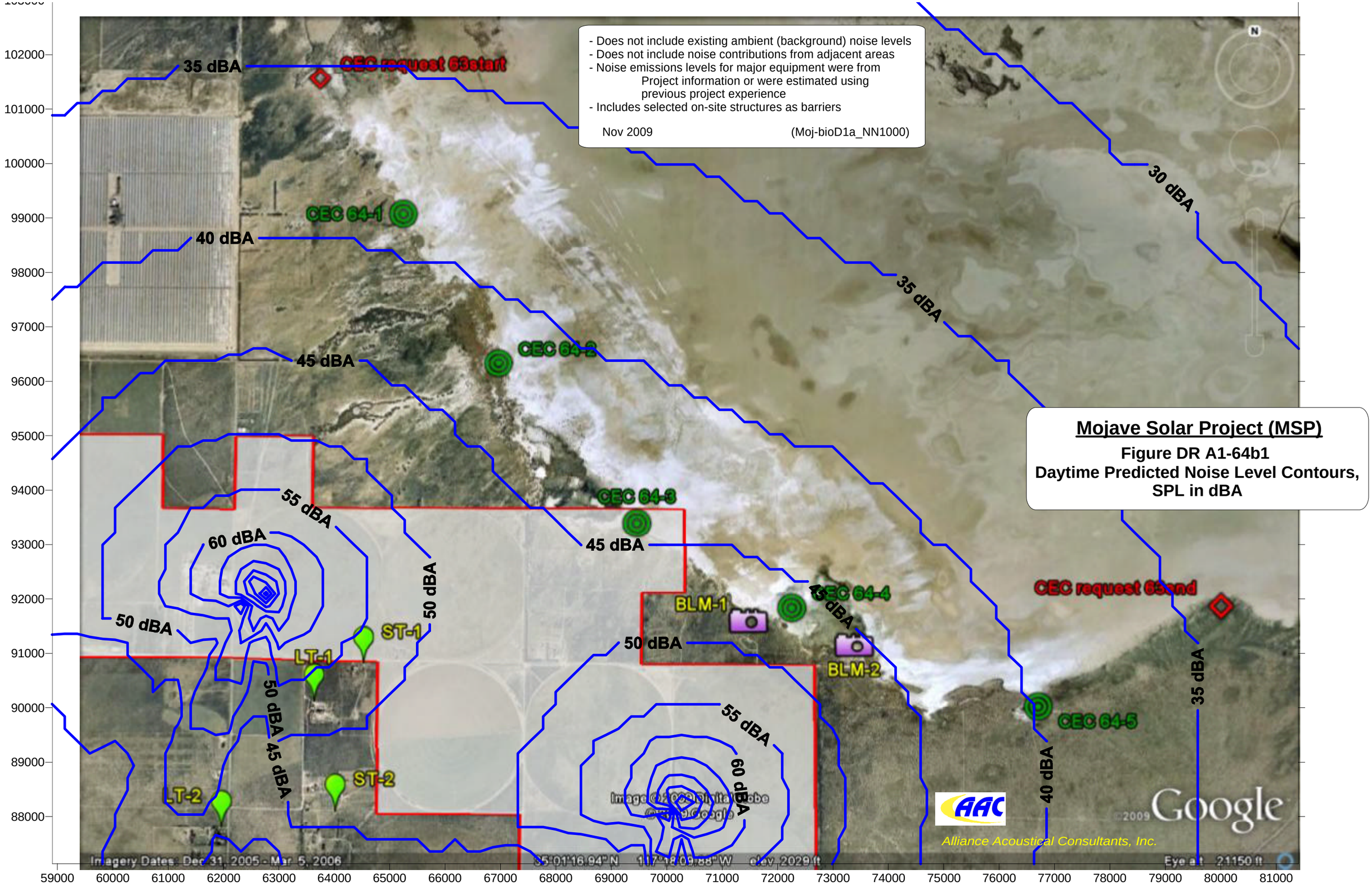
So for desert tortoise and Mohave ground squirrel this is what I think that the mitigation should be:

Undisturbed desert saltbush scrub habitat should be mitigated at a 5:1 ratio: 0.63 acres*5= 3.15 acres
disturbed desert saltbush scrub 1:2 ratio =1.2*2= 4.2 acres disturbed desert saltbush- regrowth 0.5:1 ratio=223.7*0.5= 111.85 acres Fallow agi-saltbush regrowth 0:1= 202.9*0= 0

Total acres of Mitigation (not including BUOW)= 119.2 acres

If there are any questions feel free to e-mail or call me. Have a great day.

Tonya Moore
Senior Environmental Scientist
Inland Desert Region
Department of Fish and Game
(760) 955-8139



Mojave Solar Project (MSP)

Figure DR A1-64b1
Daytime Predicted Noise Level Contours, SPL in dBA

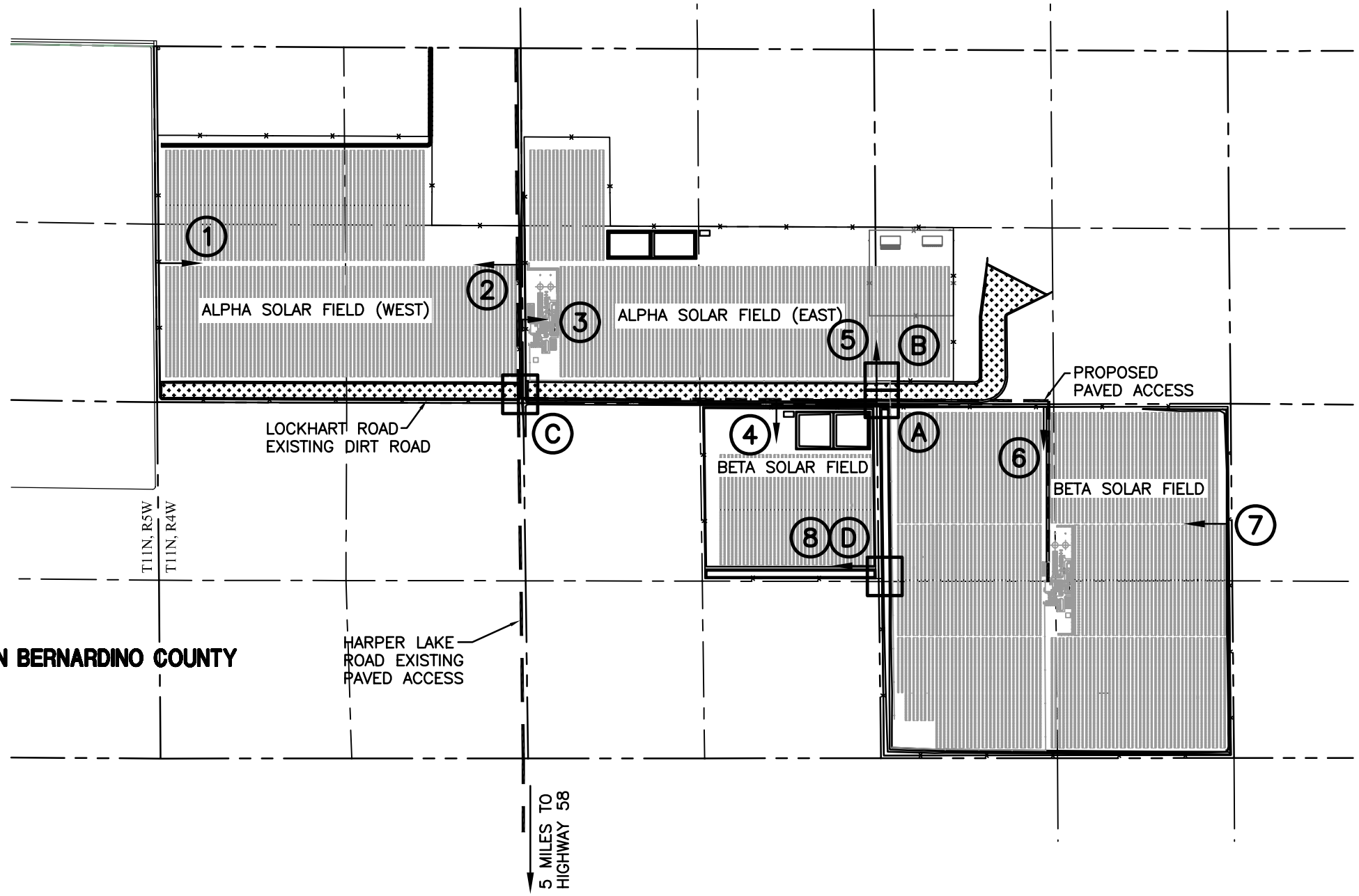
- Does not include existing ambient (background) noise levels
- Does not include noise contributions from adjacent areas
- Noise emissions levels for major equipment were from Project information or were estimated using previous project experience
- Includes selected on-site structures as barriers

Nov 2009 (Moj-bioN1a_NN1000)

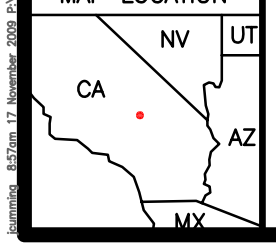
Mojave Solar Project (MSP)

Figure DR A1-64b2
Nighttime Predicted Noise Level Contours, SPL in dBA

CEC request 63start
CEC request 63end
CEC 64-1
CEC 64-2
CEC 64-3
CEC 64-4
CEC 64-5
BLM-1
BLM-2
ST-1
ST-2
LT-1
LT-2
5 dBA
10 dBA
15 dBA
20 dBA
25 dBA
Alliance Acoustical Consultants, Inc.
Image © 2009 DigitalGlobe
© 2009 Google
Google
Imagery Dates: Dec 31, 2005 - Mar 5, 2006
35°01'16.94" N 117°11'11.68" W elev 2029 ft
Eye alt 21150 ft



MAP LOCATION



LEGEND

- PROPOSED ACCESS ROUTES
- EXISTING ACCESS ROUTES
- PROPOSED FENCE LINE
- SECTION LINE
- 1/4 SECTION LINE

MOJAVE SOLAR PROJECT

PROPOSED ACCESS PLAN

0 1000' 2000' 3000'

SCALE: 1:24000

MOJAVE SOLAR LLC

Merrell-Johnson Engineering, Inc.

PROJECT:

DATE: 11/17/09

SERVICE LIST
09-AFC-5

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