In addition to said Source Controls, specific precautions will be taken when handling, storing or processing any materials during all phases of the proposed project. The utmost care and planning must be taken when using materials outside, and near any storm drain/drainage ditch inlets.

3.7.3 Treatment Control BMPs

As discussed in the Hydrology Study, runoff from the project will be directed towards detention basins and/or pond under arrays as necessary to meet the design goal to detain the 100-year runoff in basins outside the arrays, and to meet the County requirements for storage of 3" of runoff under the arrays as necessary. The preliminary design of the project considers 2 locations where infiltration testing was performed. It has been shown that the County required 3" of runoff from the project can be infiltrated within 72 hours, typically between 30 and 40 hours.

The detention basins will also have the capacity to store and infiltrate runoff from the more frequent storm events, which typically lead to storm water quality concerns. The runoff volume for the water quality storm event was calculated based on the Urban Runoff Quality Management Approach outlined in the California Stormwater BMP Handbook for New Development and Redevelopment. Based on this approach, a runoff coefficient for the site is calculated using the following regression equation:

$$C = 0.858i^3 - 0.78i^2 + 0.774i + 0.04$$

where i is the impervious fraction of the site. However, given the fact that the site impervious percentage is nearly negligible (approaches 0.1% of the developed site), use of the above regression equation is impractical (in that it yields a runoff coefficient that approaches a value of 0.04) with the proposed project. For the purpose of calculations and analysis, the Rational Method C value of 0.63 is used for water quality purposes. The depth of runoff, P_O, is then calculated as:

$$P_O = (a * C) * P_6$$

Where:
a = regression constant = 1.582 for a 24 hour draw down time
P_6 = mean annual runoff-producing rainfall depth, in watershed inches

The value for P_6 is determined using tables provided in the California Stormwater BMP Handbook. Using the table provided for the Palm Springs Thermal Airport, the location which is most representative of conditions in Imperial Valley, and a C value of 0.63, the value of P_6 is approximately 0.43 inches. These values then yield a depth of runoff of P_O = 0.43 inches or 0.036 feet.

To determine the volume of runoff from the water quality storm event, the depth of runoff is multiplied by the tributary area. Table 19 on the following page provides the volume of runoff for the water quality storm event, Water Quality Control Volume (WQCV), for each drainage basin. The infiltration time of the water quality volume was calculated using the same methods for calculating the infiltration time for the County requirement of 3" of runoff as described in the Hydrology Study portion of this document.

Table 19: WQCV and Infiltration Time

Receiving Drain: Dixie Drain #3						
Basin Name	Area (ac)	WQCV (ac-ft)	Infiltration Rate (in/hr)	Basin Area (ac)	Infiltration Rate (ac-ft/hr)	Time to Infiltrate (hr)
D1	223.5	8.0	1.45	13.3	1.6	5.0
D2	135.3	4.8	1.45	8.2	1.0	4.9
D3	160.7	5.8	1.45	9.4	1.1	5.1
D4	70.2	2.5	1.45	3.6	0.4	5.8
D5	325.2	11.7	1.45	19.3	2.3	5.0
D6	27.0	1.0	1.45	1.4	0.2	5.7
D7	174.7	6.3	7.50	12.31	7.7	0.8

Receiving Drain: Wixom Drain						
Basin Name	Area (ac)	WQCV (ac-ft)	Infiltration Rate (in/hr)	Basin Area (ac)	Infiltration Rate (ac-ft/hr)	Time to Infiltrate (hr)
W1	165.7	5.9	1.45	9.4	1.1	5.2
W2	-	-	-	-	-	-
W3	109.5	3.9	1.45	5.6	0.7	5.8
W4	8.9	0.3	1.45	0.5	0.1	5.3

Receiving Drain: Fig Drain						
Basin Name	Area (ac)	WQCV (ac-ft)	Infiltration Rate (in/hr)	Basin Area (ac)	Infiltration Rate (ac-ft/hr)	Time to Infiltrate (hr)
L1	-	-	-	-	-	-
L2	-	-	-	-	-	-
F1	55.5	2.0	1.45	2.7	0.3	6.1
F2	81.0	2.9	1.45	4.9	0.6	4.9
F3	125.8	4.5	1.45	7.2	0.9	5.2
F4	220.7	7.9	1.45	11.3	1.4	5.8
F5	46.2	1.7	1.45	2.7	0.3	5.1

As anticipated, the WQCV is infiltrated into the underlying soil in less than 72 hours. Therefore the basins are deemed adequate as treatment control BMPs for the project.

4.0 ENVIRONMENTAL IMPACTS

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would impact any of the items listed in the table below.

The following discussions are based on the proposed drainage system within the proposed and potential development area. The impact assessments are based on the significance criteria listed below for hydrology/water quality.

4.1 THRESHOLDS OF SIGNIFICANCE

Table 20: CEQA Thresholds of Significance

THRESHOLDS OF SIGNIFICANCE – VIII. HYDROLOGY AND WATER QUALITY	
Would the Project:	
A	Violate any water quality standards or waste discharge requirements?
B	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table?
C	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or in a manner which would result in a substantial erosion or siltation on- or off-site?
D	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?
E	Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?
F	Otherwise substantially degrade water quality?
G	Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?
H	Place within a 100- year flood area structures which would impede or redirect flood flows?
I	Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?
J	Be subject to inundation by seiche, tsunami, or mudflow?

4.1.1 Impact A

Would the Project violate any water quality standards or waste discharge requirements?

Impact Analysis: As a result of the recommended site design and source control measures, and the construction of the required detention basins, water quality exceedances are not anticipated, and pollutants are not expected within project runoff that would adversely affect beneficial uses in downstream receiving waters. Although specific County of Imperial regulations regarding storm water NPDES and new development do not exist, the project plans to institute controls designed to limit discharges to the appropriate standard. The project will comply with the requirements of the State

Regional Water Quality Control Board concerning coverage under the General Construction Permit. It is concluded that this issue is considered a less than significant impact.

4.1.2 Impact B

Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table (e.g. the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).

Impact Analysis: Groundwater recharge in the area will not be significantly affected due to the fact that the majority of the site will feature a pervious landscape in both the existing and proposed conditions. Detention basins will also provide infiltration and groundwater recharge. In the post construction condition, no pumping of groundwater is anticipated. During the construction phase, a significant amount of construction dewatering is not expected to be required.

As discussed in Section 3.5, groundwater at/near the project site is not used for beneficial uses, such as municipal, domestic, or industrial supply. Water needs will be provided by adjacent IID Canals, and are expected to be much less than the needs of the existing agricultural land. It is concluded that this issue is considered no impact.

4.1.3 Impact C

Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site.

Impact Analysis: The proposed drainage patterns and general drainage system will be similar to the existing site. Drainage will be routed to the detention basins for detention and infiltration. In addition, the remainder of the site will follow existing drainage patterns, with storm flows conveyed toward existing IID Drains. There is proposed rerouting of flows in three instances as discussed in Section 2.2.3, however the proposed rerouting is not substantially different from the existing condition, and will not result in substantial erosion or siltation on or off-site. Based on preliminary infiltration testing, it is shown that the project is able to infiltrate runoff. Therefore the proposed routing of flow will not result in an increase in runoff to an IID Drain or an increase in erosion or siltation on- or off-site. Due to the postponement of agricultural irrigation during the life of the project, it is anticipated that the annual runoff from the proposed project site will decrease when compared to the existing condition, which is similar to when agricultural fields are abandoned. It is concluded that this issue is considered no impact.

4.1.4 Impact D

Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site.

Impact Analysis: Existing drainage patterns will not be substantially altered due to the proposed project. The majority of the site will sheet flow through the pervious landscape, toward the detention basins. There is proposed rerouting of flows in three instances as discussed in Section 2.2.3, however the proposed rerouting is not substantially different from the existing condition, and will not result in substantial erosion or siltation on or off-site. Based on preliminary infiltration testing, it is shown that the project is able to infiltrate runoff.

Peak flow runoff from the project will be infiltrated in designated detention basins and there is no potential for increased flooding potential onsite or in offsite IID Drains. Ponding of runoff under arrays will occur to depths less than 12" and will not lead to on-site flooding. Due to the elimination of agricultural use, it is anticipated that the annual runoff from the proposed project site will decrease when compared to the existing condition. It is concluded that this issue is considered no impact.

4.1.5 Impact E

Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff.

Impact Analysis: Runoff from the project will be controlled by detention basins to not exceed existing peak storm water flow rates as discussed previously. Due to the postponement of agricultural irrigation during the life of the project, it is anticipated that the annual runoff from the proposed project site will decrease when compared to the existing condition. As such, it is concluded that this issue is considered no impact.

4.1.6 Impact F

Otherwise substantially degrade water quality

Impact Analysis: Refer to the water quality discussion included in the Impact A analysis above.

4.1.6 Impact G

Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation.

Impact Analysis: There is no housing proposed for the project. It is concluded that there is no impact related to this issue.

4.1.7 Impact H

Place within a 100-year flood hazard area structures which would impede or redirect flood flows.

Impact Analysis: Based on current FEMA Flood Insurance Rate Maps (FIRM), the project is located in Zone X. Zone X corresponds to areas that are located above the flood level having a 1% chance of occurrence (the 100-year event). Therefore the project will not place structures within a 100-year flood hazard area. Please see the FEMA FIRMettes (reduced size maps providing FIRM information for a project site rather than the entire area covered by a full sized FIRM) located in Appendix F. It is concluded that there is no impact related to this issue.

4.1.8 Impact I

Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.

Impact Analysis: The proposed project site is not located in a FEMA flood hazard area, nor will the site contain habitable structures where significant numbers of people would be put at high risk. However, existing levees are located adjacent to the project site on the Fern Canal, as well as on the Fern

Sidemain, Fig Canal and Westside Main Canal. These levees are designed to maximize water volume in the channel, predominately for agricultural use. The levees are currently maintained by the Imperial Irrigation District (IID). There are no dams immediately upstream of the project; therefore dam breakage is not a risk concerning the project site.

The Imperial Valley with its low-lying canal/drain systems, lack of relief, and infrequent, intense storm periods can lead to high intensity runoff events. However, the project site does not include any residential development or significant populations of people. It is concluded that there is no impact related to this issue.

4.1.9 Impact J

Inundation by seiche, tsunami, or mudflow.

Impact Analysis: The site is approximately 25 miles from the Salton Sea, which is the nearest large water body. Due to the distance, the Salton Sea is does not pose a particularly significant danger of inundation from seiche or tsunami as related to the proposed project site.

The site is approximately 7 miles from Mt. Signal, which is the nearest significantly sloped landscape, located across the border in Mexico. The project site is not in any danger of inundation by mudflow. It is concluded that no impact associated with this issue will occur.

5.0 MAINTENANCE

The operation and maintenance requirements for each type of BMP are contained in the following sections. The following entity will maintain all onsite site design, source control, and treatment control features.

ORGANIZATION	Campo Verde Solar, LLC.

5.1 POST-CONSTRUCTION BMPs

Post-construction BMPs will be maintained in perpetuity. Maintenance requirements for source control BMPs as well as treatment control BMPs are shown below. It shall be noted that preventative maintenance such as removal of trash and debris from the site will help ensure proper function of the BMPs.

Table 21: O&M Summary

SUMMARY OF BMP O&M	
BMP NAME	FREQUENCY
DESIGN TRASH STORAGE AREAS TO REDUCE POLLUTION INTRODUCTION	Inspect Monthly
ACTIVITY RESTRICTIONS	Review Bi-Yearly
NON-STORM WATER DISCHARGES	Review Bi-Yearly
OUTDOOR LOADING AND UNLOADING	Supervisors/Workers Shall Monitor Continuously
SPILL PREVENTION, CONTROL, AND CLEANUP	Supervisors/Workers Shall Monitor Continuously
EDUCATION	Review and Distribute Bi-Yearly
INTEGRATED PEST MANAGEMENT	Review Protocols and Educate Bi-Yearly
WASTE HANDLING AND DISPOSAL	Inspect Monthly
VEHICLE AND EQUIPMENT FUELING, CLEANING, AND REPAIR	Inspect/Review Monthly
HAZARDOUS MATERIAL MANAGEMENT	Supervisors/Workers Shall Monitor Continuously
DETENTION BASINS	Inspect Quarterly

Maintenance of the project site will be conducted by the owner, Campo Verde Solar, LLC. All construction and post construction BMPs will be the responsibility of the owner during the lifetime of the project.

The owners of the project are required to perform maintenance in perpetuity, keeping maintenance records for submittal to the County of Imperial and Regional Water Quality Control Board, if requested. In addition, the following maintenance activities will be conducted.

- Continued education of staff responsible for hazardous material hauling, loading, and use.
- Periodic visual monitoring to ensure materials are not contaminating areas exposed to storm water.

If a transfer of the property area occurs, the owner will notify the County of Imperial, and the Region 7 Colorado River Basin Regional Water Quality Control Board. The new owner will assume all responsibilities for BMP maintenance.

6.0 SUMMARY AND CONCLUSIONS

6.1 HYDROLOGY

From the analysis provided in this study, it is concluded that the project will not have a substantial impact on the hydrology of the surrounding area or of the IID Drain system. The County standard requirement to provide 3" of detention per tributary acre is being met. Detained runoff will be infiltrated into the underlying soil. Where feasible, detention basins have been provided outside of the project solar arrays. Where necessary, the project will be graded to provide the required detention under the arrays.

6.2 STORM WATER QUALITY

Post project site conditions reflect increases in impervious surfaces; however peak discharge will not be significantly altered by the proposed project. The use of source control and site design BMPs in practice through the day to day function of the project will result in a decreased potential for storm water pollution.

Maintenance will be the responsibility of the owner, who will maintain the Site Design, and Source Control, and Treatment Control BMPs throughout the lifetime of the project. In the event of sale of the site, the new owner will be required to maintain BMPs, ensuring proper function in perpetuity.

6.2.1 Long-Term Funding

Long-term funding for BMP maintenance shall be funded by the owner.

6.2.2 Access for Inspection

The private owner entity assumes responsibility for operation and maintenance of BMPs, however if needed the County of Imperial shall be granted able access for inspection through a formal agreement.

6.2.3 CEQA Impact Summary

The development of Project SWPPP and adherence to its prescribed BMPs will minimize the potential for a net increase in sediment loads in storm water discharges, relative to pre-construction levels. Furthermore, the SWPPP will prevent or minimize the discharges of polluted storm water and prohibited non-storm waters at levels that would cause or contribute to the exceedance of applicable water quality standards of downstream receiving waters during the construction period.

Based on the proposed Project improvements and associated BMPs, no substantial water quality impairments or significant increases in Project runoff are anticipated, and no adverse levels of pollutants are expected in Project runoff that would violate water quality standards or adversely affect beneficial uses of the downstream receiving waters.

Table 22: CEQA Impact Summary

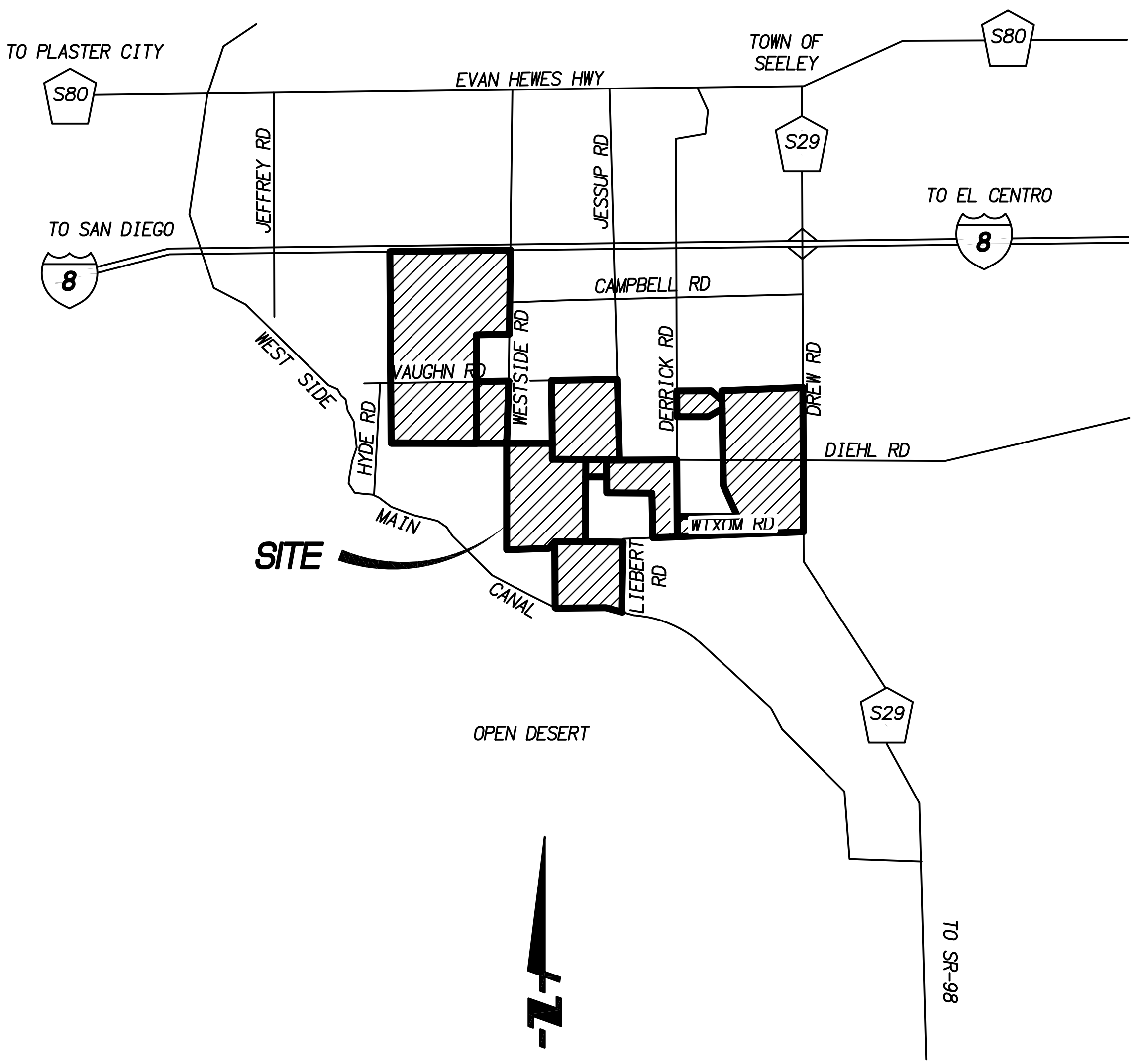
CEQA IMPACTS AND MITIGATION MEASURES		
CEQA SIGNIFICANCE CRITERIA	SIGNIFICANT IMPACT (YES/NO)	MITIGATION MEASURE
Impact A: Violate any water quality standards or waste discharge requirements?	NO	N/A
Impact B: Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table?	NO	N/A
Impact C: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or in a manner which would result in a substantial erosion or siltation on- or off-site?	NO	N/A
Impact D: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?	NO	N/A
Impact E: Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?	NO	N/A
Impact F: Otherwise substantially degrade water quality?	NO	N/A
Impact G: Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	NO	N/A
Impact H: Place within a 100- year flood area structures which would impede or redirect flood flows?	NO	N/A

CEQA IMPACTS AND MITIGATION MEASURES		
CEQA SIGNIFICANCE CRITERIA	SIGNIFICANT IMPACT (YES/NO)	MITIGATION MEASURE
Impact I: Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	NO	N/A
Impact J: Be subject to inundation by seiche, tsunami, or mudflow?	NO	N/A

APPENDIX - A

Vicinity Map

VICINITY MAP
CAMPO VERDE SOLAR
COUNTY OF IMPERIAL, CA



VICINITY MAP
NO SCALE

APPENDIX A

VICINITY MAP
CAMPO VERDE SOLAR
COUNTY OF IMPERIAL, CA

DECEMBER 2011

APPENDIX - B

Preliminary Infiltration Tests

LANDMARK
Geo-Engineers and Geologists

780 N. 4th Street
El Centro, CA 92243
(760) 370-3000
(760) 337-8900 fax

77-948 Wildcat Drive
Palm Desert, CA 92211
(760) 360-0665
(760) 360-0521 fax

September 1, 2011

Mr. Tommy Nelson
US Solar Holdings
6111 Severin Drive
La Mesa, CA 91942

Preliminary Infiltration Tests
Proposed Mt. Signal Solar Project
SW of Drew Road and I-8 Freeway
Imperial County, California
LCI Project No. LE11197

Dear Mr. Nelson:

Infiltration tests were performed on August 29 through 31, 2011 at the locations specified by US Solar for general clear water infiltration rates of the near surface soils within the proposed Mt. Signal Solar Project located between Drew Road and the West Side Main Canal south of the I-8 Freeway approximately 10 miles west of El Centro, California.. The native soils consisted of dominantly silty clays with low infiltration and minor areas of silty sands with a moderate infiltration.

Infiltration tests were conducted at two (2) locations delineated by the client within the project site. Two (2) infiltration tests were conducted at each location, one test at a depth of 12 inches below existing ground surface and one test at a depth of 2 inches (ground surface). The infiltration tests were conducted to evaluate the stormwater infiltration capacity of the soils.

The tests were conducted by drilling 6-inch diameter borings to the specified depths. A 4-inch diameter solid PVC pipe was placed in the boreholes and the bottom of the pipe pushed into the soil at the bottom of the borehole to create a seal. The PVC pipes were then filled with water. Water was maintained at a hydrostatic level of 12 inches in the bottom of each of the PVC pipes. The tests were performed over a 3 day period.

The measured infiltration rates of the soils are tabulated below:

Location	Depth	Infiltration Rate
I-1	Surface	11.24 min/inch
I-2	12 inches	8.00 min/inch
I-3	Surface	11.41 min/inch
I-4	12 inches	41.50 min/inch

The infiltration rates for stormwater basin designs are typically determined by applying a Factor of Safety of 3 to 6 to the field test rates.

Groundwater was generally encountered at a depth of 10 to 12 feet below existing ground surface in April 2011 during a geotechnical investigation conducted by EGA Consultants at the project site. The groundwater levels noted by EGA are at time of drilling and may rise with time to a stabilized level.

The project site is divided into two Soil Conservation Survey soil classifications types. The first soil type is dominated by silty sand to sandy silt with minor clay layers (Soil Types 110, 118, 122, 123, 142, and 144 of the US Soil Conservation Survey Soil Map) and the second soil type is dominated by clay soils (Soil Types 114 and 115). The USCS soil survey map (Plate A-3) shows the extent of the various soil types.

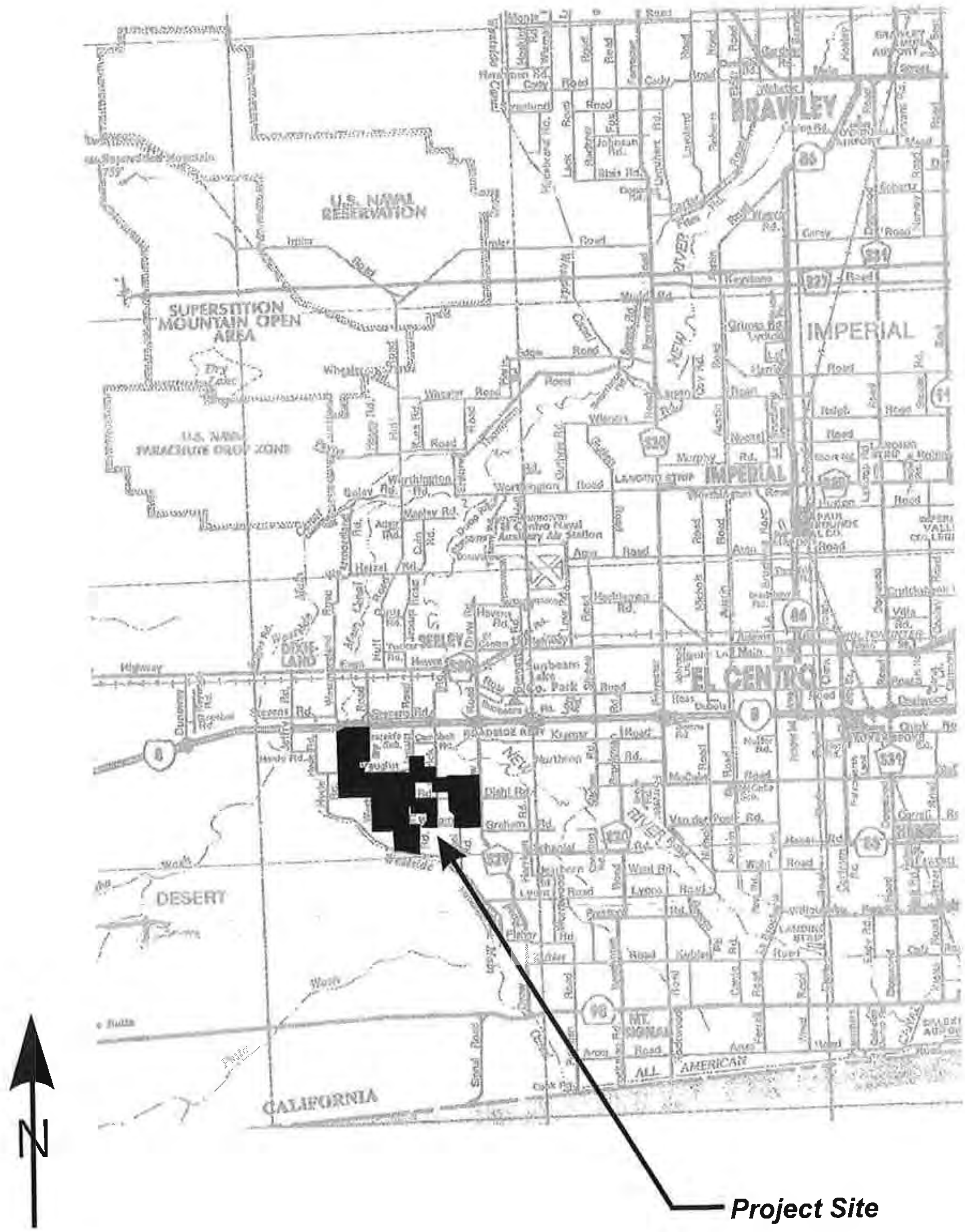
Please contact our office if there are any questions or comments regarding the infiltration tests conducted at this site.

Sincerely Yours,
Landmark Consultants, Inc.

Jeffrey O. Lyon, PE
Principal Engineer

Steven K. Williams, PG, CEG
Senior Engineering Geologist

APPENDIX A



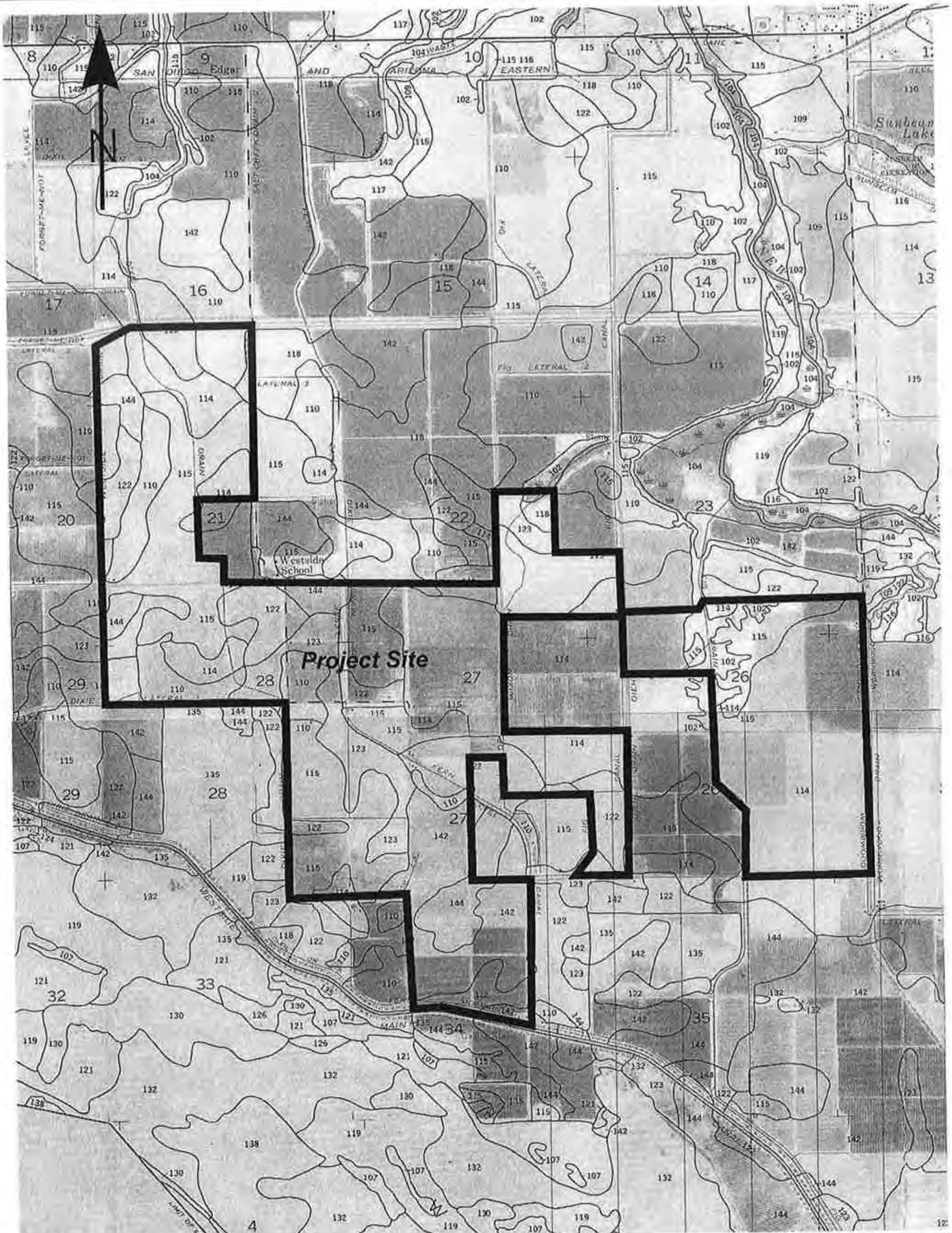
LANDMARK
Geo-Engineers and Geologists

Project No.: LE11197

Vicinity Map

Plate
A-1

LANDMARK Geo-Engineers and Geologists Project No.: LE11197	Site and Exploration Map	Plate A-2



LANDMARK
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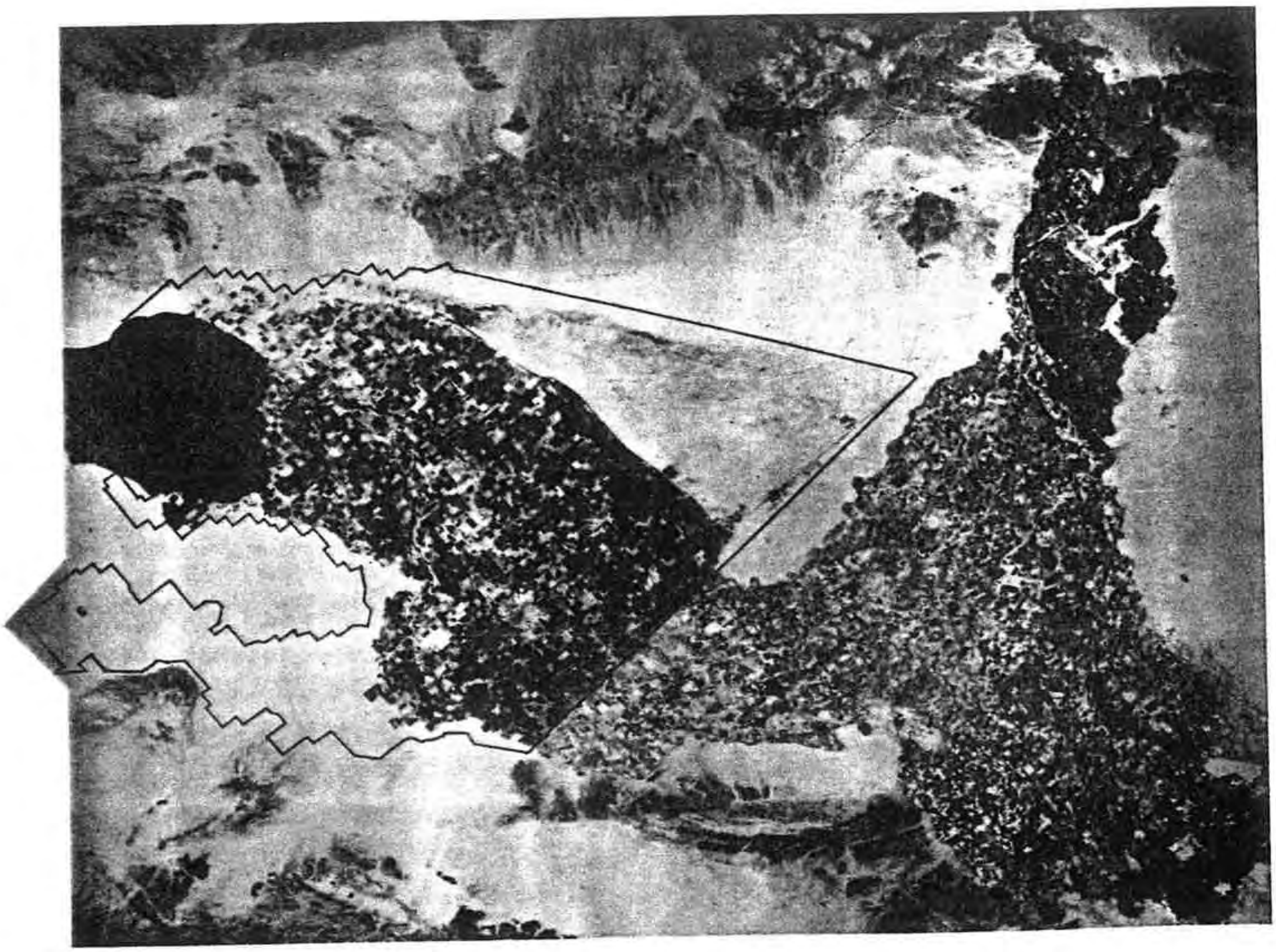
Project No.: LE11197

Soil Survey Map

Plate
A-3

Soil Survey of

IMPERIAL COUNTY CALIFORNIA IMPERIAL VALLEY AREA



United States Department of Agriculture Soil Conservation Service
in cooperation with
University of California Agricultural Experiment Station
and
Imperial Irrigation District

TABLE 11.--ENGINEERING INDEX PROPERTIES

[The symbol > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
100 Antho	0-13	Loamy fine sand	SM	A-2	0	100	100	75-85	10-30	---	NP
	13-60	Sandy loam, fine sandy loam.	SM	A-2, A-4	0	90-100	75-95	50-60	15-40	---	NP
101*:											
Antho	0-8	Loamy fine sand	SM	A-2	0	100	100	75-85	10-30	---	NP
	8-60	Sandy loam, fine sandy loam.	SM	A-2, A-4	0	90-100	75-95	50-60	15-40	---	NP
Superstition	0-6	Fine sand	SM	A-2	0	100	95-100	70-85	15-25	---	NP
	6-60	Loamy fine sand, fine sand, sand.	SM	A-2	0	100	95-100	70-85	15-25	---	NP
102*. Badland											
103 Carsitas	0-10	Gravelly sand	SP, SP-SM	A-1, A-2	0-5	60-90	50-85	30-55	0-10	---	NP
	10-60	Gravelly sand, gravelly coarse sand, sand.	SP, SP-SM	A-1	0-5	60-90	50-85	25-50	0-10	---	NP
104* Fluvaquents											
105 Glenbar	0-13	Clay loam	CL	A-6	0	100	100	90-100	70-95	35-45	15-30
	13-60	Clay loam, silty clay loam.	CL	A-6	0	100	100	90-100	70-95	35-45	15-30
106 Glenbar	0-13	Clay loam	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
	13-60	Clay loam, silty clay loam.	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
107* Glenbar	0-13	Loam	ML, CL-ML, CL	A-4	0	100	100	100	70-80	20-30	NP-10
	13-60	Clay loam, silty clay loam.	CL	A-6, A-7	0	100	100	95-100	75-95	35-45	15-30
108 Holtville	0-14	Loam	ML	A-4	0	100	100	85-100	55-95	25-35	NP-10
	14-22	Clay, silty clay	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
	22-60	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	65-85	25-35	NP-10
109 Holtville	0-17	Silty clay	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
	17-24	Clay, silty clay	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
	24-35	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	65-85	25-35	NP-10
	35-60	Loamy very fine sand, loamy fine sand.	SM, ML	A-2, A-4	0	100	100	75-100	20-55	---	NP
110 Holtville	0-17	Silty clay	CH, CL	A-7	0	100	100	95-100	85-95	40-65	20-35
	17-24	Clay, silty clay	CH, CL	A-7	0	100	100	95-100	85-95	40-65	20-35
	24-35	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	55-85	25-35	NP-10
	35-60	Loamy very fine sand, loamy fine sand.	SM, ML	A-2, A-4	0	100	100	75-100	20-55	---	NP

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
111*:											
Holtville----------	0-10	Silty clay loam	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
	10-22	Clay, silty clay	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
	22-60	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	65-85	25-35	NP-10
Imperial----------	0-12	Silty clay loam	CL	A-7	0	100	100	100	85-95	40-50	10-20
	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
112---------------- Imperial	0-12	Silty clay------	CH	A-7	0	100	100	100	85-95	50-70	25-45
	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
113---------------- Imperial	0-12	Silty clay------	CH	A-7	0	100	100	100	85-95	50-70	25-45
	12-60	Silty clay, clay, silty clay loam.	CH	A-7	0	100	100	100	85-95	50-70	25-45
114---------------- Imperial	0-12	Silty clay------	CH	A-7	0	100	100	100	85-95	50-70	25-45
	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
115*:											
Imperial----------	0-12	Silty clay loam	CL	A-7	0	100	100	100	85-95	40-50	10-20
	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
Glenbar-----------	0-13	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
	13-60	Clay loam, silty clay loam.	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
116*:											
Imperial----------	0-13	Silty clay loam	CL	A-7	0	100	100	100	85-95	40-50	10-20
	13-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
Glenbar-----------	0-13	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
	13-60	Clay loam, silty clay loam.	CL	A-6	0	100	100	90-100	70-95	35-45	15-30
117, 118----------- Indio	0-12	Loam------------	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
	12-72	Stratified loamy very fine sand to silt loam.	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
119*:											
Indio-------------	0-12	Loam------------	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
	12-72	Stratified loamy very fine sand to silt loam.	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
Vint--------------	0-10	Loamy fine sand	SM	A-2	0	95-100	95-100	70-80	25-35	---	NP
	10-60	Loamy sand, loamy fine sand.	SM	A-2	0	95-100	95-100	70-80	20-30	---	NP
120*--------------- Laveen	0-12	Loam------------	ML, CL-ML	A-4	0	100	95-100	75-85	55-65	20-30	NP-10
	12-60	Loam, very fine sandy loam.	ML, CL-ML	A-4	0	95-100	85-95	70-80	55-65	15-25	NP-10

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
121----------------- Meloland	0-12	Fine sand--------	SM, SP-SM	A-2, A-3	0	95-100	90-100	75-100	5-30	---	NP
	12-26	Stratified loamy fine sand to silt loam.	ML	A-4	0	100	100	90-100	50-65	25-35	NP-10
	26-71	Clay, silty clay, silty clay loam.	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-40
122----------------- Meloland	0-12	Very fine sandy loam.	ML	A-4	0	95-100	95-100	95-100	55-85	25-35	NP-10
	12-26	Stratified loamy fine sand to silt loam.	ML	A-4	0	100	100	90-100	50-70	25-35	NP-10
	26-71	Clay, silty clay, silty clay loam.	CH, CL	A-7	0	100	100	95-100	85-95	40-65	20-40
123*: Meloland----------	0-12	Loam-------------	ML	A-4	0	95-100	95-100	95-100	55-85	25-35	NP-10
	12-26	Stratified loamy fine sand to silt loam.	ML	A-4	0	100	100	90-100	50-70	25-35	NP-10
	26-38	Clay, silty clay, silty clay loam.	CH, CL	A-7	0	100	100	95-100	85-95	40-65	20-40
	38-60	Stratified silt loam to loamy fine sand.	SM, ML	A-4	0	100	100	75-100	35-55	25-35	NP-10
Holtville---------	0-12	Loam-------------	ML	A-4	0	100	100	85-100	55-95	25-35	NP-10
	12-24	Clay, silty clay	CH, CL	A-7	0	100	100	95-100	85-95	40-65	20-35
	24-36	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	55-85	25-35	NP-10
	36-60	Loamy very fine sand, loamy fine sand.	SM, ML	A-2, A-4	0	100	100	75-100	20-55	---	NP
124, 125----------- Niland	0-23	Gravelly sand---	SM, SP-SM	A-2, A-3	0	90-100	70-95	50-65	5-25	---	NP
	23-60	Silty clay, clay, clay loam.	CL, CH	A-7	0	100	100	85-100	80-95	40-65	20-40
126----------------- Niland	0-23	Fine sand--------	SM, SP-SM	A-2, A-3	0	90-100	90-100	50-65	5-25	---	NP
	23-60	Silty clay-------	CL, CH	A-7	0	100	100	85-100	80-95	40-65	20-40
127----------------- Niland	0-23	Loamy fine sand	SM	A-2	0	90-100	90-100	50-65	15-30	---	NP
	23-60	Silty clay-------	CL, CH	A-7	0	100	100	85-100	80-95	40-65	20-40
128*: Niland------------	0-23	Gravelly sand---	SM, SP-SM	A-2, A-3	0	90-100	70-95	50-65	5-25	---	NP
	23-60	Silty clay, clay, clay loam.	CL, CH	A-7	0	100	100	85-100	80-100	40-65	20-40
Imperial----------	0-12	Silty clay-------	CH	A-7	0	100	100	100	85-95	50-70	25-45
	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
129*: Pits											
130, 131----------- Rositas	0-27	Sand-------------	SP-SM	A-3, A-1, A-2	0	100	80-100	40-70	5-15	---	NP
	27-60	Sand, fine sand, loamy sand.	SM, SP-SM	A-3, A-2, A-1	0	100	80-100	40-85	5-30	---	NP

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
132, 133, 134, 135- Rositas	0-9	Fine sand-------	SM	A-3, A-2	0	100	80-100	50-80	10-25	---	NP
	9-60	Sand, fine sand, loamy sand.	SM, SP-SM	A-3, A-2, A-1	0	100	80-100	40-85	5-30	---	NP
136---------------- Rositas	0-4	Loamy fine sand	SM	A-1, A-2	0	100	80-100	40-85	10-35	---	NP
	4-60	Sand, fine sand, loamy sand.	SM, SP-SM	A-3, A-2, A-1	0	100	80-100	40-85	5-30	---	NP
137---------------- Rositas	0-12	Silt loam-------	ML	A-4	0	100	100	90-100	70-90	20-30	NP-5
	12-60	Sand, fine sand, loamy sand.	SM, SP-SM	A-3, A-2, A-1	0	100	80-100	40-85	5-30	---	NP
138*:											
Rositas-----------	0-4	Loamy fine sand	SM	A-1, A-2	0	100	80-100	40-85	10-35	---	NP
	4-60	Sand, fine sand, loamy sand.	SM, SP-SM	A-3, A-2, A-1	0	100	80-100	40-85	5-30	---	NP
Superstition------	0-6	Loamy fine sand	SM	A-2	0	100	95-100	70-85	15-25	---	NP
	6-60	Loamy fine sand, fine sand, sand.	SM	A-2	0	100	95-100	70-85	15-25	---	NP
139---------------- Superstition	0-6	Loamy fine sand	SM	A-2	0	100	95-100	70-85	15-25	---	NP
	6-60	Loamy fine sand, fine sand, sand.	SM	A-2	0	100	95-100	70-85	15-25	---	NP
140*:											
Torriorthents											
Rock outcrop											
141*:											
Torriorthents											
Orthids											
142---------------- Vint	0-10	Loamy very fine sand.	SM, ML	A-4	0	100	100	85-95	40-65	15-25	NP-5
	10-60	Loamy fine sand	SM	A-2	0	95-100	95-100	70-80	20-30	---	NP
143---------------- Vint	0-12	Fine sandy loam	ML, CL-ML, SM, SM-SC	A-4	0	100	100	75-85	45-55	15-25	NP-5
	12-60	Loamy sand, loamy fine sand.	SM	A-2	0	95-100	95-100	70-80	20-30	---	NP
144*:											
Vint--------------	0-10	Very fine sandy loam.	SM, ML	A-4	0	100	100	85-95	40-65	15-25	NP-5
	10-40	Loamy fine sand	SM	A-2	0	95-100	95-100	70-80	20-30	---	NP
	40-60	Silty clay------	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
Indio-------------	0-12	Very fine sandy loam.	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
	12-40	Stratified loamy very fine sand to silt loam.	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
	40-72	Silty clay------	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35

* See description of the map unit for composition and behavior characteristics of the map unit.

APPENDIX B

US Solar Infiltration Test Results

I-1 (Surface)

	Time	Time Interval	Initial Ht. (in)	Final Ht. (in)	Drop (in)	Infiltration Rate (min/in)	
8/29/2011	12:00 PM						
	12:35 PM	35	12	7.875	4.125	8.48	
	12:35 PM						
	2:04 PM	89	12	2.5	9.5	9.37	
	2:04 PM						**Average**
	3:29 PM	85	12	1.75	10.25	8.29	**8.83**
8/30/2011	10:11 AM						
	11:21 AM	70	12	8.375	3.625	19.31	
	11:21 AM						**Average**
	11:54 AM	33	12	10.25	1.75	18.86	**19.08**
8/31/2011	3:21 PM						
	4:26 PM	65	12	6.5	5.5	11.82	
	4:26 PM						**Average**
	4:50 PM	24	12	9.75	2.25	10.67	**11.24**

US Solar Infiltration Test Results

I-2 (12 in. Depth)

	Time	Time Interval	Initial Ht. (in)	Final Ht. (in)	Drop (in)	Infiltration Rate (min/in)	
8/29/2011	12:00 PM						
	12:35 PM	35	12	10.625	1.375	25.45	
	12:35 PM						
	2:04 PM	89	12	9.125	2.875	30.96	
	2:04 PM						**Average**
	3:29 PM	85	12	8.875	3.125	27.20	**29.08**
8/30/2011	10:11 AM						
	11:21 AM	70	12	9.75	2.25	31.11	
	11:21 AM						**Average**
	11:54 AM	33	12	10.875	1.125	29.33	**30.22**
8/31/2011	3:21 PM						
	4:26 PM	65	12	3.5	8.5	7.65	
	4:26 PM						**Average**
	4:50 PM	24	12	9.128	2.872	8.36	**8.00**

US Solar Infiltration Test Results

I-3 (Surface)

	Time	Time Interval	Initial Ht. (in)	Final Ht. (in)	Drop (in)	Infiltration Rate (min/in)	
8/29/2011	12:25 PM						
	1:10 PM	45	12	2.25	9.75	4.62	
	1:10 PM						
	2:53 PM	103	12	0	12	8.58	
	2:53 PM						**Average**
	3:41 PM	48	12	4.75	7.25	6.62	**7.60**
8/30/2011	10:35 AM						
	11:10 AM	35	12	6.75	5.25	6.67	
	11:10 AM						**Average**
	12:05 PM	55	12	6	6	9.17	**7.92**
8/31/2011	3:39 PM						
	4:15 PM	36	12	8.5	3.5	10.29	
	4:15 PM						**Average**
	5:02 PM	47	12	8.25	3.75	12.53	**11.41**

US Solar Infiltration Test Results

I-4 (12 in. Depth)

	Time	Time Interval	Initial Ht. (in)	Final Ht. (in)	Drop (in)	Infiltration Rate (min/in)	
8/29/2011	12:25 PM						
	1:10 PM	45	12	4	8	5.63	
	1:10 PM						
	2:53 PM	103	12	9.25	2.75	37.45	
	2:53 PM						**Average**
	3:41 PM	48	12	11	1	48.00	**42.73**
8/30/2011	10:35 AM						
	11:10 AM	35	12	11.25	0.75	46.67	
	11:10 AM						**Average**
	12:05 PM	55	12	11.125	0.875	62.86	**54.76**
8/31/2011	3:39 PM						
	4:15 PM	36	12	11	1	36.00	
	4:15 PM						**Average**
	5:02 PM	47	12	11	1	47.00	**41.50**

APPENDIX - C

County Standards and Rational Method Parameters

HYDROLOGIC SOIL GROUP MAP

LEGEND

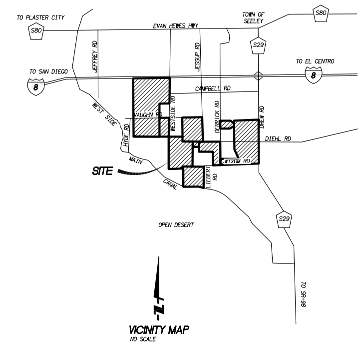
PROJECT LIMIT

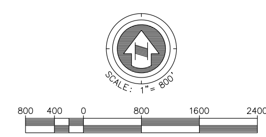
SOIL GROUP B

SOIL GROUP C

SOIL GROUP D

INFILTRATION TEST LOCATION





CAMPO VERDE SOLAR

APPENDIX C

SOIL GROUP MAP

NOVEMBER 2011

02713-002-02

FUSCOE
ENGINEERING
6390 Greenwich Drive, Suite 170
San Diego, California 92122
tel 858.554.1500 • fax 858.597.0335
www.fuscoe.com

SOURCE: USDA NATIONAL RESOURCE CONSERVATION SERVICE

Detail A - Runoff Coefficients (C), Rational Formula

Land Use	Percent Impervious Area	Hydrologic Soil Group											
		A			B			C			D		
		Slope Range Percent			Slope Range Percent			Slope Range Percent			Slope Range Percent		
		0-2	2-6	6 & over	0-2	2-6	6 & over	0-2	2-6	6 & over	0-2	2-6	6 & over
Industrial	90	0.67 0.85	0.68 0.85	0.68 0.86	0.68 0.85	0.68 0.86	0.69 0.86	0.68 0.86	0.69 0.86	0.69 0.87	0.69 0.86	0.69 0.86	0.70 0.88
Commercial	95	0.71 0.88	0.71 0.89	0.72 0.89	0.71 0.89	0.72 0.89	0.72 0.89	0.72 0.89	0.72 0.89	0.72 0.90	0.72 0.89	0.72 0.89	0.72 0.90
High Density Residential	60	0.47 0.58	0.49 0.60	0.50 0.61	0.48 0.59	0.50 0.61	0.52 0.64	0.49 0.60	0.51 0.62	0.54 0.66	0.51 0.62	0.53 0.64	0.56 0.69
Med. Density Residential	30	0.25 0.33	0.28 0.37	0.31 0.40	0.27 0.35	0.30 0.39	0.35 0.44	0.30 0.38	0.33 0.42	0.38 0.49	0.33 0.41	0.36 0.45	0.42 0.54
Low Density Residential	15	0.14 0.22	0.19 0.26	0.22 0.29	0.17 0.24	0.21 0.28	0.26 0.34	0.20 0.28	0.25 0.32	0.31 0.40	0.24 0.31	0.28 0.35	0.35 0.46
Agriculture	5	0.08 0.14	0.13 0.18	0.16 0.22	0.11 0.16	0.15 0.21	0.21 0.28	0.14 0.20	0.19 0.25	0.26 0.34	0.18 0.24	0.23 0.29	0.31 0.41
Open Space	2	0.05 0.11	0.10 0.16	0.14 0.20	0.08 0.14	0.13 0.19	0.19 0.26	0.12 0.18	0.17 0.23	0.24 0.32	0.16 0.22	0.21 0.27	0.28 0.39
Freeways & Expressways	70	0.57 0.70	0.59 0.71	0.60 0.72	0.58 0.71	0.60 0.72	0.61 0.74	0.59 0.72	0.61 0.73	0.63 0.76	0.60 0.73	0.62 0.75	0.64 0.78

Detail B - Runoff Coefficients for Specific Land Use

Land Use	Hydrologic Soil Group											
	A			B			C			D		
	Slope Range Percent			Slope Range Percent			Slope Range Percent			Slope Range Percent		
	0-2	2-6	6 & over	0-2	2-6	6 & over	0-2	2-6	6 & over	0-2	2-6	6 & over
Row Crops	.08 .22	.16 .30	.22 .38	.12 .26	.20 .34	.27 .44	.15 .30	.24 .37	.33 .50	.19 .34	.28 .41	.38 .56
Median Stripturf	.19 .24	.20 .26	.24 .30	.19 .25	.22 .28	.26 .33	.20 .26	.23 .30	.30 .37	.20 .27	.25 .32	.30 .40
Side Slopeturf			.25 .32			.27 .34			.28 .36			.30 .38
PAVEMENT												
Asphalt	.70 - .95											
Concrete	.80 - .95											
Brick	.70 - .80											
Drives, Walks	.75 - .85											
Roofs	.75 - .95											
Gravel Roads Shoulders	.40 - .60											

NOTE: The lower C values in each range should be used with the relatively low intensities associated with 2 to 10 year design recurrence intervals whereas the higher C values should be used for intensities associated with the longer 25 to 100 year deign recurrence intervals.

Figure 819.2A

Runoff Coefficients for Undeveloped Areas

Watershed Types

	Extreme	High	Normal	Low
Relief	.28 -.35 Steep, rugged terrain with average slopes above 30%	.20 -.28 Hilly, with average slopes of 10 to 30%	.14 -.20 Rolling, with average slopes of 5 to 10%	.08 -.14 Relatively flat land, with average slopes of 0 to 5%
Soil Infiltration	.12 -.16 No effective soil cover, either rock or thin soil mantle of negligible infiltration capacity	.08 -.12 Slow to take up water, clay or shallow loam soils of low infiltration capacity, imperfectly or poorly drained	.06 -.08 Normal; well drained light or medium textured soils, sandy loams, silt and silt loams	.04 -.06 High; deep sand or other soil that takes up water readily, very light well drained soils
Vegetal Cover	.12 -.16 No effective plant cover, bare or very sparse cover	.08 -.12 Poor to fair; clean cultivation crops, or poor natural cover, less than 20% of drainage area over good cover	.06 -.08 Fair to good; about 50% of area in good grassland or woodland, not more than 50% of area in cultivated crops	.04 -.06 Good to excellent; about 90% of drainage area in good grassland, woodland or equivalent cover
Surface Storage	.10 -.12 Negligible surface depression few and shallow; drainageways steep and small, no marshes	.08 -.10 Low; well defined system of small drainageways; no ponds or marshes	.06 -.08 Normal; considerable surface depression storage; lakes and pond marshes	.04 -.06 High; surface storage, high; drainage system not sharply defined; large flood plain storage or large number of ponds or marshes

Given An undeveloped watershed consisting of;
1) rolling terrain with average slopes of 5%,
2) clay type soils,
3) good grassland area, and
4) normal surface depressions.

Find The runoff coefficient, C, for the above watershed.

Solution:

Relief	0.14
Soil Infiltration	0.08
Vegetal Cover	0.04
Surface Storage	0.06
C=	0.32

APPENDIX - D

NOAA Data

NOAA Atlas 14, Volume 6, Version 2
Location name: El Centro, California, US*
Coordinates: 32.7559, -115.7264
Elevation: -35 ft*
* source: Google Maps

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.075** (0.064-0.089)	**0.115** (0.098-0.138)	**0.175** (0.148-0.210)	**0.229** (0.191-0.276)	**0.311** (0.250-0.389)	**0.382** (0.301-0.489)	**0.461** (0.354-0.607)	**0.552** (0.412-0.749)	**0.692** (0.493-0.981)	**0.815** (0.560-1.20)
10-min	**0.108** (0.091-0.128)	**0.166** (0.140-0.198)	**0.251** (0.211-0.301)	**0.328** (0.274-0.396)	**0.445** (0.359-0.558)	**0.547** (0.431-0.701)	**0.661** (0.508-0.870)	**0.792** (0.590-1.07)	**0.992** (0.707-1.41)	**1.17** (0.803-1.72)
15-min	**0.130** (0.110-0.155)	**0.200** (0.169-0.239)	**0.303** (0.256-0.363)	**0.396** (0.331-0.479)	**0.539** (0.434-0.675)	**0.662** (0.521-0.848)	**0.800** (0.614-1.05)	**0.958** (0.714-1.30)	**1.20** (0.855-1.70)	**1.41** (0.970-2.08)
30-min	**0.179** (0.152-0.214)	**0.276** (0.233-0.329)	**0.418** (0.352-0.500)	**0.546** (0.456-0.660)	**0.742** (0.598-0.929)	**0.911** (0.718-1.17)	**1.10** (0.846-1.45)	**1.32** (0.983-1.79)	**1.65** (1.18-2.34)	**1.95** (1.34-2.86)
60-min	**0.250** (0.212-0.299)	**0.385** (0.326-0.460)	**0.584** (0.492-0.700)	**0.763** (0.638-0.922)	**1.04** (0.836-1.30)	**1.27** (1.00-1.63)	**1.54** (1.18-2.03)	**1.84** (1.37-2.50)	**2.31** (1.65-3.27)	**2.72** (1.87-4.00)
2-hr	**0.341** (0.289-0.407)	**0.508** (0.429-0.606)	**0.748** (0.631-0.896)	**0.962** (0.804-1.16)	**1.28** (1.04-1.61)	**1.56** (1.23-2.00)	**1.87** (1.43-2.46)	**2.21** (1.65-3.00)	**2.74** (1.95-3.89)	**3.20** (2.20-4.71)
3-hr	**0.395** (0.334-0.471)	**0.580** (0.491-0.693)	**0.846** (0.713-1.01)	**1.08** (0.905-1.31)	**1.44** (1.16-1.80)	**1.74** (1.37-2.23)	**2.07** (1.59-2.73)	**2.45** (1.83-3.32)	**3.02** (2.15-4.28)	**3.52** (2.42-5.17)
6-hr	**0.487** (0.412-0.581)	**0.709** (0.599-0.846)	**1.02** (0.864-1.23)	**1.30** (1.09-1.58)	**1.72** (1.39-2.16)	**2.07** (1.64-2.66)	**2.46** (1.89-3.24)	**2.90** (2.16-3.93)	**3.55** (2.53-5.04)	**4.12** (2.83-6.05)
12-hr	**0.546** (0.463-0.652)	**0.803** (0.679-0.959)	**1.17** (0.988-1.40)	**1.50** (1.25-1.81)	**1.99** (1.60-2.49)	**2.40** (1.89-3.08)	**2.86** (2.20-3.76)	**3.37** (2.51-4.57)	**4.13** (2.95-5.86)	**4.79** (3.29-7.04)
24-hr	**0.683** (0.603-0.789)	**1.01** (0.896-1.17)	**1.50** (1.32-1.74)	**1.93** (1.69-2.26)	**2.59** (2.19-3.12)	**3.14** (2.61-3.86)	**3.76** (3.06-4.73)	**4.46** (3.53-5.75)	**5.51** (4.20-7.38)	**6.41** (4.73-8.86)
2-day	**0.767** (0.677-0.886)	**1.15** (1.01-1.33)	**1.71** (1.50-1.98)	**2.21** (1.93-2.58)	**2.96** (2.50-3.56)	**3.60** (2.99-4.42)	**4.31** (3.50-5.41)	**5.11** (4.04-6.58)	**6.31** (4.81-8.45)	**7.34** (5.42-10.2)
3-day	**0.812** (0.717-0.938)	**1.22** (1.07-1.41)	**1.81** (1.59-2.10)	**2.34** (2.05-2.74)	**3.14** (2.66-3.78)	**3.82** (3.18-4.69)	**4.58** (3.72-5.75)	**5.42** (4.29-6.99)	**6.70** (5.10-8.97)	**7.79** (5.75-10.8)
4-day	**0.841** (0.743-0.972)	**1.26** (1.11-1.46)	**1.88** (1.65-2.18)	**2.43** (2.12-2.84)	**3.25** (2.75-3.92)	**3.95** (3.28-4.85)	**4.72** (3.84-5.93)	**5.59** (4.43-7.21)	**6.90** (5.25-9.23)	**8.01** (5.91-11.1)
7-day	**0.888** (0.784-1.02)	**1.32** (1.17-1.53)	**1.97** (1.73-2.28)	**2.53** (2.21-2.96)	**3.39** (2.87-4.08)	**4.11** (3.41-5.04)	**4.90** (3.98-6.16)	**5.79** (4.58-7.46)	**7.11** (5.42-9.53)	**8.24** (6.08-11.4)
10-day	**0.907** (0.801-1.05)	**1.35** (1.19-1.57)	**2.01** (1.76-2.33)	**2.58** (2.26-3.02)	**3.45** (2.92-4.16)	**4.18** (3.47-5.13)	**4.97** (4.04-6.25)	**5.86** (4.64-7.55)	**7.18** (5.47-9.61)	**8.29** (6.12-11.5)
20-day	**0.989** (0.874-1.14)	**1.49** (1.32-1.73)	**2.21** (1.95-2.57)	**2.85** (2.49-3.33)	**3.79** (3.21-4.56)	**4.57** (3.79-5.61)	**5.41** (4.39-6.79)	**6.33** (5.01-8.16)	**7.67** (5.84-10.3)	**8.77** (6.47-12.1)
30-day	**1.02** (0.899-1.18)	**1.56** (1.38-1.80)	**2.34** (2.06-2.71)	**3.02** (2.63-3.52)	**4.01** (3.40-4.83)	**4.83** (4.01-5.93)	**5.70** (4.63-7.16)	**6.64** (5.26-8.55)	**7.98** (6.08-10.7)	**9.06** (6.69-12.5)
45-day	**1.08** (0.956-1.25)	**1.69** (1.49-1.95)	**2.55** (2.24-2.96)	**3.30** (2.88-3.85)	**4.39** (3.72-5.29)	**5.28** (4.38-6.48)	**6.21** (5.04-7.79)	**7.20** (5.70-9.27)	**8.59** (6.54-11.5)	**9.69** (7.15-13.4)
60-day	**1.14** (1.01-1.32)	**1.81** (1.60-2.09)	**2.76** (2.43-3.20)	**3.58** (3.13-4.18)	**4.76** (4.03-5.73)	**5.71** (4.75-7.02)	**6.71** (5.46-8.43)	**7.76** (6.14-10.0)	**9.21** (7.01-12.3)	**10.3** (7.63-14.3)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

APPENDIX - E

Existing and Proposed Conditions Basin Maps

APPENDIX E-1

Existing Basin Map

E-1 - EXISTING BASIN MAP

CAMPO VERDE SOLAR PROJECT

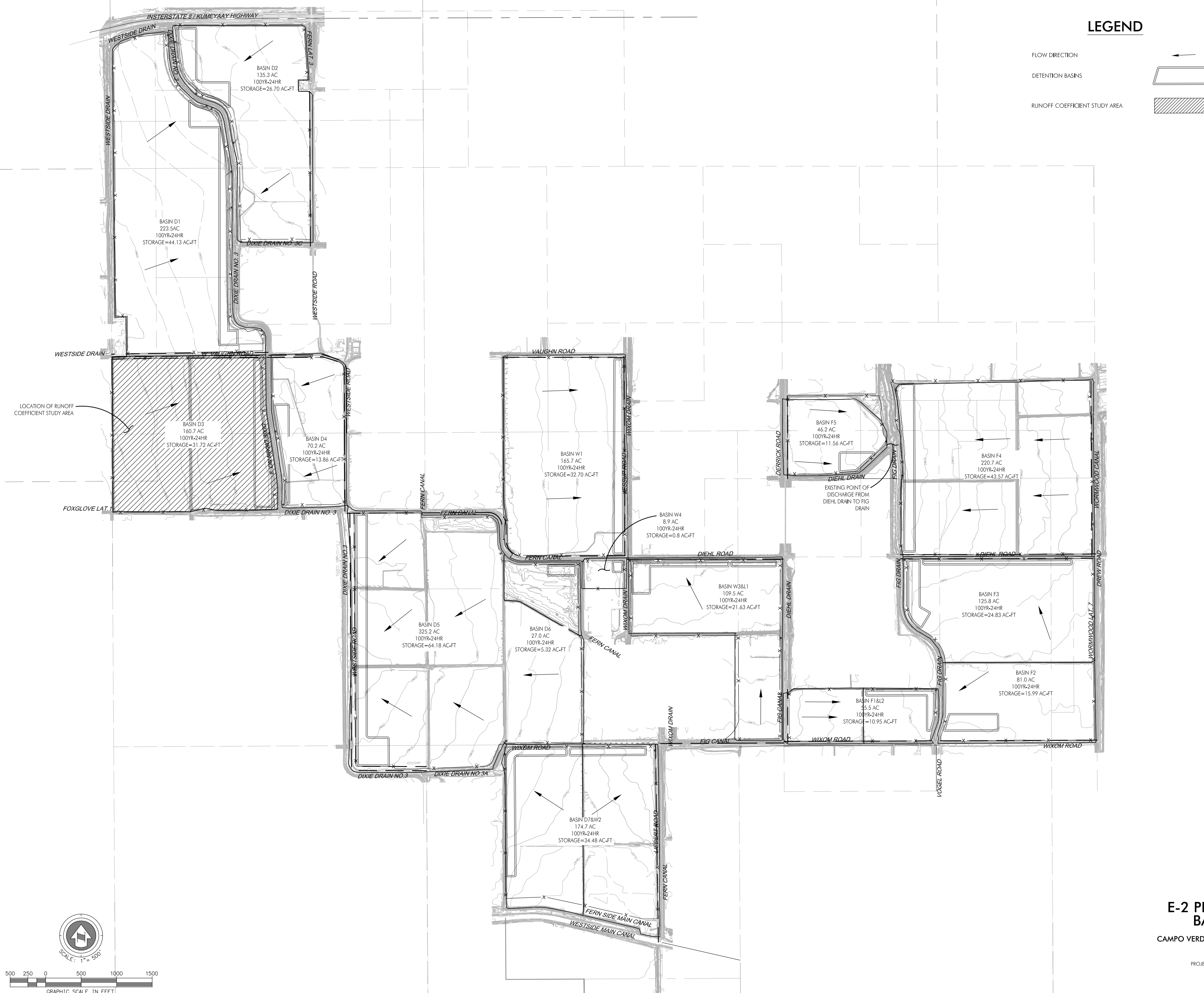
IMPERIAL COUNTY
PROJECT NUMBER: 02713-02-001
SCALE: 1"=500'
DATE: 01/2012

SHEET 1 OF 1

FUSCOE ENGINEERING
6390 Greenwich Drive, Suite 170
San Diego, California 92122
tel 858.554.1500 • fax 858.597.0335
www.fuscoe.com

APPENDIX E-2

Proposed Conditions Basin Map



E-2 PROPOSED BASIN MAP

CAMPO VERDE SOLAR PROJECT

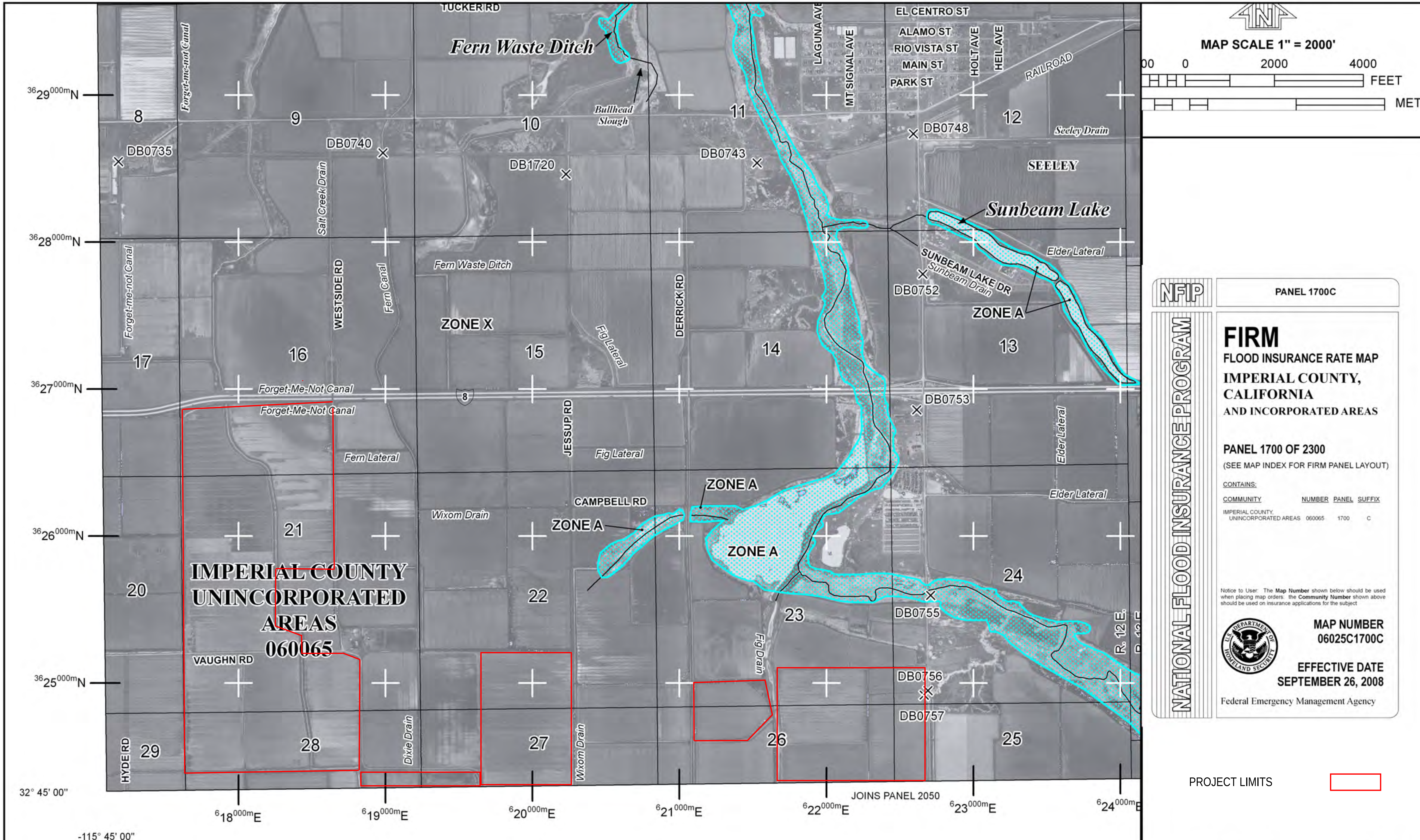
IMPERIAL COUNTY
PROJECT NUMBER: 02713-02-001
SCALE: 1"=500'
DATE: 01/2012

SHEET 1 OF 1

FUSCOE ENGINEERING
6390 Greenwich Drive, Suite 170
San Diego, California 92122
tel 858.554.1500 • fax 858.597.0335
www.fuscoe.com

APPENDIX - F

FEMA FIRMettes



NATIONAL FLOOD INSURANCE PROGRAM

NFIP

PANEL 1700C

FIRM
FLOOD INSURANCE RATE MAP
IMPERIAL COUNTY, CALIFORNIA
AND INCORPORATED AREAS

PANEL 1700 OF 2300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
IMPERIAL COUNTY, UNINCORPORATED AREAS	060065	1700	C

Notice to User: The **Map Number** shown below should be used when placing map orders: the **Community Number** shown above should be used on insurance applications for the subject

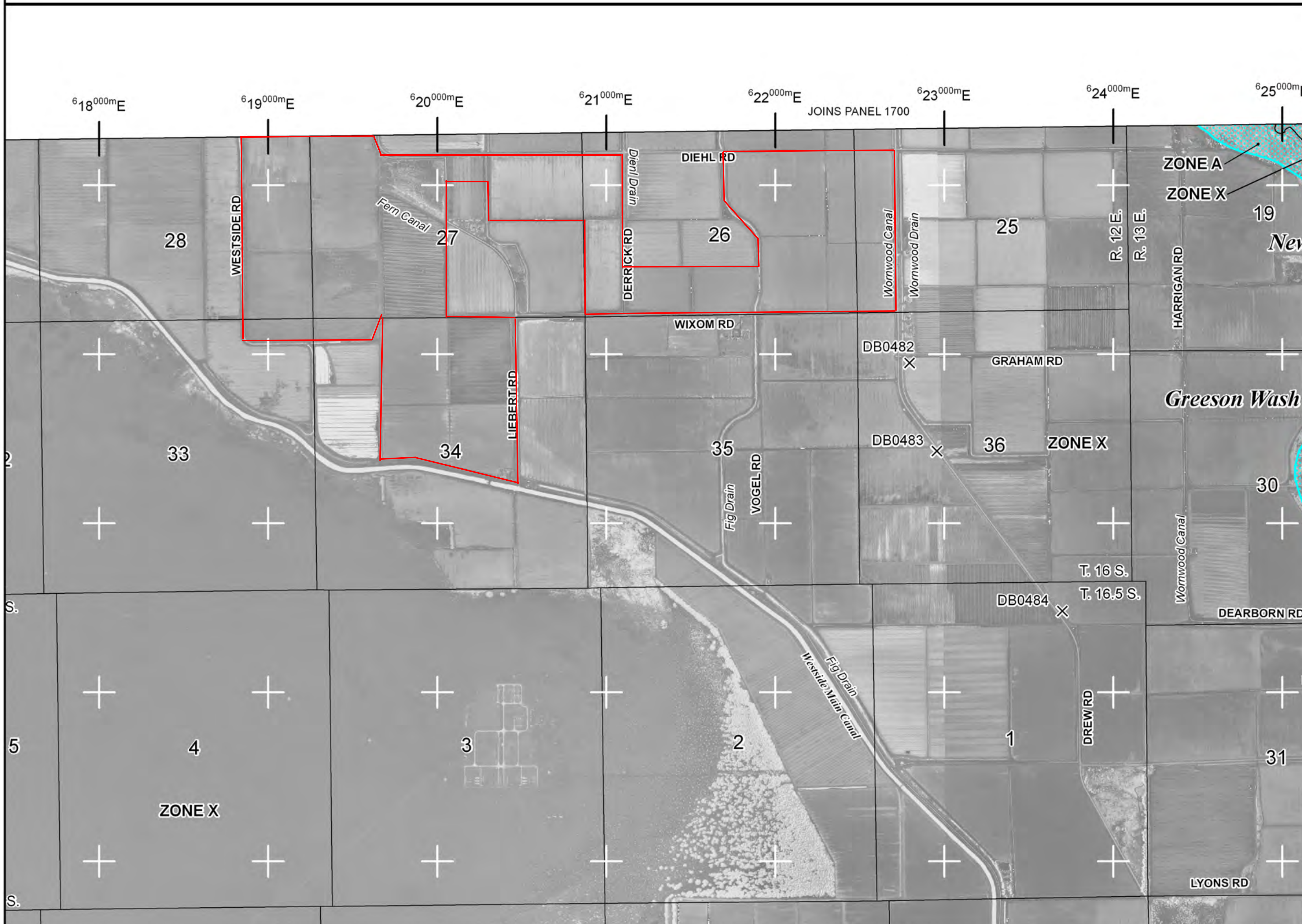
MAP NUMBER
06025C1700C

EFFECTIVE DATE
SEPTEMBER 26, 2008

Federal Emergency Management Agency

PROJECT LIMITS

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



MAP SCALE 1" = 2000'

0 2000 4000 FEET

METERS

NFIP

PANEL 2050C

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

IMPERIAL COUNTY, CALIFORNIA

AND INCORPORATED AREAS

PANEL 2050 OF 2300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
IMPERIAL COUNTY, UNINCORPORATED AREAS	060065	2050	C

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER 06025C2050C

EFFECTIVE DATE SEPTEMBER 26, 2008

Federal Emergency Management Agency

PROJECT LIMITS

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

APPENDIX J

FINAL BIOLOGICAL TECHNICAL REPORT

FINAL

Biological Technical Report for the Campo Verde Solar Project

Prepared for:

First Solar

Prepared by:

Heritage Environmental Consultants

April 2012

TABLE OF CONTENTS

Tables

Attachments

Appendices

Appendix 1: Burrowing Owl Survey Report
Appendix 2: Jurisdictional Waters Report

1.0 INTRODUCTION

The Campo Verde Solar Project (Project) is a proposed solar photovoltaic (PV) energy-generating facility located in Imperial County approximately 7 miles southwest of the community of El Centro, California (**Attachment 1: Figure 1**).

The Project is being developed to sell its electricity and all renewable and environmental attributes to an electric utility purchaser under a long-term contract to help meet California RPS goals. The applicant has a long-term Power Purchase Agreement (PPA) with San Diego Gas and Electric (SDG&E) to purchase output from the Project.

The Project Site is south of I-8, west of Drew Road, and northeast of the Westside Main Canal. **Attachment 1: Figure 2** shows the boundary of the Site and the included parcels which total approximately 1,990 acres. These private lands are currently used for agriculture.

1.1 Project Description

1.1.1 Solar Energy Facility Site

The Campo Verde Solar Project would consist of two component parts: the Solar Energy Facility Site and the Gen-tie Line. The Solar Energy Facility Site would be approximately 1,990 acres and would use First Solar PV modules that are generally non-reflective and convert sunlight into direct current (DC) electricity. The DC output of multiple rows of PV modules is collected through one or more combiner boxes and directed to an inverter that converts the DC electricity to alternating current (AC) electricity. From the inverter, the generated energy flows to a transformer where it is stepped up to distribution level voltage (approximately 34.5 kV). Multiple transformers are connected in parallel via 34.5 kV lines to the Project substation, where the power will be stepped up to 230 kV. This substation will be located at the southern end of the properties adjacent to Liebert Road. At the Project substation, the Solar Energy Facility will interconnect to the grid via a new line constructed from this location to the Imperial Valley Substation approximately 0.8 to 1.00 miles to the south. In addition, the Project may interconnect temporarily to the IID S-Line that traverses the site.

The Campo Verde Solar Project will utilize First Solar's thin-film PV modules in order to produce clean, renewable energy. The PV panels will be mounted either on fixed-tilt supports or on single-axis trackers. If mounted on fixed tilt structures, the panels would be arranged into east-west oriented rows throughout the site with panels mounted facing south at angle that optimizes the amount of direct sunlight hitting the panels. Using single-axis horizontal trackers, the panels will be oriented in north-south rows with the panels moving to track the sun as it moves across the sky during the day. The trackers include low voltage electric drive motors, controller equipment, backup power supply, and anemometer towers.

The Project's overall annual availability is expected to be in the range of 99 percent of daylight hours. **Table 1** lists the Assessor Parcel Numbers (APNs) for the Solar Energy Facility.

Table 1 – Privately Owned Parcels – Solar Energy Facility Site

Assessor's Parcel Number	Acreage	Zoning
051-270-037-000	57.19 acres	A-2-R
051-270-047-000	81.16 acres	A-2-R
051-290-038-000	13.88 acres	A-2-R
051-270-027-000	120.86 acres	A-2-R
051-300-030-000	221.88 acres	A-2-R
051-300-029-000	119.91 acres	A-2-R, A-2
051-300-025-000	164.86 acres	A-2-R
051-330-015-000	119.18 acres	A-2-R, A-3
051-330-020-000	40.0 acres	A-2-R
051-330-005-000	80.0 acres	A-3
051-350-005-000	28.8 acres	A-3
051-330-019-000	101.90 acres	A-2-R, A-3
051-350-014-000	184.00 acres	A-3
051-360-018-000	1.80 acres	A-3
051-360-001-000	57.06 acres	A-2-R
051-360-002-000	23.16 acres	A-2-R
051-360-003-000	32.03 acres	A-2-R
051-360-004-000	55.0 acres	A-2-R
051-360-032-000	203.72 acres	A-2-R, A-2
051-310-060-000	0.82 acres	A-2-R
051-310-040-000	92.23 acres	A-2
051-310-059-000	31.96 acres	A-2-R
051-310-057-000	25.27 acres	A-2-R
051-310-056-000	80.65 acres	A-2-R
051-310-049-000	9.97 acres	A-2-R
051-310-050-000	42.42 acres	A-2-R
051-310-058-000	0.90 acres	A-2-R
051-270-037-000	57.19 acres	A-2-R
051-270-047-000	81.16 acres	A-3
051-290-038-000	13.88 acres	A-2-R
Total	**1,990.61**	

1.1.2 Proposed Gen-Tie

The Solar Energy Facility will be interconnected to the regional transmission system via a 230kV double-circuit transmission line from the Solar Energy Facility to the Imperial Valley Substation. The Proposed Gen-Tie would originate at the Project substation/switchyard at the southern end of the Solar Energy Facility site and would go across BLM land for about 0.9 miles BLM to the Imperial Valley Substation. The Gen-Tie is located entirely within a BLM-designated utility corridor. Proposed impacts for this alternative are shown in **Table 2**.

1.2 Alternatives

The project considered several Gen-Tie alternatives to provide the needed interconnection to the Imperial Valley Substation. In addition to the Proposed Gen-Tie, route alternatives were developed to minimize impacts by co-locating with existing linear facilities. Proposed impacts for this alternative are shown in **Table 2**.

1.2.1 Alternative Gen-Tie Across BLM Land

The Alternative Gen-Tie across BLM Land would parallel the existing IID S-line and associated access road. The existing road would be used to provide access for this gen-tie and the existing line would not be affected by it. After it leaves the Solar Energy Facility site, this gen-tie alternative would cross a total of about 0.8 miles with about 0.4 miles on BLM land and 0.4 miles on private lands. The private lands are fallow agricultural fields. Proposed impacts for this alternative are shown in **Table 2**.

1.2.2 Private Land Gen-Tie Alternative

The Private Land Gen-Tie Alternative would originate from the western side of the Project site and would cross approximately 1.75 miles of private lands to the west. It would follow existing field roads and ditches to the C-Solar West Project site. From there, available capacity would be utilized on the C-Solar West Project's gen-tie line that has an approved right-of-way to the Imperial Valley Substation and use of that gen-tie line would not require any physical disturbance beyond that already permitted and approved. Proposed impacts for this alternative are shown in **Table 2**.

Figure 3 shows the locations of the various gen-tie alternatives described above.

In addition to any of the long-term interconnection solutions described above, a short-term electrical interconnection solution may be implemented that would involve an interconnection to IID's S Line that crosses the site. If this solution is utilized, it would provide temporary interconnection to the grid and would be replaced by the permanent interconnection into the Imperial Valley Substation when completed.

Table 2 – Proposed Impacts for the Campo Verde Solar Project

Project Component	Temporary Impacts (acres)	Permanent Impacts (acres)
Proposed Project		
Campo Verde Solar Site	1,852.0	1,852.0
Proposed Gen-Tie		
Total	**7.69**	**0.05**
Alternatives		
Alternative Gen-Tie Across BLM Land		
Total	**8.01**	**0.05**
Private Land Gen-Tie Alternative		
Total	**10.19**	**0.10**

1.1.3 Survey Area

The survey area for the Project is shown on **Attachment 1: Figure 3** and includes:

- The Campo Verde Solar Energy Facility and a 1,000-foot buffer;
- The Proposed Gen-Tie and Alternative Gen-Tie across BLM land encompassing a 160-foot Gen-tie right-of-way (ROW) corridor on federal land, and the Private Land Gen-Tie Alternative encompassing a 200-foot buffer on both sides of the ROW

The survey area is found in portions of Township 16 South, Range 12 East, Sections 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 33, and 34; and Township 16.5 South, Range 12 East, Section 3.

The survey area for most species/resources is defined as the Project Area plus a 1,000-foot buffer area. The survey area is 4,288 acres in size. Some species required different survey areas, which are described on a case-by-case basis.

1.2 Regulatory Environment

The following state and federal environmental regulations apply to the proposed project:

1.2.1 Federal

Endangered Species Act of 1973. Endangered Species Act of 1973 (16 United States Code [U.S.C.] 1531–1544), as amended (ESA), protects federally listed threatened and endangered species from unlawful take. "Take" under ESA includes activities such as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." The United States Fish and Wildlife Service (USFWS) regulations define harm to include some type of "significant habitat modification or degradation."

Section 7 of the ESA requires federal agencies to ensure that any action authorized, funded, or carried out by them is not likely to jeopardize the continued existence of listed species or modify their critical habitat. When a federal agency action, such as issuance of a permit or grant of ROW, may affect a federally listed species, the federal action agency requests initiation of either formal or informal consultation with USFWS. The final product of formal Section 7 consultation is a biological opinion in which USFWS determines whether the proposed action is likely to jeopardize the continued existence of listed species or result in destruction or adverse modification of critical habitat. If the determination is yes, the USFWS will recommend reasonable and prudent alternatives to the proposed action that would reduce the level of impact to no jeopardy/no adverse modification of critical habitat. A biological opinion may include an incidental take statement that provides the federal agency and the project applicant with incidental take authority for the activities evaluated in the biological opinion. The regulations implementing Section 7 of ESA require federal agencies to conference with the USFWS for any species that is proposed as a candidate for federal listing so that USFWS can provide non-binding recommendations that will avoid or minimize impact to the species. The USFWS may, if requested, conduct the conference as a formal consultation by providing a conference opinion and incidental take statement. If the species becomes listed, the USFWS may adopt the incidental take statement provided in the biological opinion, thus conferring incidental take authority.

Migratory Bird Treaty Act. The Migratory Bird Treaty Act of 1918 (MBTA; 16 U.S.C. 703 et seq.) is a federal statute that implements treaties with several countries on the conservation and protection of migratory birds. The number of bird species covered by the MBTA is listed at 50 Code of Federal Regulations (CFR) 10.13. The regulatory definition of "migratory bird" is broad, and includes any mutation or hybrid of a listed species and any part, egg, or nest of such birds (50 CFR 10.12). Migratory birds are not necessarily federally listed endangered or threatened species under the ESA. The MBTA, which is administered by USFWS, makes it unlawful "by any means or in any manner, to pursue, hunt, take, capture, [or] kill" any migratory bird, or attempt such actions, except as permitted by regulation. The applicable regulations prohibit the take, possession, import, export, transport, sale, purchase, barter, or offering of these activities, except under a valid permit or as permitted in the implementing regulations (50 CFR 21.11).

Bald and Golden Eagle Protection Act. The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c), enacted in 1940 and as amended, prohibits anyone, without a permit issued by the USFWS, from "taking" bald and golden eagles, including their parts, nests, or eggs. The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." For purposes of these guidelines, "disturb" means: "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

Federal Water Pollution Control Act (Clean Water Act). The Clean Water Act (CWA; 33 USC 1251 et seq.), as amended, provides a structure for regulating the discharge of pollutants into the waters of the U.S. Through this Act, the Environmental Protection Agency is given the authority to implement pollution control programs. These include setting wastewater standards for industry and water quality standards for contaminants in surface waters. The discharge of any pollutant from a point source into navigable waters is illegal unless a permit under its provisions is acquired. In California, the State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCBs) are responsible for implementing the CWA. Section 404 of the CWA regulates the discharge of dredged, excavated or fill material in wetlands, streams, rivers, and other waters of the U.S. The U.S. Army Corps of Engineers (ACOE) is the federal agency authorized to issue Section 404 Permits for certain activities conducted in wetlands or other waters of the U.S. Section 401 of the CWA grants each state the right to ensure that the State's interests are protected on any federally permitted activity resulting in any discharge into navigable waters within the State. In California, the RWQCBs are the agencies mandated to ensure protection of the State's waters. For a proposed project that requires an ACOE CWA Section 404 permit, the RWQCB must certify that such discharge complies with state water quality standards through a Water Quality Certification determination (Section 401).

California Desert Conservation Area (CDCA). The CDCA encompasses 25 million acres of land in southern California designated by Congress in 1976 through the Federal Land Policy and Management Act (FLPMA). The BLM directly administers approximately 10 million acres of the CDCA. The CDCA Plan designated Yuha Basin Area of Critical Environmental Concern (ACEC) Management Plan was prepared to give additional protection to unique cultural resources and wildlife values found in the region while also providing for multiple use management. The ACEC Management Plan allows for the "traversing of the ACEC by proposed transmission lines and associated facilities if environmental analysis demonstrates that it is environmentally sound to do so."

National Environmental Policy Act. The National Environmental Policy Act (NEPA; 42 U.S.C. 4321 et seq.) was signed into law on January 1, 1970. The Act establishes national environmental policy and goals for the protection, maintenance, and enhancement of the environment and provides a process for implementing these goals within the federal agencies. NEPA requires Federal agencies to integrate environmental values into their decision-making processes by considering the environmental impacts of, and reasonable alternatives to, their proposed actions.

1.2.2 State

California Endangered Species Act. The California Endangered Species Act of 1984 (CESA) provides a framework for the listing and protection of wildlife species determined to be threatened or endangered in California.

California Fish and Game Code 3503.5. Raptors (birds of prey) and active raptor nests are protected by the California Fish and Game Code 3503.5, which states that it is "unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird" unless authorized (California Department of Fish and Game [CDFG] 1991).

California Fish and Game Code 3503. Bird nests and eggs are protected by the California Fish and Game Code 3503, which states "it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto."

California Fish and Game Code 3513. Protects California's migratory birds by making it unlawful to take or possess any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame birds.

State of California Fully Protected Species. The classification of Fully Protected was the State's initial effort in the 1960's to identify and provide additional protection to those animals that were rare or faced possible extinction. Lists were created for fish, mammals, amphibians and reptiles, birds, and mammals. Most fully protected species have also been listed as threatened or endangered species under ESA and/or California Endangered Species Act (CESA). Fully Protected species may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock.

California Fish and Game Code, Section 1600, as amended. Under Section 1602 of the Fish and Game Code, CDFG regulates activities that would divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake that supports fish or wildlife. CDFG has jurisdiction over riparian habitats (e.g., southern willow scrub) associated with watercourses. Jurisdictional waters are delineated by the outer edge of riparian vegetation or at the top of the bank of streams or lakes, whichever is wider. CDFG jurisdiction does not include tidal areas or isolated resources. Section 1602 of the Fish and Game Code requires any person who proposes a project that will substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake or use materials from a streambed to notify the CDFG before beginning the project. If the CDFG determines that the project may adversely affect existing fish and wildlife resources, a Lake or Streambed Alteration Agreement is required.

Native Plant Protection Act. The Native Plant Protection Act (*California Fish and Game Code Section. 1900-1913*; NPPA) prohibits the taking, possessing, or sale within the state of any plant listed by CDFG as rare, threatened, or endangered. An exception to this prohibition in the Act allows landowners, under specified circumstances, to take listed plant species, provided that the owners first notify CDFG at least 10 days prior to the initiation of activities that would destroy them. The NPPA exempts from "take" prohibition "the removal of endangered or rare native plants from a canal, lateral ditch, building site, or road, or other right of way."

California Environmental Quality Act (CEQA). The California Environmental Quality Act of 1970 (CEQA), Public Resources Code (PRC) 21100 et seq., requires lead agencies to evaluate the environmental impact associated with a proposed project. CEQA requires that a local agency prepare an Environmental Impact Report (EIR) on any project it proposes to approve that may have a significant effect on the environment. The purpose of an EIR is to provide decision-makers, public agencies, and the general public with an objective document that fully discloses the potential environmental effects of a proposed project. The EIR process is specifically designed to objectively evaluate and disclose potentially significant direct, indirect, and cumulative impacts of a proposed project; to identify alternatives that may reduce or eliminate a project's significant effects; and to identify feasible measures that mitigate significant effects of a project. In addition, CEQA requires that an EIR identify those adverse impacts that remain significant after mitigation.

Porter–Cologne Water Quality Control Act, as amended. The Porter–-Cologne Act grants the State Water Resource Control Board (SWRCB) and the RWQCBs power to protect water quality and is the primary vehicle for implementation of California's responsibilities under the federal Clean Water Act. Any person proposing to discharge waste within any region must file a report of waste discharge with the appropriate regional board.

2.0 SURVEY METHODS

Data regarding biological resources within the Project Area were obtained through field surveys and literature reviews of applicable reference materials.

2.1 Field Surveys

The 4,288-acre survey area encompasses the entire Campo Verde Solar Energy Facility, the 160-foot-wide ROWs along the proposed and alternative Gen-tie routes, and buffer areas that varied for several surveys based on the target species and include 4,201 acres of private land and 87 acres of BLM-administered land.

2.1.1 General Biological Survey

Habitat assessments and general biological surveys of the proposed Campo Verde Solar Energy Facility site were conducted on May 5 and September 30, 2010, March 28 through April 5, 2011, and October 23 through 27, 2011. The associated linear facilities surveys were conducted from October 23 through 27, 2011. The focus of these surveys was twofold: 1) to document the botanical resources and potentially jurisdictional state and federal waters and wetlands, and 2) to document suitable threatened, endangered, and sensitive wildlife species habitats on the proposed Campo Verde Solar Energy Facility and along the proposed and alternative Gen-tie Line corridors. The field surveys were conducted by surveying naturally vegetated areas with public access on foot and surveying the remainder of the area from public roads. The earthen drains and canals on the Solar Energy Facility were surveyed for indications of wetland vegetation and wildlife use. High quality aerial photography was used to map habitats and other features in areas that couldn't be accessed from public roads. These areas were examined with binoculars and vegetation communities were interpreted and mapped on the aerials.

2.1.2 Focused Rare Plant Survey

Fall rare plant surveys were performed on October 23 and 24, 2011 in accordance with *Survey Protocols Required for NEPA/ESA Compliance for BLM Special Status Plant Species* (BLM 2009a) and the *Protocols for Surveying and Evaluating Impacts to Special Status native Plant Populations an natural Communities* (CDFG 2009b). The survey was conducted during the traditional blooming periods of several fall-blooming, sensitive species known from the vicinity of the project. Spring rare plant surveys were conducted for several nearby projects in the same corridor and those data were available and used for this analysis. Surveys for spring ephemeral species will be conducted during traditional blooming periods of species known or potentially occurring within the survey area (March to May, 2012).

The entire rare plant survey area on BLM lands was examined on foot using transects. Approximate 30-meter transects were walked within the survey area that encompassed the various gen-tie alignments.

Private lands were evaluated for suitability to support rare plants; it was determined that the private lands have been intensively cultivated for decades, which has resulted in a change to the natural soil profile and limited potential for growth of native plants. As such, it has been determined that the private lands do not support suitable habitat for rare plants The natural vegetation along the Westside Main Canal and the adjacent canals and drains was also surveyed to assess potential to support rare plants.

Rare plant surveys of the fallow agricultural areas were not conducted because these areas were determined to have no potential to support sensitive rare plants at the time of fall survey. Fall-germinating and blooming ephemeral plant species were absent from the undisturbed native habitats (e.g. public lands between the IV Substation and the Westside Main Canal) due to the lack of sufficient summer and early fall rains for seed germination. Spot field checks of the disturbed native habitats in the private agricultural lands north of the Westside Main Canal also revealed the absence of fall germinating and blooming ephemeral plant species. The absence of these species in higher quality native habitats led to the conclusion that these species were also absent from the previously cultivated habitats because fall germinating species did not sprout in this portion of the Yuha Desert in the fall of 2011. These low quality habitats will be surveyed in the spring of 2012.

A database search using the California Natural Diversity Database (CNDDB) RareFind indicated that five rare plant species are known from the project vicinity: brown turbans (*Malperia tenuis*) a CNPS List 2.3 species, hairy stickleaf (*Mentzelia hirsutissima*) a CNPS List 2.3 species, fairy duster (*Calliandra eriophylla*) a CNPS List 2.3 species, rock nettle (*Eucnide rupestris*) a CNPS List 2.2 species and Thurber's pilostyles (*Pilostyles thurberi*) a CNPS List 4.3 species. In addition, other sensitive species are known to potentially occur within the survey area and were included in the survey (refer to **Section 3.1.4.1** and **3.2.4.1**).

Phenology of common species at the time of the survey was used to verify that the survey was conducted within the period when rare plants would be observable. Shape files depicting survey area boundaries were uploaded onto GPS units. Transect locations were determined using UTMs. Track logs depicting transects were recorded on the GPS units.

2.1.3 Focused Burrowing Owl Surveys

Burrowing Owl surveys were conducted following California Burrowing Owl Consortium *Burrowing Owl Survey Protocol and Mitigation Guidelines* (CBOC 1993) and CDFG's *Staff Report on Burrowing Owl Mitigation* (CDFG 1995).

Phase I and Phase II surveys of the Campo Verde Solar Energy Facility site were conducted simultaneously by qualified biologists during the 2011 breeding season (March-April). Phase I and II surveys of the Gen-tie Corridors were conducted simultaneously during the fall of 2011 (October). The Phase I habitat assessments determined that most of the study area contains suitable Burrowing Owl habitat, and Phase II burrow surveys were conducted.

Phase II surveys covered the entire study area and potentially suitable burrows were recorded. Transects at 10-meter spacing were walked within the BLM Gen-tie Corridor (including a

500-foot buffer around the project area) to ensure that all suitable burrows were identified. Within agricultural lands, a combination of vehicular and pedestrian surveys were conducted along roads and irrigation infrastructure (per Bartok and Conway 2010).

Burrows that had the potential to be used by Burrowing Owls were marked using a handheld global positioning system (GPS) unit. Photos were taken of representative potential burrows and owl observations were noted. "Burrow Clusters" were recorded in areas that supported high densities of burrow entrances that were either (1) multiple entrances associated with a single burrow; or (2) separate burrows that were located too close together to support more than one breeding pair of owls (burrows within 5 meters of each other).

The Burrowing Owl nesting season begins as early as February 1 and continues through August 31 (Thomsen 1971, Zam 1974). The timing of nesting activities varies with latitude and climatic conditions. Phase III surveys were conducted on the Campo Verde Solar Site during the breeding season, beginning March 1 and ending August 31. All Burrowing Owl sightings were recorded (including occupied burrows and burrows with sign) and mapped. Numbers of adults and juveniles were recorded, as well as behavior such as courtship and copulation. Territory boundaries and foraging areas were not mapped, mainly because of the difficulty posed by the active nests being so close together where home-ranges potentially overlap.

Surveys were conducted in the morning and evening (one-half hour before to two hours after sunrise and two hours before to one-half hour after sunset). Burrows were examined for owl sign during the first observation of suitable burrows (typically during Phase II surveys). Subsequent observations were conducted from fixed points that provided visual coverage of the burrows using spotting scopes or binoculars. When possible, observers remained in vehicles to minimize disturbance to the birds as much as possible.

Surveys were conducted at each burrow on four separate days in order to minimize the likelihood of false-negative results (CBOC 1993). Phase III surveys were not conducted along the Proposed or Alternative Gen-tie Corridors in 2011 though they will be conducted during the spring of 2012 in accordance with the protocol.

Winter resident surveys are being conducted during December 2011and January 2012. Winter survey methodologies will follow Phase III protocol (CBOC 1993) and will be conducted on four separate days during the 2011/2012 Winter Season. This survey will be completed by the end of January 2012.

2.1.4 Avian Use Surveys

Winter avian use surveys are currently being conducted and will be completed by the end of January 2012. Spring avian use surveys will be completed in March or April 2012. They are all being performed by qualified biologists experienced in the identification of North American birds by sight and sound, and in accordance with *BLM's Solar Facility Point Count Protocol* (BLM 2009b). Point-count stations were located along 4 transects placed throughout the proposed Campo Verde Project Area (Solar Energy Facility and Proposed

Gen-tie Line). Transect locations were designed to sample all habitat types present within the Project Area with a focus on areas most likely to contain a high abundance and/or diversity of birds, while maintaining adequate spatial coverage of the entire Solar Energy Facility and Proposed Gen-tie Line corridor. Each transect was approximately 1,250-meters in length with point-count locations spaced every 250-meters along transects. A total of 24 point-count stations were sampled during each survey event, with a total of four survey events during the winter survey season (December 2011 to January 2012) and four survey events during the spring season (March-April 2012).

At each point count station, biologists recorded all birds seen or heard within a 100-meter radius over a 10-minute sampling period. Pairs or groups of birds were recorded as single detections to avoid issues resulting from statistical dependence. Birds seen or heard outside of the 100-meter radius were recorded as incidental observations and contributed to the overall project species list, but were excluded from analyses aimed at quantifying avian abundance. Birds that were seen or heard along transects, but between point-count stations, were also recorded as incidental observations. Point counts were generally performed no earlier than 30-minutes prior to sunrise and ended within four hours of sunrise. Surveys were not performed during inclement weather conditions (e.g. more than light or intermittent rain, winds greater than 15 miles-per-hour).

2.1.5 Jurisdictional Delineation

The Campo Verde Project Area (Solar Energy Facility and Gen-tie Line) was evaluated for drainage features during field visits performed on April 4 - 5, 2011, October 25 - 27, 2011 and December 19 - 20, 2011. Additional information was gathered using a Geographic Information System (GIS) and aerial imagery. Determinations regarding the potential jurisdictional status of the various features located within the Campo Verde Project Area are based on the applicable regulations and associated guidance documents as well as on personal communications with Lanika Cervantes, Project Manager in the Regulatory Division of the US Army Corps of Engineers (ACOE) and Magdalena Rodriguez, Wildlife Biologist, from the California Department of Fish and Game (CDFG). The Project will submit a Preliminary Jurisdictional Determination to the ACOE during the first quarter of 2012. It will also seek a Streambed Alternation Agreement under Section 1600 of the Fish and Game code.

2.2 Literature Review

Determination of the potential occurrence for listed, sensitive, or noteworthy species is based upon known ranges and habitat preferences for the species (State of California 2009 and 2010a; CNPS 2001; Reiser 2001), species occurrence records from the California Natural Diversity Database (CNDDB; State of California 2011), the BLM Special Status plant and wildlife species website (BLM 2010), and species occurrence records from other sites in the vicinity of the survey area.

Additional resources that were consulted included the *Biological Technical Report for the Imperial Solar Energy Center West* (RECON 2010a), *Biological Technical Report for the Imperial Solar Energy Center South* (RECON 2010f), the *Biological Technical Report for the*

Centinela Solar Energy Project (Heritage 2011c), Draft Environmental Impact Report/Environmental Assessment for the Centinela Solar Energy Project (EGI 2011), and the *Draft Environmental Impact Statement for the SES Solar Two* (URS 2008).

3.0 EXISTING CONDITIONS

3.1 Campo Verde Solar Energy Facility Site

The following sections describe the existing conditions on lands associated with the Campo Verde Solar Energy Facility Site (1,990 acres) and associated buffer areas (refer to **Section 1.1.3**).

3.1.1 Topography, Soils and Drainage

The survey area is located in the Yuha Basin of the Colorado Desert between agricultural lands to the north, east and west, and native desert to the south, as well as within active agricultural lands. The uplands are relatively flat, with sparse vegetation and sand that ranges from soft and rolling to flat and compact. Elevation of the survey area ranges from sea level to 46 feet below mean sea level (USGS 1976). The proposed Campo Verde Solar Site is comprised of active agricultural fields.

There are ten major soil types found within the survey area, including Badland, Glenbar, Holtville, Imperial-Glenbar, Indio-Vint, Meloland-Holtville, Indio, Vint, Meloland, Rositas soils (NRCS 2006 and 2011). These soils are primarily found on flat basin floors and are formed from clay, silt, and sandy alluvium materials.

The Campo Verde Solar Energy Facility Site parcels are currently active agriculture lands growing crops such as wheat, alfalfa, and Bermuda grass. Irrigation water is supplied by a complex, engineered system of concrete-lined canals or lateral canals operated and maintained by the Imperial Irrigation District (IID). The concrete-lined canals and lateral canals are used to deliver water to multiple farm fields and typically contain water at all times except during maintenance periods.

The farm fields are large (typically 80 acres) flat fields graded for flood irrigation. When a field is irrigated, an allocated quantity of water is allowed to flow from the IID delivery canal to a smaller ditch (locally referred to as a “head ditch”), which distributes the water evenly across the field. The head ditches are either earthen or concrete-lined. Another ditch (locally referred to as a “tail ditch”) is located at the opposite, lower elevation side of the field. The tail ditch collects any excess irrigation water and directs it to an IID-operated and maintained drain. The tail ditches on the Campo Verde Solar Energy Facility Site are all earthen and are frequently rebuilt when the fields are plowed and disked. Water generally flows from south to north through the Solar Energy Facility Site; the IID drains flow to the New River which flows to the Salton Sea.

3.1.2 General Vegetation

The Campo Verde Solar Energy Facility Site is comprised of active agricultural lands growing crops such as wheat, oats, alfalfa, and Bermuda grass. Native species of vegetation on the site are absent, with a few exceptions; no undisturbed native habitats are present on the site. Areas of native plants and disturbed vegetation communities occur in scattered areas including fallow fields, along “hedge rows” or along irrigation drains and canals. The fields on the site are ringed by a series of earthen and concrete canals and drains that provide irrigation to the fields. Sporadic riparian and wetland vegetation occur along portions of some of the earthen canals and berms. This vegetation is a mixture of native and non-native species such as arrow weed (*Pluchea serricea*) and cattails (*Typha* sp.), two native species, and tamarisk (*Tamarix ramosissima*), bitter dock (*Rumex obtusifolius*), and sprangletop (*Leptochloa* sp.).

Routine maintenance of these drains and canals involves the periodic removal of vegetation. Vegetation provides resistance to hydrologic flow; its removal increases flow. Since vegetation clearing is a routine activity, the wetland vegetation is mostly sparse and not well developed. The wetland vegetation along these canals and drains varies in time and space due to the periodic vegetation clearing activities.

The southwestern portion of the Campo Verde Solar Energy Facility Site contains several parcels that are fallow agriculture. Some native vegetation is beginning to recolonize in these areas. These areas currently do not represent native habitat. However, if left inactive, native species could eventually fully recolonize these areas. Vegetation was mapped on these parcels (**Attachment 1: Figure 6**) but a rare plant survey was not conducted. Given the absence of fall-blooming species in undisturbed native habitats on BLM lands, the decision was made not to conduct rare plant surveys. The field assessment consisted of spot-checking areas within these fields for evidence of fall germination. These areas will be surveyed during the spring of 2012.

Vegetation communities were mapped within the survey area on a one-inch-equals-400- feet color aerial photograph (**Attachment 1: Figure 6**). A total of 33 plant species, representing 17 plant families, were identified within the survey area during fall surveys. A complete list of plant species observed in the Project Area can be found in **Attachment 2**. No sensitive species were observed on the Solar Energy Facility Site (**Section 3.1.4.1**)

Fifteen vegetation communities were mapped within the private land survey area (**Table 3**). Vegetation community classifications in this BTR follow A Manual of California Vegetation (Sawyer, Keeler-Wolfe and Evens 2009) and Preliminary Descriptions of the Terrestrial Natural Communities of California (Holland 1986). Communities that are similar in composition were lumped together in the discussion following **Table 3**.

Table 3 – Vegetation Communities/Land Cover Types Within The Campo Verde Solar Energy Facility Survey Area

Vegetation Community	Acres
Active Agriculture (AG-A) Fallow Agriculture (AG-F)	3780.3 134.8
Arrow Weed Thicket (AS) Arrow Weed Thicket - Disturbed (AS-D)	9.3 11.3
Athel Tamarisk Type Woodland (AW)	1.5
Cattail Marsh (CM) Cattail Marsh - Disturbed(CM-D)	2.8 0.6
Common Reed Marsh (CRM) Common Reed Marsh - Disturbed (CRM-D)	5.0 9.6
Developed (DEV)	121.5
Disturbed Wetland (DW)	16.6
Open Water with Arrow Weed Thicket (OW)	1.3
Quailbush Scrub (BSS) Quailbush Scrub - Disturbed (BSS-D)	38.8 27.9
Tamarisk Thicket (TS)	5.9
Total	**4167.5**

3.1.2.1 Agriculture (Ag)/Fallow Agriculture (AG-F)

Active agricultural fields encompass 3,780.3 acres of the survey area (approximately 91 percent of the private land survey area). The vast majority of the proposed Campo Verde Solar Energy Facility Site occurs in this habitat type. Wheat, oats, alfalfa, and Bermuda grass are currently the primary crops within the fields. Agricultural weeds such as five-hook bassia are present along the edge of the fields.

Fallow agricultural areas are not currently under cultivation and are being invaded by non-native weeds such as five-hook bassia, tamarisk, Saharan mustard (*Brassica tournefortii*), and the native shrub quailbush. Though quailbush and tamarisk are facultative wetland species, there are no wetland areas in the fallow agricultural habitats. Areas qualifying as tamarisk thickets (and potential wetland areas) are addressed in **Section 3.1.2.5**. Fallow agricultural fields encompass 193.6 acres of the survey area (approximately 5 percent of the private land survey area).

3.1.2.2 Arrow Weed Thicket (AS and AS-D)

Arrow weed thicket is a shrub community dominated or co-dominated by arrow weed (*Pluchea serricea*). The canopy is intermittent to continuous with the shrub canopy usually less than 5 meters in height. The herbaceous layer in these communities is generally sparse. This community occurs around springs, seeps, irrigation ditches, canyon bottoms, stream borders, and seasonally flooded washes in desert. The USFWS Wetland Inventory recognizes this as a facultative wetland species. The community occurs throughout the Mojave, Colorado and Sonoran deserts of California (Sawyer et al. 2009). Within the survey area, this community occurs along irrigation drains and canals or other areas with a high water table. Tamarisk (*Tamarix ramosissima*), cattails (*Typha* sp.), and common reed (*Phragmites australis*) are major associates or co-dominants in some areas. Salt grass (*Distichlis spicata*), salt marsh fleabane (*Pluchea odorata*) and goldenbush (*Isocoma acradenia*) are sporadic minor associates. In many instances these earthen irrigation canals and drains are routinely cleared of vegetation to facilitate hydrologic flow. Areas where the vegetation has not fully recovered from the previous clearing are classified as disturbed arrow weed thicket.

Approximately 20.6 acres of arrow weed thicket (including the disturbed component) is present along the IID-managed canals (0.5 percent of the private land survey area). Most of these areas are regularly cleared of this vegetation and they are constantly changing.

3.1.2.3 Tamarisk Woodland (AW) and Tamarisk Thicket (TS)

Individuals of athel (*Tamarix aphylla*) have been planted in large numbers as a windscreen along the edges of agricultural fields. This semi-evergreen or evergreen tree reaches a height of 12 meters. The herbaceous layer in these communities is generally sparse (Sawyer et al. 2009). Approximately 1.5 acres (< 0.1 percent of the private land survey area) of tamarisk woodland.

Tamarisk thicket is a shrub community dominated or co-dominated by tamarisk (*Tamarix ramosissima*). This non-native species has invaded many areas of native riparian vegetation where they develop dense, monospecific stands across floodplains, wetlands, and lake margins. The USFWS Wetland Inventory recognizes this as a facultative species. The canopy is continuous to open with the shrub canopy usually less than 8 meters in height. The herbaceous layer in these communities is generally sparse. This community occurs throughout watercourses in the Mojave, Colorado and Sonoran deserts (Sawyer et al. 2009). Within the survey area, this community occurs within irrigation drains and canals, generally along the channel bottoms and lower slopes or within fallow fields with a high water table. Arrow weed (*Pluchea serricea*), cattails (*Typha* sp.), and common reed (*Phragmites australis*) are major associates to co-dominants in some areas. Approximately 5.9 acres (0.1 percent of the private land survey area) of tamarisk thicket are present.

3.1.2.4 Quailbush Scrub (BSS and BSS-D)

Quailbush scrub encompasses 66.7 acres of the survey area (approximately 1.5 percent of the private land survey area). Quailbush scrub is a shrub community with quailbush (*Atriplex lentiformis* ssp. *lentiformis*), the sole dominant in this community. The canopy is less than 5 meters in height and open to dense with a variable herbaceous layer. This community occurs in alkali sinks, flats, washes, wetlands and gentle to steep slopes, usually on saline or alkaline clays. This species is recognized as a USFWS Wetland Inventory facultative species. Fluvial disturbances and groundwater availability are primarily responsible for this species occurrence (Sawyer et al. 2009). Within the project area this community occurs in very dense stands along the borders of agriculture fields and in fallow agriculture fields. Though quailbush is a native shrub, it readily colonizes fallow fields; these patches still support a very high number and density of non-native invasive species, especially five-hook bassia (*Bassia hyssopifolia*). Native plant species diversity is low in this community.

3.1.2.5 Cattail Marsh (CM and CM-D)

Cattail marsh encompasses 3.4 acres of the survey area (< 0.1 percent of the private land survey area). These are semi-permanently flooded freshwater or brackish marshes that are dominated or co-dominated by cattails (*Typha latifolia*) throughout the state (Sawyer et al. 2009). Within the survey area, this community occurs along the channel bottoms of the earthen canals and drains where there is relatively permanent water source. Tamarisk (*Tamarix ramosissima*), arrow weed (*Pluchea serricea*) and common reed (*Phragmites australis*) are co-dominants or major associates in some areas. In many instances these earthen irrigation canals and drains are routinely cleared of vegetation to facilitate hydrologic flow. Areas where the vegetation has not fully recovered from the previous clearing are classified as disturbed cattail marsh.

3.1.2.6 Common Reed Marsh (CRM and CRM-D)

Common reed marsh encompasses 14.6 acres of the survey area (approximately 0.3 percent of the private land survey area). These are semi-permanently flooded and slightly brackish marshes, ditches and impoundments that are dominated or co-dominated by common reed (*Phragmites australis*). Native stands occur in wetlands throughout the Mojave, Colorado and Sonoran deserts. The USFSW Wetland Inventory recognizes common reed as a facultative wetland species (Sawyer et al. 2009). Within the survey area, these marshes occur along the channel bottoms of the canals and drains with a more permanent water source. Cattails (*Typha latifolia*), tamarisk (*Tamarix ramosissima*), and arrow weed (*Pluchea serricea*) are co-dominants or major associates. In many instances these earthen irrigation canals and drains are routinely cleared of vegetation to facilitate hydrologic flow. Areas where the vegetation has not fully recovered from the previous clearing are classified as disturbed common reed marsh.

3.1.2.7 Disturbed Wetland (DW)

Disturbed wetland encompasses 16.6 acres of the survey area (approximately 0.4 percent of the private land survey area). Earthen canals and drains that are regularly cleared of vegetation usually support herbaceous non-native species; these areas have been mapped as disturbed wetlands. Most of the species in the disturbed wetlands are non-native grasses and forbs; with the exception of salt grass, they were not identifiable at the time of the fall survey. Other species expected to occur in these drainages include sprangletop (*Leptochloa* spp.), umbrella sedge (*Cyperus* spp.) and dock (*Rumex* spp.).

3.1.2.8 Developed (DEV)

Approximately 121.5 acres of developed land occurs within the survey area (approximately 3 percent of the private land survey area). These areas contain little to no vegetation. Developed areas consist of residential dwellings, agricultural buildings, and storage areas.

3.1.2.9 Open Water with Arrow Weed Thicket (OW)

This habitat is restricted to the Westside Main Canal. Arrow weed thicket is restricted to a narrow band along the banks of this canal. Arrow weed is the dominant species and in many areas the only species along the banks of this canal. Approximately 20.6 acres (0.5 percent of the survey area) occur in this cover type.

3.1.3 General Wildlife

The wildlife species observed in and around the solar energy facility site survey area were typical of the disturbed and agricultural habitats, which provide cover, foraging, and breeding habitat for a variety of wildlife species. **Attachment 3** provides a list of all wildlife species observed.

3.1.3.1 Invertebrates

The survey area contains suitable habitat for a wide variety of invertebrates. Within the agricultural fields and along portions of the Gen-tie Line, harvester ants (*Pogonomyrmex* spp.), grasshoppers (*Orthoptera* spp.) and flies (*Diptera* spp.) were observed regularly. Cabbage white (*Pieris rapae*) and other butterflies and moths (*Lepidoptera* spp.) were also regularly observed in all portions of the survey area.

3.1.3.2 Amphibians

Most amphibians require moisture for at least a portion of their life cycle, with many requiring a permanent water source for habitat and reproduction. Terrestrial amphibians have adapted to more arid conditions and are not completely dependent on a perennial or standing source of water. These species avoid desiccation by burrowing beneath the soil or leaf litter during the day and during the dry season.

No amphibians were observed within the survey area. American Bullfrog (*Rana catasbeiana*) was observed in close vicinity to the survey area. Bullfrogs typically occupy the large drains that carry water relatively permanently.

3.1.3.3 Reptiles

The diversity and abundance of reptile species varies with habitat type. Many reptiles are restricted to certain plant communities and soil types, although some of these species would also forage in adjacent communities. Other species are more ubiquitous, using a variety of vegetation types for foraging and shelter. A diverse list of species of lizards and snakes could be expected to inhabit both agricultural and/or desert habitats.

No reptile species were observed in the survey area.

3.1.3.4 Birds

The diversity of bird species varies with respect to the character, quality, and diversity of vegetation communities. Due to the homogeneity of much of the habitat within the private land portions of the survey area, bird diversity was relatively low, but did increase in and around the larger drains.

During winter avian use surveys previously conducted in the area, Western Meadowlark (*Sturnella neglecta*) was the most frequently detected species as well as the most widespread. Other frequently detected species include Horned Lark (*Eremophila alpestris*), Black Phoebe (*Sayornis nigricans*), Long-billed Curlew (*Numenius americanus*), and Song Sparrow (*Melospiza melodia*). Other widespread species include Horned Lark, Black Phoebe, and Mourning Dove (*Zenaida macroura*). Horned Larks were by far the most numerous species during the survey. Long-billed Curlews were the second most numerous species. The most commonly observed species were all common agricultural associates.

During spring avian use surveys in the area, Red-winged Blackbird was the most frequently detected species. Other frequently detected species include Western Meadowlark (*Sturnella neglecta*), Long-billed Curlew (*Numenius americanus*), Mourning Dove (*Zenaida macroura*), Horned Lark (*Eremophila alpestris* and Cliff Swallow (*Petrochelidon pyrrhonota*. Western Meadowlark was the most widespread and other widespread species includes Red-winged Blackbird, Horned Lark, Mourning Dove, Cliff Swallow, and Long-billed Curlew (*Numenius americanus*). Red-winged Blackbirds were by far the most numerous species during the survey. Other numerous species included Cattle Egrets (*Bubulcus ibis*) and Long-billed Curlews. As was observed in the winter surveys, the most common species were common agricultural associates.

The only trees present in the area are associated with residences or other buildings. These trees are limited in number and distribution but could represent potentially suitable nesting substrate for several species of raptors. Possible nesting species include red-tailed hawk (*Buteo jamaicensis*) and great-horned owl (*Bubo virginianus*). No raptor nests were observed during any of the site visits. Other common raptors included American Kestrel, Prairie Falcon, Burrowing Owl, and Barn Owl.

3.1.3.5 Mammals

Suitable mammal habitat is limited in the agricultural lands within the survey area. Desert black-tailed jackrabbit (*Lepus californicus deserticola*), desert cottontail (*Sylvilagus audubonii*), round-tailed ground squirrel (*Spermophilus tereticaudus*), desert kangaroo rat (*Dipodomys deserti deserti*), and coyote (*Canis latrans*) were detected often within all project component survey areas through direct observation as well as burrows, tracks, and scat, though not as frequently as in native habitats. A bobcat (*Lynx rufus*) was also observed.

3.1.4 Sensitive Biological Resources

3.1.4.1 Special Status Plant Species

No sensitive plant species were observed on the Campo Verde Solar Energy Facility site, private land portions of the Gen-tie line or associated buffers, and none are expected to occur given the limited amount of suitable native habitat and the ongoing disturbances related to the agricultural activities.

3.1.4.1.1 Federally Listed Species

Based on the literature review, no federally-listed threatened or endangered plant species were identified as having the potential to occur within the survey area. No federally-listed threatened or endangered species were observed during focused rare plant surveys.

3.1.4.1.2 State-listed Species

Based on the literature review, no state-listed plant species were identified as having the potential to occur within the survey area. No state-listed species were observed on-site during focused rare plant surveys.

3.1.4.1.3 BLM Sensitive Species

BLM sensitive species include all species currently on CNPS List 1B, as well as others that are designated by the California BLM State Director. No BLM sensitive species were identified as having the potential to occur within the survey area. No BLM sensitive species were observed during focused rare plant surveys.

3.1.4.1.4 Priority Plant Species

Priority plant species are rare, unusual, or key species that are not sensitive by BLM or listed as threatened and endangered. Priority plant species are specifically plants that are included on the CNPS Lists 2–4.

One priority plant species was identified as having the potential to occur within the survey area: California satintail (*Imperata brevifoila*). This species is discussed below.

California satintail (*Imperata brevifoila*). California satintail has been reported southeast of the Imperial Valley Substation, approximately 3 miles from the Campo Verde Solar Site. This species occurs in desert wash and riparian scrub habitats; there are few desert wash habitats in the survey area and none on the Campo Verde Solar Energy Facility site. It has a low to moderate potential to occur within the tributary of the New River northeast of the site. This species is not expected to occur within the drains and canals on the Campo Verde Solar Energy Facility site. The riparian habitat along the larger canals and drains on the Campo Verde Solar Site support non-native (*e.g.*, tamarisk) or native species that grow in very dense stands (cattails and arrow weed) that generally restrict the presence of other species due to their density, and they are periodically cleared of vegetation; therefore, this uncommon species is not expected to occur within these features.

3.1.4.2 Special Status Wildlife Species

Fourteen special status wildlife species were determined to have the potential to occur within the survey area and those whose occurrence is most pertinent to the private land portions of the survey area are discussed in detail below. This includes federally listed species, state listed species, and BLM sensitive species that are known to occur in the Imperial Valley, as well as CDFG species of special concern that were observed during surveys.

3.1.4.2.1 Federally Listed Species

The following federally listed species are discussed in this section because their habitat requirements and/or potential for occurrence are most pertinent to the private land portion of the survey area, though the following discussions evaluate the potential for occurrence in both the private land portion of the survey area as well as the BLM survey area. Peninsular bighorn sheep (*O. c. nelson*; endangered) is discussed in **Section 3.2.3.1**.

Southwestern Willow Flycatcher

Species Profile

Southwestern Willow Flycatcher (SWFL) is federally listed as endangered, and all willow flycatchers in California, including the southwestern and two other subspecies (*E. t. brewsteri* and *E. t. adastus*) are state-listed as endangered. Critical habitat was designated for the SWFL on October 19, 2005 in San Diego County, California and in Arizona (USFWS 2005). No critical habitat was designated within Imperial County, California.

Willow Flycatchers are in the Tyrannidae family and are one of ten species of Empidonax flycatchers in the United States. Empidonax flycatchers are difficult to distinguish visually but have distinctive songs. SWFL is generally paler than other willow flycatcher subspecies and differs in morphology. SWFLs are migrants, arriving on their breeding grounds in mid-May to early June (Garrett and Dunn 1981; Unitt 2004). SWFL migrates south from its breeding range in August or September. Several subspecies of Willow Flycatcher are known to migrate through southern California, with the most common migrant being *E. t. brewsteri* (Unitt 2004). It is virtually impossible to differentiate between subspecies of Willow Flycatcher during migration. SWFL requires riparian habitat with willow (*Salix* spp.) thickets (Unitt 2004) for breeding. Understory species include mule fat (*Baccharis* sp.) and arrow weed (*Pluchea* sp.). SWFLs also nest in areas with tamarisk (*Tamarix* spp.) and Russian olive (*Eleagnus angustifolia*) where these species have replaced the native willow. Surface water is required at nesting sites. Estimated nesting habitat patch size varies from 0.2 to 1.5 acres. Nests are constructed in densely vegetated thickets with trees between 13 and 23 feet in height (Tibbitts et al. 1994; Sogge et al. 2010)

Threats in the United States include loss of riparian habitat due to water diversion, flood control, urbanization, grazing, and invasion of non-native species. Parasitism by brown-headed cowbirds (*Molothrus ater*) has been a significant factor in the decline of this species in California, Arizona and elsewhere (Sedgwick 2000).

SWFL breeds in southern California, Arizona, New Mexico, southern Nevada, southern Utah, western Texas, northwestern Mexico, and possibly southwestern Colorado. It winters in Mexico, Central America, and possibly northern South America. Historically common in all the lower-elevation riparian areas of southern California, the SWFL was found in the Los Angeles Basin, San Bernardino/Riverside County area, and San Diego County (Unitt 2004). SWFL persists in the Colorado, Owens, Kern, Mojave, Santa Ana, Santa Margarita, San Luis Rey, Santa Clara, Santa Ynez, Sweetwater, and San Dieguito river systems and in San Timeteo, Pilgrim, and Temecula Creeks.

<u>Critical Habitat</u>
Critical habitat was designated for the SWFL on October 19, 2005 in San Diego County, California and in Arizona (USFWS 2005). No critical habitat was designated within Imperial County, California.

<u>Occurrence</u>
SWFLs are not likely to nest within the survey area, but may migrate through the project area and possibly forage during migration within the arrow weed scrub and tamarisk scrub habitats associated with portions or all of Fig Drain, Diehl Drain, Wixom Drain, Dixie 3A Drain, Westside Drain, and Wormwood 7 Drain (**Attachment 1: Figures 4a-c**). Flycatcher vocalizations have been heard during recent biological surveys (including protocol-level SWFL surveys) near the action area along the Westside Main Canal.

Two Willow Flycatcher subspecies are known to migrate through the Imperial Valley and in the vicinity of the Campo Verde Solar Project – Southwestern Willow Flycatcher (*Empidonax trailii extimus*) and Northwestern Willow Flycatcher (*Empidonax trailii brewsteri*). These two subspecies are nearly identical in appearance (Pyle 1997), have nearly identical vocalizations (Unitt 1987), and are, thus, nearly impossible to distinguish in the field.

Willow Flycatchers were detected during surveys conducted for other solar projects in the area. Protocol-level surveys were conducted to determine their subspecies and migration status. Based on the results, it was concluded that the Willow Flycatchers detected were migrants. No resident or nesting Southwestern Willow Flycatchers were detected (RECON 2010b).

Breeding Southwestern Willow Flycatchers are riparian obligates, typically nesting in relatively dense riparian vegetation where surface water is present or soil moisture is high enough to maintain the appropriate vegetation characteristics (USFWS 2002). While some of the vegetation communities within the Campo Verde Solar Energy Facility survey area include some species associated with riparian areas, and some of the canals and drains have surface water and high soil moisture, none of the areas supports vegetation that is tall or dense enough for nesting; therefore, there is no Willow Flycatcher breeding habitat in the Campo

Verde Solar survey area. Additionally, species occurrence records from the California Natural Diversity Database (State of California 2011) do not indicate the presence of Willow Flycatchers in the vicinity of the survey area. Therefore, the available data, combined with the field surveys, indicate that there is no known suitable nesting habitat for Southwestern Willow Flycatchers in or around the Campo Verde Solar Project survey area and that Southwestern Willow Flycatchers would be expected to be present in the Campo Verde Solar Energy Facility survey area only as migrants in the vicinity of portions or all of Fig Drain, Diehl Drain, Wixom Drain, Dixie 3 Drain, Dixie 3A Drain, Dixie 3B Drain, Dixie 4 Drain, Westside Drain, Forget-Me-Not Drain 1, and Wormwood 7 Drain (**Attachment 1: Figures 4a-c**).

These data indicate that Willow Flycatchers (*E.t. extimus*, *E.t. brewsteri* or both) migrate through the Westside Main Canal corridor and may forage in the tamarisk and arrow weed vegetation during migration; however, this analysis will assume they are the southwestern subspecies in order to provide the most conservative assessment. Potential SWFL migration habitat in the action area is shown on **Attachment 1: Figures 4a-c**.

Yuma Clapper Rail

<u>Species Profile</u>
The Yuma Clapper Rail (YCR) was federally listed as endangered March 11, 1967, under the Endangered Species Preservation Act of October 15, 1966, and state-listed as threatened February 22, 1978 (USFWS 2006). The YCR is also protected under the Migratory Bird Treaty Act and similar State laws. Critical habitat has not been established for this species.

This bird breeds in freshwater marshes along the Colorado River from Needles, California, to the Colorado River delta and at the Salton Sea. The YCR breeds in freshwater marshes and brackish waters and nests on firm, elevated ground, often under small bushes. It typically occupies emergent marsh vegetation, such as pickleweed and cordgrass, as well as mature stands of bulrush and cattail around the Salton Sea. High water levels may force them into willow and tamarisk stands. Tamarisk is also used after breeding and in winter at some sites. Nests are built between March and late July in clumps of living emergent vegetation over shallow water. Typical home ranges exceed 17 acres, increasing after the breeding season.

Crayfish dominates the diet of YCR, though small fish, tadpoles, clams, and other aquatic invertebrates are also consumed (Ohmart and Tomlinson 1977; Anderson and Ohmart 1985; Todd 1986; Eddleman 1989; Conway 1990 in USFWS 2010a). The seasonal availability of crayfish in different habitat locations corresponds to shifts in habitat use by YCRs (Bennett and Ohmart 1978; Eddleman 1989, Conway et al. 1993 in USFWS 2010a).

YCRs are mostly active during daylight hours, with little to no activity after dark. Daily movement is lowest during the late breeding period (May-July) and highest during the late winter (January–February; USFWS 2010a). Juvenile dispersal, movements by unpaired males during the breeding season and by both sexes post-breeding, and relocations in response to changing water levels are also documented (USFWS 2010a). Studies to determine migratory patterns showed a difficulty in locating the YCR during winter months without telemetry.

While the YCR was previously thought to be migratory, experts have determined that they are year-round residents, albeit discreet during winter months, of the lower Colorado River and Salton Sea (USFWS 2010a).

Habitat destruction and depredation by mammals and raptors have caused population declines. It is also possible that increased selenium concentrations from agricultural runoff are affecting reproduction (Unitt 2004; Zeiner 1989).

Critical Habitat
No critical habitat has been designated for YCR, and none is proposed.

Occurrence
This species is not likely to nest within the survey area. There are seven narrow patches of typha and typha/phragmites habitat in the action area associated with Fig Drain, Wixom Drain, Dixie 3A Drain, an unnamed wetland adjacent to Dixie 3A Drain, Dixie 4 Drain, Westside Drain and Wormwood 7 Drain (**Attachment 1: Figures 4a-c)**. These areas exhibit steep shelving to the water level, creating water depths deeper than those preferred by YCR. They are also narrow and linear in nature. The sides of the channels are steep and would inhibit nesting, and vehicles travel the elevated hard-packed dirt roads on either side of the channels regularly. Given the lack of suitable breeding habitat within the channels and the high level of human disturbance adjacent to the channels, this species is not likely to nest within this cattail marsh vegetation.

There is a low potential for YCR to forage in the cattail marsh vegetation or winter in the tamarisk thickets associated with Fig Drain, Wixom Drain, Dixie 3A Drain, an unnamed wetland adjacent to Dixie 3A Drain, Dixie 4 Drain, Westside Drain and Wormwood 7 Drain (**Attachment 1: Figures 4a-c)**. The active agricultural fields immediately adjacent to the cattail marshes provide a constant source of human disturbance in the area, and where these areas are located along the outside boundary of the project area, these practices will continue to occur after construction is completed. The nearest known location for this species is within Wixom Drain near Fig Lagoon, approximately 0.5 miles north of the action area (USFWS 2010b). The New River is approximately 0.3 miles north and east of the action area and may provide the nearest suitable nesting habitat for this species. Given the distance from suitable and potential nesting habitat and level of existing human disturbance due to agricultural practices, there is a very low potential for YCR to forage within the isolated cattail marsh habitats or to winter in the tamarisk vegetation within the survey area. In addition, this species was not incidentally observed during numerous biological surveys conducted in and near these habitats for the other solar projects in the area.

3.1.4.2.2 State Listed Species

Four state-listed wildlife species were evaluated based on their known occurrences in Imperial County: greater Sandhill Crane (*Grus canadensis tabida*), Yuma clapper rail, barefoot banded gecko (*Coleonyx switaki*), and Peninsular bighorn sheep. Of these species, the Yuma clapper rail and Peninsular bighorn sheep are federally listed and discussed in

Sections 3.1.4.2.1 and 3.2.4.2.1 (respectively). The greater Sandhill Crane and barefoot banded gecko species are discussed below.

Greater Sandhill Crane (*Grus canadensis tabida*)

Species

The Greater Sandhill Crane is state-listed as threatened and is protected under the federal MBTA and similar State legal protections. This species is known to winter in Imperial County California (Zeiner et al. 1989).

Habitat

Both Greater (*Grus canadensis tabida*) and Lesser (*G. c. canadensis*) Sandhill Cranes occur in California. Historically, *G. c. tabida* was a fairly common breeder on the northeastern plateau (Zeiner et al. 1989). It is now reduced greatly in numbers, and breeds only in Siskiyou, Modoc, Lassen, Sierra Valley, Plumas and Sierra counties (Zeiner et al. 1989). In summer, this subspecies occurs in and near wet meadows as well as shallow lacustrine, and freshwater emergent wetland habitats. It winters primarily in the Sacramento and San Joaquin valleys from Tehama County south to Kings County, where it frequents annual and perennial grassland habitats, moist croplands with rice or corn stubble, and open, emergent wetlands. It prefers relatively treeless plains. The migratory subspecies *G. c. canadensis* winters in similar habitats in the San Joaquin and Imperial valleys (Zeiner et al. 1989), and to a lesser extent in the Sacramento Valley. In southern California, it concentrates on the Carrizo Plain, San Luis Obispo County, with smaller flocks near Brawley, Imperial County, and Blythe, Riverside County (Zeiner et al. 1989). The latter two flocks may be partly, or largely, *G. c. tabida*, which formerly wintered more commonly in southern California, but which has declined greatly there and throughout its range. Outside of known wintering grounds, *G. c. tabida* is extremely rare except that it migrates over much of interior California. A few coastal sightings of Greater Sandhill Crane exist from Marin County southward, but there are no records from offshore islands. When foraging, the Greater Sandhill Crane prefers open shortgrass plains, grain fields, and open wetlands (Zeiner et al. 1989), but it may also feed on dry plains far from water. The Greater Sandhill crane feeds on grasses, forbs, especially cereal crops (newly planted or harvested); and also uses it's long bill to probe in soil for roots, tubers, seeds, grains, earthworms, and insects. It will also feed on larger prey, such as mice, small birds, snakes, frogs, and crayfish.

Occurrence

The greater sandhill crane is likely to forage within the agricultural fields within the private lands portion of the survey area at times during winter, but this species is not expected to breed in the survey area. This species was not observed during field surveys.

Barefoot Banded Gecko (*Coleonyx switaki*)

Species

The barefoot banded gecko is state-listed as threatened. Its known range occurs along the eastern face of the Peninsular Ranges in San Diego and Imperial Counties, and little information is known about its extended range or abundance.

Habitat
Habitat for the barefoot banded gecko is found in arid rocky areas on flatlands, canyons, and thornscrub, especially where there are large boulders and rock outcrops, and where vegetation is sparse (Murphy 1974). In California, this species inhabits the arid desert slopes of the eastern side of the Peninsular Ranges from Borrego Springs south to the Baja California border, and may occur at elevations from near sea level to over 2,000 ft. (700 m). An isolated population is known to occur in the Coyote Mountains of Imperial County. It ranges farther south in Baja California along the eastern edge of the mountains to near Santa Rosalia (Murphy 1974).

The barefoot banded gecko is insectivorous. Most likely, the breeding season lasts from spring to summer, May to July. Females lay one or two eggs, roughly 3 weeks after mating, and may lay eggs several times each season. Eggs hatch after around 2 months, in late summer to early fall (Murphy 1974).

Occurrence
No barefoot banded geckos are expected to occur within the survey area based on a lack of suitable habitat in the form of large boulders and rocky outcrops. This species was not observed during field surveys.

3.1.4.2.3 BLM Sensitive Wildlife

Seven BLM sensitive wildlife species were evaluated based on their presence on the BLM sensitive list within the El Centro Field Office's jurisdiction: Colorado Desert fringe-toed lizard (*Uma notata notata*), flat-tailed horned lizard, barefoot banded gecko, Western Burrowing Owl, Mountain Plover, California leaf-nosed bat (*Macrotus californicus*), and pallid bat (*Antrozous pallidus*). The barefoot banded gecko is also a state-listed species and is discussed in **Section 3.1.4.2.2**.

The following BLM sensitive species are discussed in this section because their habitat requirements and/or potential for occurrence are most pertinent to the private land portion of the survey area, though the following discussions evaluate the potential for occurrence in both the private land portion of the survey area as well as the Gen-tie Line survey area. Colorado desert fringe-toed lizard and flat-tailed horned lizard are discussed in **Section 3.2.3.3**.

Burrowing Owl (*Athene cunicularia*)

Species
The Burrowing Owl is a California Species of Special Concern and a BLM sensitive species. It is protected by the MBTA and California Fish & Game Code §§ 3503, 3503.5, 3513. Nesting occurs from March through August. Burrowing Owls typically form a pair-bond for more than 1 year and exhibit high site fidelity, reusing the same burrow year after year (Haug et al. 1993). The female remains inside the burrow during most of the egg laying and incubation period and is fed by the male throughout brooding. Burrowing Owls are opportunistic feeders, consuming a diet that includes arthropods, small mammals, and birds, and occasionally amphibians and reptiles (Haug et al. 1993). Urbanization has greatly

reduced the amount of suitable habitat for this species. Other contributions to the decline of this species include the poisoning of squirrels and prairie dogs, and collisions with automobiles. A survey effort carried out between 1991 and 1993 indicated that major population densities remain in the Central and Imperial valleys (DeSante et al.1996), where this species is a year-round resident in Imperial County.

Habitat

The Burrowing Owl is primarily restricted to the western United States and Mexico. Habitat for the Burrowing Owl includes dry, open, short-grass areas often associated with burrowing mammals (Haug et al. 1993). In Imperial County it can be found in desert scrub, grassland, and agricultural areas, where it digs its own or occupies existing burrows.

Occurrence

During focused burrowing owl surveys several active Burrowing Owl burrows were observed within the survey area, primarily associated with berms and ditches lining the active agricultural fields (Heritage 2012, Heritage unpub. data). These surveys identified 65 active burrows within the survey area and 76 inactive burrows. **Figure 5** shows the location of active burrows in and around the Project Area.

Mountain Plover

Species Profile

On June 29, 2010, USFWS announced the proposed listing of the Mountain Plover as threatened under the ESA of 1973, as amended (USFWS 2010a). The proposed rule to list the Mountain Plover as a threatened species was withdrawn by Federal Register dated May 12, 2011, Therefore, ESA Section 7 consultation is no longer required. The Mountain Plover (family Charadriidae) is a small terrestrial shorebird, which averages 8 inches in length. Mountain Plovers are light brown above and white below, and are distinguished from other plovers by the lack of a contrasting dark breast band. Mountain Plovers are migratory, wintering in California, southern Arizona, Texas, and Mexico, and breeding primarily in Colorado and Montana from April through June. Breeding also occurs in Arizona, Utah, Wyoming, Nebraska, Kansas, Oklahoma, Texas, and New Mexico. The Sacramento, San Joaquin, and Imperial valleys of California are thought to support the greatest number of wintering Mountain Plovers (USFWS 2010c).

Throughout their range, Mountain Plovers are found within sparsely vegetated areas such as xeric shrublands, shortgrass prairie, and barren agricultural fields, but rarely near water. They are a diurnal species, foraging during daylight hours for ants, beetles, and crickets, and grasshoppers with a series of short runs and stops.

Mountain Plovers nest in areas with short vegetation and bare ground, including near livestock watering tanks. Nests are constructed as a depression in the ground and lined with organic debris in areas with at least 30-percent bare ground and with nearby conspicuous objects such as rocks or forb clumps. Vegetation at nest sites is typically less than 4 inches in height and slope is less than 5 percent. Nest sites are typically dominated by needle-and-thread (*Stipa comata*), blue grama (*Bouteloua gracilis*), buffalo grass (*Buchloe dactyloides*), plains prickly pear cactus (*Opuntia polycantha*), June grass (*Koeleria cristata*), and sagebrush (*Artemisia* sp.; USFWS 1999). Mountain Plovers have historically nested on black-tailed prairie dog (*Cynomys ludovisianis*) towns. Clutch size ranges from 1–4 eggs.

Mountain Plovers use non-breeding (wintering) habitats that are similar to those they use on breeding grounds: heavily grazed pastures, burned fields, fallow fields, and tilled fields (Hunting et al. 2001 in Andres and Stone 2009; Knopf and Wunder 2006 in Andres and Stone 2009). Mountain Plovers were historically associated with kangaroo rat (*Dipodomys*) precincts and California ground squirrel (*Spermophilus beecheyi*) colonies within the Central Valley of California (U.S. Fish and Wildlife Service 2003 in Andres and Stone 2009). In California's Imperial Valley, they preferentially use alfalfa fields that have been harvested and grazed by domestic sheep, as well as Bermuda grass fields that have been burned post-harvest (Wunder and Knopf 2003 in Andres and Stone 2009).

Mountain Plovers are considered to have been historically common in western and central Kansas; between Fort Supply, Oklahoma, and Dodge City, Kansas; western South Dakota; and they may have bred in northern Mexico (USFWS 1999). Information from the Breeding Bird Survey and Christmas Bird Count data shows a decline in the Mountain Plover at a rate of 2.7–2.8 percent per year from 1966 to 2007, although the data are characterized as having deficiencies (Andres and Stone 2009).

Threats to the Mountain Plover include loss of habitat due to conversion of grasslands to urban and active agricultural uses in their breeding grounds, prairie dog control, domestic livestock management; human disturbance during the nesting season; grasshopper control measures; use of pesticides; and other land uses throughout their range (USWFW 1999). Specific conservation issues for the Mountain Plover in the Imperial Valley include the variable nature of agricultural crops; although cultivated fields are abundant in the Central and Imperial Valleys, varying proportions may be suitable in any given year (Andres and Stone 2009). Economic forces in any given year dictate crop selection and livestock operations, which can positively or negatively affect Mountain Plover habitat (Andres and Stone 2009).

Because Mountain Plovers are relatively tolerant of disturbance, human intrusion and disturbance have not been identified as major winter conservation threats, although response varies for individual birds (Andres and Stone 2009). Mountain Plovers have been described as extremely tolerant of machinery, including off-road vehicles, tractors, and military aircraft (Andres and Stone 2009). Plovers will quickly leave roost areas when approached by walking humans (Knopf and Wunder 2006 in Andres and Stone 2009).

Critical Habitat

No critical habitat has been designated for the Mountain Plover, and none is proposed.

Occurrence

Mountain Plovers are known to over-winter in the Imperial Valley, foraging within the large agricultural complex that surrounds El Centro and spans from Mexico to the Salton Sea. In 2009, the Imperial County Agricultural Crop and Livestock Report (Imperial County 2009) reported approximately 353,128 acres of field crops to be grown within this large agricultural complex, including primarily alfalfa hay, Bermuda grass hay, Kleingrass hay, pastured crops, Sudan grass hay, and wheat. An additional 62,237 acres of primarily alfalfa and Bermuda grass were grown as seed crops (Imperial County 2010), totaling over 415,365 acres of alfalfa and grass crops. Additional grass crop fields are present south of the border in Mexico. As discussed previously, Mountain Plovers forage in the fields at various stages of the crop rotation, including when soils are freshly tilled prior to planting; when the crops are young and vegetative growth is still under 25 centimeters in height; after the crops have been harvested, and short stubble is present; and after the fields have been burned to prepare them for the next crop.

A survey conducted in 1999 by the Point Reyes Bird Observatory catalogued the avifauna using the Salton Sea and surrounding agricultural complex (Shuford et al. 2000). The survey counted approximately 2,486 Mountain Plovers in February, 2,790 in November, and 3,758 in December in the Imperial Valley in 1999. The mean number for these three surveys represents about 30–38 percent of the species' estimated population of 8,000–10,000 individuals (anonymous 1999 in Shuford et al. 2000). On prior surveys across the California wintering range, 2,072 Mountain Plovers were recorded in the Imperial Valley in 1994, and 755 Mountain Plovers were recorded in 1998. This represented 61 and 35 percent of the totals of 3,390 and 2,179 individuals found statewide, respectively (B. Barnes in CDFG unpubl. data; K. Hunting in Shuford et al. 2000).

The higher totals in the Imperial Valley in 1999 are thought to reflect an increase in observer coverage over prior years rather than a population increase (Shuford et al. 2000). Plovers were distributed widely over the Imperial Valley with no consistent areas of concentration in 1999, presumably reflecting the shifting availability of suitable fields with the temporal and spatial variation in cultivation practices (Shuford et al. 2000). Concentrations of Mountain Plovers in relatively few sites in February 1999 appeared to reflect a preference by plovers for burned fields during that season (Shuford et al. 2000). The survey shows flocks foraging throughout the agricultural complex during the winter, including several flocks approximately within the study area ranging in size from 1-250 individuals.

A more recent survey, coordinated by the Natural History Museum of Los Angeles County (NHMLAC), was conducted throughout the Imperial Valley on January 21–23, 2011. This survey recorded 877 Mountain Plovers within approximately 20 percent of the 23 search areas; no Mountain Plovers were detected south of Interstate 8 (Molina 2011). This survey shows a marked decline in population numbers from previous surveys coordinated by the NHMLAC in 2007 (which yielded 4,687 birds within 86 percent of areas surveyed), and 2008 (which yielded 2,955 birds within 74 percent of the search areas).

This decline in population numbers does not appear to relate directly to the amount of foraging habitat available in the Imperial Valley. The acreage of agricultural fields fluctuated by tens of thousands of acres between 2005 and 2009, but the fluctuations in acreage remained within ±15 percent of the average acreage every year (**Table 4**; Imperial County 2006, 2007, 2008, 2009, 2010). The population numbers of Mountain Plover decreased from 2007 to 2008 (Molina 2011), while the acreage of field crops (foraging habitat) increased from 2007 to 2008.

Table 4 – Agricultural Crop History for 2005-2009 in the Imperial Valley

Year	Field Crop (acres)	Seed Crop (acres)	Total (Acres)	Estimated Habitat During Winter Months (50% of Total)	Variation From Prior Year	Variation From Average
2009	353,128	62,237	415,365	207,683	(30,759)	7,279
2008	412,335	64,547	476,882	238,441	31,583	23,480
2007	352,156	61,561	413,717	206,859	(11,179)	8,103
2006	361,383	74,691	436,074	218,037	14,249	3,076
2005	351,174	55,711	407,577	203,789	---	11,173
Average	**366,174**	**63,749**	**429,923**	**214,962**	**---**	**10,622**

Source: Imperial County (2006-2010)
Notes: Variation in acres of estimated foraging habitat varies year to year by 10,000 to 30,000 acres.
Total estimated foraging habitat has been relatively stable or increasing from 2005-2010.

As the crops and rotation schedules on any given field often differ from year to year, the amount of foraging habitat available to Mountain Plovers also differs from year to year and throughout the year. Given the constraints of available crop rotation history, information provided by landowners, and examination of the current conditions of the fields, a conservative approach was taken to estimating potential available habitat within the proposed Campo Verde Solar Energy Facility. Assuming that any given crop/field is suitable as foraging habitat for 50 percent of the wintering months of November through February—either providing habitat after being planted until it grows over 9.84 inches, or after the crops have been harvested and/or burned mid-winter in preparation for a spring crop—it is estimated that approximately 3,807 of the 4,268 acres would be available as moderate to highly suitable foraging habitat within the proposed Campo Verde survey area at any given time during winter. This assumes the current crop types (alfalfa, wheat, and Bermuda grass).

On January 18, 2011, USFWS provided the Interim—Survey Guidance for Wintering Mountain Plover (*Charadrius montanus*) in the Imperial Valley (USFWS 2011). It provides guidance on conducting presence/absence surveys and determining winter population numbers for Mountain Plover. Surveys were conducted at two nearby solar projects: Centinela Solar Energy Project (located approximately 3.2 miles to the southeast) and the ISEC South project (located approximately 5.3 miles to the southeast) and no Mountain Plovers were detected. Surveys are being conducted during February, 2012. Mountain plovers were observed on multiple occasions during field surveys for the Campo Verde Project.

California Leaf-nosed Bat (*Macrotus californicus*)

<u>Species</u>
The California leaf-nosed bat is a Species of Special Concern and a BLM sensitive species. This bat is found primarily in desert areas of the southwestern United States, and ranges through Imperial County and the eastern parts of Riverside and San Diego Counties in California.

<u>Habitat</u>

The California leaf-nosed bat is commonly found in desert habitats that include riparian, wash, scrub, succulent scrub, alkali scrub, and palm oasis. The species is non-migratory and active year-round, requiring rocky, rugged terrain, caves, or mine shafts for roosting. These gregarious bats have been observed in groups of up to 500, with both sexes roosting together during the non-breeding season and separately during spring and summer. It forages over flats and washes within one mile of its roost, and is a "gleaning" insectivore which captures prey such as crickets, grasshoppers, beetles, and sphinx moths straight from the ground or foliage rather than in flight (BCI 2010). It typically hunts within a few feet of the ground using its superior eyesight to search for insects. Population declines are generally attributable to loss of roost sites resulting from human intrusion and physical alteration (Zeiner et al. 1990).

Occurrence
The thickets, agricultural fields and irrigation channels within the survey area offer foraging opportunities for this species. The nearest reported location for the California leaf-nosed bat is approximately 22 miles northwest of the proposed project (State of California 2010b). No known roosts occur in the survey area, and there is no suitable roosting habitat within or near the survey area.

Pallid Bat (*Antrozous pallidus*)

Species
The Pallid bat is a Species of Special Concern and a BLM sensitive species. It is a locally common yearlong resident of low elevations throughout most of California.

Habitat
This bat occupies a variety of habitats including grasslands, shrublands, woodlands, and forests at elevations ranging from sea level up through mixed conifer forests. The species occurs most commonly in open, dry habitats and prefers rocky areas for roosting. Pallid bats are social, commonly roosting in multi-species groups of 20 or more. The day roosts, such as caves, crevices, and mines, must protect the bats from high temperatures. The bats forage low over open ground, and consume large, hard-shelled prey items such as beetles, grasshoppers, cicadas, spiders, scorpions, and Jerusalem crickets. Pallid bats are very sensitive to disturbance at the roosting sites as these roosts are crucial for metabolic economy and juvenile development. Population declines are generally attributable to loss of roost sites resulting from human intrusion and physical alteration (Zeiner et al. 1990).

Occurrence
The entire survey area offers foraging opportunities for this species. The nearest reported location for the pallid bat is approximately 22 miles west of the proposed project (State of California 2010b). Roosts are not known to occur in the survey area, and there is no suitable roosting habitat within or near the survey area.

3.1.4.2.4 California Species of Special Concern and Fully Protected Species

Three species that are classified as CDFG Species of Special Concern were observed within the survey area or were observed during surveys for nearby projects (RECON 2010a, 2010b, Heritage 2011c); Loggerhead Shrike, Crissal Thrasher (*Toxostoma crissale*), and LeConte's Thrasher (*T. lecontei lecontei*). Golden Eagle (*Aquila chrysaetos*), a CDFG Fully Protected Species, and protected under the Bald and Golden Eagle Protection Action, MBTA, and Fish & Game Code sections 3503, 3503.5, and 3513, was also observed near the Project Area (Heritage 2011c). The following discussions evaluate the potential for occurrence of California Species of Special Concern and Fully Protected Species in both the private land portion of the survey area as well as the Gen-tie survey area.

Loggerhead Shrike (*Lanius ludovicianus*)

Species
The Loggerhead Shrike is a CDFG Species of Special Concern and is a year-round resident in Imperial County.

Habitat
The Loggerhead Shrike inhabits most of the continental United States and Mexico and is a year-round resident of southern California. The Loggerhead Shrike prefers open habitat with perches for hunting and fairly dense shrubs for nesting (Yosef 1996). In southern California, Loggerhead Shrikes inhabit grasslands, agricultural fields, chaparral, and desert scrub (Unitt 1984). Their breeding season is from March to August. Loggerhead Shrikes are highly territorial and usually live in pairs in permanent territories (Yosef 1996). Loggerhead Shrikes feed on small reptiles, mammals, amphibians, and insects that they often impale on sticks or thorns before eating. Loggerhead Shrike populations are declining, likely due to urbanization and loss of habitat and, to a lesser degree, pesticide use (Yosef 1996).

Occurrence
Loggerhead Shrikes were observed regularly within the private land portions of the survey area. The agricultural habitats associated with the Solar Energy Facility provide suitable foraging habitat for this species. No Loggerhead Shrike nests were identified, though the species may nest in mesquite or tamarisk habitats in the vicinity of the private land portions of the survey area.

Crissal Thrasher (*Toxostoma crissale*)

Species
The Crissal Thrasher is a CDFG Species of Special Concern and is a year-round resident in Imperial County.

Habitat
A resident of southeastern California deserts, it is still fairly common in Colorado River Valley but local and uncommon elsewhere. This species occupies dense thickets of shrubs or low trees in desert riparian and desert wash habitats. In eastern Mojave Desert of San Bernardino

and southeastern Inyo counties, it also occurs in dense sagebrush and other shrubs in washes within juniper and pinyon–juniper habitats, up to 1800 m (5900 ft.). It is also a resident in the Imperial, Coachella, and Borrego valleys, but numbers have declined markedly in recent decades (Grinnell and Miller 1944; Remsen 1978; Garrett and Dunn 1981 as cited in Zeiner 1989).

This species forages mostly on the ground, especially between and under shrubs. It uses its bill to dig in friable soil and to probe in litter. Its diet is poorly known, but includes insects, other invertebrates, berries, and other small fruits, seeds, and occasionally small lizards (Bent 1948 at cited in Zeiner 1989). Breeding season for the crissal thrasher lasts from February into June with a peak in March and April.

The Crissal Thrasher's numbers have been reduced greatly by removal of mesquite brushland for agricultural development and by introduction of tamarisk. Off-road vehicle activity also may also degrade habitat and disturb thrashers (Zeiner 1989).

Occurrence

This species has been observed within mesquite thickets associated with nearby projects (RECON 2010). The active agricultural areas within the private land portions of the survey area do not support suitable nesting or foraging habitat for this species due to the lack of suitable vegetation and the lack of loose, friable soils for foraging. Crissal Thrashers were not observed within the survey area.

Le Conte's Thrasher (*Toxostoma lecontei lecontei*)

Species

The Le Conte's Thrasher is a CDFG Species of Special Concern and a year-round resident in Imperial County.

Habitat

Le Conte's Thrasher is an uncommon to rare, local resident in southern California deserts from southern Mono County south to the Mexican border, and in western and southern San Joaquin Valley. It occurs primarily in open desert wash, desert scrub, alkali desert scrub, and desert succulent shrub habitats. Le Conte's Thrasher may also occur in Joshua tree woodlands with scattered shrubs (Grinnell and Miller 1944; McCaskie et al. 1979, 1988; Garrett and Dunn 1981 as cited in Zeiner 1989).

This species feeds on a variety of insects and other terrestrial arthropods; occasionally on seeds, small lizards, other small vertebrates (Bent 1948; Sheppard 1970 as cited in Zeiner 1989). It primarily forages on ground by probing and digging in soil and litter with bill. The Le Conte's Thrasher is a year-round, non-migratory species that breeds from late January into early June, with a peak from mid-March to mid-April.

Occurrence
This species was observed within desert wash vegetation associated with a nearby project (RECON 2010). The active agricultural areas within the private land portions of the survey area do not support suitable nesting or foraging habitat for this species due to the lack of suitable vegetation and the lack of loose, friable soils for foraging. LeConte's Thrashers were not observed within the survey area.

3.1.4.2.5 Golden Eagle *(Aquila chrysaetos)*

Species
This eagle occurs throughout the United States and is a rare resident in San Diego County and Imperial Counties (Unitt 2004; Zeiner 1989).

Habitat
Golden Eagles nest on cliffs of all heights and in large trees in open areas, and use rugged, open habitats with canyons and escarpments used most frequently for nesting (Zeiner 1989). Alternative nest sites are maintained, and old nests are reused. Golden Eagles build large platform nests, often 3 meters (10 feet) across and 1 meter (3 feet) high, of sticks, twigs, and greenery.

This species forages over large areas of grassland, desert, and open chaparral or sage scrub where they primarily prey upon rabbits, ground squirrels and prairie dogs. Golden Eagles forage close to and far from their nests, i.e. < 6 kilometers from the center of their territories, but have been observed to move 9 kilometers from the center of their territories in favorable habitat (McGrady et al. 2002 as cited in USFWS 2010d). These distances may be greater in xeric habitats (USFWS 2010c).

Occurrence
In San Diego County, Golden Eagles have been documented to be on the decline, which may represent regional trends (Unitt 2004). Golden Eagles are infrequently sited foraging over agricultural lands in the Imperial Valley in Imperial County. A Golden Eagle was observed foraging over the Mount Signal Drain and adjacent agricultural fields during surveys associated with a nearby project, approximately 4.5 miles southeast of the Imperial Valley Substation (Heritage 2011c). No previous records of this species were identified within the project vicinity (State of California 2011). There is natural and manmade nesting habitat for Golden Eagle in the regional vicinity (mountains to the northwest and south in Mexico), and the Solar Energy Facility site provides low quality foraging habitat for the species. Formal eagle surveys were not identified by the agencies as necessary for this project; instead, for the purposes of this and other analyses, occasional eagle foraging activities are assumed to occur within and around the project area. No suitable nesting habitat is present within the survey area or the immediate vicinity. Therefore, Golden Eagles are not expected to nest within the survey area.

The nearest known Golden Eagle population is approximately 10 miles northwest of the survey area, in the Coyote Mountains (Recon 2010a, 2010b). The In-Ko-Pah and Jacumba mountains, approximately 10 miles west of the proposed project, also provide suitable habitat for this species. Due to the distance from known territories, Golden Eagles associated with these populations are not expected to forage within or adjacent to the survey area. Mt. Signal, approximately 5.5 miles south of the Project Area, across the U.S.-Mexico border, may support suitable nesting habitat, although data for this area were not identified during the literature search. Individuals nesting in or around Mt. Signal could potentially use the survey area and surrounding vicinity for foraging activities.

3.1.4.3 Riparian Habitat or Sensitive Natural Communities

Special status natural communities are those communities "that are of limited distribution statewide or within a county or region and are often vulnerable to environmental effects of projects" (State of California 2009b). There are approximately 20.6 acres of arrow weed thicket (approximately 11.3 acres of which are disturbed) and approximately 1.3 acres of open water with arrow weed thicket within the survey area.

There are several riparian habitats within the survey area associated with the large irrigation drains present throughout the survey area. These communities include common reed marsh, cattail marsh, tamarisk thicket, and disturbed wetland. None of these communities are considered to be special status communities.

There are no other special status communities present within the survey area.

3.1.4.4 Jurisdictional Waters

A jurisdictional delineation was conducted to determine the extent of ACOE, CDFG, and RWQCB resources within the survey area. The private land survey area for potentially jurisdictional waters was comprised of the Campo Verde Solar Energy Facility. A 200-foot buffer area was surveyed and analyzed for this resource. The delineation results for these surveys are included in **Appendix 4**. The Drainage Report was submitted to the ACOE and CDFG in February 2012, but no response has been received to date. Therefore, the following discussion of jurisdictional waters may change pending ongoing consultation with ACOE and CDFG. **Attachment 1: Figure 7** shows the potentially jurisdictional ACOE and CDFG waters.

3.1.4.4.1 ACOE Jurisdictional Waters

Wetlands

Two ACOE wetland areas were identified within the private land portions of the survey area. The first (Feature 50) is immediately south and outside of the project area boundary, along Diehl Road (**Attachment 1: Figure 7, Page C-3**). This area is a defunct irrigation drain that receives water from an adjacent drain. The second (Feature 11A) is located just west of Drew Road in the northeast corner of the project area (**Attachment 1: Figure 7, Page F-1**). Formal wetland delineations were not performed in these areas. However, based on wetland vegetation (cattail, phragmites, etc.) and wetland hydrology (inundation), the features are assumed to be jurisdictional wetlands. All other ACOE jurisdictional areas delineated are preliminarily considered non-wetland waters of the U.S., made up of irrigation canals and drains.

Non-wetland Waters of the U.S.

Non-wetland waters within the private land portion of the Survey Area are primarily associated with the larger irrigation canals and drains.

A total of 18 features were identified as potentially federally jurisdictional (**Attachment 1: Figure 7**), while 98 features were identified as not federally jurisdictional. All of the features on the Solar Site are man-made features constructed wholly within uplands; these features are used for agricultural irrigation (supply and drainage). Typically the head ditches used to irrigate individual fields, as well as the tail ditches used to drain individual fields, convey water during periodic and infrequent irrigation events; they are typically dry and would not meet the definition of a Relatively Permanent Water (RPW) and, thus, would not be jurisdictional. The larger, Imperial Irrigation District (IID)-maintained, concrete-lined canals and lateral canals used to convey water to multiple fields convey water for most of the year and would likely be considered federally jurisdictional. Similarly, the larger IID-maintained drains that collect tail water from multiple fields convey water at all times of the year and would likely be considered federally jurisdictional. More detailed information including location, name of the feature, width of the ordinary high water mark, and a detailed mapbook is included in **Appendix 2 – Jurisdictional Waters Report**.

3.1.4.4.2 CDFG Jurisdictional Waters

CDFG generally takes jurisdiction of all stream features including drains and canals. The CDFG jurisdiction extends from the top of bank to the opposite top of bank on these features or the limits of riparian vegetation if this vegetation extends beyond the top of the banks. Wetlands need to only fulfill one of the three aforementioned ACOE (hydrology, hydric soils, wetland vegetation) criteria to be considered CDFG jurisdictional wetlands.

Under Section 1600 of the CDFG Code, CDFG jurisdiction includes "…bed, channel or bank of any river, stream or lake designated by the department in which there is any time an existing fish or wildlife resource or from which these resources derive benefit…" Canals, aqueducts, irrigation ditches, and other means of water conveyance can also be considered streams if they support aquatic life, riparian vegetation or stream dependent terrestrial benefit (Cylinder 1995).

Generally speaking, most canals, head and tail ditches do not support riparian habitat. Larger drains, however, typically do support some riparian habitat and are often considered state jurisdictional. Drainage features were considered potentially jurisdictional if they exhibited naturally occurring bed and bank, riparian vegetation potentially providing wildlife habitat, and/or evidence of regular flow. A total of 23 features were identified as potentially state jurisdictional (**Attachment 1: Figure 7**). Features occurring within the Campo Verde Solar Energy Facility that did not satisfy these criteria were very small tail ditches and concrete lined head ditches. The tail ditches were frequently isolated within individual fields, did not support distinct bed and bank, riparian vegetation or evidence of regular flow, or are plowed under and re-created each time the field is replanted. The head ditches convey water during periodic and infrequent irrigation events; they are typically dry. The larger, IID-maintained, concrete-lined canals and lateral canals used to convey water to multiple fields convey water for most of the year, sometimes support riparian vegetation and/or fisheries, and would likely be considered CDFG jurisdictional. Similarly, the larger IID-maintained drains that collect tail water from multiple fields convey water for most of the year and would likely be considered CDFG jurisdictional.

More detailed information including location, name of the feature, width of bank to bank, and a detailed mapbook is included in **Appendix 2 – Jurisdictional Waters Report**.

3.1.4.5 Habitat Connectivity and Wildlife Corridors

Wildlife movement corridors and habitat linkages are areas that connect suitable wildlife habitat areas in a region otherwise fragmented by rugged terrain, changes in vegetation, or human disturbance. Corridors are generally local pathways connecting short distances usually covering one or two main types of vegetation communities. Linkages are landscape level connections between very large core areas and generally span several thousand feet and cover multiple habitat types. Natural features such as canyon drainages, ridgelines, or areas with vegetation cover provide corridors and linkages for wildlife travel. The habitat connectivity provided by corridors and linkages is important in providing access to mates, food, and water, allowing the dispersal of individuals away from high-density areas, and facilitating the exchange of genetic traits between populations (Beier and Loe 1992).

Both avian and terrestrial wildlife species are able to move freely throughout the survey area and are not restricted to a specific corridor or linkage.

3.2 Gen-tie Line Alternatives

The following sections describe the existing conditions on lands associated with the Proposed Gen-Tie, the Alternative Gen-Tie across BLM land, and the Private Land Gen-Tie Alternative and associated buffer areas. This area is referred to as the "gen-tie survey area".

3.2.1 Soils and Topography

The survey area is located in the Yuha Basin of the Colorado Desert between agricultural lands to the north and east and native desert to the south and west. No alluvial fans or small washes are present in the gen-tie line corridors. The area is relatively flat, with sparse vegetation and sand that ranges from soft and rolling to flat and compact. The gen-tie survey area is comprised of native desert, active agricultural fields, and fallow agricultural fields.

There are ten major soil types found within the survey area, including Badland, Glenbar, Holtville, Imperial-Glenbar, Indio-Vint, Meloland-Holtville, Indio, Vint, Meloland, Rositas soils (NRCS 2006 and 2011). These soils are primarily found on flat basin floors and are formed from clay, silt, and sandy alluvium materials.

The elevation trends downward from the south to the north. Soils are very permeable and there are no drainages or washes present in the Gen-tie Line corridor on BLM lands. Presumably, most surface water is absorbed into the ground or sheet flows to the Westside Main Canal just north of the BLM lands.

3.2.2 General Vegetation

Thirteen vegetation communities were mapped within the gen-tie survey area. The following sections describe existing vegetation in the gen-tie survey area. Communities that are similar in composition were lumped together in the discussion.

3.2.2.1 Creosote Bush-White Bursage Scrub (CBS and CBS-D)

Creosote bush–white bursage scrub (including the disturbed component) is the major component of the survey area. This community is dominated by creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*) with relatively sparse vegetative cover and flat topography. Four-wing saltbush (*Atriplex canescens*) and plicate tiquilia (*Tiquilia palmeri*) are present as sporadic minor associates. This community occurs in minor washes and rills, alluvial fans, bajadas, upland slopes, usually on well-drained alluvial, colluvial and sandy soils (Sawyer, et al. 2009). It covers approximately 67% of the central Mojave Desert and 70% of the Colorado and Sonoran deserts in California (Sawyer et al. 2009). Plantain (*Plantago* sp.), narrow-leaf cryptantha (*Cryptantha angustifolia*), basket evening-primrose (*Oenothera deltoides*) and narrow-leaf oligomeris (*Oligomeris linifolia*) are very common in the herbaceous layer. Other ephemeral species expected to occur within this community include: short-ray desert marigold (*Baileya pauciradiata*), desert dandelion (*Malacothrix glabrata*), spectacle-pod (*Dithyrea californica*), onyx flower (*Achyronychia cooperi*) and bajada lupine (*Lupinus cocinnus*). Areas of high human disturbance are classified as disturbed creosote bush-white bursage scrub.

3.2.2.2 Agriculture (Ag) and Fallow Agriculture (AG-F)

Active agricultural fields primarily consist of alfalfa and Bermuda grass Agricultural weeds such as five-hook bassia are present along the edge of the fields.

Fallow agricultural fields are being invaded by non-native weeds such as five-hook bassia, tamarisk, Saharan mustard (*Brassica tournefortii*), and the native shrub quailbush.

3.2.2.3 Arrow Weed Thicket (AS and AS-D)

Arrow weed thicket is a shrub community dominated or co-dominated by arrow weed (*Pluchea serricea*). The canopy is intermittent to continuous with the shrub canopy usually less than 5 meters in height. The herbaceous layer in these communities is generally sparse. This community occurs around springs, seeps, irrigation ditches, canyon bottoms, stream borders, and seasonally flooded washes in desert. The USFWS Wetland Inventory recognizes this as a facultative wetland species. The community occurs throughout the Mojave, Colorado and Sonoran deserts of California (Sawyer et al. 2009). Within the Gen-tie survey area, this community occurs along irrigation drains and canals. Areas where the vegetation has not fully recovered from the previous clearing are classified as disturbed arrow weed thicket. Most of these areas are regularly cleared of this vegetation and they are constantly changing.

3.2.2.4 Stabilized Desert Dunes – Disturbed (SDD-D)

Stabilized desert dunes in the survey area are the result of several types of windbreaks that have been created to prevent sand from blowing into the agricultural fields. These windbreaks include plantings of athel (*Tamarix aphylla*), soil berms and hay bale/soil berms. These berms have created stabilized sand dunes primarily on the windward sides of these features. The vegetation in these areas is dominated by creosote bush, four-wing saltbush and three-fork ephedra (*Ephedra trifurca*). Ephemeral species expected to occur here are the same as those described previously for the creosote bush scrub, especially basket evening-primrose (*Oenothera deltoides*), dicoria (*Dicoria canescens*) and parch locoweed (*Astragalus aridus*) and desert locoweed (*Astragalus didymocarpus*). Because these dunes are an artifact of human creation and the foreign materials that are a part of this dune system, these have been classified as disturbed dunes.

3.2.2.5 Athel Tamarisk Type Woodland (AW)

Individuals of athel (*Tamarix aphylla*) have been planted as a windscreen along the edges of agricultural fields. This semi-evergreen or evergreen tree reaches a height of 12 meters. The herbaceous layer in these communities is generally sparse (Sawyer et al. 2009).

3.2.2.6 Tamarisk Thicket (TS)

Tamarisk thicket is a shrub community dominated or co-dominated by tamarisk (*Tamarix ramosissima*). This non-native species has invaded many areas of native riparian vegetation where they develop dense, monospecific stands across floodplains, wetlands, and lake margins. The USFWS Wetland Inventory recognizes this as a facultative species. The canopy is continuous to open with the shrub canopy usually less than 8 meters in height. The herbaceous layer in these communities is generally sparse. This community occurs throughout watercourses in the Mojave, Colorado and Sonoran deserts (Sawyer et al. 2009). Within the survey area, this community occurs within irrigation drains and canals, generally along the channel bottoms and lower slopes or within fallow fields with a high water table. Arrow weed (*Pluchea serricea*), cattails (*Typha* sp.), and common reed (*Phragmites australis*) are major associates to co-dominants in some areas.

3.2.2.7 Developed/Disturbed (DEV/DH)

Developed/disturbed land occurs within the survey area. These areas contain little to no vegetation. Disturbed areas include areas adjacent to the Imperial Valley Substation on BLM land and one residence on private land within the buffer. These areas are usually kept bare of vegetation by constant vehicle traffic but may support non-native weed species.

3.2.2.8 Open Water with Arrow Weed Thicket (OW)

This habitat is restricted to the Westside Main Canal. Arrow weed thicket is restricted to a narrow band along the banks of this canal. Arrow weed is the dominant species and in many areas the only species along the banks of this canal.

3.2.2.9 Common Reed Marsh – Disturbed (CRM-D)

Common reed marsh includes semi-permanently flooded and slightly brackish marshes, ditches and impoundments that are dominated or co-dominated by common reed (*Phragmites australis*). Native stands occur in wetlands throughout the Mojave, Colorado and Sonoran deserts. The USFSW Wetland Inventory recognizes common reed as a facultative wetland species (Sawyer et al. 2009). Within the survey area, these marshes occur along the channel bottoms of the canals and drains with a more permanent water source. Cattails (*Typha latifolia*), tamarisk (*Tamarix ramosissima*), and arrow weed (*Pluchea serricea*) are co-dominants or major associates. In many instances these earthen irrigation canals and drains are routinely cleared of vegetation to facilitate hydrologic flow. Areas where the vegetation has not fully recovered from the previous clearing are classified as disturbed common reed marsh.

3.2.2.10 Disturbed Wetland (DW)

Disturbed wetland included earthen canals and drains that are regularly cleared of vegetation usually support herbaceous non-native species; these areas have been mapped as disturbed wetlands. Most of the species in the disturbed wetlands are non-native grasses and forbs; with the exception of salt grass, they were not identifiable at the time of the fall survey. Other species expected to occur in these drainages include sprangletop (*Leptochloa* spp.), umbrella sedge (*Cyperus* spp.) and dock (*Rumex* spp.).

3.2.3 Special Status Plant Species

Fall Blooming and/or Woody Perennial Special Status Plants

Most of the Special Status Species that are known from the vicinity of the project area are either not expected to occur or would have a low potential to occur within the BLM lands. The majority of the species are not expected to occur because of lack of appropriate habitat, or lack of known or historical populations from the vicinity. Species with a low potential for occurrence have suitable habitat present within the survey areas on BLM lands, but due to the relatively small amount of habitat, the proximity to agricultural fields, the Imperial Valley substation, and several existing transmission lines, their potential for occurrence is much less likely.

Table 5 lists all the fall blooming Special Status Plants that are known from the vicinity of the Campo Verde Project area or the Imperial Valley. No Special Status Plants were observed during this survey. This area of Imperial County experienced very little summer/fall rainfall. As a result, there was no evidence that any fall blooming, ephemeral species germinated during the fall 2011. Because of the low amount of rainfall, fall blooming Special Status Plants that could be present onsite may not have been observable.

Approximately one-half of the gen-tie survey area on BLM lands was surveyed in November 2010 for the Centinela Solar Energy Project (Heritage 2011c); no Special Status Species were observed in this area at that time either even though fall blooming species were present in this area in 2010.

A total of 8 fall-blooming Special Status Species were assessed for their potential for occurrence in the gen-tie survey area **(Table 5)** including: Abram's spurge (*Chamaesyce abramsiana*) (Priority Plant Species), California ditaxis (*Ditaxis serrata* var. *californica*) (Priority Plant Species), glandular ditaxis (*Ditaxis claryana*) (Priority Plant Species), Algodones Dunes sunflower (*Helianthus niveus* ss. *tephrodes*) (State Endangered), pink velvet mallow (*Horsfordia alata*) (Priority Plant Species), Newberry's velvet mallow (*Horsfordia newberryi*) (Priority Plant Species), California satintail (*Imperata brevifolia*) (Priority Plant Species) and dwarf germander (*Teucrium cubense* ssp. *depressum*) (Priority Plant Species). They are discussed in **Sections 3.2.3.2, and 3.2.3.4**.

In addition to the 8 fall blooming species, six other perennial species would have been observable (or their host would have been observable in the case of the parasitic plants) if present, because of their life-forms, (e.g. shrubs, stem succulents or parasitic plants) even though they would not have been blooming at the time of the survey. These species include: Wolf's cholla (*Cylindropuntia wolfii*) (BLM Sensitive), little-leaf elephant tree (*Bursera microphylla*) (Priority Plant Species), fairy duster (*Calliandra eriophylla*) (Priority Plant Species), crucifixion thorn tree (*Castela emoryi*) (Priority Plant Species), Wiggins croton (*Croton wigginsii*) (BLM Sensitive), and Thurber's pilostyles (*Pilostyles thurberi*) (Priority Plant Species). They are discussed in **Sections 3.2.3.3 and 3.2.3.4**.

<u>Spring-blooming Special Status Plants</u>

Some species with the potential to occur in the project area are spring ephemerals (**Table 5**). Many of these species have a low potential for occurrence because they occur in specialized habitats (e.g., rocky desert scrub) that are absent from this portion of the Yuha Basin, or they are species that do not have reported populations or suitable habitats near the project site.

Surveys during the traditional blooming period of these spring ephemeral species will be conducted during the spring 2012. However, based on literature review of biological technical reports and personal observations, populations of brown turbans (*Malperia tenuis*) (Priority Plant Species), Parish's desert-thorn (*Lycium parishii*) (Priority Plant Species), Utah vine milkweed (*Funastrum utahense*) (Priority Plant Species), hairy stickleaf (*Mentzelia hirsutissima*) (Priority Plant Species) and rock nettle (*Eucnide rupestris*) (Priority Plant Species) are known to occur the vicinity of the Campo Verde gen-tie line. Habitats for these species are present within the Campo Verde gen-tie survey area.

Table 5 provides a detailed analysis of all special status plant species evaluated for the Gen-tie Survey area.

3.2.3.1 Federally-listed Species

Based on the literature review and field surveys, no federally listed threatened or endangered plant species were identified as having the potential to occur within the Gen-tie survey area. No federally listed threatened or endangered species were observed during focused rare plant surveys.

3.2.3.2 State-listed Species

Algodones Dunes sunflower is a California state listed endangered species and a California Native Plant Society's (CNPS) Rare Plant Rank 1.2 (Rare, Threatened or Endangered in California, and elsewhere/fairly endangered in California) species. This species was not observed during the survey which coincided with its blooming period (September – May). There is very marginal suitable habitat (desert dunes) within the project area on BLM lands. As mentioned previously, these dunes are the result of human created windbreaks. This species is also only known from the Algodones Dunes; the site is well outside of the known range of this species. Despite the lack of sufficient rainfall that might have made detection of this species inconclusive, this is not expected to occur within the Campo Verde Project area on the BLM or private lands.

No state-listed species were observed on-site during focused rare plant surveys.

3.2.3.3 BLM Sensitive Species

BLM sensitive species include all species currently on CNPS List 1B, as well as others that are designated by the California BLM State Director. Based on the literature review, three BLM sensitive plant species have the potential to occur within the Gen-tie survey area (Algodones Dunes sunflower, Wiggins' croton and Wolf's cholla). Algodones Dunes sunflower is discussed in **Section 3.2.3.2**.

Wiggins' croton is a California state listed rare species and a BLM sensitive species that was historically considered restricted to the Algodones Dunes on East Mesa, though this species has recently been reported near Plaster City. Individuals of croton previously observed around the IV Substation adjacent to the Campo Verde Gen-tie survey area are California croton (*Croton californicus*) (John Messina pers obs). No individuals in the genus *Croton* were observed within the Campo Verde gen-tie survey area during the survey. Wiggins' croton is not expected to occur within the gen-tie survey area.

Wolf's cholla is a BLM Sensitive Species, a CNPS Rare Plant Rank 4.3 species (Plants of limited distribution/ not endangered in California), and a CNDDB special plant. Wolf's cholla is a small, multi-branched cactus with cylindrical stem segments. This species is known from Pinto Wash south of the Project area. Though the survey did not coincide with its flowering period, no cactus species were observed within the Campo Verde Gen-tie survey area. As such this species is not expected to occur within the gen-tie survey area.

No other BLM Sensitive Species are expected to occur within the Gen-tie survey area.

3.2.3.4 Priority Plant Species

Priority plant species are rare, unusual, or key species that are not sensitive by BLM or listed as threatened and endangered. Priority plant species are specifically plants that are included on the CNPS Lists 2–4. Several priority plant species were identified as having the potential to occur within the survey area. **Table 5** provides additional detail about the potential for priority plant species to occur within the survey area.

California satintail is a CNPS Rare Plant Rank 2.1 species (Rare, Threatened or Endangered in California, more common elsewhere/seriously endangered in California) and a CNDDB special plant. This tall perennial grass occurs in riparian scrub and mesic habitats, which are not present along the gen-tie corridors on the BLM lands. This species was not observed during the fall survey, which coincided with this species blooming period (September-May) and is not expected to occur on BLM lands.

Abram's spurge is known from several historical locations from the vicinity of the Campo Verde Project area. Abram's spurge is a CNPS 2.2 species (Rare, Threatened or Endangered in California, more common elsewhere/fairly endangered in California) and a CNDDB special plant that is a fall/winter blooming species (September – November). This species was not observed during the fall survey, which may be inconclusive due to the lack of summer/fall precipitation in the Campo Verde project area. Despite this, Abram's spurge would have a low potential for occurrence within the BLM lands because much of the suitable habitat is adjacent to agricultural activities, a substation and transmission line corridors.

Glandular ditaxis (*Ditaxis claryana*) is a CNPS Rare Plant Rank 2.2 species (Rare, Threatened or Endangered in California, more common elsewhere/fairly endangered in California) and a CNDDB special plant. The fall survey coincided with this herbaceous perennial blooming period (October through March). This species was not observed during the fall survey, which may be inconclusive due to the lack of summer/fall precipitation in the Campo Verde project area. Despite this, glandular ditaxis would have a low potential for occurrence within the BLM lands because much of the suitable habitat is adjacent to agricultural activities, a substation and transmission line corridors. There are also no known reported populations within the vicinity of the Campo Verde Project area.

Dwarf germander (*Teucrium cubense* ssp. *depressum*) is a CNPS Rare Plant Rank 2.2 species (Rare, Threatened or Endangered in California, more common elsewhere/fairly endangered in California) and a CNDDB special plant that blooms March – May and September- November (if fall rains occur). There is no suitable habitat for this species (sandy washes and wet soils) within the survey area. Though summer and fall rains may not have been sufficient for seed germination, this species is not expected to occur within the survey area due to the lack of suitable habitat.

California ditaxis (*Ditaxis serrata* var. *californica*) is a CNPS Rare Plant Rank 3.2 species (Plants for which more information is needed/fairly endangered in California) and a CNDDB special plant. The fall survey coincided with this herbaceous perennial blooming period from March through December. This species was not observed during the fall survey, which may be inconclusive due to the lack of summer/fall precipitation in the Campo Verde Project area. Despite this, California ditaxis would have a low potential for occurrence within the BLM lands because much of the suitable habitat is adjacent to agricultural activities, a substation and transmission line corridors. There are also no known reported populations within the vicinity of the Campo Verde Project area.

Pink velvet mallow and Newberry's velvet mallow are both CNPS Rare Plant Rank 4.3 species (Plants of limited distribution/not very endangered in California) and CNDDB special plants. These species are both sub-shrubs that bloom throughout the year (February – December), including the time of the survey. These species are members of the Malvaceae Family, which have distinctive leaf features that also aid with their identification. No members of this family were observed during the time of the survey. In addition, rocky desert scrub is absent from the survey area so these species are not expected to occur.

Thurber's pilostyles is a CNPS Rare Plant Rank 4.3 species (Plants of limited distribution/not very endangered in California) and a CNDDB special plant. Thurber's pilostyles is a parasitic plant of the genus *Psorothamnus.* This species is known from Pinto Wash south of the Project area. Though this species would not have been observable at the time of the survey, its host plant would have been observable if present. No individuals of the genus *Psorothamnus* were observed during the survey. As such Thurber's pilostyles is not expected to occur within the survey area. Thurber's pilostyles, a parasitic species, would not have been observable at the time of the survey, as it blooms in January but its host plant, woody shrubs or trees in the genus *Psorothamnus*, would have been observable.

Little-leaf elephant tree, fairy duster, and crucifixion thorn tree are all CNPS Rare Plant Rank 2.3 species (Rare, Threatened or Endangered in California, more common elsewhere/not very endangered in California) and CNDDB special plants. All are perennial trees or shrubs and would have been observable during the time of the survey. In addition, preferred habitats for these species are typically more rocky or gravelly bajadas or playas that are not present within the Campo Verde Project area. As such these species are not expected to occur within the survey area.

Rock nettle is a CNPS Rare Plant Rank 2.2 species (Rare, Threatened or Endangered in California, more common elsewhere/fairly endangered in California) and a CNDDB special plant. Brown turbans, Parish's desert-thorn and hairy stickleaf are all CNPS Rare Plant Rank 2.3 species (Rare, Threatened or Endangered in California, more common elsewhere/not very endangered in California) and CNDDB special plants. Utah vine milkweed is a CNPS Rare Plant Rank 4.2 species (Plants of limited distribution/fairly endangered in California). These species have a low to moderate potential for occurrence within the BLM lands associated with the gen-tie. Though suitable habitat is present, it is adjacent to agricultural activities, a substation and transmission line corridors.

The remainder of the plants on List 2 either have a very low potential for occurrence or are not expected to occur within the BLM lands associated with the gen-tie because of the absence of suitable habitat of the site is outside of the known range of these species. Spring rare plant surveys will be conducted in the spring of 2012.

Table 5 – Special Status Plant Species Potentially Occurring in the Gen-tie Survey Area

Fall Blooming Special Status Plant Species		
Species Name	**Sensitivity Status**	**Potential for Occurrence**
Little-leaf elephant (*Bursera microphylla*)	CDFG: Special Plant CNPS Rare Plant Rank: 2.3	Occurs in alluvial fan scrub (Reiser 2001) and rocky areas in Sonoran Desert scrub. Deciduous tree; blooms June-July (CNPS 2011). Not observed within Campo Verde project area during survey. Distinctive tree species would have been observed during surveys if present. Nearest location in In-Ko-Pah Gorge, Sweeney Pass and Arroyo Tapiado quads (CNPS, 2011). Alluvial fan scrub habitat and rocky scrub absent in the Campo Verde project area. Closest sites are in rocky desert foothills to west of site. Species is not expected to occur within project area.
Fairy duster (*Calliandra eriophylla*)	CDFG: Special Plant CNPS Rare Plant Rank 2.3	Occurs in Sonoran Desert scrub primarily on rocky hillsides and bajadas (Reiser, 2001; CNPS 2011). Deciduous shrub; blooms January – March (CNPS 2011). Not observed during survey but would have been observable if present. Not expected to occur due to absence of suitable habitat in Campo Verde project area. One CNDDB occurrence south of the Campo Verde project area which is also likely the Yuha Basin Quad location reported by CNPS (2011). Most occurrences of this species in East Mesa of Imperial County (CNPS 2011).
Crucifixion thorn (*Castela emoryi*)	CDFG: Special Plant CNPS Rare Plant Rank 2.3	Occurs in playas and gravelly areas in Sonoran Desert scrub. Deciduous shrub; blooms April – July (CNPS 2011). Not observed during survey. Distinctive shrub species would have been observed if present. Not expected to occur. Suitable habitat (i.e., playas and gravelly areas) absent in Campo Verde project area. Known from Yuha Basin and Coyote Wells quads (CNPS 2011).
Abram's spurge (*Chamaesyce abramsiana*)	CDFG: Special Plant CNPS Rare Plant Rank 2.2	Occurs in sandy Sonoran Desert scrub. Annual; blooms September – November (CNPS 2011). Suitable habitat present in Campo Verde project area. Historical collections known from Calexico, Heber and Brawley quads (CNPS, 2011). Not observed during focused survey for this species in October 2011which was conducted during this species' traditional flowering period. However, late summer and fall rains may have been insufficient for seeds to germinate this year. Low potential to occur in native desert scrub habitats in Campo Verde project area.
Wiggins croton (*Croton wigginsii*)	BLM: Sensitive CDFG Rare CNPS Rare Plant Rank 2.2	Occurs in desert dunes and Sonoran Desert scrub. Shrub; blooms March – May. CNPS reports species restricted to Algodones Dunes and all CNPS locations are on the East Mesa (CNPS 2011). Known from near Plaster City between S-80 and I-80 (URS, 2010). Not observed and not expected to occur in the Campo Verde project area. Marginal suitable habitat present (i.e. desert dunes), but dunes are result of human creation and site and is outside of species range.
Wolf's cholla (*Cylindropuntia wolfii*)	BLM: Sensitive CDFG: Special Plant CNPS Rare Plant Rank 4.3	Occurs in Sonoran Desert scrub, usually on alluvial fans or rocky slopes (Reiser 2001). Stem succulent that blooms from March-May. Known from San Diego and Imperial counties and Baja, California (CNPS 2011). Known from Pinto Wash south of the IV substation. No individuals of this genus observed within Campo Verde project area. Species not expected to occur within Campo Verde project area.
Glandular ditaxis (*Ditaxis claryana*)	CDFG: Special Plant CNPS Rare Plant Rank 2.2	Occurs in sandy Sonoran Desert scrub. Herbaceous perennial; blooms October – March. Known from Algodones Dunes. Ogliby and Iris quads are closest reported populations (CNPS 2011). Not observed during survey. October 2011 survey conducted during this species traditional blooming period. However, late summer and fall rains may have been insufficient for this year. Despite this, the species is not expected to occur, as Campo Verde project area is outside of known range.
California ditaxis (*Ditaxis serrata* var. *californica*)	CDFG: Special Plant CNPS Rare Plant	Sonoran Desert scrub. Herbaceous perennial, blooms March-December. Nearest known occurrence Clark Lake Quad in northern Anza Borrego

	Rank 3.2	State Park. Most other reported locations along the I-10 corridor between Indio and Blythe (CNPS 2011). Not observed during survey. October 2001 survey conducted during this species traditional blooming period. However, late summer and fall rains may have been insufficient this year. Despite this, the species is not expected to occur, as Campo Verde project area is well south of reported range of this species in California.
Algodones Dunes sunflower (*Helianthus niveus* ssp. *tephrodes*)	CDFG: Endangered CNPS Rare Plant Rank 1B.2	Occurs in desert dunes and is restricted to the Algodones Dunes of East Mesa. This herbaceous perennial blooms from September-May. Not observed during October 2011 survey nor expected to occur in Campo Verde project area. However, late summer and fall rains may have been insufficient for species to grow this year. Marginal suitable habitat present (i.e. desert dunes), but dunes are result of human creation and site and is outside of species range.
Pink velvet mallow (*Horsfordia alata*)	CDFG: Special Plant CNPS Rare Plant Rank 4.3	Occurs in rocky Sonoran Desert scrub. This perennial shrub blooms almost year round from February-December. This species is reported from Imperial County but no quad data is available (CNPS 2011). Suitable habitat (rocky desert scrub) is absent from Campo Verde project area. As a shrub, this species is not expected to occur in the Campo Verde project area because it would have been observable during October 2011 survey if present.
Newberry's velvet mallow (*Horsfordia newberryi*)	CDFG: Special Plant CNPS Rare Plant Rank 4.3	Occurs in rocky Sonoran Desert scrub. This perennial shrub blooms almost year round from February-December. This species is reported from the Carrizo Mountain Quad (CNPS 2011). Suitable habitat i.e. rocky areas, is absent in the Campo Verde project area. As a shrub, this species is not expected to occur in the Campo Verde project area because it would have been observable during October 2011 survey if present.
California satintail (*Imperata brevifolia*)	CDFG: Special Plant CNPS Rare Plant Rank 2.1	Riparian scrub; desert scrub. Herbaceous perennial; blooms September – May (CNPS 2011). CNDDB occurrence immediately east of Campo Verde project area between Greeson Wash and New River. Not observed during October 2011survey. Not expected to occur in the BLM lands Campo Verde project area due to the lack of suitable habitat. This species is not expected to occur in the project area but has a low to moderate potential for occurrence in a side tributary of the New River on the private lands immediately along the northeastern boundary of the solar site within the project's buffer area. This species was not observed along that tributary though a focused survey was not conducted due to health hazards posed by pollutants in the New River.
Thurber's pilostyles (*Pilostyles thurberi*)	CDFG: Special Plant CNPS Rare Plant Rank: 4.3	Herbaceous perennial parasitic on *Psorothamnus* spp.; blooms January. Known from Plaster City and Mount Signal (Reiser 2001). Known from southwest of Plaster City between S-80 and I-80 (URS 2010). Known from Pinto Wash south of the IV Substation. Not expected to occur in Campo Verde project area due to the absence of this species host plants in the Campo Verde project area.
Dwarf germander (*Teucrium cubense* ssp. *depressum*)	CDFG: Special Plant CNPS Rare Plant Rank: 2.2	Occurs in sandy washes, streams and wet soils, Sonoran Desert scrub. Annual; blooms March – May (September- November if fall rains occur). Known from Coyote Wells quad (CNPS 2011). Not observed or expected in Campo Verde project area. Suitable habitat (i.e., sandy washes) absent. Not observed during survey. October 2001 survey conducted during this species traditional blooming period. However, late summer and fall rains may have been insufficient for seeds to germinate this year.
Spring Blooming Special Status Plant Species		
Chaparral sand verbena (*Abronia villosa* var. *aurita*)	BLM: Sensitive CDFG: Special Plant CNPS Rare Plant Rank 1B.1	Occurs in sandy floodplains or flats in generally, inland arid areas of sage scrub and open chaparral and desert dunes (Reiser 2001; CNPS 2011). Annual; blooms January – September (CNPS 2011). Known from Calexico, Seeley, and Superstition Mountains quads (CNPS, 2010). Marginal dune habitat present within native habitats in Campo Verde project area. Low to moderate potential for occurrence. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.
Watson's amaranth	CDFG: Special Plant	Occurs in Sonoran Desert Scrub. Annual; blooms August – September.

(*Amaranthus watsonii)*	CNPS Rare Plant Rank 4.3	Not observed but survey occurred outside of traditional blooming period. Suitable habitat present within native desert scrub in Campo Verde project area. Known from Calexico and Heber quads (CNPS 2011). Low to moderate potential for occurrence within desert scrub habitats. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.
Salton milk vetch (*Astragalus crotalariae*)	CDFG: Special Plant CNPS Rare Plant Rank 4.3	Occurs in sandy or gravelly Sonoran Desert scrub habitat and is known from the Superstition Mountains quad. This herbaceous perennial blooms from January to April (CNPS 2011). Potential habitat present within Campo Verde project area. Low to moderate potential for occurrence within desert scrub habitats. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.
Harwood's milk vetch (*Astragalus insularis* var. *harwoodii*)	CDFG: Special Plant CNPS Rare Plant Rank: 2.2	Occurs in Sonoran Desert scrub with gravelly, sandy washes or dunes (Reiser, 2001). Annual; blooms January-May (CNPS 2011). Known from southwest of Plaster City between S-80 and I-80 (URS 2010). Also known from In-Ko-Pah Gorge and Coyote Wells quads (CNPS 2011). Habitat (sandy dunes) present within native desert scrub in survey. Known from Coyote Wells quad (CNPS 2011). Low to moderate potential for occurrence within desert scrub habitats. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.
Borrego milk vetch (*Astragalus lentiginosus* var. *borreganus*)	CDFG: Special Plant CNPS Rare Plant Rank 4.3	Occurs in sandy Sonoran Desert scrub habitat and is known from the Shell Reef quad in upper Borrego Valley and from the Algodones Dunes on East Mesa. This herbaceous perennial blooms from February to May (CNPS 2011). Potential habitat present. Low potential for occurrence within project area. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.
Peirson's milk vetch (*Astragalus magdalenae* var. *peirsonii*)	USFWS: Threatened CDFG: Endangered BLM: Sensitive CNPS Rare Plant Rank 1B.2	Occurs in desert dunes habitat, this species is known from fewer than 10 occurrences. Known from Algodones Dunes on East Mesa and upper Borrego Valley. A herbaceous perennial that blooms from December to April (CNPS 2011). Marginal dune habitat present. Low potential for occurrence within project. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.
Desert ayenia (*Ayenia compacta*)	CDFG: Special Plant CNPS Rare Plant Rank: 2.3	Occurs in rocky Sonoran Desert scrub. A herbaceous perennial that blooms from March to April (CNPS 2011). Closest reported populations include Jacumba and Sweeney Pass. This species not expected to occur in the Campo Verde project area due to the lack of suitable habitat, i.e., rocky areas. Known populations are well west of the corridor in the rocky mountains above the Yuha Basin. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.
Sand evening primrose (*Camissonia arenaria*)	CDFG: Special Plant CNPS Rare Plant Rank 2.2	Occurs in sandy or rocky Sonoran Desert scrub. This annual/herbaceous perennial blooms from November–May and is reported from the Quartz Peak quad in the Chocolate Mountains (CNPS 2011). Though suitable habitat is present the reported occurrences of this species are distant from the Campo Verde project area. Low potential for occurrence. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.
Peirson's pincushion (*Chaenactis carphoclinia* var. *peirsonii*)	BLM: Sensitive CDFG: Special Plant CNPS Rare Plant Rank 1B.3	Occurs in sandy Sonoran Desert scrub. Annual; blooms March-April. Known only from the eastern Santa Rosa Mountains with closest reported location from the Borrego Mountain SE quad (CNPS 2011). Suitable habitat present in Campo Verde project area. However, species not expected to occur within Campo Verde project area due to its present known range. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.
Arizona spurge (*Chamaesyce arizonica*)	CDFG: Special Plant CNPS Rare Plant Rank 2.3	Occurs in sandy Sonoran Desert scrub. Known from the In-Ko-Pah Gorge Quad, this species is undocumented in Imperial County. This herbaceous perennial blooms from March to April (CNPS 2011). Not expected to occur within Campo Verde project area. Though suitable habitat is present, Campo Verde project area is outside of this species current known range. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.
Flat-seeded spurge	BLM: Sensitive	Occurs in desert dunes and sandy Sonoran Desert scrub. Known in

(*Chamaesyce platysperma*)	CDFG: Special Plant CNPS Rare Plant Rank 1B.2	California from only four herbarium collections and one collection from Imperial County in 1987 (CNPS 2011). Annual; blooms February – September. Known from Superstition Mountain and Kane Springs quads in Imperial County (CNPS 2011). Not expected to occur within Campo Verde project area. Though marginal suitable habitat for this species exists, species is very rare in Imperial County. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.
Las Animas colubrinia (*Colubrinia californica*)	CNPS Rare Plant Rank 2.3	Occurs in Sonoran Desert scrub (CNPS 2001) often localized around springs and mesic rocky canyon bottoms (Reiser 2001). This deciduous shrub blooms from April-June and is reported from Picacho Peak and Quartz Peak in the Chocolate Mountains (CNPS, 2001). Suitable habitat lacking and site is outside known current distribution. Not expected to occur within Campo Verde project area. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.
Spiny abrojo (*Condalia globosa* var. *pubescens*)	CDFG: Special Plant CNPS Rare Plant Rank 4.2	Occurs in Sonoran Desert scrub. This deciduous shrub blooms from March-May. This species is reported from Imperial County but no quad data is available (CNPS 2011). Suitable habitat is present in the Campo Verde project area. Low potential for occurrence. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.
Ribbed cryptantha (*Cryptantha costata*)	CDFG: Special Plant CNPS Rare Plant Rank: 4.3	Occurs in desert sand dunes and sandy desert scrub. Annual; blooms February – May (CNPS 2011). Reiser (2001) reports an old historical collection from Pinto Wash. Marginal suitable habitat within Campo Verde project area. Low potential for occurrence. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.
Rock nettle (*Eucnide rupestris*)	CDFG: Special Plant CNPS Rare Plant Rank 2.2	Sonoran Desert scrub. Annual; blooms December – April. Known from Mount Signal and Coyote Wells quads (CNPS 2011). CNDDB occurrence in Yuha Basin (likely CNPS Coyote Wells quad location). Suitable habitat present in Campo Verde project area. Low to moderate potential for occurrence. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.
Utah vine milkweed (*Funastrum (=Cynachum) utahense*)	CDFG: Special Plant CNPS Rare Plant Rank: 4.2	Occurs in sandy or gravelly Sonoran Desert Scrub. Herbaceous, perennial growing on desert shrubs; blooms April – June (CNPS 2011). Known from southwest of Plaster City between S-80 and I-80 (URS 2010). Suitable habitat present in Campo Verde project area. Known from Yuha Basin south of S80. Low to moderate potential for occurrence. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.
Curly herissantia (*Herissantia crispa*)	CDFG: Special Plant CNPS Rare Plant Rank 2.3	Occurs in Sonoran Desert scrub. Annual- herbaceous perennial; Blooms August – September. Only known from two locations in California, both in San Diego County (Pinto Wash and Mountain Springs Grade) (CNPS 2011). Not known from Imperial County. Suitable habitat present in Campo Verde project area. However, site is well below reported lower elevational range (700m) (CNPS 2011). Not expected to occur due to species known range. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.
Baja California ipomopsis (*Ipomopsis effusa*)	CDFG: Special Plant CNPS Rare Plant Rank 2.1	Occurs in washes in Sonoran desert scrub. Annual; blooms April – June. Only known location in California from Pinto Wash west of the site. Considered a waif in California, more common in Baja, California (CNPS 2011). Suitable habitat present in Campo Verde project area. Not expected in the Campo Verde project area due to known range and rarity in California. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.
Slender-leaved ipomopsis (*Ipomopsis tenuifolia*)	CDFG: Special Plant CNPS Rare Plant Rank 2.3	Occurs in rocky/gravelly Sonoran Desert scrub. Herbaceous perennial; blooms March – May. Known from In-Ko-Pah Gorge and Jacumba quads (CNPS 2011). Suitable habitat, (i.e., rocky/gravelly desert scrub) absent. Site outside of known current range of species. Not expected to occur within Campo Verde project area.
Pygmy lotus (*Lotus haydonii*)	CNPS Rare Plant Rank 1B.3	Occurs in rocky Sonoran Desert scrub. Herbaceous perennial; blooms January – June. Known from In-Ko-Pah Gorge quad (CNPS 2011).

		Suitable habitat (i.e., rocky/gravelly desert scrub) absent. Site outside of current known range of species and well below reported lower elevational range (520m) (CNPS 2011). Not expected to occur within Campo Verde project area. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.
Mountain Springs bush lupine (*Lupinus excubitus* var. *medius*)	BLM: Sensitive CDFG: Special Plant CNPS Rare Plant Rank 1B.3	Occurs in Sonoran Desert scrub. Perennial shrub; blooms March – May. Known from In-Ko-Pah Gorge and surrounding quads of desert transition areas (CNPS 2011). Marginal habitat (species range is more in desert transition habitats). Site outside of current species known range and well below reported lower elevational range (425m) (CNPS 2011). Not expected to occur within Campo Verde project area. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.
Parish's desert-thorn (*Lycium parishii*)	CDFG: Special Plant CNPS Rare Plant Rank: 2.3	Occurs in Sonoran Desert scrub with sandy plains and washes. Shrub; blooms March – April. Known from In-Ko-Pah Gorge and Carrizo Mountain quads (CNPS 2011). Reported south of Hwy 98. Suitable habitat present. Low to moderate potential for occurrence within Campo Verde project area. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.
Coulter's lyrepod (*Lyrocarpa coulteri* var. *palmeri*)	CDFG: Special Plant CNPS Rare Plant Rank 4.3	Occurs in rocky or gravelly Sonoran Desert scrub. This herbaceous perennial; blooms January – June (Reiser 2001; CNPS 2001). Reiser (2001) reports this species from a number of rocky desert canyons in eastern San Diego County. Suitable habitat (i.e., rocky/boulders) absent. Not expected to occur within Campo Verde project area. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.
Brown turbans (*Malperia tenuis*)	CDFG: Special Plant CNPS Rare Plant Rank: 2.3	Occurs in sandy, Sonoran Desert scrub. Annual, blooms March – April (CNPS 2011). Several CNDDB locations in Yuha Basin which correspond to CNPS locations for the Mount Signal, Painted Gorge and Yuha Basin quads (CNPS 2011). Suitable habitat present. Low to moderate potential for occurrence within Campo Verde project area. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.
Hairy stickleaf (*Mentzelia hirsutissima*)	CDFG: Special Plant CNPS Rare Plant Rank: 2.3	Occurs in Sonoran Desert Scrub on rocky hillsides and desert mesas (Reiser 2001; CNPS 2011). Annual; blooms March – May. Known from Mount Signal quad (CNPS 2011). Rocky hillsides absent but desert mesas present. Most of this species' localities in the desert transition areas to the east of the site including localities from In-Ko-Pah Gorge and Sweeny Pass quads (CNPS 2011). Low to moderate potential for occurrence within Campo Verde project area. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.
Creamy blazing star (*Mentzelia tridentata*)	CDFG: Special Plant CNPS Rare Plant Rank 1B.3	Occurs in rocky, gravelly and sandy desert scrub. Annual; blooms March – May. Known from In-Ko-Pah Gorge quad (CNPS 2011). Suitable sandy scrub habitat present in Campo Verde project area. However, site outside of known range in California and well below lower elevational limit (700 meters) reported for this species (CNPS 2011). Not expected to occur within Campo Verde project area. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.
Slender-lobed four o'clock (*Mirabilis tenuiloba*)	CDFG: Special Plant CNPS Rare Plant Rank: 4.3	Occurs in Sonoran Desert Scrub. A herbaceous perennial that blooms March – May. This species is reported from the 17 Palms Quad (CNPS 2011). Suitable desert scrub habitat present in Campo Verde project area. Low to moderate potential for occurrence. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.
Slender wooly-heads (*Nemacaulis denudata* var. *gracilis*)	CDFG: Special Plant CNPS Rare Plant Rank: 2.2	Occurs in desert dunes and Sonoran Desert scrub. Annual; blooms March – May. Known from Coyote Wells quad. Most of locations for this species are in Algodones Dunes of East Mesa (CNPS 2011). Marginal dune habitat present. Low to moderate potential for occurrence within Campo Verde project area. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.

Giant Spanish-needle (*Palafoxia arida* var. *gigantea*)	BLM: Sensitive CDFG: Special Plant CNPS Rare Plant Rank 1B.3	Occurs in desert dunes. Annual- herbaceous perennial; blooms March – May. Known from Algodones Dunes on the East Mesa (CNPS 2011). Marginal desert dune habitat present. Site is well west of reported range of species. Not expected to occur within Campo Verde project area. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.
Sand food (*Pholisma sonorae*)	BLM: Sensitive CDFG: Special Plant CNPS Rare Plant Rank 1B.2	Occurs in desert dunes and sandy Sonoran Desert scrub. This herbaceous perennial is parasitic on native desert shrubs and blooms from March – May. This species is known from the Holtville West Quad just east of the corridors and most of the locations are in the Algodones Dunes of the East Mesa (CNPS 2011). This species would have a low to moderate potential for occurrence in the Campo Verde project area. Suitable habitat (sandy areas and dunes) is marginal. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.
Desert unicorn-plant (*Proboscidea althaeifolia*)	CDFG: Special Plant CNPS Rare Plant Rank 4.3	Occurs in sandy, Sonoran Desert scrub. Herbaceous perennial; blooms May – August (CNPS 2011). There are no CNPS or CNDDB locations for this species in the vicinity of the project. Suitable habitat present, low to moderate potential for occurrence within Campo Verde project area. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.
Desert spike-moss (*Selaginella eremophila*)	CDFG: Special Plant CNPS Rare Plant Rank: 2.2	Occurs in rocky or gravelly terrain in Sonoran Desert scrub (Reiser 2001; CNPS 2011). Herbaceous perennial is most conspicuous in May-July (CNPS 2011). Closest reported populations in rocky desert scrub of In-Ko-Pah and Sweeney Pass quads (CNPS 2011). Not expected to occur within Campo Verde project area due to the lack of suitable habitat. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.
Mecca aster (*Xylorhiza cognata*)	CDFG: Special Plant CNPS Rare Plant Rank 1B.2	Occurs in Sonoran Desert scrub. This species is known from 17 Palms Quad. This herbaceous perennial blooms from January-June. Most of the reported occurrences are in the Indio and Mecca Hills surrounding Palm Springs and Indio (CNPS 2011). Suitable habitat present, but site may also be at limits of known species range. Not expected to occur within Campo Verde project area. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.
Orcutt's woody-aster (*Xylorhiza orcuttii*)	BLM: Sensitive CDFG: Special Plant CNPS Rare Plant Rank: 1B.2	Occurs in Sonoran Desert scrub in rocky canyons and sandy washes (Reiser 2001). Herbaceous perennial; blooms March – April (CNPS 2011). Closest reported localities are Carrizo and Borrego Mountain quads, areas of rocky terrain. Suitable habitat absent. Not expected to occur within Campo Verde project area. Surveys for this species will be conducted in appropriate habitat within its blooming season in 2012.

Sensitivity Status Codes used in this table:
USFWS: Endangered- Plant taxa that are listed as threatened under the Federal Endangered Species Act
CDFG: Endangered- Plant taxa that are listed as endangered with extinction under the California Endangered Species Act
Special Plant: Plant taxa that are inventoried by the CNDDB
BLM: Sensitive- Plants that are designated by the State Director for special management consideration.
CNPS: Rare Plant Rank 1: Rare, Threatened or Endangered in California and elsewhere
Rare Plant Rank 2: Rare, Threatened or Endangered in California, more common elsewhere
Rare Plant Rank 3: Plants for which more information is needed
Rare Plant Rank 4: Plants of Limited Distribution
Threat extension: .1- Seriously endangered in California
2- Fairly endangered in California
3- Not very endangered in California

3.2.4 Alternative Descriptions - Vegetation

3.2.4.1 Proposed Gen-Tie

General Vegetation

Table 6 shows the ten vegetation communities that occur within the survey area for the Proposed Gen-Tie. These are shown on **Attachment 1 – Figure 6**.

Table 6 - Vegetation Communities/Land Cover Types
Proposed Gen-Tie

Vegetation Community	BLM Land (Acres)	Private Land (Acres)
Active Agriculture (AG-A)	1.49	2.22
Fallow Agriculture (AG-F)	0.79	0.96
Arrow Weed Thicket (AS)	0.41	0.44
Arrow Weed Thicket - Disturbed (AS-D)	0.21	0.50
Athel Tamarisk Type Woodland (AW)	0.42	0.52
Creosote Bush - White Bursage Scrub (CBS)	35.14	0.00
Creosote Bush - White Bursage Scrub - Disturbed (CBS-D)	1.82	2.33
Developed (DEV)	2.19	0.00
Open Water with Arrow Weed Thicket (OW)	0.71	0.44
Stabilized Desert Dunes - Disturbed (SDD-D)	22.28	0.00
Total	**65.46**	**7.41**

Special Status Plant Species

The potential for the occurrence of special status species for this gen-tie-alternative is described above and summarized in **Table 5**.

3.2.4.2 Alternative Gen-Tie Across BLM Land

General Vegetation

Table 7 shows the ten vegetation communities that occur within the survey area for the Alternative Gen-Tie across BLM land. These are shown on **Attachment 1 – Figure 6**.

Table 7 - Vegetation Communities/Land Cover Types
Alternative Gen-Tie Across BLM Land

Vegetation Community	BLM Land (Acres)	Private Land (Acres)
Active Agriculture (AG-A)	0.00	1.40
Fallow Agriculture (AG-F)	0.00	21.50
Arrow Weed Thicket – Disturbed (AS-D)	0.00	0.32
Athel Tamarisk Type Woodland (AW)	0.43	0.04
Tamarisk Thicket (TS)	0.00	0.17
Creosote Bush - White Bursage Scrub (CBS)	22.36	2.03
Creosote Bush - White Bursage Scrub - Disturbed (CBS-D)	0.60	1.37
Developed (DEV)	2.19	2.13
Open Water with Arrow Weed Thicket (OW)	0.00	1.34
Stabilized Desert Dunes - Disturbed (SDD-D)	1.22	0.09
Total	**26.92**	**30.39**

Special Status Plant Species

The potential for the occurrence of special status species for this gen-tie-alternative is described above and summarized in **Table 5**.

3.2.4.3 Private Land Gen-Tie Alternative

General Vegetation

Table 8 shows the eight vegetation communities that occur within the survey area for the Private Land Gen-Tie Alternative. These are shown on **Attachment 1 – Figure 6**.

Table 8 - Vegetation Communities/Land Cover Types
Private Land Gen-Tie Alternative

Vegetation Community	Private Land (Acres)
Active Agriculture (AG-A)	112.26
Fallow Agriculture (AG-F)	4.04
Arrow Weed Thicket (AS)	0.83
Athel Tamarisk Type Woodland (AW)	0.27
Common Reed Marsh - Disturbed (CRM-D)	0.50
Developed (DEV)	3.35
Disturbed Wetland (DW)	1.11
Open Water with Arrow Weed Thicket (OW)	1.25
Total	**123.61**

Special Status Plant Species

There are no suitable habitats for special status species along this gen-tie-alternative.

3.2.5 General Wildlife

The wildlife species observed in the gen-tie survey area were typical of common Colorado Desert habitats, which provide cover, foraging, and breeding habitat for a variety of wildlife species. **Attachment 3** provides a list of all wildlife species observed and some of the primary species are described below.

3.2.5.1 Invertebrates

The Gen-tie survey area contains suitable habitat for a wide variety of invertebrates. Within the Gen-tie line, harvester ants (*Pogonomyrmex* spp.), and flies (*Diptera* spp.) were observed regularly. Cabbage white (*Pieris rapae*) and other butterflies and moths (*Lepidoptera* spp.) were also regularly observed in all portions of the survey area.

3.2.5.2 Amphibians

Most amphibians require moisture for at least a portion of their life cycle, with many requiring a permanent water source for habitat and reproduction. Terrestrial amphibians have adapted to more arid conditions and are not completely dependent on a perennial or standing source of water. These species avoid desiccation by burrowing beneath the soil or leaf litter during the day and during the dry season. No amphibians were observed within the gen-tie survey area.

3.2.5.3 Reptiles

The diversity and abundance of reptile species varies with habitat type. Many reptiles are restricted to certain plant communities and soil types, although some of these species would also forage in adjacent communities. Other species are more ubiquitous, using a variety of vegetation types for foraging and shelter.

Four reptile species were commonly observed throughout the gen-tine survey area or are known to occur in the immediate vicinity of the gen-tie survey area: desert iguana (*Dipsosaurus dorsalis*), common zebra-tailed lizard (*Callisaurus draconoides*), Great Basin tiger whiptail (*Aspidoscelis tigris tigris*), sidewinder rattlesnake (*Crotalus cerastes*), and Flat-tailed horned lizard (FTHL; *Phrynosoma mcallii*). FTHL individuals and sign have been observed immediately south of the IV Substation (see **Section 3.2.6.3**).

3.2.5.4 Birds

The diversity of bird species varies with respect to the character, quality, and diversity of vegetation communities. Due to the homogeneity of much of the habitat within the Gen-tie survey area, bird diversity is relatively low.

Common species are expected to include Horned Lark (*Eremophilia alpestris*), Mourning Dove (*Zenaida macroura*) Yellow-rumped Warbler (*Dendroica coronate*), Blue-gray Gnatcatcher (*Polioptila caerulea*), Black-tailed Gnatcatcher (*Polioptila melanura*), White-crowned Sparrow (*Zonotrichia leucophrys*), Rufous-crowned Sparrow (*Aimophila ruficeps*), Black Phoebe *Sayornis nigricans*), and Turkey Vulture (*Cathartes aura*).

Turkey Vultures are known to roost on transmission line structures associated with existing transmission lines running south out of the IV Substation. A pair of Red-tailed Hawks (*Buteo jamaicensis*) has been observed tending a stick nest approximately 0.3-miles southeast of the Proposed Gen-Tie ROW, on a Southwest Powerlink transmission line structure.

3.2.5.5 Mammals

Suitable mammal habitat is present within the gen-tie survey area. Desert black-tailed jackrabbit (*Lepus californicus deserticola*), desert cottontail (*Sylvilagus audubonii*), round-tailed ground squirrel (*Spermophilus tereticaudus*), desert kangaroo rat (*Dipodomys deserti deserti*), and coyote (*Canis latrans*) were detected often within or immediately adjacent to the Gen-tie survey area through direct observation as well as burrows, tracks, and scat.

3.2.6 Special Status Wildlife Species

Fifteen special status wildlife species were determined to have the potential to occur within survey area and those whose potential occurrence is most pertinent to the gen-tie survey area are discussed in detail below. These species include federally listed species, state listed species, and BLM sensitive species that are known to occur in the Imperial Valley, as well as CDFG species of special concern that were observed during surveys.

3.2.6.1 Federally-listed Species

Suitable habitat for Southwestern Willow Flycatcher and Yuma Clapper Rail exists in several agricultural drains within the gen-tie survey area (discussed in **Section 3.1.4.2.1**).

Peninsular Bighorn Sheep

<u>Species Profile</u>
Peninsular bighorn sheep, formerly known as *O. c. cremnobates*, was federally listed endangered on March 18, 1998, and state-listed threatened on June 27, 1971 (USFWS 2001). Previously, *O. c. cremnobates* was considered to be distinct from the other subspecies of *Ovis canadensis*. However, new deoxyribonucleic acid (DNA) analysis has concluded that *O. c. cremnobates* are genetically indistinct from Nelson's bighorn sheep (*Ovis canadensis nelsoni*); *O. c. cremnobates* was taxonomically reclassified as *O. c. nelsoni* and designed as a "distinct vertebrate population segment" (DPS USFWS 2009). The Peninsular DPS occurs within the Peninsular Ranges and was listed as federally endangered (USFWS 2001). Critical habitat was designated in 2009 and includes portions of western Imperial County,

approximately 12 miles west of the action area. A recovery plan was also prepared for the bighorn sheep in the Peninsular Ranges in 2000 (USFWS 2000).

Peninsular bighorn sheep prefer steep, open slopes, canyons, and washes in hot and dry desert regions where the land is rough, rocky, and sparsely vegetated. Open terrain with good visibility is critical, because bighorn sheep primarily rely on their sense of sight to detect predators (USFWS 2001). Most Peninsular bighorn sheep live between 300 and 4,000 feet in elevation, where average annual precipitation is less than four inches and daily high temperatures average 104 degrees Fahrenheit (°F) in the summer. Caves and other forms of shelter (e.g., rock outcrops) are used during inclement weather and for shade during hotter months. In the Peninsular Ranges, bighorn sheep browse on a wide variety of plants, including shrubs, forbs, cacti, and grasses (USFWS 2001). Although steep escape route terrain is closely associated with bighorn sheep, low rolling and flat terrain including foothills and washes provide an alternative source of high quality browse forage during times when resources become limited (USFWS 2001). Lambing areas are associated with ridge benches or canyon rims adjacent to steep slopes or escarpments. Alluvial fans (sloping deposits of gravel, sand, clay, and other sediments that spread fanlike at the base of canyons and washes) are also used for breeding, feeding, and movement (USFWS 2001).

Peninsular bighorn sheep are closely associated with mountainous habitat and often are hesitant to venture far from escape terrain (Geist 1971 in USFWS 2000). Although they have been documented to move great distances from escape terrain on rare occasions (Schwartz et al. 1986 in USFWS 2000), it is common to observe animals moving a short distance from escape terrain in search of forage or water sources, or moving between neighboring mountains. Researchers have documented animals ranging at a variety of distances from mountainous terrain (greater than 20 percent slope), from 0.5 to 1.6 miles, but Peninsular bighorn sheep were most frequently found within 0.5 miles of the mountainous terrain (USFWS 2000).

Historically, bighorn sheep have been documented in the Peninsular Ranges since early explorers such as Anza observed them in the 1700s (Bolton 1930 in USFWS 2001). The distribution of Peninsular bighorn sheep has become more fragmented in the recent past, possibly due to the construction of roads that bisect ancestral bighorn trails and restrict bighorn movement (USFWS 2001). Bighorn sheep exhibit a naturally patchy distribution as a result of natural breaks in mountainous habitat (Schwartz et al. 1986 and Bleich et al. 1990a and 1996 in USFWS 2001). Currently, the Peninsular bighorn is distributed in fragmented populations from the Jacumba Mountains in San Diego County near the U.S./Mexico border to the San Jacinto Mountains in Riverside County (USFWS 2001).

Critical Habitat

Critical habitat for Peninsular bighorn sheep was designated in 2009 and includes portions of western Imperial County. The closest DCH is approximately 12 miles west of the action area in the Jacumba Mountains.

Occurrence
The nearest recorded location for this species was approximately 16 miles west of the survey area, in the rocky hills southwest of Ocotillo, California (USFWS 2010b). The survey area does not contain the steep, rocky terrain that typically provides cover and habitat for the Peninsular bighorn sheep. The Coyote, In-Ko-Pah, and Jacumba mountains that provide suitable year-round habitat for this species are located 11 to 14 miles from the survey area. The project is situated in the large agricultural complex that surrounds El Centro on the eastern edge of the Yuha Desert, and does not function as a movement corridor for Peninsular bighorn sheep between the Peninsular mountain ranges in western Imperial Valley. In addition, the site is too far from the Peninsular ranges and the corridors between the ranges to serve as a source habitat for foraging or water (USFWS 2000). The location of the survey area within predominantly agricultural lands also reduces the likelihood of use by Peninsular bighorn sheep, which are sensitive to human activity and disturbance (USFWS 2010d).

Peninsular bighorn sheep were not detected in the survey area during numerous biological surveys. Given the distance from suitable rocky terrain; agricultural lands within the survey area; distance of suitable foraging habitat from the Jacumba Mountains; lack of detection within the survey area; and the unlikelihood of the survey area to function as a movement corridor for this species, Peninsular bighorn sheep are not expected to occur within the survey area or the vicinity.

3.2.6.2 State-listed Species

State listed species with the potential to occur within the Gen-tie survey area include: greater Sandhill Crane (*Grus canadensis tabida*), barefoot-banded gecko (*Coleonyx switaki*), and Peninsular bighorn sheep. Sandhill crane and barefoot-banded gecko are discussed in **Section 3.1.4.2.2**. Peninsular bighorn sheep is discussed in **Section 3.2.6.1**.

3.2.6.3 BLM Sensitive Species

Seven BLM sensitive wildlife species were evaluated based on their presence on the BLM sensitive list within the El Centro Field Office's jurisdiction. These include the Colorado Desert fringe-toed lizard (*Uma notata notata*), flat-tailed horned lizard, barefoot banded gecko, Western Burrowing Owl, Mountain Plover, California leaf-nosed bat (*Macrotus californicus*), and pallid bat (*Antrozous pallidus*). The barefoot banded gecko is also a state-listed species and is discussed above. Mountain Plover, California leaf-nosed bat, and pallid bat are discussed in **Section 3.1.4.2.3**.

Colorado Desert Fringe-toed Lizard (*Uma notata notata)*

Species
The Colorado Desert fringe-toed lizard is a CDFG Species of Special Concern and a BLM sensitive species. This species is primarily insectivorous, but will also feed on plant material. This species' diet consists of ants, beetles, antlion larvae, hemipterans, grasshoppers, and caterpillars. Plant foods include buds, flowers, leaves, and seeds. Conspecifics and other lizards are also eaten occasionally. Sight is most frequently used to

find food on the surface of sand. Buried fringe-toed lizards also use hearing to detect prey on the sand surface, or to find buried prey when above ground (Zeiner et al. 1988).

Fringe-toed lizards usually seek refuge from enemies by burrowing in the sand ("sand swimming") within 5 to 6 centimeters (2 to 2.4 inches) of the surface. They are usually buried on the lee sides of dunes and hummocks to prevent excavation by wind. Rodent burrows and the bases of shrubs are also used for cover and thermoregulation. Lizards usually hibernate in sand 30 centimeters (12 inches) deep, but juveniles and subadults may be found closer to the surface (Zeiner et al. 1988).

Habitat
The Colorado Desert fringe-toed lizard is found in the Colorado desert, south of the Salton Sea in Imperial and San Diego Counties. Its elevational range extends from sea level up to 180 meters (590 feet; Jennings and Hayes 1994). The Colorado Desert fringe-toed lizard is restricted to fine, loose, wind-blown sand dunes, dry lakebeds, sandy beaches or riverbanks, desert washes, and sparse desert scrub (Zeiner et al. 1988).

Occurrence
This species has a moderate potential to occur within Creosote Bush – White Bursage Scrub and Stabilized Sand Dune habitats present in the survey area, but none were observed during surveys. This species is known to occur approximately three miles south of the survey area (State of California 2010). Some of the area within the Creosote Bush – White Bursage Scrub habitat represents potentially suitable habitat although loose sandy areas are limited in depth and extent and are not highly suitable. The Stabilized Sand Dune habitat represents higher quality habitat for this species due the greater depth and extend of loose sandy areas.

Flat-tailed Horned Lizard (*Phrynosoma mcallii*)

Species
In California, the flat-tailed horned lizard (FTHL) was designated a sensitive species by the BLM in 1980. In 1988, a petition was submitted to the California Fish and Game Commission (CFGC) to list the species as endangered. In 1989, the commission voted against the proposed listing. In 1993, the USFWS published a proposed rule to list the FTHL as a threatened species (USFWS 2010a). In 2006, the USFWS withdrew its proposal (USFWS 2006). On March 2, 2010, USFWS re-instated the 1993 proposed listing of the FTHL as federally threatened (USFWS 2010e). The Ninth Circuit Court of Appeals ordered the USFWS to make a final listing determination by November 3, 2010. On March 15, 2011, the USFWS again withdrew its proposal to list the FTHL under the Endangered Species Act (USFWS 2011).

FTHL has the typical flattened body shape of horned lizards. It is distinguished from other species in its genus by its dark dorsal stripe, lack of external openings, broad flat tail, and comparatively long spines on the head (Funk 1981 as cited in Interagency Coordinating Committee [ICC] 2003). The FTHL has two rows of fringed scales on each side of its body. The species has cryptic coloring, ranging from pale gray to light rust brown dorsally and white or cream ventrally with a prominent umbilical scar. The only apparent external difference between males and females is the presence of enlarged postanal scales in males. Maximum snout-vent length for the species is 3.3 inches (Muth and Fisher 1992 as cited in ICC 2003).

FTHLs escape extreme temperatures by digging shallow burrows in the loose sand. Adults are primarily inactive from mid-November to mid-February. Juvenile seasonal activity is often dependent on temperature fluctuations. Breeding activity takes place in the spring with young hatching in late July and September. The diet of horned lizards typically consists of greater than 95 percent native ant species, mostly large harvester ants (*Pogonomyrmex* spp.).

<u>Habitat</u>
The FTHL is found in the low deserts of southwestern Arizona, southeastern California, and adjacent portions of northwestern Sonora and northern Baja California, Mexico. In California, the FTHL is restricted to desert washes and desert flats in central Riverside, eastern San Diego, and Imperial counties. The majority of the habitat for the species is in Imperial County (Turner et al. 1980 as cited in ICC 2003).

The lizard is known to inhabit sand dunes, sheets, and hummocks, as well as gravelly washes. The species is thought to be most abundant in creosote bush scrub vegetation communities. However, this species may also be found in desert scrub, desert wash, succulent shrub, alkali scrub, and sparsely vegetated sandy flats. It is typically found in dry, hot areas of low elevation (less than 800 feet).

<u>Occurrence</u>
The BLM gen-tie survey area is located with the Yuha Desert Management Area. The Creosote Bush – White Bursage Scrub and, especially, Stabilized Sand Dune habitats associated with the BLM Gen-tie Line survey area have the potential to support FTHL and FTHL are known to occur in this area

Focused surveys for FTHL were performed as part of a nearby project immediately south of the Gen-tie survey area. A total of 14 observations of potential FTHL sign were recorded during those surveys (Heritage 2011c). FTHL sign was not limited to the sandiest portions of the survey area, and FTHL sign was found in disturbed areas in several instances (e.g. on an existing road), often times in areas with compacted and/or gravelly soils.

Flat-tailed horned lizard density in the survey area appears to be low. FTHL are apparently not limited to the most highly suitable habitats, and have been observed in disturbed habitats. Thus, the entire BLM gen-tie survey area can be considered occupied, although at low densities compared to areas with greater expanses of higher-quality habitat in other portions of the MA. The Stabilized Sand Dune habitats likely represent the highest quality habitat for this species, based on the depth and extent of loose sandy area associated with this habitat type.

Western Burrowing Owl

Burrowing Owl is discussed in detail in **Section 3.1.4.2.3**. Suitable habitat within the gen-tie survey area occurs in the active agriculture, fallow agriculture, and creosote bush – white bursage habitat types.

3.2.6.4 California Species of Special Concern and Fully Protected Species

Three species that are classified as CDFG Species of Special Concern were observed within the survey area or were observed during surveys for nearby projects (RECON 2010a, 2010b; Heritage 2011c); Loggerhead Shrike, Crissal Thrasher (*Toxostoma crissale*), and LeConte's thrasher (*T. lecontei lecontei*). Golden eagle (*Aquila chrysaetos*), a CDFG Fully Protected Species, and protected under the Bald and Golden Eagle Protection Action, MBTA, and Fish & Game Code sections 3503, 3503.5, and 3513, has also been observed near the survey area (Heritage 2011a). These species are discussed is **Section 3.1.4.2.4**.

3.2.7 Alternative Descriptions - Wildlife

3.2.7.1 Proposed Gen-Tie

<u>General Wildlife</u>

The invertebrates, amphibians, reptiles, birds, and mammals that occur along this gen-tie alternative are the same as those described in **Section 3.2.5**.

<u>Special Status Wildlife</u>

Thirteen of the fifteen special status wildlife species discussed in **Section 3.2.6** have the potential to occur along the proposed gen-tie (there is no habitat for Yuma Clapper Rail or barefoot-banded gecko). These species include federally listed species, state listed species, and BLM sensitive species that are known to occur in the Imperial Valley, as well as CDFG species of special concern that were observed during surveys.

Thirty suitable, inactive Burrowing Owl burrows were initially recorded in the survey area for this gen-tie route. However, they occur within dune habitats and regularly get filled in or collapsed. During these surveys, Burrowing Owls were not observed.

3.2.7.2 Alternative Gen-Tie Across BLM Land

<u>General Wildlife</u>

The invertebrates, amphibians, reptiles, birds, and mammals that occur along this gen-tie alternative are the same as those described in **Section 3.2.5**.

Special Status Wildlife

Thirteen of the fifteen special status wildlife species discussed in **Section 3.2.6** have the potential to occur along the alternative gen-tie across BLM land (there is no habitat for Yuma Clapper Rail or barefoot-banded gecko). These species include federally listed species, state listed species, and BLM sensitive species that are known to occur in the Imperial Valley, as well as CDFG species of special concern that were observed during surveys.

Two suitable, inactive Burrowing Owl burrows (abandoned irrigation pipe) were recorded in the survey area in the Fallow Agriculture habitat within the survey area for this gen-tie route. No Burrowing Owls were observed during the surveys.

3.2.7.3 Private Land Gen-Tie Alternative

General Wildlife

The invertebrates, amphibians, birds, and mammals that occur along this gen-tie alternative are the same as those described in **Section 3.2.5**. No reptile species were observed in the survey area for this alternative.

Special Status Wildlife

Eleven of the fifteen special status wildlife species discussed in **Section 3.2.6** have the potential to occur along the proposed gen-tie (there is no habitat for Peninsular bighorn sheep, barefoot-banded gecko, flat-tailed horned lizard, or Colorado Desert fringe-toed lizard). These species include federally listed species, state listed species, and BLM sensitive species that are known to occur in the Imperial Valley, as well as CDFG species of special concern that were observed during surveys.

Three suitable Burrowing Owl burrows were recorded in the survey area in the Active Agriculture habitat within the survey area for this gen-tie route. No Burrowing Owls were observed during the surveys.

3.2.8 Riparian Habitat or Sensitive Natural Communities

Special status natural communities are those communities "that are of limited distribution statewide or within a county or region and are often vulnerable to environmental effects of projects" (State of California 2009b). Arrow weed thicket is considered a special status natural community. There are no other special status natural communities or other riparian habitats within the survey area.

3.2.8.1 Proposed Gen-Tie

The arrow weed thicket associated with the Westside Main Canal near the north end of the Proposed Gen-Tie is considered a special status natural community. There are approximately

1.6 acres of arrow weed thicket and 1.2 acres of open water with arrow weed thicket present within the Proposed Gen-Tie Line survey area.

3.2.8.2 Alternative Gen-Tie Across BLM Land

There are approximately 1.3 acres of open water with arrow weed thicket and 0.3 acres of arrow weed thicket within the survey area for this gen-tie route.

3.2.8.3 Private Land Gen-Tie Alternative

There are approximately 0.8 acres of arrow weed thicket and 1.3 acres of open water with arrow weed thicket near the west end of the Private Land Gen-Tie.

3.2.9 Jurisdictional Waters

A jurisdictional delineation was conducted to determine the extent of ACOE, CDFG, and RWQCB resources within the survey area. The gen-tie survey area for potentially jurisdictional waters was comprised of the three gen-tie alternatives and a 200-foot buffer area. The delineation results for these surveys are included in **Appendix 2**. The Drainage Report was submitted to the ACOE and CDFG in February 2012, but no response has been received to date. Therefore, the following discussion of jurisdictional waters may change pending ongoing consultation with ACOE and CDFG. **Attachment 1: Figure 7** shows the potentially jurisdictional ACOE and CDFG waters.

3.2.9.1 ACOE Jurisdictional Waters

No ACOE wetlands were identified within the gen-tie survey area. The Westside Main Canal was the only jurisdictional water of the U.S. (non-wetland) identified within the Proposed Gen-Tie or Alternative Gen-Tie across BLM land survey area. This feature crosses a small portion of BLM-managed lands near the northern terminus of the Proposed Gen-Tie alternative and the Alternative Gen-Tie across BLM land; both would span this feature. Several potentially jurisdictional WOUS occur within the Private Land Gen-Tie survey area; all would be spanned.

3.2.9.2 CDFG Jurisdictional Waters

CDFG generally takes jurisdiction of all stream features including drains and canals. The CDFG jurisdiction extends from the top of bank to the opposite top of bank on these features or the limits of riparian vegetation if this vegetation extends beyond the top of the banks. Wetlands need to only fulfill one of the three aforementioned ACOE (hydrology, hydric soils, wetland vegetation) criteria to be considered CDFG jurisdictional wetlands.

Under Section 1600 of the Fish and Game Code, CDFG jurisdiction includes "…bed, channel or bank of any river, stream or lake designated by the department in which there is any time an existing fish or wildlife resource or from which these resources derive benefit…" Canals, aqueducts, irrigation ditches, and other means of water conveyance can also be considered streams if they support aquatic life, riparian vegetation or stream dependent terrestrial benefit (Cylinder 1995).

The Westside Main represents the only potentially state jurisdictional feature within the Proposed Gen-Tie and Alternative Gen-Tie Across BLM Land survey area and it would be spanned. Several potentially state jurisdictional features occur within the Private Land Gen-Tie survey area; all would be spanned

3.2.10 Habitat Connectivity and Wildlife Corridors

Wildlife movement corridors and habitat linkages are areas that connect suitable wildlife habitat areas in a region otherwise fragmented by rugged terrain, changes in vegetation, or human disturbance. Corridors are generally local pathways connecting short distances usually covering one or two main types of vegetation communities. Linkages are landscape level connections between very large core areas and generally span several thousand feet and cover multiple habitat types. Natural features such as canyon drainages, ridgelines, or areas with vegetation cover provide corridors and linkages for wildlife travel. The habitat connectivity provided by corridors and linkages is important in providing access to mates, food, and water, allowing the dispersal of individuals away from high-density areas, and facilitating the exchange of genetic traits between populations (Beier and Loe 1992).

Both avian and terrestrial wildlife species are able to move freely throughout the gen-tie survey area and are not restricted to a specific corridor or linkage.

3.2.11 California Desert Conservation Area

The Proposed Gen-Tie and Alternative Gen-Tie across BLM Land survey area lies within the California Desert Conservation Area (CDCA). This area is within a designated utility corridor (Utility Corridor N) and within the Yuha Basin Area of Critical Environmental Concern (ACEC) as designated by the CDCA. The Proposed Gen-Tie is entirely on private lands.

4.0 ENVIRONMENTAL CONSEQUENCES

The proposed project would result in approximately 1,852 acres of permanent impacts and approximately 7.69 acres of temporary impacts. **Table 9** summarizes the expected impacts to vegetation communities from the various project alternatives/components.

The following impact sections describe the anticipated impacts on lands associated with the Campo Verde Solar Energy Facility and the gen-tie line alternatives separately.

Table 9 – Proposed Impacts to Vegetation Communities by Alternative/Project Component

Vegetation Community	Campo Verde Solar Site	Proposed Gen-Tie	Alternative Gen-Tie Across BLM Land	Private Land Gen-Tie Alternative
Permanent Impacts				
Active Agriculture (AG-A)	1677.45	--	--	0.09
Arrow Weed Thicket (AS)	0.08	--	--	--
Arrow Weed Thicket Disturbed (AS-D)	2.19	--	--	--
Athel Tamarisk Type Woodland (AW)	1.25	--	--	--
Common Reed Marsh- Disturbed (CRM-D)	--	--	--	--
Creosote Bush - White Bursage Scrub (CBS)	--	0.03	0.03	--
Creosote Bush - White Bursage Scrub - Disturbed (CBS-D)	--	--	--	--
Developed (DEV)	0.30	--	--	--
Fallow Agriculture (AG-F)	123.13	--	0.02	0.01
Quailbush Scrub (BSS)	31.68	--	--	--
Quailbush Scrub- Disturbed (BSS-D)	15.51	--	--	--
Tamarisk Thicket (TS)	0.40	--	--	--
Stabilized Desert Dunes- Disturbed (SDD-D)	--	0.02	--	--
Total Permanent Impacts	**1852**	**0.05**	**0.05**	**0.10**
Temporary Impacts				
Active Agriculture (AG-A)	--	--	--	9.08
Arrow Weed Thicket (AS)	--	0.21	--	--

Arrow Weed Thicket Disturbed (AS-D)	--	--	--	--
Athel Tamarisk Type Woodland (AW)	--	0.03	0.01	--
Common Reed Marsh- Disturbed (CRM-D)	--	--	--	--
Creosote Bush - White Bursage Scrub (CBS)	--	5.54	5.27	--
Creosote Bush - White Bursage Scrub - Disturbed (CBS-D)	--	--	0.20	--
Developed (DEV)	--	--	--	0.34
Disturbed Wetland (DW)	--	--	--	0.05
Fallow Agriculture (AG-F)	--	--	2.10	0.50
Open Water with Arrow Weed Thicket (OW)	--	--	--	--
Quailbush Scrub (BSS)	--	--	--	--
Quailbush Scrub- Disturbed (BSS-D)	--	--	--	--
Tamarisk Thicket (TS)	--	--	--	--
Stabilized Desert Dunes- Disturbed (SDD-D)	--	1.91	0.43	--
Total Temporary Impacts	**0**	**7.69**	**8.01**	**10.19**

4.1 Campo Verde Solar Energy Facility Site

Development of the proposed Campo Verde Solar Energy Facility Site would result in approximately 1,852 acres of permanent disturbance and no areas of temporary disturbance and the (**Table 9**).

4.1.1 Impact to Special Status Species

For purposes of this report, the proposed project would have a significant impact if it would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies or regulations, or by the CDFG or USFWS.

4.1.1.1 Special Status and Priority Plant Species

No special status or priority plant species are expected to occur within the solar energy facility survey area. Therefore, no impacts to special status or priority plant species are expected to occur as a result of project implementation.

4.1.1.2 Special Status Wildlife Species

4.1.1.2.1 Federally Listed Species

Southwestern Willow Flycatcher

Construction of the proposed project is not likely to directly affect SWFL individuals, because there is no nesting habitat in the survey area and no habitat used during migration habitat will be removed. The Bird and Bat Conservation Strategy (BBCS) will be prepared by the Applicant and approved by the appropriate agencies prior to surface disturbing activities. It will outline conservation measures for construction, operation and maintenance activities to minimize potential impacts to bird populations, including SWFL migration and other important avian habitats.

Light and noise from heavy equipment during construction may result in short-term avoidance of small areas of foraging habitat that are located near construction activities. These would be short-term impacts given the brief amount of time (likely two weeks or less) this species may forage in the vicinity during migration. Work in the immediate vicinity of potentially suitable SWFL habitat will be conducted primarily during daylight hours; however, if it becomes necessary to conduct work at night, lighting will be needed for worker safety This lighting will be directed toward the interior of the Campo Verde Solar Site or at the specific tower location being constructed in order to minimize effects. Generally, noise from the construction of solar facilities similar to the Campo Verde Solar Site may exceed 60 dB(A) for a distance of up to 1,280 feet from the source. Minimization and avoidance measures to reduce potential noise effects to avian species will be implemented following the BBCS, including timing construction to minimize effects to avian species and a seasonal nighttime construction buffer around potential SWFL migratory habitat. Given the brief amount of time SWFL may be foraging within the action area during migration, and the implementation of impact avoidance and minimization measures, any effects to SWFL from noise and lighting would be minimal and short-term.

The O&M activities of the Campo Verde Project are unlikely to have more than a discountable effect on SWFL that may be foraging within the migration habitats (**Attachment 1: Figure 4a-c)** adjacent to the Campo Verde Solar Energy Facility Site during migration. Noise and lighting during operations will be minimal and directed toward the interior of the Campo Verde Solar Site where the operations facilities are located and would be similar in nature to noise associated with current agricultural activities. Therefore, O&M activities are not expected to provide a significant source of disturbance to avian species, including SWFL, outside of the Campo Verde Solar Energy Facility Site.

Suitable migration habitat in the survey area occurs in migrants in the vicinity of portions or all of Fig Drain, Diehl Drain, Wixom Drain, Dixie 3A Drain, Westside Drain, and Wormwood 7 Drain (**Attachment 1: Figures 4a-c**). The project will not directly disturb acreage inside these habitats. No project features will be built within, over or under any of the drains or wetlands containing potentially suitable migratory habitat for the SWFL. The solar panels will be installed in areas that are actively farmed and fencing will be installed near existing field edges to prevent equipment from entering drains and wetlands or associated riparian habitats during construction and operations.

Potential impacts to the SWFL would appear to be limited to the risk that night-migrating SWFL individuals could collide with the gen-tie line and temporal displacement of migrant willow flycatchers if construction activities adjacent to their habitat temporarily deter foraging. Bird flight diverters will be installed on the gen-tie line along the segments that cross the suitable migration habitat; therefore, impacts would be less than significant.

The Campo Verde Solar Energy Facility will include several earthen stormwater retention/detention basins to manage stormwater flows. Run-off flows from the Campo Verde Solar Energy Facility will be directed to these basins, where water will be allowed to percolate through the soil. The detention basins will be sized to meet county and RWQCB standards. The O&M building and delivery areas will also be designed to accommodate storm water runoff in accordance with County guidelines. No indirect effects to SWFL foraging habitat along the portions of Fig Drain, Diehl Drain, Wixom Drain, Dixie 3 Drain, Dixie 3A Drain, Dixie 3B Drain, Dixie 4 Drain, Westside Drain, Forget-Me-Not Drain 1, and Wormwood 7 Drain supporting potentially suitable SWFL migratory habitat are expected to occur resulting from run-off.

Yuma Clapper Rail

Construction of the Campo Verde Solar Energy Facility is not likely to have more than a discountable effect on YCR individuals, as potential habitat is limited and isolated and this species is not expected to nest within the survey area. The BBCS will provide guidance on minimizing disturbance to all avian species during construction, and no potential foraging or wintering habitat will be removed during construction or grading.

Given the nearest known occurrence is approximately 0.5 miles north of the survey area and the poor quality of YCR habitat, there is a low potential for YCR to forage or winter in the cattail marsh or common reed marsh vegetation associated with Fig Drain, Wixom Drain, Dixie 3A Drain, an unnamed wetland adjacent to Dixie 3A Drain, Dixie 4 Drain, Westside Drain and Wormwood 7 Drain (**Attachment 1: Figures 4a-c)**. Light and noise from heavy equipment during construction has a low probability of temporarily impacting YCR given the low potential for this species to forage or winter adjacent to and/or within the Campo Verde Solar Energy Facility. Work will be conducted primarily during daylight hours; however, if it becomes necessary to conduct work at night, lighting will be needed for worker safety. This lighting will be directed toward the interior of the Campo Verde Solar Energy Facility in order to minimize effects. Generally, noise from the construction of solar facilities similar to the Campo Verde Solar Energy Facility may exceed 60 dB(A) for a distance of up to 1,280 feet from the source. Minimization and avoidance measures to reduce potential noise effects to avian species, including YCR, will be implemented following the BBCS, including timing construction to minimize effects to avian species. Given the low likelihood that YCR forages or winters in these small habitat patches within the survey area and the implementation of impact avoidance and minimization measures, any effects to YCR from noise and lighting would be minimal and short-term.

The O&M activities of the Project will not affect YCR in the unlikely event that this species forages within the cattail marsh adjacent to and/or within the proposed Campo Verde Solar Energy Facility. Any noise and lighting during operations will be minimal, and the level of human disturbance is not expected to increase significantly above the agricultural practices that are currently taking place and will continue to take place. Therefore, O&M activities are not expected to affect YCR.

The low quality potential foraging and wintering habitat patches will not be removed during construction of the project, and no effects to YCR due to potential habitat loss will occur.

The Campo Verde Solar Energy Facility will include several earthen stormwater detention basins to manage stormwater flows, respectively. Run-off flows from the Campo Verde Solar Energy Facility will be directed to these basins, where water will be allowed to percolate through the soil. The detention basins will be sized to meet county and RWQCB standards. The O&M building and delivery areas, will be provided with storm water containment designed to accommodate runoff in accordance with County guidelines. No indirect effects to YCR foraging habitat or wintering habitat along the with Fig Drain, Wixom Drain, Dixie 3A Drain, an unnamed wetland adjacent to Dixie 3A Drain, Dixie 4 Drain, Westside Drain or Wormwood 7 Drain are expected to occur resulting from run-off.

Unpaved roads exist adjacent to the Fig Drain, Wixom Drain, Dixie 3A Drain, an unnamed wetland adjacent to Dixie 3A Drain, Dixie 4 Drain, Westside Drain and Wormwood 7 Drain, therefore, no additional grading beyond standard maintenance, of Campo Verde Solar Energy Facility access roads adjacent to potential foraging or winter habitat is anticipated. Indirect impacts to these habitats resulting from sedimentation are not expected to occur. Because downstream flows are expected to be maintained at current levels, effects to downstream YCR habitat are not anticipated.

4.1.1.2.2 State Listed Species

As discussed in **Section 3.1.4.2.2**, the barefoot-banded gecko is not expected to occur in the survey area and is not discussed further in this document.

Greater Sandhill Crane

Greater Sandhill Cranes may forage during the winter in the active agricultural habitats present within the survey area. Approximately 1,677.5 acres of agricultural land would be removed under the Proposed Action. Given the large amount of potentially suitable foraging habitat in the immediate vicinity of the Project Area and the Imperial Valley, it is unlikely that the loss of this potentially suitable foraging habitat would significantly impact wintering Greater Sandhill Cranes.

Light and noise from heavy equipment during construction is not expected to adversely modify the behavioral patterns of foraging Sandhill Cranes given the vast amount of foraging habitat in the immediate vicinity of the survey area. Work will be conducted primarily during daylight hours; however, if it becomes necessary to conduct work at night, lighting will be needed for worker safety. This lighting will be directed toward the interior of the Campo Verde Solar Site in order to minimize effects to Sandhill Cranes that may be roosting in adjacent fields. The Sandhill Crane is a diurnal species and is not expected to be active at night. . Generally, noise from the construction of solar facilities similar to the Campo Verde Solar Energy Facility may exceed 60 dB(A) for a distance of up to 1,280 feet from the source. Minimization and avoidance measures to reduce potential noise effects to avian species, including Sandhill Crane, will be implemented following the BBCS, including timing construction to minimize effects to avian species. Because the Sandhill Crane is relatively tolerant of disturbance on its wintering grounds, the brief periods when they may forage within any given field in the vicinity of the action area, and the implementation of impact avoidance and minimization measures (see Mitigation Measures B4 and B7), disturbance to Sandhill Cranes from noise and lighting would be unlikely.

The O&M activities are unlikely to affect Sandhill Cranes that may be foraging adjacent to the Campo Verde Solar Energy Facility during the winter. Noise and lighting during operations will be minimal and directed toward the interior of the Campo Verde Solar Energy Facility, where the operations facilities are located. General O&M activities that may be conducted within the Campo Verde Solar Energy Facility include equipment inspection and/or repairs, solar panel washing, weed abatement activities, and security guard duties involving the use of motor vehicles. Panel washing may also require a water truck access. These O&M activities are anticipated to be at the same level of intensity as the current agricultural operations and are not expected to affect the overall behavioral patterns of Sandhill Cranes within the survey area.

Sandhill Cranes are only active during daylight hours, and no collisions with the Proposed Gen-Tie Line, solar panels, or other facility structures are anticipated, as they will be visible, and therefore avoidable, if Sandhill Cranes are actively moving in and around the Campo Verde Project. In addition, Avian Power Line Interaction Committee (APLIC) measures to avoid and minimize potential collisions (APLIC 2006) will be detailed in the BBCS for implementation. Therefore, O&M activities would have an insignificant or discountable effect on Greater Sandhill Cranes foraging within or adjacent to the survey area.

4.1.1.2.3 BLM Sensitive Species

Burrowing Owl

The 1995 California Department of Fish and Game's Staff Report on Burrowing Owl Mitigation (CDFG 1995) defines impact to Burrowing Owl as:

- Disturbance within 50 meters (approx. 160 feet.) which may result in harassment of owls at occupied burrows;
- Destruction of natural and artificial burrows (culverts, concrete slabs, and debris piles that provide shelter to Burrowing Owls); and
- Destruction and/or degradation of foraging habitat adjacent (within 100 meters) of an occupied burrow(s).

As discussed in **Section 3.1.4.2.3**, 65 occupied Burrowing Owl burrows were observed within the survey area. While direct removal of these burrows are not anticipated as the result of project implementation, adjacent agricultural fields, which represent suitable foraging habitat for these burrows will be graded during construction activities.

Impacts to any Burrowing Owl individuals and/or active Burrowing Owl burrows would be considered potentially significant, and mitigation in the form of avoidance and impact minimization would be required to reduce the impact to a level of less than significant. In accordance with the CDFG Staff Report on Burrowing Owl Mitigation (1995), impacts to foraging habitat within 100 meters (approximately 300 feet) of each active burrow would be considered significant and would require mitigation in order to reduce impacts to a level less than significant.

After construction is complete, Burrowing Owls may occur along the remaining earthen lined canals and drains in and around the Project Area.

All permanent lighting within the Campo Verde Solar Energy Facility will be low profile fixtures that point inward toward the Campo Verde Solar Energy Facility with directional hoods or shades to reduce light from shining into the adjacent habitat. In addition, any lighting not required daily for security purposes will have motion sensor or temporary use capabilities. No significant impact due to lighting is expected to occur to this species, and no mitigation is required.

No equipment or components of the Campo Verde Solar Energy Facility or gen-tie Line are expected to produce noise that would exceed ambient noise in the vicinity. No significant impact due to noise is expected to occur to this species, and no noise mitigation is required.

Mitigation Measure B3 would be implemented in order to reduce impacts to Burrowing Owls to less than significant. These mitigation measures would include pre-construction clearance surveys, relocation of owls whose burrows would be directly removed by construction activities and compensatory mitigation acreage. Consultation with CDFG regarding on-site mitigation is ongoing and agency approval of the project Burrowing Owl Mitigation and Monitoring Plan would be required before the start of construction. Exact mitigation acreages will be determined in consultation with CDFG.

Mountain Plover

The risk of death or injury to Mountain Plover resulting from the Campo Verde project is unlikely for the following reasons:

- This species does not nest within the survey area or in the Imperial Valley; therefore, there is no risk of destroying nests or eggs, harming chicks, or discouraging parents from returning to the nest.
- The species is naturally evasive and will readily move out of harm's way to avoid construction activities. They would likely find suitable fields nearby for foraging.
- Foraging habitat would be removed permanently on the Campo Verde Solar Site; therefore, Mountain Plovers would not attempt to forage on the site and there would be no risk of collision with solar panels and other components.

The Mountain Plover is protected under the MBTA. As such, it is unlawful to kill this species. Therefore, the Applicant must avoid killing Mountain Plover and employ avoidance measures necessary to avoid killing or injuring any Mountain Plover. The BBCS will include measures designed to minimize disturbance to all avian species during construction, including measures such as bird flight diverters, pre-construction nest surveys, nest buffers, etc., to prevent take of MBTA-protected birds during construction and operation of the Project.

Light and noise from heavy equipment during construction is expected to be of short duration and should not adversely modify the behavioral patterns of foraging Mountain Plover in the region given the vast amount of foraging habitat in the immediate vicinity of the survey area. Work will be conducted primarily during daylight hours; however, if it becomes necessary to conduct work at night, lighting will be needed for worker safety. This lighting will be directed toward the interior of the Campo Verde Solar Site in order to minimize effects to Mountain Plover that may be roosting in adjacent fields. However, Mountain Plover is a diurnal species and is not expected to be active at night. Generally, noise from the construction of solar facilities similar to the Campo Verde Solar Energy Facility Site may exceed 60 dB(A) for a distance of up to 1,280 feet from the source. Minimization and avoidance measures to reduce potential noise effects to avian species, including Mountain Plover, will be implemented following the BBCS, including timing construction to minimize effects to avian species. Because the Mountain Plover is relatively tolerant of disturbance on its wintering grounds, the brief periods when plovers may forage within any given field in the vicinity of the survey area, and the implementation of impact avoidance and minimization measures, disturbance to Mountain Plover from noise and lighting would be unlikely.

The O&M activities are unlikely to affect Mountain Plovers that may be foraging adjacent to the Campo Verde Solar Energy Facility during the winter. Noise and lighting during operations will be minimal and directed toward the interior of the Campo Verde Solar Energy Facility, where the operations facilities are located. General O&M activities that may be conducted within the Campo Verde Solar Energy Facility include equipment inspection and/or repairs, solar panel washing, weed abatement activities, and security guard duties involving the use of motor vehicles. Panel washing may also require a water truck access. These O&M activities are anticipated to be at the same level of intensity as the current agricultural operations and are not expected to affect the overall behavioral patterns of Mountain Plovers within the survey area. Mountain Plover is only active during daylight hours, and no collisions with the Proposed Gen-Tie Line, solar panels, or other facility structures are anticipated, as they will be visible, and therefore avoidable, if Mountain Plovers are actively moving in and around the Campo Verde Project. In addition, Avian Power Line Interaction Committee (APLIC) measures to avoid and minimize potential collisions (APLIC 2006) will be detailed in the BBCS for implementation. Therefore, O&M activities would have an insignificant or discountable effect on Mountain Plover foraging within or adjacent to the survey area.

Approximately 1,677.5 acres of potential foraging habitat for Mountain Plover would be permanently removed. Conservatively assuming that entire acreage is suitable foraging habitat at any given time, this loss of foraging habitat would account for less than 0.8 percent of the estimated foraging habitat (using the five-year average of 214,962 acres) available in the Imperial Valley. This does not take into account the likely significant acreage of suitable foraging habitat in Mexico, just across the border. The permanent loss of less than 0.8 percent of suitable foraging habitat in the Imperial Valley is a discountable loss of habitat in the Imperial Valley.

Large avian predators such as ravens (genus *Corvus*), Loggerhead Shrikes (*Lanius ludovicianus*), and Prairie Falcon (*Falco mexicanus*) may be drawn to the Campo Verde Solar Energy Facility due to the increase in food sources such as garbage cans and nesting/perching areas such as the perimeter fence. This potential increase in avian predators may indirectly affect Mountain Plover within and adjacent to the Campo Verde Solar Energy Facility, but this effect would be minimized by implementation of a Raven Control Plan, which will focus on minimizing predator attractants, discouraging raptor nesting, etc.

No indirect effects to Mountain Plover due to herbicide use are anticipated. The timing and formula of any herbicide used for control of weeds will be in accordance with the Campo Verde Project Weed Management Plan, which will conform to resource agency standards to minimize impacts to sensitive biological resources.

Pallid Bat and California Leaf-nosed Bat

These species may use all or portions of the Project Area for foraging, though neither is expected to roost within the Project Area or immediate vicinity. Project implementation would result in the permanent disturbance of approximately 1,852 acres of potentially suitable foraging habitat. This disturbance would reduce the quality of the foraging habitat, but is not expected to totally eliminate it. The potential for continued foraging following project implementation would be supported by the larger drains and canals within the Campo Verde Solar Energy Facility that would remain undisturbed and could continue to support prey populations for both species. Given the large amount of suitable foraging habitat in the immediate vicinity of the project and in the Imperial Valley (essentially all agricultural lands) and the continued foraging opportunities following project implementation, the proposed project is not expected to significantly impact either the pallid bat or the California leaf-nosed bat.

4.1.1.2.4 Golden Eagle

Suitable nesting habitat is not present within the survey area and the species is not expected to nest within or in the immediate vicinity of the survey area. The project vicinity contains habitat features that could be conducive to eagle use and foraging, and occasional foraging may occur on the Project site. Suitable foraging habitat would be removed by the project. However, based on the limited amount of habitat that would be removed compared to the amount of suitable foraging habitat available in and around the Imperial Valley, and the low prey availability in agricultural habitats as compared to the surrounding native desert, this loss of habitat is unlikely to disturb Golden Eagles that may occasionally use the project area for foraging. Incidental observations within the valley suggest that the most suitable foraging habitat within the agricultural lands may be the larger IID-maintained drains. No large drains would be removed as a result of project implementation.

Historical records and results of this analysis indicate that direct impacts to eagles are unlikely to result from the proposed project construction or operation, due to the low numbers of eagles that may use the area for foraging and the tubular steel structures that will be used which will decrease the potential for perching and nesting. Additionally, the amount of suitable foraging habitat (1,852 acres) that would be removed by the project is small relative to the amount of habitat available in and around the Imperial Valley. This would not represent a significant impact to this species given the vast amounts of suitable foraging habitat in the surrounding vicinity and in the Imperial Valley (essentially all agricultural lands) and the relative infrequence with which the species has been observed in the survey area and vicinity. Therefore, no take is anticipated, and an Eagle Conservation Plan is not necessary for the project. Specific avoidance and minimization measures for eagles are addressed within this document.

4.1.2 Impact to Riparian Habitat or Special Status Communities

For purposes of this report, special status vegetation communities (i.e., natural communities) are those communities "that are of limited distribution statewide or within a county or region and are often vulnerable to environmental effects of projects" (State of California 2009b). The project would have a significant impact if it would:

- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the CDFG or USFWS.

As discussed in Section 4.0 and shown on **Table 9**, arrow weed thicket is the only special status natural community potentially affected by the proposed project. This community is considered sensitive whether or not it has been disturbed.

Impacts to arrow weed thicket are detailed in **Table 9** and shown on **Attachment 1: Figure 6**. Though very limited in extent (2.27 acres of permanent impact), these impacts could be considered potentially significant and may require mitigation to offset this impact to sensitive habitats to reduce impacts to levels less than significant.

Soil disturbed due to grading during construction and continued use of the Campo Verde Solar Energy Facility Site and access roads along the gen-tie line may result in the introduction or increased density of non-native invasive plant species. These species can undermine the habitat quality and integrity of the native plant communities. The risk of non-native invasive species establishment in sensitive natural communities will be assessed as part of the Weed Risk Assessment, which is being prepared but has not yet been completed for the project.

Riparian habitats occur on the perimeters of surface or near-surface waters and provide a transition zone between aquatic and terrestrial zones. In the survey area, three communities would be characterized as riparian – arrow weed thicket, common reed marsh, and disturbed wetland. Arrow weed thicket would be the only one impacted by this alternative (2.27 acres permanently and 0.22 acres temporarily).

4.1.3 Impact to Jurisdictional Waters

The jurisdictional waters report for the proposed project have recently been submitted to the agencies in order to verify the jurisdictional status of the drainage features present within the Project Area; however, the agencies have not responded. It is anticipated that one CDFG jurisdictional water (Feature #14 in the project Jurisdictional Waters Report) and no ACOE jurisdictional waters would be impacted by the solar energy facility (**Attachment 1: Figure 8**). The CDFG jurisdictional feature that would be impacted is a small agricultural tail ditch that supports a small amount of riparian vegetation (primarily arrow weed). This feature is approximately 6 feet wide (bank to bank) and could be removed entirely. This would result in the loss of approximately 0.26 acres of CDFG jurisdictional waters.

Mitigation for permanent impacts to CDFG riparian habitat is typically at a 2:1 ratio, while mitigation for temporary impacts to CDFG riparian habitat is typically at a 1:1 ratio. A Section 1600 Streambed Alteration Agreement would also need to be authorized for impacts to CDFG resources.

4.1.4 Impact to Wildlife Movement and Nursery Sites

Wildlife movement corridors are considered sensitive by resource and conservation agencies. The impact analysis provided below is based on the CEQA thresholds of significance. The project would have a significant impact if it would:

- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

A chain link perimeter fence will surround the proposed Campo Verde Solar Energy Facility Site, allowing small mammals and reptiles to move freely through the site. Although medium- and large- sized mammals will not be able to move through the Campo Verde Solar Energy Facility Site, it should not inhibit their movement through the Yuha Basin or surrounding agricultural lands.

The project will impact the ability of medium and large mammals to move through the project site, but it should not inhibit their movement through the Yuha Basin or surrounding agricultural lands; it is therefore considered a less than significant impact. There is no anticipated impact to nursery sites, and no additional mitigation would be required.

4.2 Gen-tie Line Alternatives

4.2.1 Impact to Special Status and Priority Plant Species

4.2.1.1 Proposed Gen-Tie

Special Status Species

No federally listed, state-listed or BLM sensitive plant species are known or expected to occur within the Proposed Gen-Tie corridor based on spring surveys completed for projects in the same corridor; however, spring surveys have not been completed for this project. Based on survey results from other projects, there are no anticipated impacts to federally listed, state-listed or BLM sensitive plant species as the result of project implementation. If special status or priority plants are located during the surveys, mitigation measures will be implemented to reduce impacts to less than significant.

Priority Plant Species

Abram's spurge (CNPS 2.2), glandular ditaxis (CNPS 2.2), and California ditaxis (CNPS 3.2) have a low potential for occurrence within the Proposed Gen-Tie survey area. Rock nettle (CNPS 2.2 and CNDDB special plant), Brown turbans, Parish's desert-thorn and hairy stickleaf (CNPS 2.3 and CNDDB special plants), and Utah vine milkweed (CNPS 4.2) have a low to moderate potential for occurrence.

Impacts to these species are not anticipated because they were not observed during surveys and habitat is of low quality. However, if impacts occur, they will be relatively minor based on the small impact areas (7.69 acres of temporary impacts and 0.05 acre of permanent impacts).

Though considered sensitive species, the relatively low ranking status of these species means that any mitigation requirements would be satisfied with mitigation for these species' habitats (e.g., mitigation for the creosote bush – white bursage scrub habitat would mitigate for impacts to the preferred habitats for these species). Species-specific mitigation requirements would not be necessary.

4.2.1.2 Alternative Gen-Tie Across BLM Land

Special Status Species

No federally listed, state-listed or BLM sensitive plant species are known or expected to occur within the Alternative Gen-Tie Across BLM Land corridor based on spring surveys completed for projects in the same corridor; however, spring surveys have not been completed for this project. Based on survey results from other projects, there are no anticipated impacts to federally listed, state-listed or BLM sensitive plant species as the result of project implementation. If special status or priority plants are located during the surveys, mitigation measures will be implemented to reduce impacts to less than significant.

Priority Plant Species

Abram's spurge (CNPS 2.2), glandular ditaxis (CNPS 2.2), and California ditaxis (CNPS 3.2) have a low potential for occurrence within the Proposed Gen-Tie survey area. Rock nettle (CNPS 2.2 and CNDDB special plant), Brown turbans, Parish's desert-thorn and hairy stickleaf (CNPS 2.3 and CNDDB special plants), and Utah vine milkweed (CNPS 4.2) have a low to moderate potential for occurrence.

Impacts to these species are not anticipated because they were not observed during surveys and habitat is of low quality. However, if impacts occur, they will be relatively minor based on the small impact areas (8.01 acres of temporary impacts and 0.05 acre of permanent impacts).

Though considered sensitive species, the relatively low ranking status of these species means that any mitigation requirements would be satisfied with mitigation for these species' habitats (e.g., mitigation for the creosote bush – white bursage scrub habitat would mitigate for impacts to the preferred habitats for these species). Species-specific mitigation requirements would not be necessary.

4.2.1.3 Private Land Gen-Tie Alternative

No special status or priority plant species are expected to occur within the Private Land Gen-Tie Alternative survey area. Therefore, no impacts to special status or priority plant species are expected to occur as a result of project implementation.

4.2.2 Impact to Special Status Wildlife Species

4.2.2.1 Proposed Gen-Tie

4.2.2.1.1 Federally Listed Species

Southwestern Willow Flycatcher

Expected impacts to Southwestern Willow Flycatcher are discussed in **Section 4.1.1.2.1**. Construction of the Proposed Gen-Tie is not likely to directly affect Southwestern Willow Flycatcher (SWFL) individuals, because there is no nesting habitat in the survey area and no habitat used during migration will be impacted. An Avian and Bat Protection Plan (ABPP) will provide guidance designed to minimize disturbance and avoid project related impacts to migration and other important avian habitats.

Suitable SWFL migration habitat in the Proposed Gen-Tie survey area occurs only in the vicinity of Dixie 3B Drain, just west of the Westside Main crossing (**Attachment 1: Figure 4c**). The Proposed Gen-Tie will not disturb acreage inside these habitats, nor would the gen-tie line be built across this habitat. No project features will be built within, over or under any of the drains or wetlands containing potentially suitable migratory habitat for the SWFL.

Potential impacts to the SWFL would be limited to the risk that night-migrating SWFL individuals could collide with the gen-tie line and temporal displacement of migrant willow flycatchers if nearby construction activities temporarily deter foraging. Bird flight diverters will be installed on the gen-tie line along the segments that cross the Westside Main Canal. Therefore impacts would be less than significant.

Peninsular Bighorn Sheep

No effects to Peninsular bighorn sheep are anticipated because there is no suitable habitat for the species in the project area, the closest known habitat is approximately 11 miles away, and the nearest known occurrence is 16 miles west of the project area.

4.2.2.1.2 State Listed Species

State listed species with the potential to occur within the Proposed Gen-Tie survey area include: Greater Sandhill Crane (*Grus canadensis tabida*) and Peninsular bighorn sheep. Potential impacts to Sandhill crane are discussed in **Section 4.1.1.2.2** and impacts to Peninsular bighorn sheep are discussed in **Section 4.2.2.1.1**.

4.2.2.1.3 BLM Sensitive Species

Colorado Desert Fringe-toed Lizard

Direct impacts to Colorado Desert fringe-toed lizard may occur during construction of the Proposed Gen-Tie. Construction activities such as the movement of construction vehicles or heavy equipment and the installation of electric line towers may result in the direct mortality, injury, or harassment of Colorado Desert fringe-toed lizards. These impacts would be considered significant and mitigation would be required to reduce impacts below significance. Mitigation B5, that will be implemented for FTHL, would also act as mitigation for this species because suitable habitat for these species overlaps; therefore, no additional mitigation is anticipated and impacts to this species would be below significance. Refer to Mitigation B5 for specific details.

The creosote bush–white bursage scrub vegetation and stabilized desert dunes within the Gen-tie corridor provides habitat for this species, and impacts to this habitat could be potentially significant for the Colorado Desert fringe-toed lizard. Impacts to Colorado Desert fringe-toed lizard habitat would be reduced via the following measures:

- No new access roads will be constructed; disturbance would be limited to short overland travel extending from existing access roads.
- Extensive resource surveys have been conducted to facilitate the siting of the electric line components to insure they are located in a manner that creates the least amount of disturbance to resources.
- Whenever possible, any removal of vegetation will be in the form of trimming instead of root grubbing, to allow shrubs to readily re-sprout. The only soil removal necessary during Gen-tie Line construction will be during excavation of tower footings and trenching.

The Proposed Gen-Tie Alternative may permanently impact approximately 0.05 acres of suitable Colorado Desert fringe-toed lizard habitat and temporarily impact approximately 7.45 acres of suitable Colorado Desert fringe-toed lizard habitat.

Disturbance of soil and vegetation will take place during construction, which can encourage invasive, exotic plant species to encroach into Colorado Desert fringe-toed lizard habitat. In addition, construction vehicles and equipment can transport seeds and vegetation from other regions within their tires and other various parts under the vehicles. This potential increase in invasive, exotic plant species would be considered a significant impact to Colorado desert fringe-toed lizard due to construction of the proposed project and mitigation would be required to reduce impacts below significance. Mitigation for FTHL would be considered sufficient mitigation for this species (refer to Mitigation B2 and B5) because these species occupy similar habitats; these would reduce impacts to a level less than significant.

General O&M activities that may be conducted along the Gen-tie Line include equipment inspection and/or repairs, tower washing, and weed abatement activities. These O&M activities will require vehicles to occasionally drive the existing access roads along the Gen-tie Line and travel overland.

Colorado Desert fringe-toed lizard injury or mortality could potentially occur due to occasional use of the transmission line access roads, weed abatement, or any other activities that may result in ground disturbance outside of the designated access roads. The anticipated frequency of travel along gen-tie access roads is expected to represent a negligible increase in traffic compared to the ongoing traffic associated with construction and maintenance of the IV Substation, Border Patrol activity and OHV use of the area.

Flat-tailed Horned Lizard

Direct impacts to FTHL may occur during construction of the gen-tie line. Construction activities such as the movement of construction vehicles or heavy equipment and the installation of electric line towers or solar site components may result in the direct mortality, injury, or harassment of FTHLs. These impacts would be considered significant and mitigation would be required to reduce impacts to a level less than significant.

The proposed transmission corridor alternatives are within the Yuha Desert Flat-tailed Horned Lizard Management Area, as designated in the 2003 *Flat-tailed Horned Lizard Rangewide Management Strategy* (RMS; ICC 2003). The creosote bush–white bursage scrub vegetation and stabilized desert dune habitat within the Management Area provides habitat for this species; impacts to these habitats are considered potentially significant and would require mitigation to reduce impacts to a level less than significant. In accordance with the *Flat-tailed Horned Lizard Rangewide Management Strategy*, compensation would be required for impacts to FTHL habitat (see Mitigation B5). In accordance with the RMS, the proposed impacts to the MA are the minimum necessary to construct the project:

- The proposed Campo Verde Solar Site is located outside of the Yuha MA, within active agricultural fields.
- No new access roads will be constructed; disturbance would be limited to short overland travel extending from existing access roads.
- Extensive resource surveys have been conducted to facilitate the siting of the electric line components to insure they are located in a manner that creates the least amount of disturbance to resources.
- Whenever possible, any removal of vegetation will be in the form of trimming instead of root grubbing, to allow shrubs to readily re-sprout. The only soil removal necessary during gen-tie Line construction will be during excavation of tower footings and trenching.

Proposed impacts to FTHL habitat within the MA for the Proposed Gen-Tie are 0.05 acres of permanent impact and 7.45 acres of temporary impact. Disturbance of soil and vegetation will take place during construction, which can encourage invasive, exotic plant species to encroach into FTHL habitat. In addition, construction vehicles and equipment can transport seeds and vegetation from other regions within their tires and other various parts under the vehicles. This potential increase in invasive, exotic plant species would be considered a significant impact to FTHL due to construction of the proposed project and mitigation would be required to reduce impacts to a level less than significant. Refer to Mitigation B2 and B5.

General O&M activities that may be conducted along the gen-tie line include equipment inspection and/or repairs, tower washing, and weed abatement activities. These O&M activities will require vehicles to occasionally drive the existing access roads in the area and travel overland to structure sites if needed.

FTHL injury or mortality could potentially occur due to occasional travel to the structure sites, weed abatement, or any other activities that may result in ground disturbance outside of the designated access roads. The anticipated frequency of travel to gen-tie structure sites is expected to represent a negligible increase in traffic compared to the ongoing traffic associated with construction and maintenance of the IV Substation, Border Patrol activity and OHV use of the area.

The implementation of Mitigation Measure B5 would reduce impacts to FTHL to less than significant.

Burrowing Owl

The Burrowing Owl is both a California Species of Special Concern and a BLM sensitive species. BLM generally uses CDFG guidance for impact assessment and mitigation for this species. The 1995 California Department of Fish and Game's Staff Report on Burrowing Owl Mitigation (CDFG 1995) defines impact to Burrowing Owl as:

- Disturbance within 50 meters (approx. 160 feet) which may result in harassment of owls at occupied burrows;
- Destruction of natural and artificial burrows (culverts, concrete slabs, and debris piles that provide shelter to Burrowing Owls); and
- Destruction and/or degradation of foraging habitat adjacent (within 100 meters) of an occupied burrow(s).

As discussed in **Section 3.2.7.1**, thirty suitable but unoccupied Burrowing Owl burrows were observed within the survey area, though they are located within the unstable desert dunes and are regularly filled in because of the structural instability of the sand. Direct removal of these burrows is not anticipated to occur as the result of implementation of the Proposed Gen-Tie because the burrows would be spanned and adjacent suitable foraging habitat for these burrows would not be removed during construction activities.

No equipment or components of the gen-tie line are expected to produce noise either during construction or operation that would exceed ambient noise in the vicinity. Therefore, no significant impact is expected and no noise mitigation is required.

Mitigation Measure B3 would be implemented in order to minimize impacts to Burrowing Owls. These mitigation measures would include pre-construction clearance surveys, relocation of owls whose burrows would be directly removed by construction activities, and possibly the acquisition of compensatory mitigation acreage if required. Consultation with CDFG regarding on-site mitigation is ongoing and agency approval of a Burrowing Owl Mitigation Plan for the gen-tie would be obtained before the start of construction. The specific mitigation measures for Burrowing Owl will be determined in consultation with CDFG.

Mountain Plover

Impacts to Mountain Plover are expected to be less than significant (**Section 4.1.1.2.3**).

California Leaf-nosed Bat and Pallid Bat

These species may use the northern portion of the Proposed Gen-Tie survey area for foraging (along the Westside Main Canal), though neither is expected to roost in the vicinity. Construction of the Proposed Gen-Tie would not result in the temporary or permanent direct removal of potentially suitable foraging habitat because the canal would be spanned. Following construction, the span of the canal by the gen-tie line could pose a minor collision risk to foraging bats but this would be considered less than significant because of the distance to known populations of these species and the species' inherent ability to avoid obstructions through the use of echolocation. The potential for continued foraging following project implementation would continue to be supported by the larger drains and canals that support prey populations for both species. Given that the project will not remove any suitable habitat for either species, the large amount of suitable foraging habitat available throughout Imperial County, and the continued foraging opportunities following project implementation, the proposed project is not expected to significantly impact either the pallid bat or the California leaf-nosed bat.

4.2.2.1.4 California Species of Special Concern and Fully Protected Species

Loggerhead Shrike

Loggerhead Shrikes are known to forage and may nest in the Proposed Gen-Tie survey area. Construction activities would be completed within 2 to 6 months but could result in temporary avoidance of the area by this species for that period. There is a large amount of suitable foraging habitat in the area surrounding this alternative that could be utilized by the species during and after construction so there would be no permanent impacts or significant impacts. Also, Mitigation B7 would be implemented to ensure there would be no impacts to nesting Loggerhead Shrikes. Therefore, impacts would be less than significant for this species.

Crissal Thrasher and LeConte's Thrasher

The area crossed by the Proposed Gen-Tie line does not support suitable nesting or foraging habitat for these species. Therefore, there would be no impacts from construction or operation of this alternative.

Golden Eagle

Potential impacts to Golden Eagle are discussed in **Section 4.1.1.2.4**. In addition, the Proposed Gen-Tie line would represent a potential impact to Golden Eagles by presenting a risk of collisions. Bird flight diverters will be installed on the gen-tie line along the segments that cross the Westside Main Canal, which would alleviate some of the risk. Given the relative infrequency within which Golden Eagles use the Project Area and the use of bird flight diverters and the implementation of an BBCS the impact to Golden Eagles from the construction of the gen-tie line is expected to be minimal.

4.2.2.2 Alternative Gen-Tie Across BLM Land

4.2.2.2.1 Federally Listed Species

Southwestern Willow Flycatcher

The impacts to this species resulting from implementation of this gen-tie alternative would generally be the same as that described for the Proposed Gen-Tie in **Section 4.2.2.1.1**. Suitable migration habitat in the vicinity of this alternative occurs along the Dixie 3B Drain, approximately 2,000 feet west of the Westside Main Canal crossing associated with this alternative (**Attachment 1 – Figure 4c**). Construction of this alternative will not directly disturb acreage inside these habitats nor would the gen-tie be built across any of the drains or wetlands containing potentially suitable migratory habitat for the SWFL.

Potential impacts to the SWFL would appear to be limited to the risk that night-migrating SWFL individuals could collide with the gen-tie line and temporal displacement of migrant willow flycatchers if construction activities temporarily deter foraging in nearby areas. Bird flight diverters will be installed on the gen-tie line along the segments that cross the Westside Main Canal to minimize the potential for collision. Therefore, impacts would be less that significant.

Penisular Bighorn Sheep

Impacts to this species would not occur as described for the Proposed Gen-Tie in **Section 4.2.2.1.1**.

4.2.2.2.2 State Listed Species

Potential impacts to Sandhill crane are discussed in **Section 4.1.1.2.2** and impacts to Peninsular bighorn sheep are discussed in **Section 4.2.2.1.1**.

4.2.2.2.3 BLM Sensitive Species

Colorado Desert Fringe-toed Lizard

The impacts to this species resulting from implementation of this gen-tie alternative would generally be the same as that described for the Proposed Gen-Tie in **Section 4.2.2.1.3**. This alternative may temporarily impact approximately 5.90 acres of suitable Colorado Desert fringe-toed lizard habitat during construction and permanently impact approximately 0.03 acres of suitable Colorado Desert fringe-toed lizard habitat after construction. The mitigation that will be implemented for FTHL would also act as mitigation for this species because they use the same habitats. Therefore, no additional mitigation is anticipated and impacts to this species would be less than significant.

Flat-tailed Horned Lizard

The impacts to this species resulting from implementation of this gen-tie alternative would be similar to but slightly less than that described for the Proposed Gen-Tie in **Section 4.2.2.1.3**. Impacts to FTHL habitat from implementation of this alternative would be 5.90 acres of temporary impacts during construction and 0.03 acres of permanent impacts. The mitigation described for the Proposed Gen-Tie for this species would be implemented, so impacts to this species would be less than significant.

Burrowing Owl

The impacts to this species resulting from implementation of this gen-tie alternative would be similar to but slightly less than that described for the Proposed Gen-Tie in **Section 4.2.2.1.3**. As discussed in **Section 3.2.6.3**, two suitable but unoccupied Burrowing Owl burrows were observed within the survey area. Direct removal of these burrows is not anticipated as the result of project implementation (they would be spanned), and adjacent suitable foraging habitat for these burrows would not be removed during construction activities. Mitigation measure B3 (Section 4.4.2.3) would be implemented in order to reduce impacts to less than significant.

Mountain Plover

The impacts to this species resulting from implementation of this gen-tie alternative would be similar to that described for the Proposed Gen-Tie in **Section 4.2.2.1.3**.

California Leaf-nosed Bat and Pallid Bat

The impacts to this species resulting from implementation of this gen-tie alternative would be similar to that described for the Proposed Gen-Tie in **Section 4.2.2.1.3**.

4.2.2.2.4 California Species of Special Concern and Fully Protected Species

The impacts to these species resulting from implementation of this gen-tie alternative would generally be the same as that described for the Proposed Gen-Tie in **Section 4.2.2.1.4**. This alternative would affect small areas of the same habitats and the same mitigation measures would be implemented.

4.2.2.3 Private Gen-Tie Alternative

4.2.2.3.1 Federally Listed Species

Southwestern Willow Flycatcher

The impacts to this species resulting from implementation of this gen-tie alternative would be similar to that described for the Proposed Gen-Tie in **Section 4.2.2.1.1**. Suitable migration habitat in the vicinity of this alternative occurs along Dixie Drain 4 and Westside Drain (**Attachment 1 - Figure 4a**). Construction of the Private Gen-Tie Alternative will not directly disturb acreage inside these habitats, but the gen-tie would be built across this habitat.

Potential impacts to the SWFL would be limited to the risk that night-migrating SWFL individuals could collide with the gen-tie line and temporal displacement of migrant willow flycatchers if nearby construction activities temporarily deter foraging. Bird flight diverters will be installed on the gen-tie line along the segment that crosses Dixie Drain 4, Westside Drain, and the Westside Main Canal. Therefore, impacts would be less than significant.

Yuma Clapper Rail

Construction of the Private Gen-Tie Alternative is not likely to have an effect on YCR individuals. The nearest known occurrence of nesting YCR is approximately 1.8 miles east of the project area, however, there is no suitable nesting habitat in the survey area. There is a potential for YCR to forage or winter in the habitat associated with Dixie Drain 4 and Westside Drain (**Attachment 1 - Figure 4a)**. Noise from equipment during construction would have a low probability of temporarily impacting YCR given the low potential for this species to occur within the Private Gen-Tie Alternative area. Minimization and avoidance measures to reduce potential effects to avian species, including YCR, will be implemented according to an approved ABPP, including timing construction to minimize effects to avian species.

Given the low likelihood that YCR forages or winters within the small habitat patches within the project area along with the implementation of impact avoidance and minimization measures, any effects to YCR from construction of this alternative would be minimal and short-term.

The O&M activities associated with the gen-tie are not expected to affect YCR. Any noise during operations will be minimal and the level of human disturbance is not expected to increase significantly above the agricultural practices that are currently taking place and will continue to take place.

Peninsular Bighorn Sheep

Impacts to this species would not occur because there is no suitable habitat in the Private Gen-Tie Alternative survey area.

4.2.2.3.2 State Listed Species

As discussed in **Section 3.2.7.3**, the barefoot-banded gecko is not expected to occur in the survey area and will not be impacted by this alternative. Peninsular bighorn sheep is discussed above.

Greater Sandhill Crane

Greater Sandhill Cranes may forage during the winter in the active agricultural habitats adjacent to the Private Gen-Tie Alternative corridor. Approximately 0.1 acres of agricultural land would be affected by implementation of the alternative. Given that all of the agricultural lands in Imperial County provide potentially suitable foraging habitat including that in the vicinity of this alternative, it is unlikely that the loss of this small amount of potentially suitable foraging habitat would impact wintering Greater Sandhill Cranes.

Noise from heavy equipment during construction is not expected to adversely modify the behavioral patterns of foraging Sandhill Cranes because the vast amount of foraging habitat in the vicinity will allow them to utilize the area. The Sandhill Crane is a diurnal species and is not expected to be active at night. Minimization and avoidance measures to reduce potential noise effects to avian species, including Sandhill Crane, will be implemented in accordance the ABPP, including timing construction to minimize effects to avian species. Because the Sandhill Crane is relatively tolerant of disturbance on its wintering grounds (Zeiner et al. 1989), the brief periods when they may forage within any given field in the vicinity of the action area, and the implementation of impact avoidance and minimization measures (see Mitigation Measures B4 and B7), disturbance to Sandhill Cranes from noise would be unlikely.

Sandhill Cranes are only active during daylight hours, and no collisions with the proposed gen-tie line are anticipated, as they will be visible and avoidable. In addition, Avian Power Line Interaction Committee (APLIC) measures to avoid and minimize potential collisions (APLIC 2006) will be detailed in the ABPP for implementation.

4.2.2.3.3 BLM Sensitive Species

Colorado Desert Fringe-toed Lizard

There is no habitat for this species in the Private Land Gen-Tie ROW. Therefore, no impacts to this species are anticipated from implementation of the alternative.

Flat-tailed Horned Lizard

There is no habitat for this species in the Private Land Gen-Tie ROW. Therefore, no impacts to this species are anticipated from implementation of the alternative.

Burrowing Owl

The impacts to this species resulting from implementation of this gen-tie alternative would generally be the same as that described for the Proposed Gen-Tie in **Section 4.2.2.1.3**. Three suitable but unoccupied Burrowing Owl burrows were observed within the survey area for this alternative. Direct removal of these burrows would not occur as the result of construction of the gen-tie because they would be spanned and adjacent suitable foraging habitat for these burrows would not be removed as a result of construction activities. No impacts would occur during operation and maintenance activities because these activities would use the existing farm roads adjacent to the line. Mitigation measure B3 would be implemented to ensure impacts would be minor.

Mountain Plover

This alternative traverses suitable habitat for the Mountain Plover in the area and this species does not nest within the project area or in the Imperial Valley. Approximately 0.1 acres of agricultural land would be affected by implementation of the alternative. Given that all of the agricultural lands in Imperial County provide potentially suitable foraging habitat including that in the vicinity of this alternative, it is unlikely that the loss of this small amount of potentially suitable foraging habitat would impact wintering Mountain Plovers, and impacts would be less than significant.

The Mountain Plover is protected under the MBTA. Therefore, the Applicant would employ avoidance measures as defined in the ABPP which will include measures designed to minimize disturbance to all avian species during construction, including measures to prevent take of MBTA-protected birds during construction and operation of the Project.

Avian predators such as ravens (genus *Corvus*), Loggerhead Shrikes (*Lanius ludovicianus*), and Prairie Falcon (*Falco mexicanus*) may be drawn to the area due to the increase in nesting/perching areas such as gen-tie structures. This potential increase in avian predators could potentially indirectly affect Mountain Plover within the vicinity of the Private Land Gen-Tie, but this effect would be minimized by implementation of a Raven Control Plan.

No indirect effects to Mountain Plover due to herbicide use are anticipated. The timing and formula of any herbicide used for control of weeds will be in accordance with the proposed project Weed Management Plan, which conforms to resource agency standards to minimize impacts to sensitive biological resources.

California Leaf-nosed Bat and Pallid Bat

The impacts to this species resulting from implementation of this gen-tie alternative would be similar to that described for the Proposed gen-Tie in **Section 4.2.2.1.3**.

4.2.2.3.4 California Species of Special Concern and Fully Protected Species

The impacts to these species resulting from implementation of this gen-tie alternative would generally be the same as that described for the Proposed Gen-Tie in **Section 4.2.2.1.4**.

4.2.1 Impact to Riparian Habitat or Special Status Natural Communities

For purposes of this report, sensitive vegetation communities (i.e., natural communities) are those identified by the CDFG (State of California 2010b) and CEQA. Reasons for the designation as "sensitive" include restricted range, cumulative losses throughout the region, and a high number of endemic sensitive plant and wildlife species that occur in the vegetation communities. Riparian habitats occur on the perimeters of surface or near-surface waters and provide a transition zone between aquatic and terrestrial zones. In this project area, three communities would be characterized as riparian – arrow weed thicket, common reed marsh, and disturbed wetland. None would be disturbed permanently and only one, arrow weed thicket, would be temporarily impacted by this alternative and it is discussed below.

As shown in **Table 9**, arrow weed thicket is the only special status natural community potentially affected by the gen-tie.

The project would have a significant impact if it would:

- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the CDFG or USFWS.

4.2.1.1 Proposed Gen-Tie

The Proposed Gen-Tie would temporarily impact 0.21 acres of arrow weed thicket and none permanently. Though very limited in extent, these impacts would be mitigated through reclamation.

Soil disturbed during construction and continued use of the access roads along the gen-tie line may result in the introduction or increased density of non-native invasive plant species. The risk of non-native invasive species establishment in sensitive natural communities will be assessed as part of the Weed Management Plan that will be prepared for the project.

4.2.3.2 Alternative Gen-Tie Across BLM Land

There would be no impacts to riparian habitat or sensitive natural communities by this alternative.

4.2.3.3 Private Land Gen-Tie Alternative

There would be no impacts to riparian habitat or sensitive natural communities by this alternative.

4.2.2 Impact to Jurisdictional Waters

The final jurisdictional waters report for the proposed project was recently submitted to the agencies in order to verify the jurisdictional status of the drainage features present within the Project Area. Based on that report, all potentially state and federal jurisdictional waters will be spanned; therefore, there would be no impacts to state or federal jurisdictional waters by the Proposed Gen-Tie, Alternative Gen-Tie Across BLM Land, or the Private Land Gen-Tie Alternative.

4.2.3 Impact to Wildlife Movement and Nursery Sites

Wildlife movement corridors are considered sensitive by resource and conservation agencies. The impact analysis provided below is based on the CEQA Guidelines Appendix G thresholds of significance. The project would have a significant impact if it would:

- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

Neither the Proposed Gen-Tie Line, the Alternative Gen-Tie Across BLM Land, nor the Private Gen-Tie Alternative would inhibit the movement of wildlife in and around the gen-tie survey area. No fencing or other terrestrial obstructions would be installed. Moreover, the Proposed Gen-Tie Line and Alternative Gen-Tie Across BLM Land would be located in a designated utility corridor along with several other existing transmission lines and would not represent a novel feature on the landscape.

Thus, there is no anticipated impact to wildlife movement or nursery sites, and no additional mitigation would be required.

4.2.4 Impact to California Desert Conservation Area

Pursuant to CEQA, the project would have a significant impact if it would:

- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

The Proposed Gen-Tie Line and the Alternative Gen-Tie Across BLM Land is an allowable use under the CDCA, as the proposed ROW's fall within the CDCA designated "Utility Corridor N." This area is also designated as an ACEC and the BLM manages all land uses within the ACEC in order to minimize impact to this sensitive area. All proposed impacts to resources discussed in Section 4 are in conformance with the CDCA and maintain the integrity and intent of the Conservation Plan.

The Private Gen-Tie Alternative is located entirely on private lands outside of the CDCA.

5.0 RECOMMENDED MITIGATION

A number of general measures, designed to reduce potential indirect impact to resources in the Project Area as well as restore and/or improve the quality of habitat in the Project Area, will be implemented as part of the Project design. In addition, mitigation measures for specific sensitive biological resources would be implemented in order to further reduce the potential direct and indirect impacts of project implementation and are identified below.

B1 Vegetation Communities
Mitigation for permanent and temporary impacts to creosote bush-white burr sage scrub, arrow weed scrub, tamarisk scrub, shall be accomplished via the mitigation for flat-tailed horned lizard because these native habitats are considered potentially suitable flat-tailed horned lizard habitat and are within a designated management area on BLM land. **Table 7** describes the proposed impacts to each vegetation community. Thus, disturbance to native vegetation communities will not require unique mitigation but will rely on the requirements of mitigation measure B5.

B2 Noxious, Invasive and Non-Native Weeds
To minimize the introduction and spread of weed species, a Weed Management Plan will be developed and implemented. The weed management plan will include a discussion of specific weeds identified on site that will be targeted for eradication or control as well as a variety of measures that will be undertaken during construction and O&M activities to prevent the introduction and spread of new weed species as a result of the project.

General measures to prevent the spread of weeds include:

- Limiting disturbance areas during construction to the minimal required to perform work and limiting ingress and egress to defined routes
- Maintaining vehicle wash and inspection stations, and closely monitoring the types of materials brought onto the site to minimize the potential for weed introduction
- Use of certified weed free mulch, straw wattles, hay bales and seed mixes
- Reestablishing native vegetation along the Gen-tie line as quickly as practicable on disturbed sites is the most effective long-term strategy to avoid weed invasions
- Monitoring and rapid implementation of control measures to ensure early detection and eradication for need weed invasions

Weed control methods that may be used include both physical and chemical control. Physical control methods include manual hand pulling of weeds, or the use of hand and power tools to uproot, girdle, or cut plants. Herbicide applications are a widely used, effective control method for removing infestations of invasive weed species. However, inadvertent application of herbicide to adjacent native plants must be avoided, which can often be challenging when weeds are interspersed with native cover. Before applying herbicide, contractors will be required to obtain any required permits from state and local authorities. Only a State of California and federally certified contractor will be permitted to perform herbicide applications. All herbicides will be applied in accordance with applicable laws, regulations, and permit stipulations. Only herbicides and adjuvants approved by the State of California and BLM for use on public lands will be used within or adjacent to the project site. Invasive plants species on BLM lands would be prevented, controlled, and treated through an Integrated Pest Management approach per the *Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Report (PER 2007).* Only herbicides approved by BLM in California will be used on BLM lands. Herbicide application can only occur on BLM lands with an approved Pesticide Use Proposal (PUP).

B3 Burrowing Owl

<u>Mitigation Measures</u>

Burrowing Owls are known to occur in and along the active agricultural fields within the proposed Campo Verde Solar Site. The following measures will avoid, minimize, or mitigate potential impact to Burrowing Owls during construction activities:

1. To the extent practicable, initial grading and clearing within the project footprint should take place between September 1 and January 31 to avoid impacts to any breeding Burrowing Owls. Occupied burrows should not be removed during the nesting season (February 1 through August 31) unless a qualified biologist approved by CDFG verifies through non-invasive methods that either (a) the birds have not begun egg-laying and incubation; or (b) that juveniles from the occupied burrows are foraging independently and are capable of independent survival. If initial grading and clearing within the project footprint is to begin during the breeding season (February 1 through August 31), the following measures (#2 through #4 below) will be implemented.
2. Within 30-days prior to initiation of initial grading and clearing, pre-construction clearance surveys for this species shall be conducted by qualified and agency-approved biologists to determine the presence or absence of this species within the grading area. The proposed grading areas shall be clearly demarcated in the field or via GPS by the project engineers and Designated Biologist prior to the commencement of the pre-construction clearance survey. The surveys shall follow the protocols provided in the *Burrowing Owl Survey Protocol and Mitigation Guidelines*.
3. When removal of occupied burrows is unavoidable, the following mitigation measures shall be implemented outside of the breeding season. Passive relocation methods are to be used by the biological monitors to move the owls out of the impact zone. This includes covering or excavating all burrows and installing one-way doors into occupied burrows. This will allow any animals inside to leave the burrow, but will exclude any animals from re-entering the burrow. A period of at least one week is required after the relocation effort to allow the birds to leave the impacted area before excavation of the burrow can begin. The burrows should then be excavated and filled in to prevent their reuse. The removal of active burrows on-site requires construction of new burrows or the enhancement of existing unsuitable burrows (i.e., enlargement or clearing of debris) at a mitigation ratio of 2:1 at least 50 meters from the impacted area and must be constructed as part of the above-described relocation efforts.
4. As the project construction schedule and details are finalized, an approved biologist shall prepare a Burrowing Owl Mitigation and Monitoring Plan that will detail the approved, site-specific methodology proposed to minimize and mitigate impacts to this species. Passive relocation, destruction of burrows, and construction of artificial

burrows can only be completed upon prior approval by and in cooperation with the CDFG.

Compensatory Mitigation

Consultation with CDFG intended to determine the amount and conditions of compensatory mitigation for foraging habitat lost as a result of project implementation is currently ongoing. The applicant is currently preparing a compensatory mitigation plan that could include a combination of (or one of) on-site mitigation or National Fish and Wildlife Foundation's Impact-Directed Environmental Accounts program. Exact mitigation acreages will be determined in consultation with CDFG.

B4 General O&M Mitigation Measures

A number of general mitigation measures, designed to reduce potential direct and indirect impacts to resources in the project area will be implemented after construction as standard Operation and Maintenance protocols. In order to reduce the potential impact to biological resources during operations and maintenance, the following will be implemented:

- A brief Annual Report will be submitted to the relevant resource agencies documenting the implementation of the following general measures as well as any resource-specific measures such as habitat restoration and/or compensation:
  - Speed limits along all gen-tie Line access roads and unpaved roads within the solar energy facility will not exceed 15 miles per hour. Gen-tie line access for O&M activities shall be kept to the minimum necessary for operations and be accomplished during the winter months when feasible. This limited access and annual timing is designed to prevent FTHL mortality.
  - Annual formal Worker Education Training shall be established for all employees and any subcontractors at the Campo Verde Solar Site to provide instruction on sensitive species identification; measures to avoid contact, disturbance, and injury; and reporting procedures in the case of dead and/or injured wildlife species. The USFWS and the BLM shall be notified per approved guidelines and channels of authority if mortality should occur. Species requiring reporting will be decided in consultation with the BLM and USFWS and will be detailed in the *Wildlife Mortality Reporting Program*.
  - A *Raven Control Plan* will be prepared and implemented that details specific measures for storage and disposal of all litter and trash produced by the Campo Verde Solar Site and its employees. This plan is designed to discourage scavengers that may also prey on wildlife in the vicinity. All employees will be familiar with this plan and littering shall be prohibited. This plan will be approved by the BLM and CDFG.
  - A *Weed Management Plan* will be prepared and implemented that describes specific on-going measures to remove weedy plant species from the solar energy facility and encourages native plant growth. This plan should be prepared in conformance with herbicide and native seed/planting guidelines outlined in the project's Site Reclamation and Revegetation Plan, and will be approved by the BLM.

- A *Wildlife Mortality Reporting Program* will be prepared and implemented to identify and report any dead or injured animals observed by personnel conducting O&M activities within the solar energy facility and along the gen-tie line. An appropriate reporting format for dead or injured special status wildlife observed within the solar energy facility and along the gen-tie line will be developed in coordination with the USFWS and the BLM. In addition, reporting of any dead or injured avian species found along the gen-tie line will follow the existing USFWS Bird Fatality/Injury Reporting Program (https://birdreport.fws.gov/). Species requiring reporting will be decided in consultation with the BLM and USFWS.
- A Bird and Bad Conservation Strategy (BBCS) will be prepared that will outline conservation measures for construction and O&M activities that might reduce potential impacts to bird populations. These measures incorporate APLIC (2006) design guidelines for overhead utilities by incorporating recommended or other methods that enhance the visibility of the lines to avian species. The BBCS will also address disturbance minimization, timing of construction, minimization of activities that would attract prey and predators, and incorporation of the Wildlife Mortality Reporting Program and Raven Control Plan discussed above.

B5 Flat-tailed Horned Lizard

<u>Mitigation Measures</u>

In accordance with the *FTHL Rangewide Management Strategy* (ICC 2003), the measures proposed below are designed to avoid, minimize, and/or compensate for potential direct and indirect effects construction of the proposed project may have on FTHL. The following will be implemented when conducting construction activities within the creosote bush-white burr sage scrub and other native vegetation types vegetation in the gen-tie line ROW:

1. Prior to ground-disturbing activities, an individual shall be designated and approved by the BLM as the Designated Biologist[1] (i.e. field contact representative) along with approved Biological Monitors as needed for construction, particularly within the Yuha MA. The Designated Biologist will be designated for the period during which on-going construction and post-construction monitoring and reporting by an approved biologist is required, such as annual reporting on habitat restoration. Each successive Designated Biologist will be approved by the BLM's Authorized Officer (i.e., BLM field manager, El Centro). The Designated Biologist will have the authority to ensure compliance with the conservation measures for the FTHL and will be the primary agency contact for the implementation of these measures. The Designated Biologist will organize and oversee the work of the biological monitors and have the authority and responsibility to halt activities that are in violation of the conservation measures. An organizational chart shall be provided to BLM prior to ground-disturbing activities

[1] A qualified Designated Biologist must have (1) a bachelor's degree with an emphasis in ecology, natural resource management, or related science; (2) three years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or the Wildlife Society (3) previous experience with applying terms and conditions of a biological opinion; and, (4) the appropriate permit and/or training if conducting focused or protocol surveys for listed or proposed species.

with a clear chain of command and contact information (cell phones). A detailed list of responsibilities for the Designated Biologist is summarized below. To avoid and minimize impacts to biological resources, the Designated Biologist will:

- Notify BLM's Authorizing Officer at least 14 calendar days before initiating ground disturbing activities.
- Immediately notify BLM's Authorized Officer in writing if the Project applicant is not in compliance with any conservation measures, including but not limited to any actual or anticipated failure to implement conservation measures within the time periods specified.
- Conduct compliance inspections at a minimum of once per month during on-going construction after clearing, grubbing, and grading are completed, and submit a monthly compliance report to BLM's Authorized Officer until construction is complete.

2. The boundaries of all areas to be disturbed (including staging areas, access roads, and sites for temporary placement of spoils) will be delineated with stakes and flagging prior to construction activities. Where feasible, the areas shall be cleared of FTHL and fenced (according to the Strategy) to exclude FTHL from re-entering these construction areas, particularly in the MA and other high-use areas such as for staging of equipment or parking areas. Spoils will be stockpiled in disturbed areas lacking native vegetation or where habitat quality is poor, such as the agricultural fields rather than native desert. To the extent possible, disturbance of shrubs and surface soils due to stockpiling will be minimized. All disturbances, vehicles, and equipment will be confined to the flagged and cleared areas. To the extent possible, surface disturbance will be timed to minimize mortality to FTHL (see FTHL Construction Measure #7 below).
3. Approved Biological monitor(s) will assist the Designated Biologist in conducting pre-construction surveys and in monitoring of mobilization, ground disturbance, grading, construction, operation, closure, and restoration activities. The biological monitor(s) will have experience conducting FTHL field monitoring, have sufficient education and field experience to understand FTHL biology, be able to identify FTHL scat, and be able to identify and follow FTHL tracks. The Designated Biologist will submit the resume, at least three references, and contact information of the proposed biological monitors to the BLM for approval. To avoid and minimize impacts to biological resources, the Biological Monitors will assist the Designated Biologist with the following:
   - Be present during construction (e.g., grubbing, grading, solar panel installation) activities that take place in FTHL habitat to avoid or minimize take of FTHL. Activities include, but are not limited to, ensuring compliance with all impact avoidance and minimization measures, monitoring for FTHLs and removing lizards from harm's way, and checking avoidance areas (e.g., washes) to ensure that signs, and stakes are intact and that human activities are restricted in these avoidance zones.
   - At the end of each work day, inspect all potential wildlife pitfalls (trenches, bores and other excavations) for wildlife and then backfill. If backfilling is not feasible, all trenches, bores, and other excavations will be contoured at a 3:1

slope at the ends to provide wildlife escape ramps, or completely and securely covered to prevent wildlife access.
  - During construction, examine areas of active surface disturbance periodically, at least hourly, when surface temperatures exceed 29°Celsius (C; 85°F) for the presence of FTHL.
4. Prior to Project initiation, a worker environmental awareness program (WEAP) will be developed and implemented, and will be available in both English and Spanish. Wallet-sized cards summarizing this information will be provided to all construction, operation, and maintenance personnel. The education program will include the following aspects:
   - biology and status of the FTHL,
   - protection measures designed to reduce potential impact to the species,
   - function of flagging designating authorized work areas,
   - reporting procedures to be used if a FTHL is encountered in the field, and
   - driving procedures and techniques, for commuting to, and driving on, the Project site, to reduce mortality of FTHL on roads.
5. FTHLs will be removed from harm's way during all construction activities, per item #6 below. To the extent feasible, methods to find FTHLs will be designed to achieve a maximal capture rate and will include, but not be limited to using strip transects, tracking, and raking around shrubs. During construction, the minimum survey effort will be 30 minutes per 0.40 ha (30 minutes per 1 ac). Persons that handle FTHLs will first obtain all necessary permits and authorization from the CDFG. If the species is federally listed, only persons authorized by both CDFG and USFWS will handle FTHLs. FTHL removal surveys will also include:
   - A Horned Lizard Observation Data Sheet and a Project Reporting Form, per Appendix 8 of the RMS, will be completed. During construction, quarterly reports describing FTHL removal activity, per the reporting requirements described in Mitigation Measure #1 above, will be submitted to the BLM.
6. The removal of FTHLs out of harm's way will include relocation to nearby suitable habitat in low-impact (e.g., away from roads and solar panels) areas of the Yuha MA. Relocated FTHLs will be placed in the shade of a large shrub in undisturbed habitat. If surface temperatures in the sun are less than 24° Celsius (C) 75° Fahrenheit (F) or exceed 38°C (100° F), the Designated Biologist or biological monitor, if authorized, will hold the FTHL for later release. Initially, captured FTHLs will be held in a cloth bag, cooler, or other appropriate clean, dry container from which the lizard cannot escape. Lizards will be held at temperatures between 75° F and 90° F and will not be exposed to direct sunlight. Release will occur as soon as possible after capture and during daylight hours. The Designated Biologist or biological monitor will be allowed some judgment and discretion when relocating lizards to maximize survival of FTHLs found in the Project area.
7. To the maximum extent practicable, grading in FTHL habitat will be conducted during the active season, which is defined as March 1 through September 30, or if ground temperatures are between 24°C (75° F) and 38 °C (100° F). If grading cannot be conducted during this time, any FTHLs found will be removed to low-impact areas (see above) where suitable burrowing habitat exists, (e.g., sandy substrates and shrub cover).

8. Temporarily disturbed areas associated with gen-tie line construction and staging areas on federal lands, will be revegetated according to the Site Reclamation and Revegetation Plan (SRRP) approved by the BLM. The SRRP must be approved in writing by the BLM prior to any vegetation-disturbing activities. Restoration involves recontouring the land, replacing the topsoil (if it was collected), and maintaining (i.e., weeding, replacement planting, supplemental watering, etc.), and monitoring the restored area for a period of 5 years (or less if the restoration meets all success criteria). Components of the SRRP will typically include:
    - The incorporation of Desert Bioregion Revegetation/Restoration Guidance measures. These measures generally include alleviating soil compaction, returning the surface to its original contour, pitting or imprinting the surface to allow small areas where seeds and rain water can be captured, planting seedlings that have acquired the necessary root mass to survive without watering, planting seedlings in the spring with herbivory cages, broadcasting locally collected seed immediately prior to the rainy season, and covering the seeds with mulch.

<u>Operations and Maintenance</u>

In order to reduce the potential impact to FTHL during O&M, the following will be implemented when conducting O&M along the Gen-tie line:

9. At least 15 days prior to the commencement of construction and within 15 days following completion of construction activities, the Designated Biologist will provide the BLM a Project FTHL Status Report, which will include, at a minimum:
    - A general description of the status of the project site within the MA.
    - A copy of the table in the Project biological monitoring report with notes showing the current implementation status of each conservation measure.
    - An assessment of the effectiveness of each completed or partially completed measure in avoiding and minimizing project impacts
    - A completed a Project Reporting Form from the Flat-tailed Horned Lizard Rangewide Management Strategy (RMS; ICC 2003)
    - A summary of information regarding any FTHL mortality in conjunction with the Project's Wildlife Mortality Reporting Program.
    - Recommendations on how conservation measures might be changed to more effectively avoid, minimize, and offset future project impacts on the FTHL.
10. The Designated Biologist or biological monitor(s) will evaluate and implement the best measures to reduce FTHL mortality along access and maintenance roads, particularly during the FTHL active season (March 1 through September 30). These measures will include:
    - A speed limit of 15 miles per hour when driving access roads within suitable FTHL habitat. The Designated Biologist may reduce this speed limit to 10 mph in areas identified as active wildlife corridors as needed to reduced mortality. All vehicles required for O&M within suitable FTHL habitat must remain on the designated access/maintenance roads. Cross country vehicle and equipment use outside of designated work areas in suitable FTHL habitat shall be prohibited.

- O&M activities occurring within suitable FTHL habitat including weed abatement or any other O&M activity that may result in ground disturbance will be conducted outside of the FTHL active season whenever feasible. If any O&M activities must be conducted during the FTHL active season that may result in ground disturbance within suitable FTHL habitat, such as weed abatement or vehicles requiring access outside of a designated access road, a biological monitor will be present during activities to reduce FTHL impacts.

Implementation of these measures would be based on annual FTHL activity levels, the best professional judgment of the Designated Biologist, and site specific road utilization. FTHL found on access/maintenance roads will be relocated out of harm's way by the Designated Biologist or qualified FTHL monitor.

Compensatory Mitigation

In accordance with the *Flat-tailed Horned Lizard Rangewide Management Strategy*, mitigation would be required for impacts to FTHL habitat. FTHL are known to occur in the native vegetation along the Proposed Gen-Tie and Alternative Gen-Tie across BLM land ROWs. In accordance with the *Rangewide Management Strategy*, compensation for permanent impact to this habitat within the MA will be at a 6:1 ratio. Acreages of proposed disturbance to FTHL habitat by alternative can be found in **Table 8**.

No mitigation for FTHL is required for the active agricultural land within the Campo Vesolar energy facility or the gen-tie Line alternatives, as agricultural lands do not provide habitat for this species.

B6 Nesting Raptors

Raptors and active raptor nests are protected under California Fish and Game Code 3503.5, 3503, 3513. In order to prevent direct and indirect noise impact to nesting raptors such as Red-tailed Hawk, the following measures should be implemented:

- To the extent practicable, initial grading and clearing within the project site should take place outside the raptors' breeding season of February 1 to July 15.
- If construction occurs between February 1 and July 15, an approved biologist shall conduct a pre-construction clearance survey for nesting raptors in suitable nesting habitat (e.g., tall trees or transmission towers) that occurs within 500 feet of the survey area. If any active raptor nest is located, the nest area will be flagged, and a 500-foot buffer zone delineated, flagged, or otherwise marked. No work activity may occur within this buffer area, until an approved biologist determines that the fledglings are independent of the nest.

<u>Operations and Maintenance Impact Mitigation</u>

Mitigation for potential impact to raptors and other avian species due to collision with the Proposed Gen-Tie Line is discussed below in Mitigation Measure B7 (Mitigation for Migratory Birds and Other Sensitive Non-migratory Bird Species), including the development of an BBCS.

B7 Migratory Birds and Other Sensitive Non-migratory Bird Species

In order to reduce the potential indirect impact to migratory birds, bats and raptors, a Bird and Bat Conservation Strategy (BBCS) will be prepared following the USFWS's guidelines and then implemented by the Project proponent. This BBCS will outline conservation measures for construction and O&M activities that might reduce potential impacts to bird populations and will be developed by the applicant in conjunction with and input from the USFWS.

Construction Conservation Measures

Construction conservation measures to be addressed in the BBCS include:

- Minimizing disturbance to vegetation to the maximum extent practicable.
- Clearing vegetation outside of the breeding season. If construction occurs between February 1 and September 15, an approved biologist shall conduct a pre-construction clearance survey for nesting birds in suitable nesting habitat that occurs within the proposed area of impact. Pre-construction nesting surveys will identify any active migratory birds (and other sensitive non-migratory birds) nests. Direct impact to any active migratory bird nest should be avoided.
- Minimize wildfire potential.
- Minimize activities that attract prey and predators.
- Control of non-native plants
- Apply APLIC design guidelines for overhead utilities (APLIC 2006) by incorporating recommended or other methods that enhance the visibility of the lines to avian species.

Operations and Maintenance Measures

Operations and maintenance conservation measures to be incorporated into the BBCS include:

- Preparation of a Raven Control Plan that avoids introducing water and food resources in the area surrounding the solar energy facility.
- Incorporate APLIC guidelines for overhead utilities as appropriate to minimize avian collisions with Gen-tie Line facilities (APLIC 2006).
- Minimize noise
- Minimize use of outdoor lighting.
- Implement post—construction avian monitoring that will incorporate the Wildlife Mortality Reporting Program

B8 Jurisdictional Waters

The Proposed Action may impact CDFG jurisdictional riparian habitat. Mitigation for permanent impacts to CDFG riparian habitat is typically at a 2:1 ratio, while mitigation for temporary impacts to CDFG riparian habitat is typically at a 1:1 ratio. A Section 1600 Streambed Alteration Agreement would also need to be authorized for impact to CDFG resources.

6.0 CUMULATIVE EFFECTS

The proposed project has the potential to result in impacts to sensitive vegetation communities, flat-tailed horned lizards, Burrowing Owls, Mountain Plovers, migratory birds, and jurisdictional water resources. However, with the implementation of the mitigation measures outlined in Section 5, these impacts would be reduced to a level of less than significant. As with the proposed project, each of the following projects would be required to provide mitigation for any impacts to biological resources; therefore, the proposed project would not contribute to a significant cumulative biological resources impact.

Table 10 – Approved and/or Proposed Projects In Imperial Valley Under BLM Jurisdiction

Project Name	Description of Project	Impacts	Size/Location	Assumption s	Status
Centinela Solar Energy, LLC	230-kV line. Develop electric-generating facility with normal capacity of 275 megawatts using photovoltaic solar power. Constructed on approximately 1,861 acres. Construction done in two phases and will include operation and administration building, maintenance building, control building, and utilities and services for ancillary facilities and structures.	Impacts to sensitive vegetation communities, the burrowing owl, mountain plovers, migratory birds, flat-tailed horned lizard, and jurisdictional waters. Mitigation reduces impacts to less than significant.	7.5 miles southwest of the City of El Centro in the Mt. Signal Area.	2.75 mile gen-tie line; 1.25 miles on BLM land. 1,861 acres of permanent impact on active ag land and 5 acres permanent impact in native desert.	ROW Grant and EIR Certification end of December 2012.
"S" Line Upgrade 230-kV Transmission Line Project (Imperial Irrigation District)	The "S" Line route runs the IID/San Diego Gas & Electric Imperial Valley Substation located on BLM lands. The project is located in Imperial County. The IID proposes to upgrade about 18 miles of the 230-kV overhead electrical transmission line by installing (+/-) 285 new double-circuit steel poles (including all existing polymer horizontal insulators) to replace the	Impacts to the burrowing owl, Yuma clapper rail, and flat-tailed horned lizard. Mitigation reduces impacts to less than significant.	18 miles various Composed segments. I-8, Hwy 86, 10 miles southwest of the City of El Centro, near Liebert and Wixom Toads, to the north and terminating at the EL Centro Switching Station on Dogwood Road new Villa Road.	For 18 miles of transmission line there are 108 acres of disturbance to BLM land (not all of this is BLM, 2.151 acres is on BLM land and the rest is on private land).	End review 12/17/2009; MND filed with mitigation measures. ROW amended/ Renewed 03/2010.

Project Name	Description of Project	Impacts	Size/Location	Assumptions	Status
	existing wood poles supporting a single 230-kV circuit. The execution plan is to complete the pole replacement and upgrades in three poles. The "S" Line would be upgraded at distinct locates with an assigned order of importance on the basis of system outages, structural reliability, risk, construction feasibility, and costs.				
Imperial Valley Solar (Stirling Energy Systems Two, LLC)	230-kV line (proposed in DEIS that is currently out on CEC website)-CACA-047740. Develop electric-generating facility with normal capacity of 709 megawatts using concentrated solar power. Constructed on approximately 6,500 acres (10 square miles). Construction done in two phases and will include operation and administration building, maintenance building, water treatment system, yard tanks, control building, and utilities and	Visual resources are significant and unavoidable. All others less than significance after mitigation. Biological resources impact to 92.8 acres of Sonoran creosote brush scrub. Compensatory mitigation for 6,619.9 acres of FTHL suitable habitat. Loss of approximately 165 acres of waters of the U.S. and 840 acres of CDFG jurisdictional streambeds. Impacts to 328 known prehistoric	Imperial Valley, 100 miles east of San Diego, 14 miles west of EL Centro, and 4 miles east of Ocotillo Wells.	Impacts of 6,571 acres of BLM lands and 93 acres of Yuha FTHL MA. Impacts to 840 acres of CDFG jurisdictional streambeds. Impacts to 328 known prehistoric and historical surface archaeological	BLM ROD signed on 9/28/10. CEQ decision on 9/29/10.

Project Name	Description of Project	Impacts	Size/Location	Assumptions	Status
	services for ancillary facilities and structures.	and historical surface archaeological resources. Paleontological resources are documented and are likely. DESCP would mitigate potential storm water and sediment project-related impacts. Potential surface and groundwater impacts. Conversion of approximately 6,500 acres of land-mitigation is required.		resources.	
Sunrise 500-kV Line IV West Solar Farm Interconnection to Imperial Valley Substation (authorized, parallels the South West Powerlink 500-kV Line-CACA-047658	The project also includes new 230-kV and 138-kV transmission lines and a 230-kV substation and rebuilt 138-kV substation. The U.S. Bureau of Reclamation is the lead agency with BLM as a cooperating agency. IB substation is completely surrounded by BLM land (5 miles of new transmission lines in the Yuha Desert). Project will be 120 feet wide and is proposed to run northwest of the Imperial	Primary issues include cultural (historic properties, Native American lands, and archeological resources), biological (Flat-tailed horned lizard and Western Burrowing Owl), and paleontological (fossils). 7.65 acres of permanent impact. 12.2 acres of temporary impact. 770 acres of BLM land.	Imperial Valley to Penasquitos. Located in the Yuha Basin Area of Critical Habitat in the southwestern portion of Imperial County. 8/9 miles southwest of the town of El Centro. Map included.	Impact to 180.1 acres of Yuha FTHL MA.	POWER Engineers Final Environmental Impact Statement (EIS) complete. ROW authorized 02/2009

Project Name	Description of Project	Impacts	Size/Location	Assumptions	Status
	Valley Substation in the shortest route possible while retaining a buffer of a minimum of 500 feet away from private land in the area.				
C Solar Development LLC West	CSOLAR Development, LLC West proposed 230-kV line (follows the Dixieland Line alignment) CACA-051644. 250 megawatts of electricity on 1,100 acres of previously disturbed private farmland. Will cross 0.5 mile of public land and then aligns to the existing Southwest Powerlink.	Proposed ROW lies within the Yuha Basin ACEC and in the Yuha Desert Management Area for the flat-tailed horned lizard. Will fully mitigate impacts. Permanently impact 9 acres of public lands (will use existing access to minimize impact). 69.9 acres of BLM land	Follows the 230-kv lines from the international border going north alignment. Map in reference document.	Impacts to 13.7 acres of BLM Land and 3 acres of Yuha FTHL MA.	Draft plan for development complete 1/25/10. Currently working on NEPA analysis.
SDG&E Photovoltaic Solar Field	SDG&E proposed photovoltaic solar field. CACA-051625. Producing 12 to 14 megawatts of renewable energy.	To be determined in the plan of development (POD). 351.250 (this number will be reduced per their new POD) acres of impact to BLM land.	Located on approximately 100 acres of federal land directly adjacent to SDG&E's Imperial Valley substation.	Impacts to biological resources have yet to be assessed fully. Impacts to 100 acres of BLM Lands.	Application submitted for transportation and utility systems.
North Gila to Imperial Valley	Southwest Transmission Partners double-circuit 500-	Visual impacts would minimized to the extent	Between North Gila Substation in	Impacts to 450	STP is preparing a

Project Name	Description of Project	Impacts	Size/Location	Assumptions	Status
#2 (Southwest Transmission Partners)	kV line coming in from the east. Project would provide high-voltage transmission capacity in the southeastern U.S> to facilitate the development and interconnection of renewable energy. The total ROW will be approximately 1,903 acres of BLM Land. Project will be approximately 75 miles long. CACA51575.	possible by locating the structures of the new line adjacent to and with the same spacing as existing structures. Impacts to biological resources will result. 13,881.02 acres of BLM land.	Yuma County, Arizona and the Imperial Valley Substation in Imperial County. Project will follow the same route as existing Southwest Powerlink 500-kV line.	acres of BLM Lands and approximately 3 acres of Yuha FTHL MA disturbed.	Plan of Development. Have not started on the NEPA analysis.
Dixieland Connection to IID Transmission System	Interconnection of IID's "S" Line from the IID Substation to the Imperial Valley Substation Route.	Lies in the Yuha Basin ACEC in the Yuha Desert Management Area for flat-tailed horned lizards and Western burrowing owl (impacts will be mitigated). Potential impacts to cultural and paleontological resources.	Follows the 230-kV lines from the international border going north alignment. Approximately 10 to 12 miles southwest of the City of El Centro, Imperial County.	20 acres of impacts to FTHL and Western burrowing owl. 34.2 acres of land disturbed.	Application filed and currently still in planning phases.
C Solar Development LLC	CSOLAR Development, LLC West proposed solar energy facility consisting of three primary components: 1) the construction and operation of a 200 Megawatt Imperial Solar Energy Center	The proposed 120-foot ROW for the electrical transmission line corridor and an existing dirt access road that would be widened by five feet to provide	The proposed access road traverses both BLM lands and private land, and is located on the west side of the Westside Main Canal. The	Impacts to 10.1 acres of disturbed lands under the jurisdiction of BLM.	Final EA, April 2011.

Project Name	Description of Project	Impacts	Size/Location	Assumptions	Status
	South solar energy facility; 2) the construction and operation of electrical transmission lines that would connect the solar power facility to the existing Imperial Valley Substation; and, 3) the improvement and use of an existing dirt access road, a portion of which traverses BLM lands. As part of the project, the facility would interconnect to the utility grid at the 230 kV side of the Imperial Valley Substation via a 230 kV electrical transmission line and associated access.	secondary access are both located in the Yuha Basin ACEC in the Yuha Desert Management Area for flat-tailed horned lizards. Potential impacts to cultural and paleontological resources.	proposed transmission lines and a portion of the access road would be located within the Yuha Desert, and within BLM's Utility Corridor "N" of the California Desert Conservation Area plan (the CDCA Desert Plan).		
Mount Signal Solar Farm	Proposed 82-LV line (follows the C Solar Imperial Solar Energy Center South alignment). Project would create 200 megawatts of electricity on 1,375 acres of private farmland in the Imperial Valley. Proposed transmission line route would parallel existing 230 kV lines and share transmission line with C Solar Imperial Valley Energy	Lies in the Yuha Basin ACEC in the Yuha Desert Management Area for flat-tailed horned lizards and Western burrowing owl (impacts will be mitigated). Potential impacts to cultural and paleontological resources.	Located on 1,375 acres of privately owned land located 2.5 to 7.5 miles west of Calexico in southern Imperial County. Right-of-Way is located within BLM lands.		Application filed and currently working on NEPA Analysis.

Project Name	Description of Project	Impacts	Size/Location	Assumptions	Status
	South project.				

Table 11 – Approved and/or Proposed Projects In Imperial Valley Under Imperial County Jurisdiction

ID	Project Name/Agency ID	Location	Ownership	Status	Project Description
1	Las Aldeas Specific Plan	North of Adams Avenue, east of Austin Road and west of La Brucheri Road	Las Aldeas Specific Plan Westshore (Lerno) Development	City of El Centro working on staff report and condition of approval.	The Las Aldeas Specific Plan project is a mixed-use project of 2,156 single-family residential units, 84 multifamily residential units, 467 4-plex residential units, 27.95 acres of commercial zoning, 10.79 acres of light manufacturing zoning, 21.78 acres of park, 48.18 acres of retention basin, and 23.09 acres for two school sites.
2	Linda Vista	West side of Clark Road and I-8 and McCabe Road	City of El Centro Brent Grizzle		The Linda Vista project is a mixed-use project consisting of 182 single-family homes and a 6-acre commercial lot.
3	Desert Village #6	West of Clark Road between I-8 and Home Road	City of El Centro	Approved granted extension of 2 years for filing final map of subdivision (Aug. 2008)	The Desert Village Project #6 consists of 95 single-family homes, 260 apartments, and 7.3 acres of commercial.
4	Commons	East side of Dogwood Avenue between I-8 and	City of El Centro		The Commons is a regional shopping center of 780,000

ID	Project Name/Agency ID	Location	Ownership	Status	Project Description
		Danenberg Drive			square feet.
5	Imperial Valley Mall	Southeast corner of Dogwood Road and Danenberg Road	City of El Centro		The Imperial Valley Mall consists of a regional shopping center of 1,460,000 square feet and 306 single-family houses
6	Miller Burson	South of Ross Road and east of Austin Road	Miller Burson Development Design and Engineering	Responses to Draft EIR under preparation.	The Miller Burson project consists of a 570 single-family residential project.
7	Courtyard Villas	Northwest of I-8 and Austin Road	City of El Centro	EIR in Process	The Courtyard Villas is a project consisting of 54 single-family homes.
8	Willow Bend (East) & Willow Bend (West)	Northeast corner of Clark Road and McCabe Road	City of El Centro		The Willow Bend (East) and Willow Bend (West) is a combined project of 216 single-family homes.
9	Lotus Ranch	Southwest corner of I-8 and La Brucheri Road.	Gary McPhetrige	On hold per applicant request (June 2008)	The Lotus Ranch project is a residential project of 616 single-family homes and a 600-student elementary school.
10	Mosaic	South of SR-86 and bisected by Dogwood Ranch		EIR in Process	The Mosaic project is a residential project of 1,156 single-family units and 2.7 acres of commercial.

ID	Project Name/Agency ID	Location	Ownership	Status	Project Description
11	Hallwood/Calexico Place 111 & Casino	Southwest corner of SR-111 and Jasper Road	City of Calexico	Approved	The Calexico Place 111 and Casino project is a mixed-use project of residential, commercial, and casino.
12	Calexico Mega Park	Southeast corner of SR-111 and Jasper Road			The Calexico Mega Park project is a mixed-use project of a commercial and regional shopping center.
13	County Center II Expansion	Southwest corner of McCabe Road and Clark Road (8th Street in the City of El Centro)	County and ICOE	EIR in Process	mixed-use project of a commercial center, expansion of the Imperial County Office of Education, a Joint-use Teacher Training and Conference Center, Judicial Center, County Park, Jail Expansion, County Administrative Complex, Public Works Administration, and a County Administration Complex.
14	Desert Springs Oasis	Northwest of the Boley Road and Westmoreland Road	Rob and Don Preston of the Barone Group	EIR in Process	The project components include the construction of a geothermal brine processing facility, a 49.9-MW (net) turbine-generator facility, 230-

ID	Project Name/Agency ID	Location	Ownership	Status	Project Description
					kV switchyard, power distribution centers, and a short interconnection transmission line to the IID electrical transmission grid exporting generated power.
15	Mt. Signal	Eight miles southwest of the City of El Centro	MMR Power Solutions, LLC		The Mt. Signal project is a proposed 49.4 megawatt solar hybrid power station on roughly 974 acres.
16	Coyote Wells (Wind Zero)	Ocotillo/Nomirage Area	Wind Zero Group, Inc.	Approved	The project is a 944+/- acre privately owned law enforcement training facility to meet the needs of local and regional law enforcement and public safety agencies. This project includes several closed circuit road tracts, shooting ranges, tactical training buildings, classrooms, temporary housing, RV park, 2 heliports, airstrip, along with a number of support facilities
17	Granite Carroll Sand and	4 miles northwest of	Granite	Approved	The Granite Carroll

ID	Project Name/Agency ID	Location	Ownership	Status	Project Description
	Gravel Mine	Ocotillo			Sand and Gravel Mine is a mining operation project.
18	Imperial Valley Solar Project (Formerly SES Solar Two)	4 miles east of Ocotillo	BLM	BLM's Record of Decision Signed	The Imperial Valley Solar Project is an electric generating facility capable of producing approximately 750 megawatts of electricity on approximately 6,500 acres.
19	Imperial Solar Energy Center West	8 miles west of the City of El Centro		EIR/EA in Process	The Imperial Solar Energy Center West project is a photovoltaic solar facility capable of producing approximately 250 megawatts of electricity on approximately 1,130 acres.
20	Imperial Solar Energy Center South	Mt. Signal area of unincorporated Imperial County, approximately eight miles west of the City of Calexico.	CSOLAR Development, LLC	Final EIR, April 2011.	The proposed solar energy facility consists of three primary components: 1) the construction and operation of a 200 Megawatt Imperial Solar Energy Center South solar energy facility; 2) the

ID	Project Name/Agency ID	Location	Ownership	Status	Project Description
					construction and operation of electrical transmission lines that would connect the solar power facility to the existing Imperial Valley Substation; and, 3) the improvement and use of an existing dirt access road, a portion of which traverses BLM lands. As part of the project, the facility would interconnect to the utility grid at the 230 kV side of the Imperial Valley Substation via a 230 kV electrical transmission line and associated access.
21	Superstition Solar 1	Westmorland	Superstition Sunpeak	EIR in Process	The Superstition Solar 1 project is a photovoltaic solar energy facility capable of producing 500 megawatts of electricity on approximately 5,516 acres.
22	Mount Signal Solar	Mt. Signal	8 Minute	In Process	The Mount Signal Solar project is a solar energy

ID	Project Name/Agency ID	Location	Ownership	Status	Project Description
					project located on approximately 1,375 acres of agriculture land and will produce approximately 200 megawatts of electricity.
23	Bethel Solar X, Inc	Calexico	Jim Doyle	In Process	The Bethel Solar X, Inc project is a solar hybrid energy project that will produce approximately 49.40 megawatts of electricity on approximately 571 acres of land.
24	Energy Solar Source I, LLC	Niland	Energy Source	In process	The Energy Solar Source I project is a solar energy project that will produce 80 megawatts of electricity on approximately 480 acres of land.
25	Energy Solar Source II, LLC	Niland	Energy Source	In process	The Energy Solar Source II project is a solar energy project that will produce 80 megawatts of electricity on 480 acres of land.
26	Salton Sea Solar Farm I	Calipatria	8 minute/81BM	County of Imperial just received	The Salton Sea Solar Farm I project is a solar energy project that will produce approximately

ID	Project Name/Agency ID	Location	Ownership	Status	Project Description
					49.9 megawatts of electricity on approximately 320 acres of land.
27	Salton Sea Solar Farm Ii	Calipatria	8 minute/81BM	County of Imperial just received	The Salton Sea Solar Farm II project is a solar energy project that will produce approximately 100 megawatts of electricity on approximately 623 acres of land.
28	Calipat Solar Farm I	Calipatria	8 minute energy	County of Imperial just Received	The Calipat Solar Farm I project is a solar energy project that will produce approximately 50 megawatts of electricity on approximately 280 acres of land.
29	Calipat Solar Farm II	Calipatria	8 minute energy	County of Imperial just received	The Calipat Solar Farm II project is a solar energy project that will produce approximately 50 megawatts of electricity on approximately 280 acres of land.
30	Frink Road Solar Power	Niland	Granite Construction	County of Imperial in process	The applicant Granite Construction Company proposes to construct a

ID	Project Name/Agency ID	Location	Ownership	Status	Project Description
					Solar Power Generator Farm. It will be comprised of 436 Integrated High Concentration Photovoltaic Solar Power Generators, 200 Square foot single story equipment building, twenty three (23) concrete transformer pads, onsite water storage tank, and an all weather fire access road. Additionally, a 10-acre substation is proposed to be constructed in the northern portion of the project site.
31	Keystone Solar Power	Mesquite SPA	Granite Construction	County of Imperial in process	The Applicant, Granite Construction Company, is proposing to operate a 6.06 megawatt photovoltaic solar plant. The project would include a 200-square foot single story equipment building five (5) concrete transformer pads, an all-weather fire access

ID	Project Name/Agency ID	Location	Ownership	Status	Project Description
					road, a water storage tank and 88 high-concentration photovoltaic (HCPV) Solar Power Generators (Machines).
32	Midway Solar Farm I	Calipatria	8 minute	County of Imperial just received	The Midway Solar Farm I project is a solar photovoltaic project that will produce approximately 50 megawatts of electricity on approximately 326 acres of land.
33	Midway Solar Farm II	Calipatria	8 minute	County of Imperial just received	The Midway Solar Farm II project is a solar photovoltaic energy project that will produce approximately 155 megawatts of electricity on approximately 803 acres of land.
34	IV Solar Company	Niland	Sun Peak Solar	Approved	The IV Solar Company project is a solar photovoltaic energy project that will produce approximately 23 megawatts of electricity on approximately 123

ID	Project Name/Agency ID	Location	Ownership	Status	Project Description
					acres of land.
35	Chocolate Mountain	Niland	8minute Energy	Approved	The Chocolate Mountain is a solar photovoltaic energy project that will produce approximately 49.9 megawatts of electricity on approximately 320 acres of land.
36	Ocotillo Express	Ocotillo	Pattern Energy	EIR/EIS in progress	The Ocotillo Express Wind Project consists of the construction and operation of wind turbine generators and associated facilities necessary to successfully generate up to 550 megawatts of electrical energy.
37	Hudson Ranch II	Niland	HR Power II	EIR to be prepared	The Hudson Ranch II project is a geothermal energy project that will produce approximately 49.9 megawatts of electricity on approximately 326.26 acres of land.
38	Black Rock Unit # 1 2 3 Geothermal Project	Niland	Calenergy	Approved by Imperial County Planning	Black Rock Unit # 1 2 3 project is a

ID	Project Name/Agency ID	Location	Ownership	Status	Project Description
				Department and California Energy Commission	geothermal energy project that will produce approximately 159 megawatts of electricity on approximately 160 acres of land.
39	Wister Project	Niland	Ormat	EIR in process	The Wister Project is a 49.9 net MW geothermal power plant that will includes up to 50 geothermal water wells. This project is located in within the Salton Sea Known Geothermal Resource Area (KGRA). The project site is currently agricultural.
40	Ram Power/Overlay	Brawley	Ram Power	EIR in process	Ram Power Overlay is a geothermal energy project that will produce approximately 50 megawatts of electricity on approximately 27,875 acres of land.
41	Orni 19	Brawley	Ormat	EIR in Process	ORNI 19, LLC/Ormat Nevada Inc. proposes to permit, construct, operate and maintain

ID	Project Name/Agency ID	Location	Ownership	Status	Project Description
					the East Brawley Geothermal Development Project that would consist of the following facilities. A 49.9 net MW geothermal power plant consisting of up to six (6) OEC binary generation units (12.5 MW gross each) with vaporizers, turbines, generators, condensers, pre-heaters, pumps and piping, motive fluid (isopentene) storage, a motive fluid vapor recovery system, a gas scrubber and a regenerative thermal oxidizer (RTO) and related equipment.
42	USS Mount Signal	7 miles southwest of the community of El Centro, California	USS MSS Permits, LLC	CUP Application Received/EIR to be prepared	The proposed project is a photovoltaic (PV) solar generating facility located approximately 7 miles southwest of the community of El Centro, California. The approximately 2,267 acre project site is located south of

ID	Project Name/Agency ID	Location	Ownership	Status	Project Description
					Interstate 8 and west of Drew Road and is currently private land used for agriculture.
43	Mayflower Solar Farm Project	5.5 mile south southeast of the town of Calipatria	Solar Gen 2,LLC	CUP Application Received 6/24/11	The project is a nominal 50 megawatt alternating current (MWAC) solar photovoltaic (PV) energy generation project on approximately 482 acres.
44	Arkansas	2.5 miles east of the town of Calipatria	Solar Gen 2, LLC	CUP Application Received 6/24/11	The project is a nominal 50 megawatt alternating current (MWAC) solar photovoltaic (PV) energy generation project on approximately 481 acres.
45	Sonora	4.5 miles north northeast of the town of Calipatria	Solar Gen 2, LLC	CUP Application Received 6/27/11	The project is a nominal 50 megawatt alternating current (MWAC) solar photovoltaic (PV) energy generation project on approximately 488 acres.
46	Alhambra	3.5 miles south southeast	Solar Gen 2, LLC	CUP Application	The project is a

ID	Project Name/Agency ID	Location	Ownership	Status	Project Description
		of the town of Calipatria		Received 6/24/11	nominal 50 megawatt alternating current (MWAC) solar photovoltaic (PV) energy generation project on approximately 482 acres.
47	Acorn Greenworks	9.7 miles southwest of El Centro just west of the Westside Main Canal.	Silverado Power, LLC dba Acorn Greenworks, LLC	CUP Application Received 6/30/11.	The project is a 150 megawatt alternating current solar photovoltaic (PV) project with 5,280 feet of transmission line. The project site is comprised of seven parcels (APN 051-380-032, 033, 052-170-027, 072, 073, 01 & 051-390-023) on 693 acres.
48	Silverleaf Solar Energy	Approximately 7 Miles southwest of El Centro	Agile Energy	Applications pending to County and BLM	Project is 160 MW PV solar project with 230-kV transmission gen-tie crossing same BLM land as Campo Verde Project. Solar site is on approximately 1,096 acres of private land currently in active agricultural production

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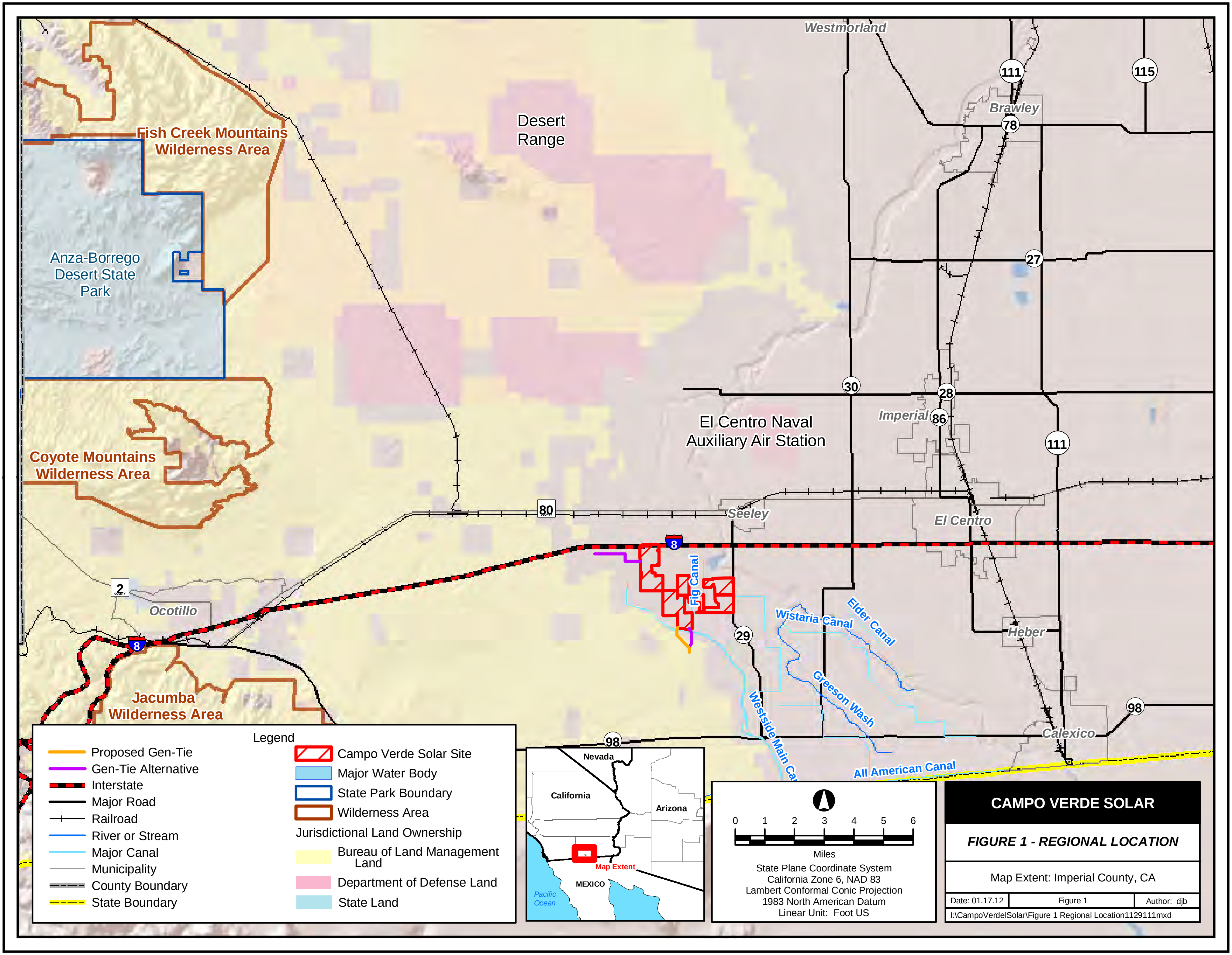
ATTACHMENTS

ATTACHMENT 1 - FIGURES



Westmorland
Brawley
111
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111
El Centro Naval
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Coyote Mountains
Wilderness Area
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Heber
Jacumba
Wilderness Area
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Calexico
All American Canal
Legend
Proposed Gen-Tie
Gen-Tie Alternative
Interstate
Major Road
Railroad
River or Stream
Major Canal
Municipality
County Boundary
State Boundary
Campo Verde Solar Site
Major Water Body
State Park Boundary
Wilderness Area
Jurisdictional Land Ownership
Bureau of Land Management
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Department of Defense Land
State Land
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California
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California Zone 6, NAD 83
Lambert Conformal Conic Projection
1983 North American Datum
Linear Unit: Foot US
CAMPO VERDE SOLAR
FIGURE 1 - REGIONAL LOCATION
Map Extent: Imperial County, CA
Date: 01.17.12
Figure 1
Author: djb
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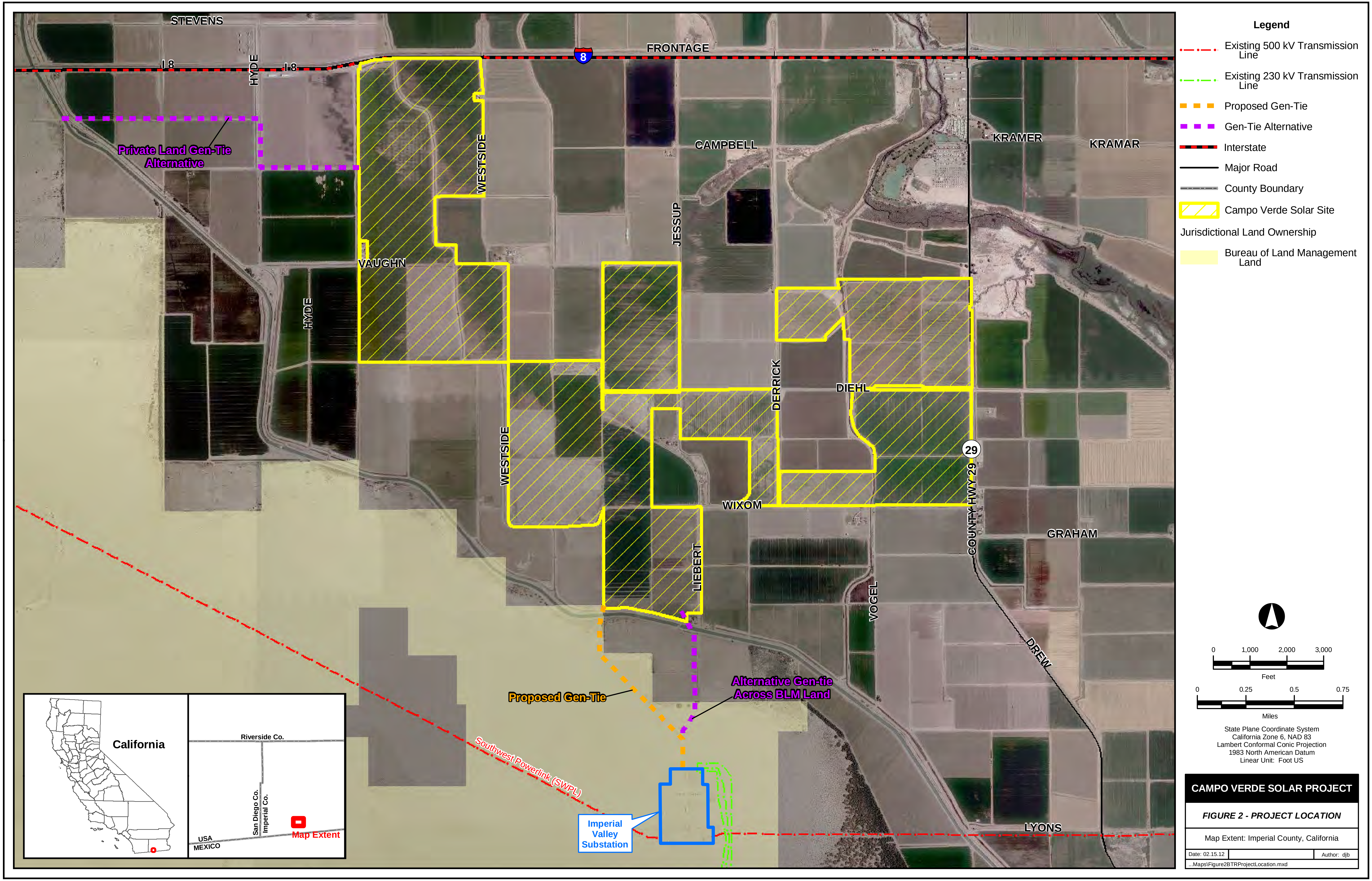

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Private Land Gen-Tie Alternative
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DERRICK
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WESTSIDE
29
WIXOM
COUNTY HWY 29
GRAHAM
LIEBERT
VOGEL
DREW
Proposed Gen-Tie
Alternative Gen-tie Across BLM Land
Southwest Powerlink (SWPL)
Imperial Valley Substation
LYONS
California
Riverside Co.
San Diego Co.
Imperial Co.
USA
MEXICO
Map Extent
Legend
Existing 500 kV Transmission Line
Existing 230 kV Transmission Line
Proposed Gen-Tie
Gen-Tie Alternative
Interstate
Major Road
County Boundary
Campo Verde Solar Site
Jurisdictional Land Ownership
Bureau of Land Management Land
0 1,000 2,000 3,000
Feet
0 0.25 0.5 0.75
Miles
State Plane Coordinate System
California Zone 6, NAD 83
Lambert Conformal Conic Projection
1983 North American Datum
Linear Unit: Foot US
CAMPO VERDE SOLAR PROJECT
FIGURE 2 - PROJECT LOCATION
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Date: 02.15.12
Author: djb
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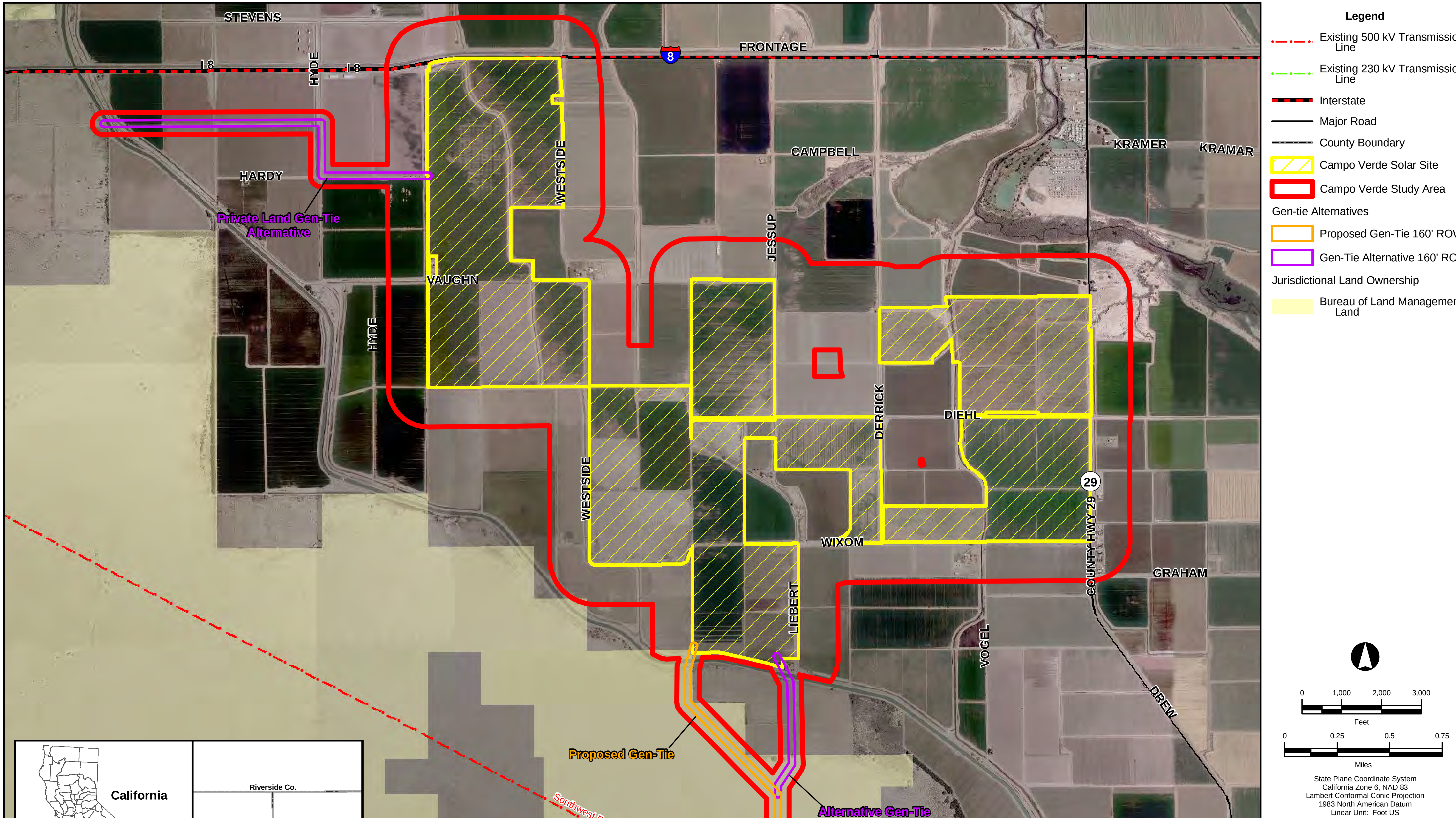

CAMPO VERDE SOLAR PROJECT

FIGURE 3 - SURVEY AREA

Map Extent: Imperial County, California

Date: 02.15.12 Author: djb

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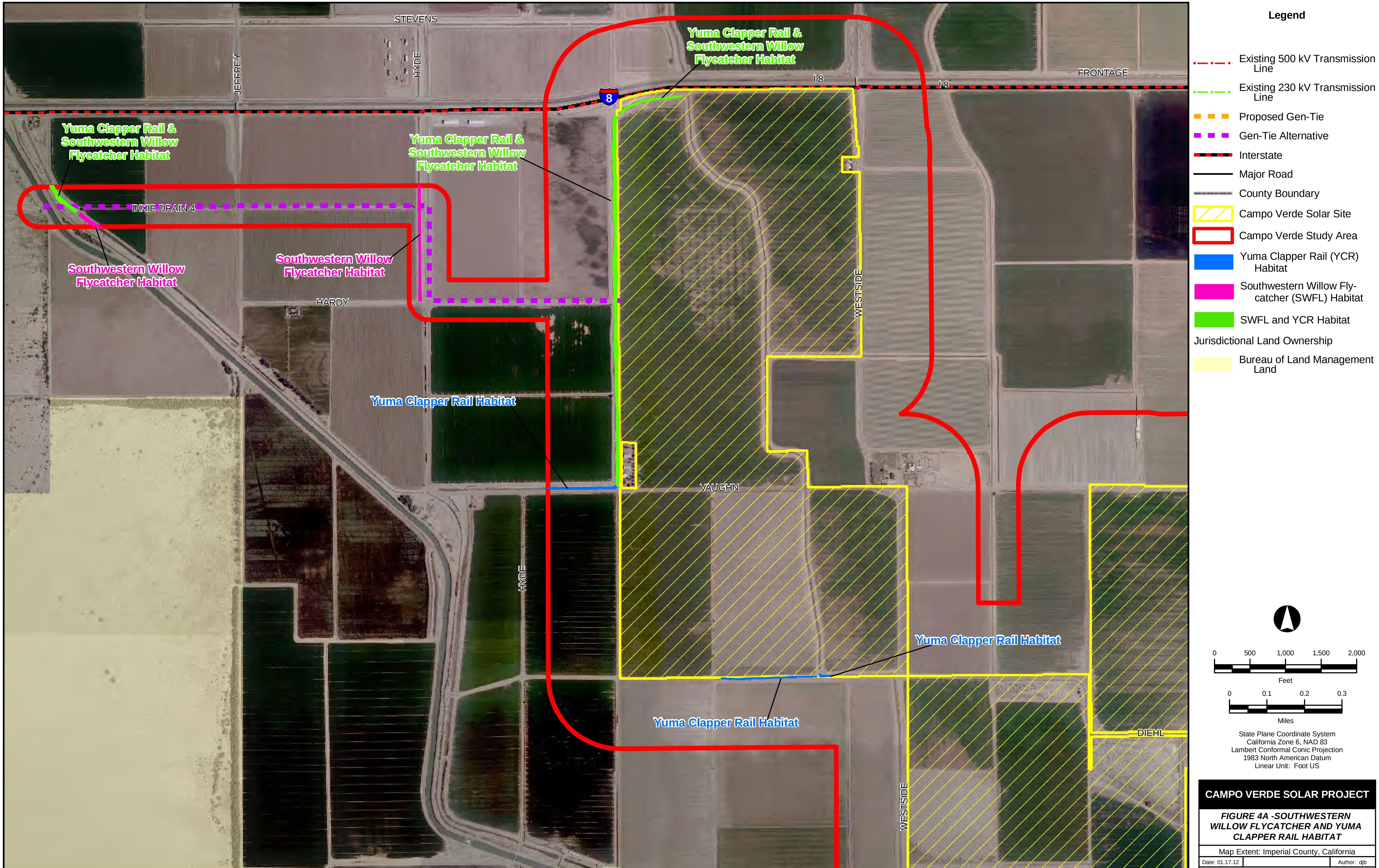

CAMPO VERDE SOLAR PROJECT

FIGURE 4A -SOUTHWESTERN WILLOW FLYCATCHER AND YUMA CLAPPER RAIL HABITAT

Map Extent: Imperial County, California

Date: 01.17.12 | Author: djb

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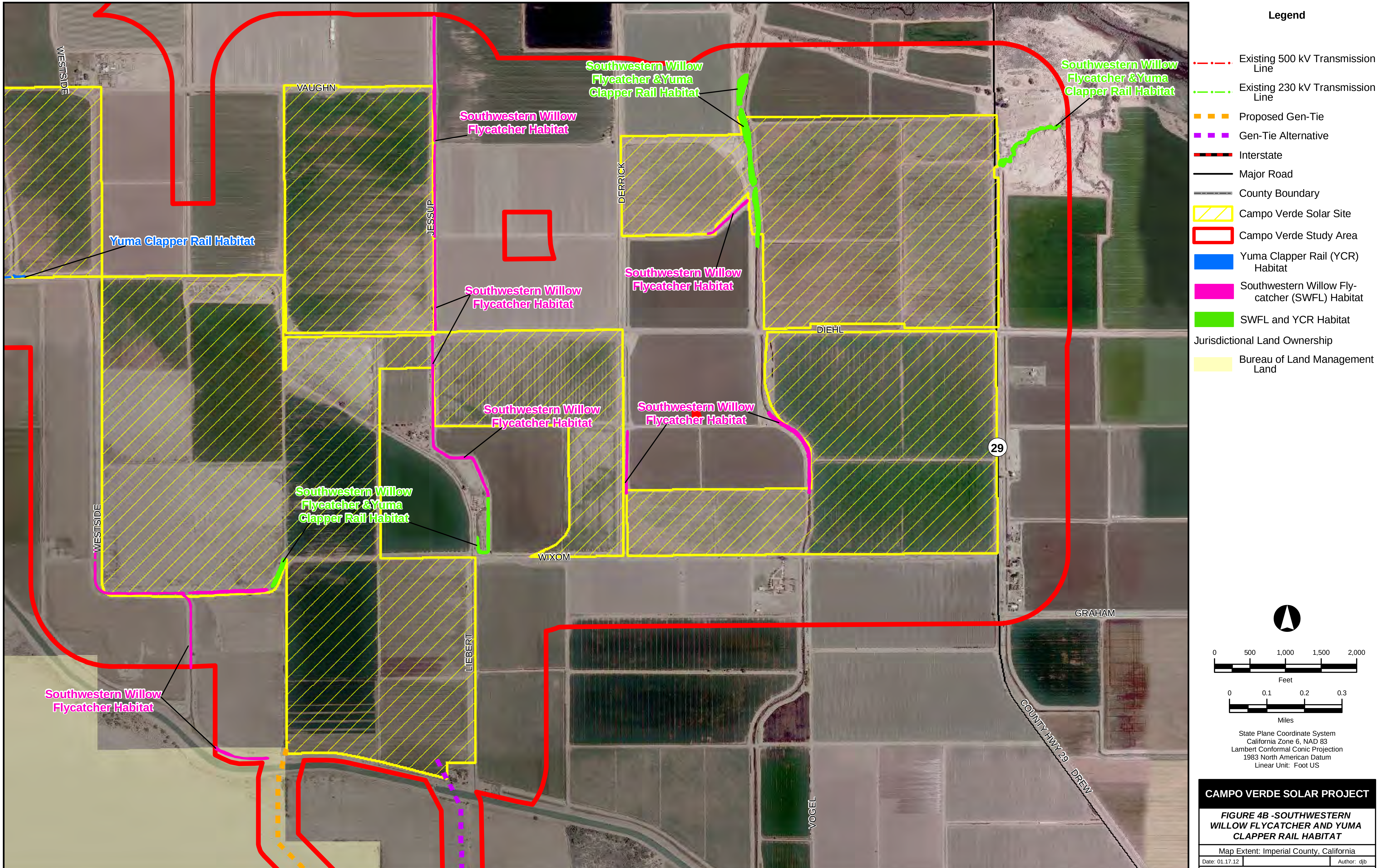


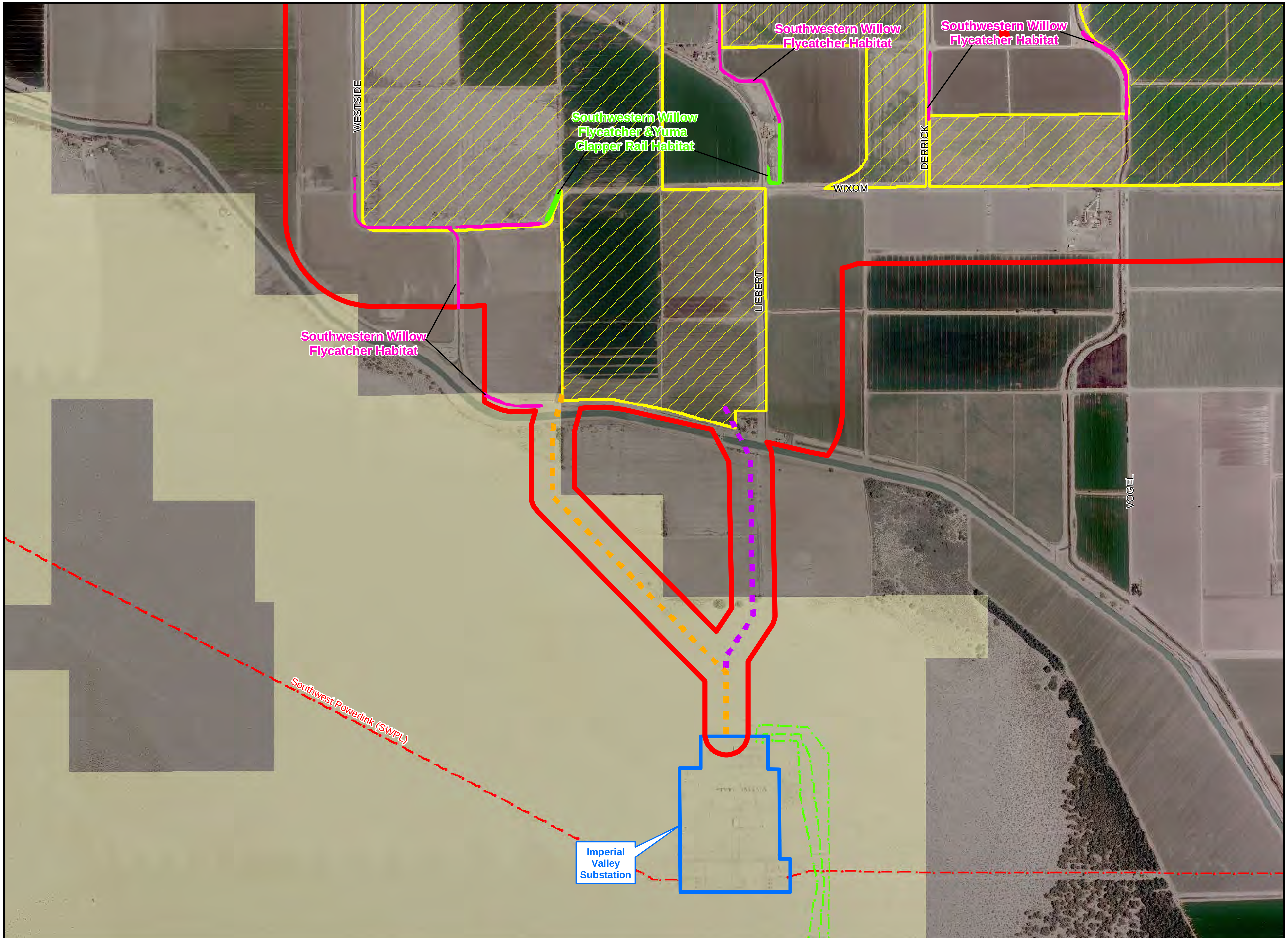
CAMPO VERDE SOLAR PROJECT

FIGURE 4B -SOUTHWESTERN WILLOW FLYCATCHER AND YUMA CLAPPER RAIL HABITAT

Map Extent: Imperial County, California

Date: 01.17.12 Author: djb

...Maps\SWFL and YCR Habitat.mxd



Legend

- Existing 500 kV Transmission Line
- Existing 230 kV Transmission Line
- Proposed Gen-Tie
- Gen-Tie Alternative
- Interstate
- Major Road
- County Boundary
- Campo Verde Solar Site
- Campo Verde Study Area
- Yuma Clapper Rail (YCR) Habitat
- Southwestern Willow Fly-catcher (SWFL) Habitat
- SWFL and YCR Habitat

Jurisdictional Land Ownership

- Bureau of Land Management Land

0 500 1,000 1,500 2,000
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State Plane Coordinate System
California Zone 6, NAD 83
Lambert Conformal Conic Projection
1983 North American Datum
Linear Unit: Foot US

CAMPO VERDE SOLAR PROJECT

FIGURE 4C -SOUTHWESTERN WILLOW FLYCATCHER AND YUMA CLAPPER RAIL HABITAT

Map Extent: Imperial County, California

Date: 01.17.12 Author: djb

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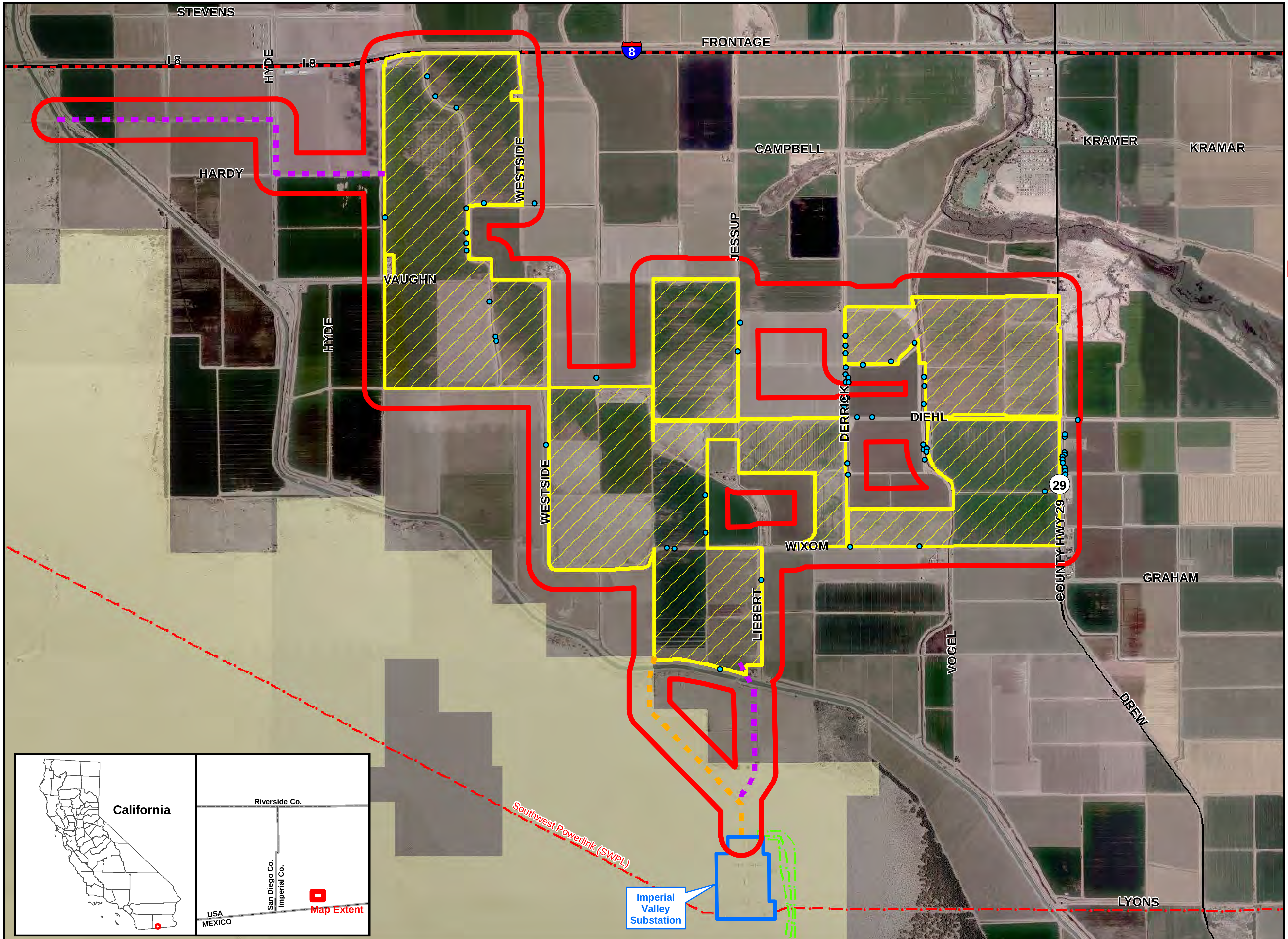

Legend

- Active Burrow
- Existing 500 kV Transmission Line
- Existing 230 kV Transmission Line
- Proposed Gen-Tie
- Gen-Tie Alternative
- Interstate
- Major Road
- County Boundary
- Campo Verde Solar Site
- Burrowing Owl Survey Area

Jurisdictional Land Ownership

- Bureau of Land Management Land

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California Zone 6, NAD 83
Lambert Conformal Conic Projection
1983 North American Datum
Linear Unit: Foot US

CAMPO VERDE SOLAR PROJECT

FIGURE 5 -BURROWING OWL OCCURRENCES

Map Extent: Imperial County, California

Date: 01.17.12 Author: djb

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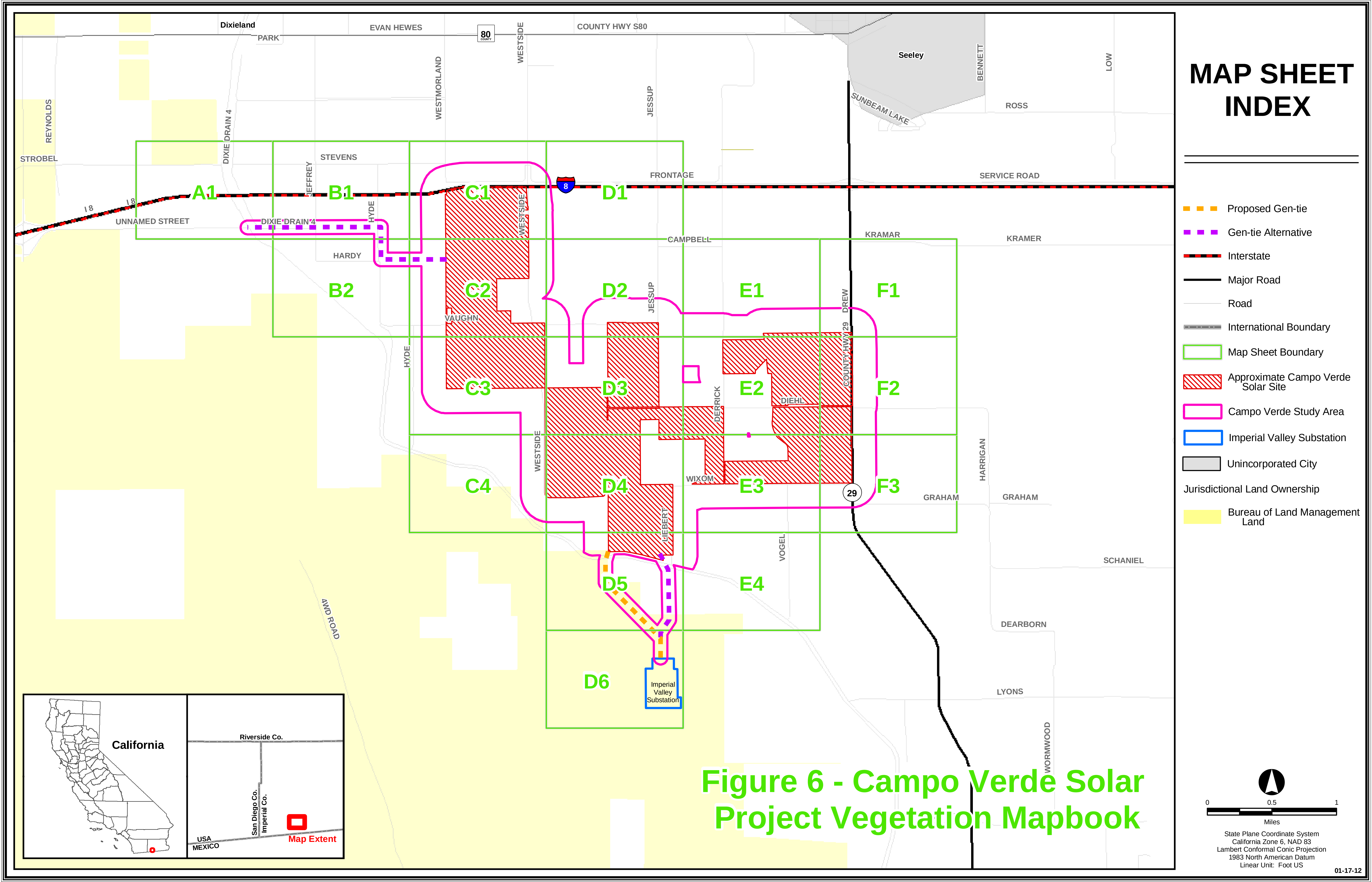


Figure 6 - Campo Verde Solar Project Vegetation Mapbook

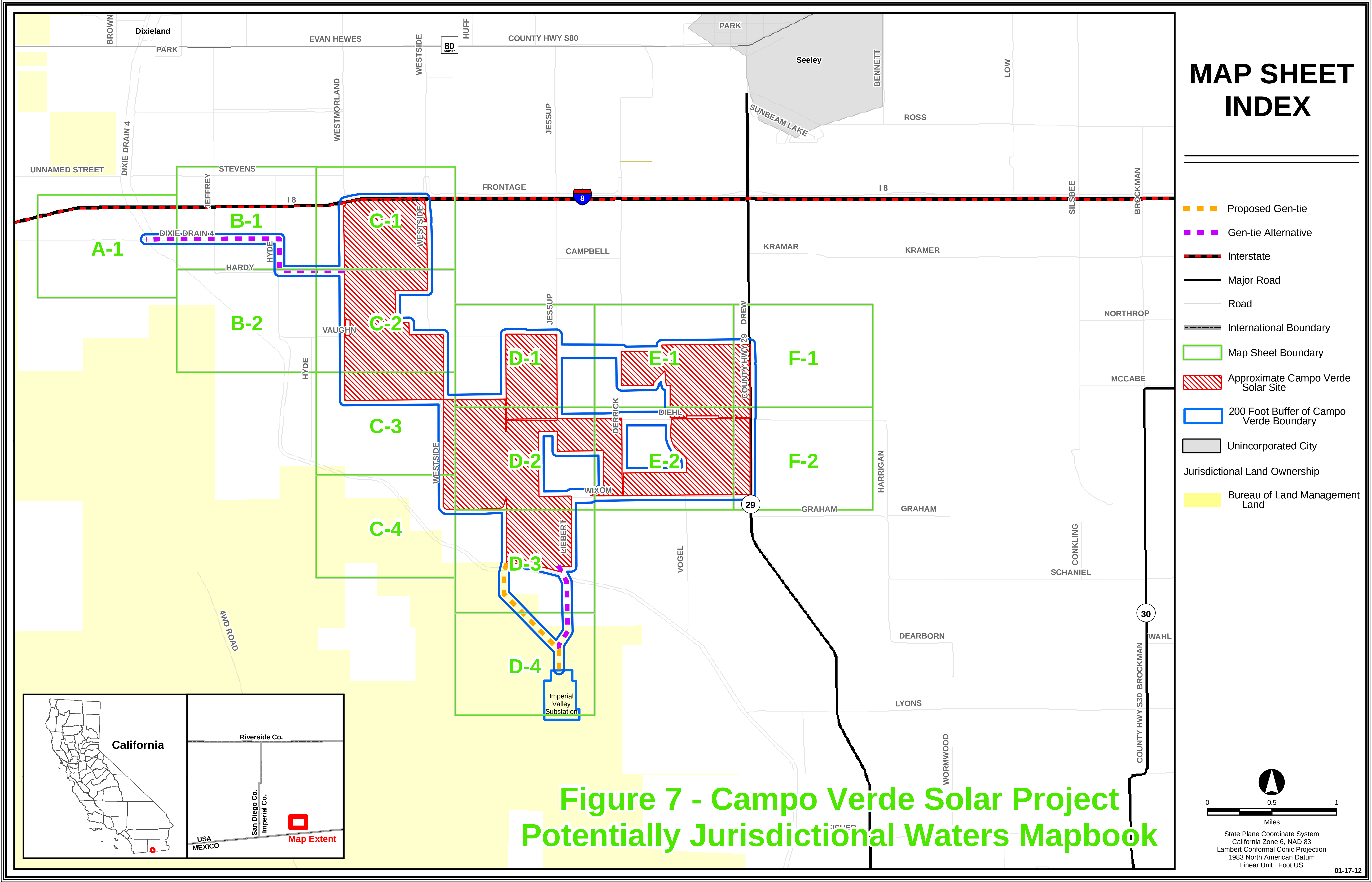
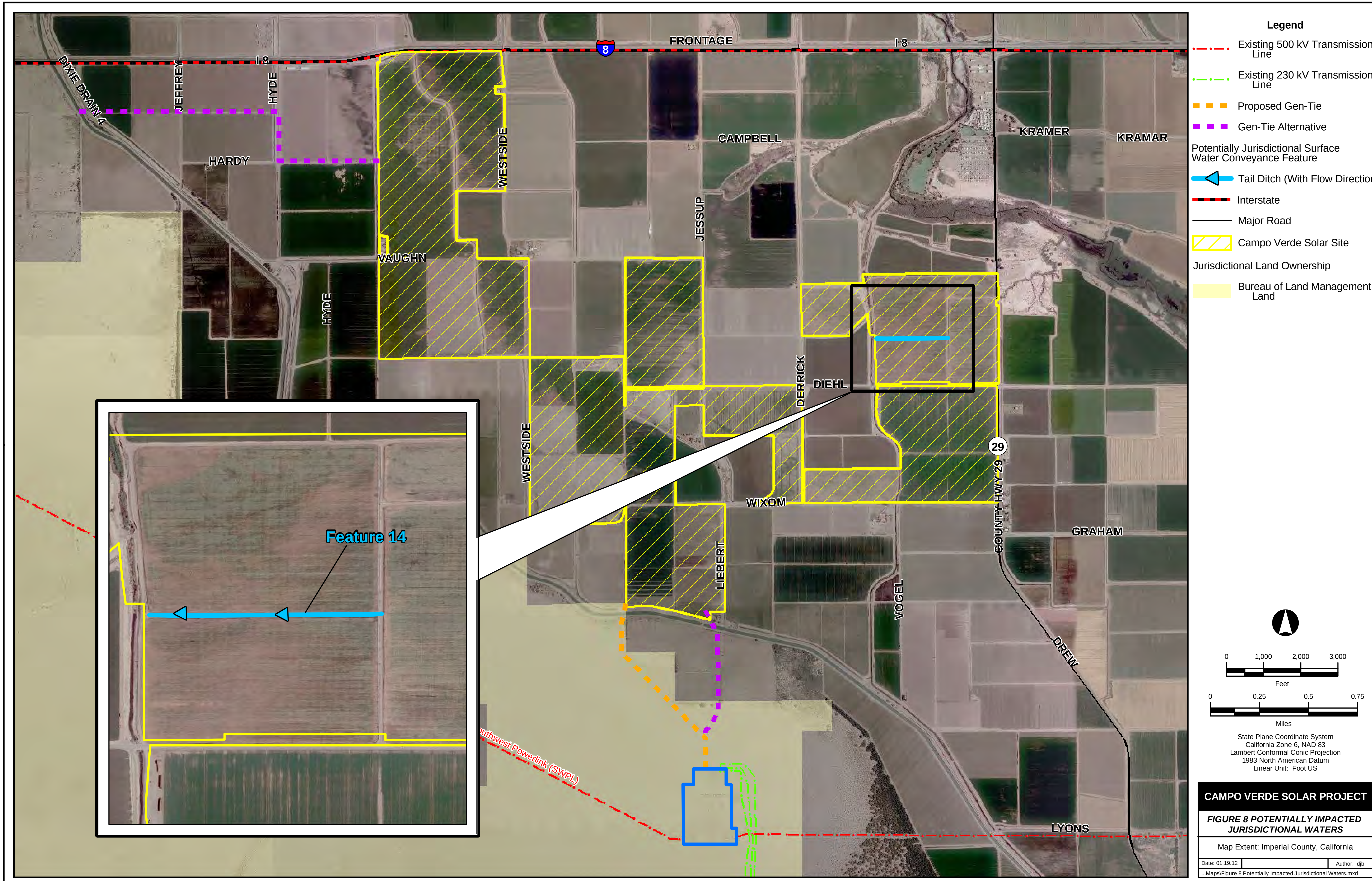


Figure 7 - Campo Verde Solar Project Potentially Jurisdictional Waters Mapbook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Southwest Powerlink (SWPL)
LYONS
Feature 14
Legend
Existing 500 kV Transmission Line
Existing 230 kV Transmission Line
Proposed Gen-Tie
Gen-Tie Alternative
Potentially Jurisdictional Surface Water Conveyance Feature
Tail Ditch (With Flow Direction)
Interstate
Major Road
Campo Verde Solar Site
Jurisdictional Land Ownership
Bureau of Land Management Land
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California Zone 6, NAD 83
Lambert Conformal Conic Projection
1983 North American Datum
Linear Unit: Foot US
CAMPO VERDE SOLAR PROJECT
FIGURE 8 POTENTIALLY IMPACTED JURISDICTIONAL WATERS
Map Extent: Imperial County, California
Date: 01.19.12
Author: djb
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ATTACHMENT 2 – PLANT SPECIES OBSERVED IN THE CAMPO VERDE SURVEY AREA

Campo Project - Plant Species Observed in Study Area

Family/Scientific Name	Common Name	Habitat	Observed in Campo Verde Project Area (BLM Lands)
Ephedraceae			
Ephedra trifurca	Three-fork ephedra	DS	Yes
Agavaceae			
Hesperocallis undulata	Desert lily	DS	Yes
Poaceae			
Cynodon dactylon	Bermuda grass	AD	Yes
Distichlis spicata	Salt grass	Canals	No
Phragmites australis	Common reed	Canals	No
Schismus arabicus	Arabian schismus	DS	Yes
Typhaceae			
Typha latifolia	Cattails	Canals	No
Amaranthaceae (inc. Chenopodiaceae)			
Atriplex canescens	Shadscale	DS	Yes
Atriplex lentiformis	Big saltbush	DS	Yes
Bassia hyssopifolia	Five-hook bassia	AD	No
Asteraceae			
Ambrosia dumosa	White Bursage	DS	Yes
Isocoma acradenia	Goldenbush	DS	Yes
Palafoxia arida var. *arida*	Spanish needles	DS	Yes
Pluchea odorata	Salt marsh fleabane	Canals	No
Pluchea serricea	Arrow-weed	Canal Banks	No
Boraginaceae			
Cryptantha angustifolia	Narrow-leaf cryptantha	DS	Yes
Cryptantha maritima	White-hair cryptantha	DS	Yes
Brassicaceae			
Brassica tournefortii	Sahara mustard	DS	Yes
Ehretiaceae			
Tiquilia palmeri	Palmer's coldenia	DS	Yes
Tiquilia plicata	Plicate coldenia	DS	Yes
Fabaceae			
Dallea mollissima	Soft prarie clover	DS	Yes
Prosopis glandulosa var. *torreyana*	Honey mesquite	Wash	Yes
Prosopis pubescens	Screw bean mesquite	Wash	No
Onagraceae			
Camissonia brevipes	Sun cup	DS	Yes
Oenothera deltoides	Basket evening-primrose	DS	Yes
Plantaginaceae			
Plantago ovata	Woolly plantain	DS	Yes
Plantago patagonica	Desert plantain	DS	Yes
Polygonaceae			
Eriogonum thomasii	Buckwheat	DS	Yes
Resedaceae			

Oligomeris linifolia	Narrow-leaf oligomeris	DS	Yes
Solanaceae			
Lycium sp.	Desert thorn	DS	Yes
Tamaricaceae			
Tamarix ramosissima	Tamarisk	Ditch, Canal	Yes
Tamarix aphylla	Athel	DS	Yes
Zygophyllaceae			
Larrea tridentata	Creosote bush	DS	Yes

ATTACHMENT 3 – WILDLIFE SPECIES OBSERVED IN THE CAMPO VERDE SURVEY AREA

Campo Verde Project - Wildlife Species Observed/Detected in Study Area

Common Name	***Scientific Name***
Birds	
American Coot	*Fulica americana*
American Kestrel	*Falco sparverius*
Barn Swallow	*Hirundo rustica*
Black Phoebe	*Sayornis nigricans*
Blue-gray Gnatcatcher	*Polioptila caerulea*
Burrowing Owl	*Athene cunicularia*
California Gull	*Larus californicus*
Cattle Egret	*Bubulcus ibis*
Cliff Swallow	*Petrochelidon pyrrhonota*
Common Ground Dove	*Columbia passerina*
Common Raven	*Corvus corax*
European Starling	*Sturnus vulgaris*
Gambel's Quail	*Callipepla gambelii*
Great-tailed Grackle	*Quiscalus mexicanus*
Greater Roadrunner	*Geococcyx californianus*
Horned Lark	*Eremophila alpestris*
Killdeer	*Charadrius vociferus*
Loggerhead Shrike	*Lanius ludovicianus*
Long-billed Curlew	*Numenius americanus*
Mourning Dove	*Zenaida macroura*
Northern Harrier	*Circus cyaneus*
Northern Mockingbird	*Mimus polyglottos*
Prairie Falcon	*Falco mexicanus*
Red-tailed Hawk	*Buteo jamaicensis*
Red-winged Blackbird	*Agelaius phoeniceus*
Rock Dove	*Columbia livia*
Rufous-crowned Sparrow	*Aimophila ruficeps*
Savannah Sparrow	*Passerculus sandwichensis*
Say's Phoebe	*Sayornis saya*
Snowy Egret	*Egretta thula*
Song Sparrow	*Melospiza melodia*
Turkey Vulture	*Cathartes aura*
Western Kingbird	*Tyrannus verticalis*
Western Meadowlark	*Sturnella neglecta*
White-crowned Sparrow	*Zonotrichia leucophrys*

Common Name	***Scientific Name***
White-faced Ibis	*Plegadis chihi*
White-winged Dove	*Zenaida asiatica*
Yellow-rumped Warbler (Audubon's)	*Dendroica coronata auduboni*
Mammals	
Bobcat	*Lynx rufus*
Coyote	*Canis latrans*
Desert cottontail	*Sylvilagus audubonii*
Kangaroo rat	*Dipodomys* sp.
Round-tailed Ground Squirrel	*Xerospermophilus tereticaudus*
Reptiles	
Desert Iguana	*Dipsosaurus dorsalis*
Flat-tailed Horned Lizard	*Phrynosoma mcallii*
Gecko	*Coleonix* sp.
Western whiptail	*Cnemidophorus tigris*

APPENDICES

APPENDIX 1 – BURROWING OWL SURVEY REPORT

Campo Verde Solar Energy Project
Protocol Burrowing Owl Survey Report

Phase I, II and III Survey Report (2011 Breeding and 2011/2012 Winter Resident)

Prepared for:

First Solar
1111 Broadway, Fourth Floor
Oakland, California 94607

Prepared by:

Heritage Environmental Consultants, LLC
2870 Emporia Court
Denver, Colorado 80238

HERITAGE
ENVIRONMENTAL
CONSULTANTS, LLC

February 2012

Table of Contents

List of Tables

List of Figures

1.0 PROJECT OVERVIEW

Western Burrowing Owls (*Athene cunicularia hypugea*) are common in Imperial County (DeSante et al. 2004) and were identified as a species of interest during the early planning stages for the Campo Verde Solar Project (Project). The Project is a proposed 1,990 acre solar photovoltaic (PV) energy-generating facility (solar energy facility site) located in Imperial County approximately 7 miles southwest of the community of El Centro, California. **Figure 1** shows the general location of the project.

The Project would use First Solar PV modules that are generally non-reflective and convert sunlight into direct current (DC) electricity. The DC output of multiple rows of PV modules is collected through one or more combiner boxes and directed to an inverter that converts the DC electricity to alternating current (AC) electricity. From the inverter, the generated energy flows to a transformer where it is stepped up to distribution level voltage (approximately 34.5 kV). Multiple transformers are connected in parallel via 34.5 kV lines to the Project substation, where the power will be stepped up to 230 kV.

The Project will be interconnected to the regional transmission system via a new gen-tie line constructed to the Imperial Valley Substation. This interconnection will be accomplished via one of three potential options – two requiring rights-of-way across federal lands managed by the Bureau of Land Management (BLM) and one located entirely on private lands (**Figure 2**).

The two gen-tie line alternatives that would cross BLM lands would originate at the Project substation/switchyard at the southern end of the Project site and would go south to the Imperial Valley Substation. Either of these two alternatives would be built as a double-circuit 230 kV line.

- The Alternative Gen-Tie across BLM land would follow the existing IID S-line and would cross about 0.4 miles of BLM land.
- The Proposed Gen-Tie Alternative would follow existing roads and would cross about 0.9 miles of BLM land. Both of these options are located entirely within a BLM-designated utility corridor.

The Private Gen-tie Alternative being considered is to develop a single-circuit 230 kV line originating on the western side of the Project site. It would cross approximately 1.75 miles of private lands to the west and would utilize available capacity on a line that has an approved right-of-way to the Imperial Valley Substation.

The purpose of the surveys was to identify Burrowing Owl nests on or near the proposed project site, within the proposed Gen-tie Line corridors, and/or associated buffers.

2.0 Introduction

The Burrowing Owl is a California Species of Special Concern and a BLM sensitive species. It is protected by the MBTA and California Fish & Game Code §§ 3503, 3503.5, 3513. Nesting occurs from March through August (Haug et al. 1993). Burrowing Owls typically form a pair-bond for more than 1 year and exhibit high site fidelity, reusing the same burrow year after year (Haug et al. 1993). The female remains inside the burrow during most of the egg laying and incubation period and is fed by the male throughout brooding. Burrowing Owls are opportunistic feeders, consuming a diet that includes arthropods (typically insects), small mammals, small birds, and occasionally amphibians and reptiles (Haug et al. 1993). Urbanization has greatly reduced the amount of suitable habitat for this species. Other contributions to the decline of this species include the poisoning of squirrels and prairie dogs, and collisions with automobiles. A survey effort carried out between 1991 and 1993 indicated that major population densities in California remain in the Central and Imperial Valleys (DeSante et al.1996; DeSante et al. 2004). This species is a year-round resident in Imperial County. Up to 70% of California's Burrowing Owls reside in the Imperial Valley (Wilkerson et al. 2011). Recent survey efforts have indicated a slight population decline in the Imperial Valley (-2.5%; Wilkerson et al. 2011).

The Burrowing Owl is primarily restricted to the western United States and Mexico. Habitat for the Burrowing Owl includes dry, open, short-grass areas often associated with burrowing mammals (Haug et al. 1993). In Imperial County, it is found in desert scrub, grasslands, and agricultural areas. Agricultural areas may benefit the species and appear to represent preferred habitat in Imperial County (DeSante et al. 1996; DeSante et al. 2004; Wilkerson et al. 2011; Bartok and Conway 2010).

The California Burrowing Owl Consortium (CBOC) developed the *Survey Protocol and Mitigation Guidelines* (CBOC 1993) document to meet the need for uniform standards when surveying Burrowing Owl populations and evaluating impacts from development projects. These guidelines are generally accepted by the California Department of Fish and Game (CDFG) and are intended to provide a decision-making process that should be implemented wherever there is potential for an action or project to adversely affect Burrowing Owls or the resources that support them.

The CBOC guidelines suggest Burrowing Owl surveys be conducted in three phases. The purpose of a Phase I survey is to assess the presence of Burrowing Owl habitat in the project area. Phase II surveys are necessary to determine if suitable burrows occur on the site. Phase III surveys are intended to characterize owl presence during the nesting season and/or during winter. This report presents the findings of the Phase I, II, and III surveys within the proposed Campo Verde Solar Project Site and associated buffers; and the Phase I and II surveys with the proposed Gen-tie Line corridors and associated buffers (see **Section 3.0**).

3.0 Study Area

The study area is comprised of five main components: (1) the 1,990-acre Campo Verde Solar Site; (2) the Proposed Gen-tie; (3) the Alternative Gen-tie across BLM land; (4) Private Gen-tie Alternative; and (5) a 500-foot buffer surrounding the Campo Verde Solar Energy Facility Site and the Gen-tie Corridors (**Figure 2**).

The Campo Verde Solar Energy Facility Site is primarily active agricultural lands growing crops such as alfalfa, Sudan grass, and Bermuda grass. Native vegetation on the site is generally absent with a few exceptions. The fields on the site are ringed by a series of earthen and concrete canals and drains that provide irrigation and drainage for the fields. Sporadic and limited riparian and wetland vegetation occur along portions of the earthen canals and berms. This vegetation is a mixture of native and non-native species and includes tamarisk (*Tamarix ramosissima*), cattails (*Typha* sp.), common reed (*Phragmites australis*), salt grass (*Distichlis spicata*), arrow weed (*Pluchea serricea*) and salt marsh fleabane (*Pluchea odorata*). Routine maintenance of these drains and canals by the Imperial Irrigation District (IID) involves the periodic removal of vegetation to maintain uninhibited water flow. Since vegetation clearing is a routine activity, the wetland vegetation is usually sparse and not well developed. Removal of this vegetation also provides suitable Burrowing Owl habitat once mammals return to these areas and excavate burrows (Bartok and Conway 2010); therefore, Burrowing Owl habitat in the project area is regularly changing, including creation of new burrow sites and loss of existing burrow sites. Topography in the study area is generally flat.

The Private Gen-tie Alternative would cross approximately 1.75-miles of active agricultural land that is similar to the Campo Verde Solar Energy Facility. The Proposed Gen-tie would follow existing roads and would cross about 0.9 miles of BLM land. The Alternative Gen-Tie Across BLM land would follow the existing IID S-line and would cross about 0.4 miles of BLM land. Both of these options are located entirely within a BLM-designated utility corridor. This area is generally flat Colorado Desert dominated by creosote bush (*Larrea tridentata*) scrub, athel (*Tamarix aphylla*) windbreaks, stabilized desert dune complex and arrow weed thicket.

4.0 Survey Methods

4.1 Phase I and Phase II Surveys

Phase I and Phase II surveys of the Campo Verde Solar Energy Facility Site were conducted simultaneously by qualified biologists during the 2011 breeding season (March-April). Phase I and II surveys of the Gen-tie Corridors were conducted simultaneously during the fall of 2011 (October). The Phase I habitat assessments determined that most of the study area contains suitable Burrowing Owl habitat, and Phase II burrow surveys were conducted.

Phase II surveys covered the entire study area and potentially suitable burrows were recorded. Transects at 10-meter spacing were walked within the Proposed Gen-Tie and Alternative Gen-tie Across BLM land (including a 500-foot buffer around the project area) to ensure that all suitable burrows were identified. Within agricultural lands, a combination of vehicular and pedestrian surveys were conducted along roads and irrigation infrastructure (per Bartok and Conway 2010).

Burrows that had the potential to be used by Burrowing Owls were marked using a handheld global positioning system (GPS) unit. Photos were taken of representative potential burrows and owl observations were noted. "Burrow Clusters" were recorded in areas that supported high densities of burrow entrances that were either (1) multiple entrances associated with a single burrow; or (2) separate burrows that were located too close together to support more than one breeding pair of owls (burrows within 5 meters of each other).

4.2 Phase III Surveys

The Burrowing Owl nesting season begins as early as February 1 and continues through August 31 (Thomsen 1971, Zam 1974). The timing of nesting activities varies with latitude and climatic conditions. Phase III surveys at the Campo Verde Solar Energy Facility Site were conducted during the breeding season, beginning March 1 and ending August 31. All Burrowing Owl sightings were recorded (including occupied burrows and burrows with sign) and mapped. Numbers of adults and juveniles were recorded (**Appendix A**), as well as behavior such as courtship and copulation. Territory boundaries and foraging areas were not mapped, mainly because of the difficulty posed by the active nests being so close together where home-ranges potentially overlap.

Surveys were conducted in the morning and evening (one-half hour before to two hours after sunrise and two hours before to one-half hour after sunset). Burrows were examined for owl sign during the first observation of suitable burrows (typically during Phase II surveys). Subsequent observations were conducted from fixed points further from the burrows that provided visual coverage of the burrows using spotting scopes or binoculars. When possible, observers remained in vehicles to minimize disturbance to the birds.

Surveys were conducted at each burrow on four separate days in order to minimize the likelihood of false-negative results (CBOC 1993). Phase III breeding season surveys will be conducted for the gen-tie corridors in March and April 2012.

4.3 PHASE III WINTER RESIDENT SURVEYS

Phase III winter resident surveys were conducted during December 2011 and January 2012 at the Campo Verde Solar Energy Facility Site and within the gen-tie corridors. Winter survey methodologies followed Phase III protocol (CBOC 1993). Winter resident surveys were conducted on four separate days during the 2011/2012 Winter Season.

5.0 Survey Results

5.1 Phase I and II Surveys

In its current condition, the study area and surrounding areas were observed to contain suitable nesting habitat for Burrowing Owls. The site contains both natural and artificial burrows. The natural burrows were most commonly associated with slopes along berms, canals, or drains where soil conditions are apparently more suitable for burrow construction. In the absence of suitable natural burrows, Burrowing Owls have been known to nest in man-made features. Numerous man-made features in the study area also provide suitable artificial burrow opportunities, including concrete and metal culverts and irrigation pipes.

Phase I and II surveys were conducted between the spring and fall of 2011. **Table 1** lists dates, times, weather, and the project components evaluated for the Phase II surveys. One-hundred and eighty-one potentially suitable burrows were identified during the Phase II surveys (**Figure 3**).

Table 1. Phase I and Phase II Survey Details

Date	Time	Weather Conditions	Project Component
March 28, 2011	1200-1830	70°F; clear, wind <5mph	Solar Energy Facility Site
March 29, 2011	0655-1840	51-80°F; clear, calm	Solar Energy Facility Site
October 26, 2011	0745-1200	66°F; clear, wind <5mph	Gen-tie Corridors
October 27, 2011	0745-1645	77°F; clear, wind <5mph	Gen-tie Corridors

5.2 Phase III Surveys

Table 2 lists dates, times, weather, and visibility for the Phase III surveys. Due to the number of active burrows and individuals observed, data for each active burrow have been included in **Appendix A**. **Table 3** summarizes the results of the Phase III survey and breaks down results by project component. **Figure 4** shows the location of the active burrows. To the maximum extent practicable, active burrows were surveyed in reverse order during each round of Phase III surveys so that owls could be observed at different times of the day during each survey period.

Table 2. Phase III Survey Details

Date	Time	Weather Conditions
BREEDING SEASON SURVEYS (Campo Verde Solar Energy Facility Site)		
March 28, 2011	1628-1745 (Concurrent with Phase II Survey)	70°F; clear, wind <5mph
March 29, 2011	1619-1753	51-80°F; clear, calm
March 30, 2011	1630-1911	82°F; mostly clear, wind <5mph
March 31, 2011	0620-0755 1649-1918	53-64°F; mostly clear, calm 82-95°F, clear, winds 0-5mph
April 1, 2011	0620-735	55-62°F; clear, winds 0-5mph
April 4, 2011	1659-1902	76-83°F; clear, calm
April 5, 2011	0615-0829 1705-1908	51-59°F; clear, winds 0-5mph 80-87°F, partly cloudy, winds <5mph
April 6, 2011	1648-1846	77-83°F, partly cloudy, winds 5-25mph
WINTER RESIDENT SURVEY (Campo Verde Solar Energy Facility Site and Gen-tie Corridors)		
December 7, 2011	0611-0825	33°F, clear, calm
December 8, 2011	0610-0815	31-33°F, clear, calm
December 14, 2011	0605-0823	41°F, clear, calm
December 19, 2011	1430-1702	54-65°F, partly cloudy, calm
December 20, 2011	1430-1610	63-67°F, clear, winds 0-5mph
January 4, 2012	1458-1631	79°F, clear, calm
January 5, 2012	1444-1646	64-76°F, clear, calm
January 6, 2012	0620-0846	39-55°F, clear, calm
January 23, 2012	1500-1700	67-69°F, partly cloudy, wind 10-20mph
January 24, 2012	1510-1636	64-69°F, mostly clear, winds <5mph
January 25, 2012	0624-810	42-50°F, mostly clear, winds <5mph

There were a total of 65 active and 76 inactive burrows identified in the study area. Because the 32 burrows identified during the October 2011 Phase I and II surveys were recorded after the breeding season, the activity status of these burrows is unknown; Phase III surveys will be conducted at these burrows in the spring of 2012. There were 23 active burrows within the solar energy facility and 42 active burrows within the 500-foot buffer area. There were no active burrows identified within the Gen-tie Line corridors or associated buffers (**Table 3**; **Figure 4**).

All burrows were observed or assumed to be attended by a pair (2) of Burrowing Owls. Cooperative breeding has not been observed in the species (Haug et al. 1993) and no more than 2 adults were ever suspected to be associated with any burrow in the study area. In several instances only one adult was ever observed at a given burrow. However, without a mark-recapture or color banding study, it is not possible to confirm that these represent instances of an unpaired adult. Therefore, for the purposes of this report, all adult owls within the project area are assumed to be paired. "Active burrow" should be interpreted to represent a "breeding pair" throughout this document.

Table 3. Phase III Burrow Status Summary

Burrow Status	Campo Verde Facility	Campo Verde Facility Buffer	BLM Gen-tie Corridor	BLM Gen-tie Corridor Buffer	Private Gen-tie Corridor	Private Gen-tie Corridor Buffer	*Total*
Active	23	42	0	0	0	0	*65*
Inactive	44	32	0	0	0	0	*76*
Status Unknown	0	0	12	17	0	3	*32*
Total	**67**	**74**	**12**	**17**	**0**	**3**	***173***

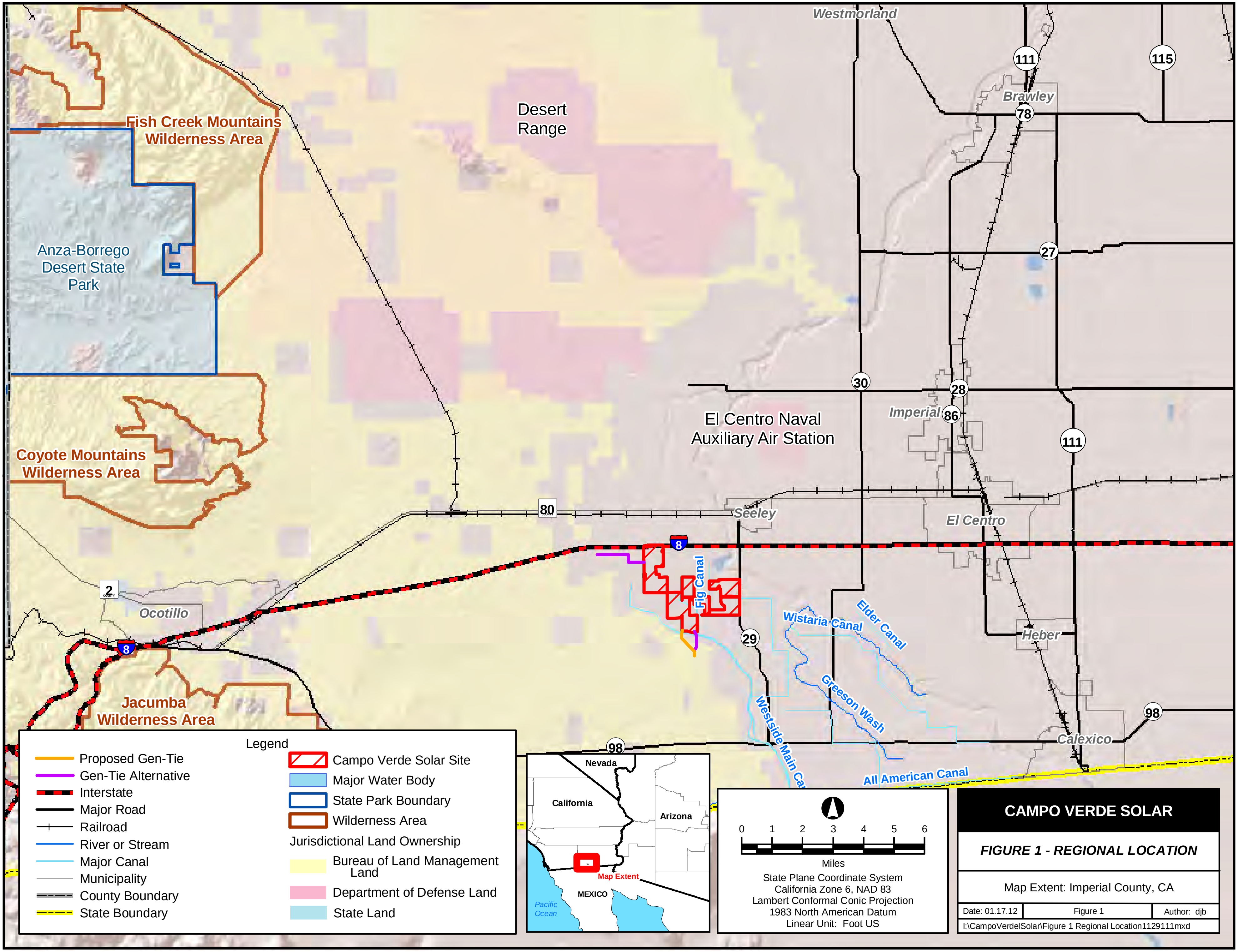
A table enumerating all active burrows and listing the survey results by date can be found in **Appendix A.**

5.3 WINTER RESIDENT SURVEY

A total 186 burrows were surveyed during the winter resident surveys. Fourteen (14) new potentially suitable burrows were identified during the winter resident surveys and a burrow that had previously been assigned two unique numbers was consolidated. A significant number (69) of the burrows became unsuitable during the course of the winter surveys. This was primarily a result of two phenomena: 1) Burrows located along and near the Proposed Gen-Tie Alternative became unsuitable at a very high rate; approximately 19 of 32 burrows (59%) became unsuitable during the winter surveys. It is suspected that the loose sand and friable soils in this area contributed to the rate of burrows collapsing or filling in; 2) A major rain event in mid-December appears to have caused several bank slumps and burrow collapses that account for many of the other burrows that became unsuitable.

A maximum of 38 burrows were observed to be active during the winter resident surveys. However, six (6) of these burrows collapsed during the course of the surveys and only 32 remained active by the end of the survey.

Occupancy rates were appreciably lower during the winter surveys compared to the breeding season. During the breeding season, 65 of 141 (46%) burrows were active, while at the end of the winter surveys 32 of 117 (27%) burrows were active.


Westmorland
111
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Brawley
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Anza-Borrego
Desert State
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Imperial
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El Centro Naval
Auxiliary Air Station
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Coyote Mountains
Wilderness Area
80
Seeley
El Centro
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Fig Canal
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Ocotillo
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Wistaria Canal
Elder Canal
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Heber
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Greeson Wash
Westside Main Ca
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Calexico
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Major Canal
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County Boundary
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Campo Verde Solar Site
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FIGURE 1 - REGIONAL LOCATION
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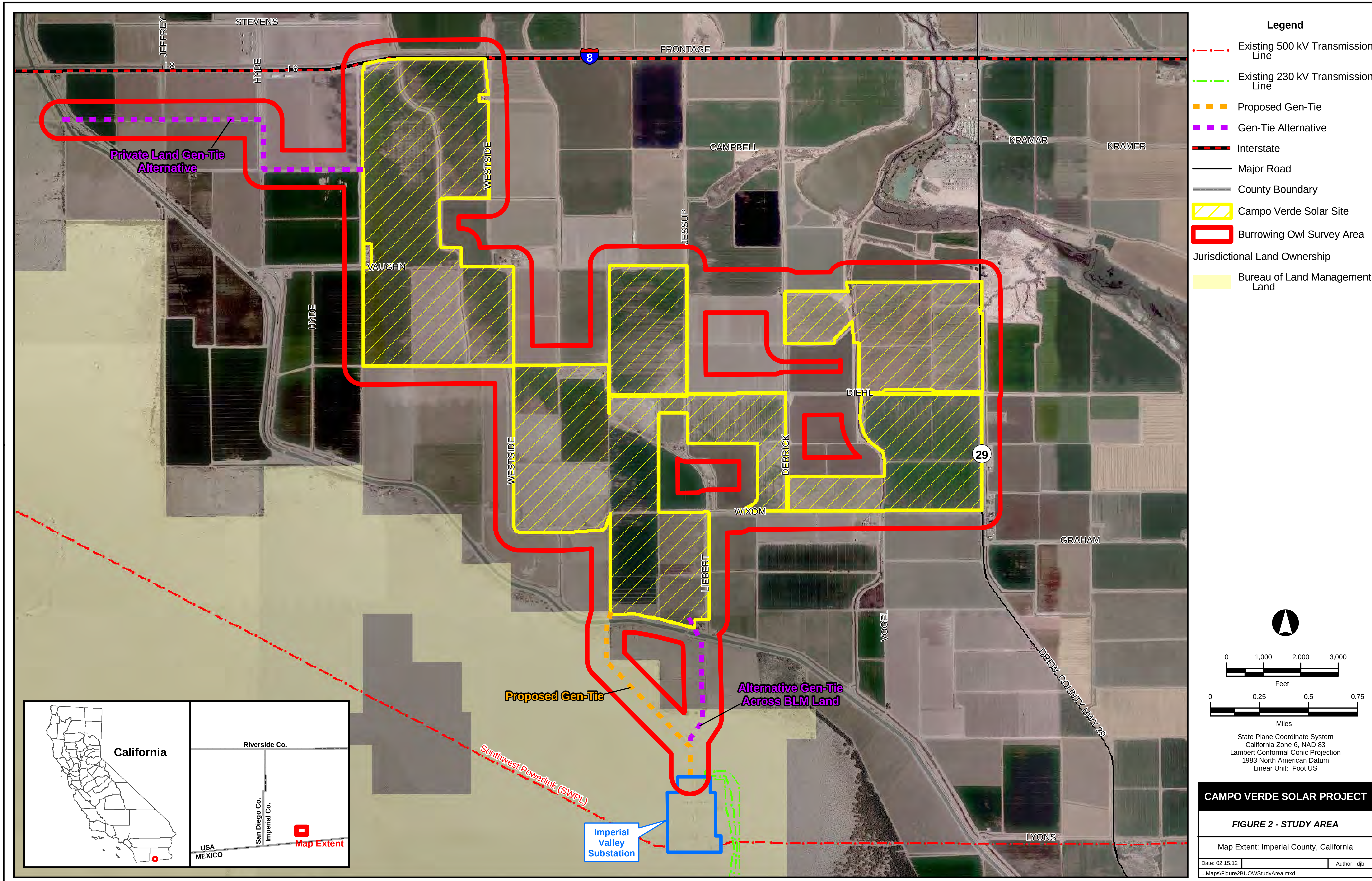

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Map Extent
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Existing 500 kV Transmission Line
Existing 230 kV Transmission Line
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CAMPO VERDE SOLAR PROJECT
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Author: djb
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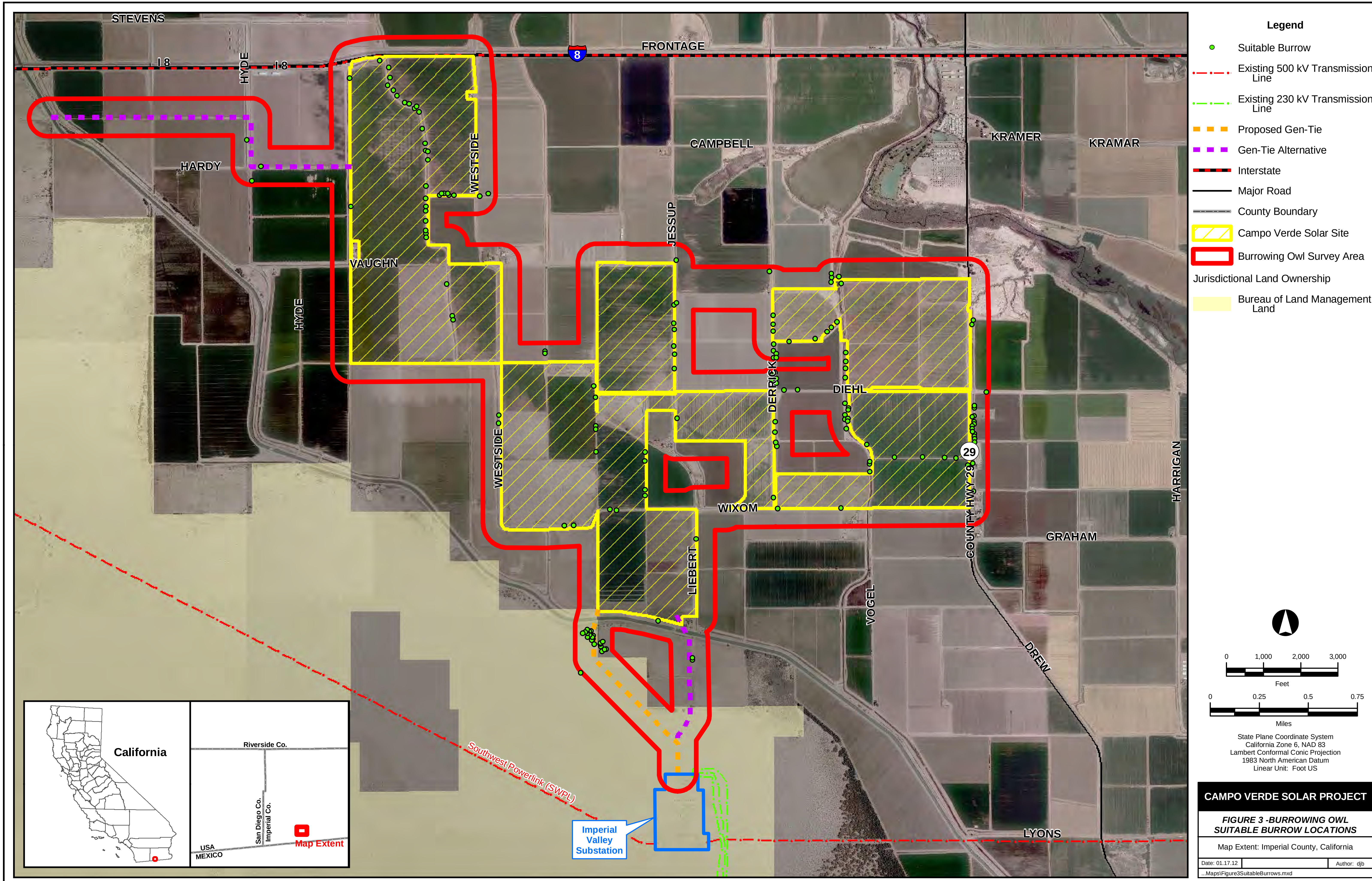

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Suitable Burrow
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Existing 230 kV Transmission Line
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Gen-Tie Alternative
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Jurisdictional Land Ownership
Bureau of Land Management Land
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Lambert Conformal Conic Projection
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Linear Unit: Foot US
CAMPO VERDE SOLAR PROJECT
FIGURE 3 -BURROWING OWL SUITABLE BURROW LOCATIONS
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Date: 01.17.12
Author: djb
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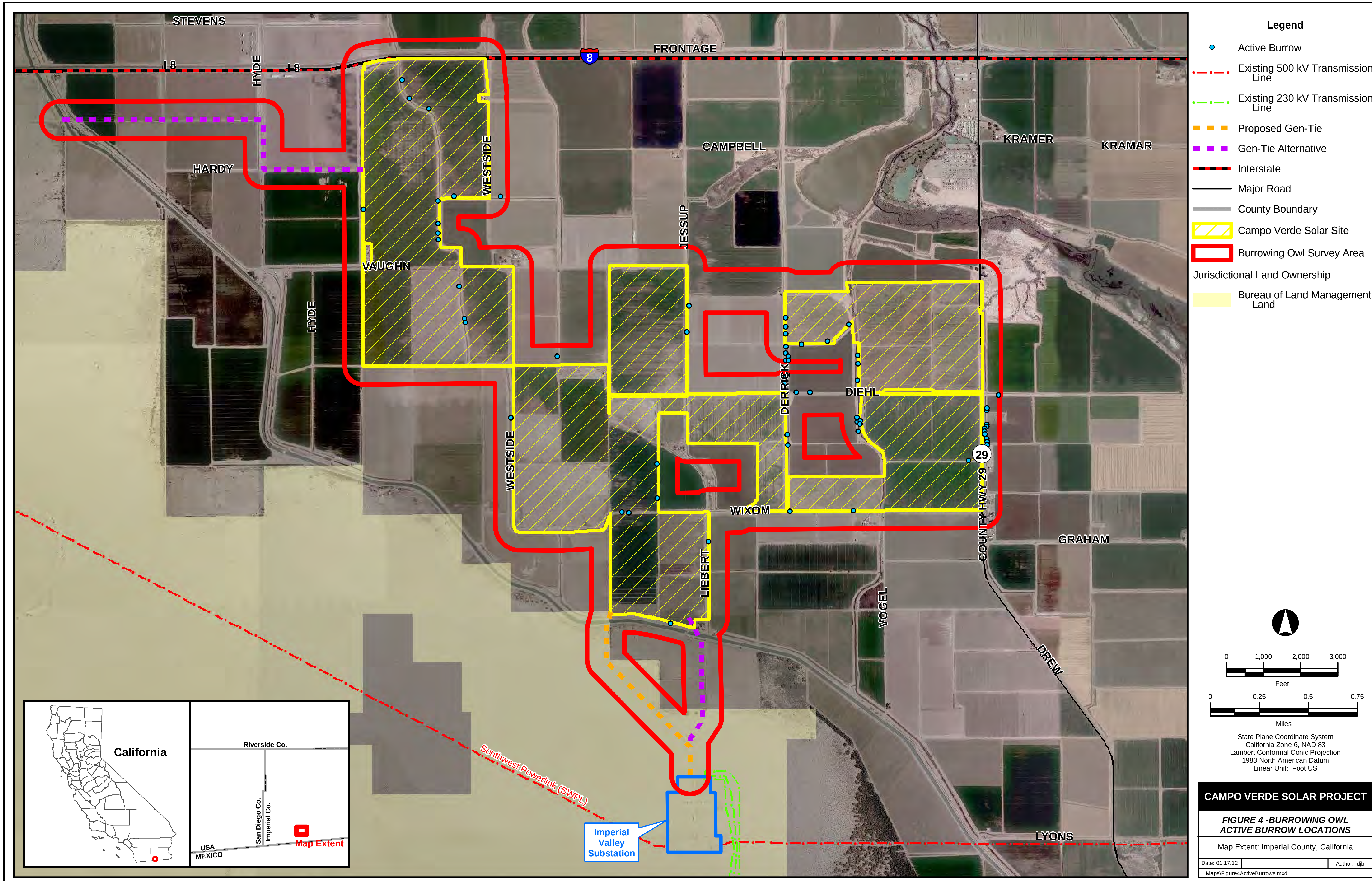

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Map Extent
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Active Burrow
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Existing 230 kV Transmission Line
Proposed Gen-Tie
Gen-Tie Alternative
Interstate
Major Road
County Boundary
Campo Verde Solar Site
Burrowing Owl Survey Area
Jurisdictional Land Ownership
Bureau of Land Management Land
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Miles
State Plane Coordinate System
California Zone 6, NAD 83
Lambert Conformal Conic Projection
1983 North American Datum
Linear Unit: Foot US
CAMPO VERDE SOLAR PROJECT
FIGURE 4 -BURROWING OWL ACTIVE BURROW LOCATIONS
Map Extent: Imperial County, California
Date: 01.17.12
Author: djb
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Selected Photos

Adult Burrowing Owl and representative active burrow with pellets, whitewash, and other debris.

Representative potentially suitable man-made burrow (Eastern BLM Gen-tie Corridor).

Representative potentially suitable natural burrow (Western BLM Gen-tie Corridor).

Representative potentially suitable natural burrow with sign (whitewash)(Western BLM Gen-tie Corridor).

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Appendix A – Active Burrow Owl Data

Burrow ID	Project Component	2011 Breeding Season		2011/2012 Winter Resident	
		Date	# Owls	Date	# Owls
2	500-foot Buffer	3/30/2011	1		
		3/31/2011	0		
		4/5/2011	1		
		4/6/2011	0		
3	500-foot Buffer	3/30/2011	1		
		3/31/2011	1		
		4/5/2011	1		
		4/6/2011	2		
5	500-foot Buffer	3/30/2011	1		
		3/31/2011	0		
		4/5/2011	0		
		4/6/2011	0		
6	500-foot Buffer	3/30/2011	2		
		3/31/2011	0		
		4/5/2011	0		
		4/6/2011	0		
7	500-foot Buffer	3/30/2011	0	12/7/2011	1
		3/31/2011	2	12/19/2011	1
		4/5/2011	1	1/5/2012	1
		4/6/2011	1	1/25/2012	1
8	500-foot Buffer	3/30/2011	1		
		3/31/2011	0		
		4/5/2011	0		
		4/6/2011	0		
10	500-foot Buffer	3/30/2011	0		
		3/31/2011	1		
		4/5/2011	0		
		4/6/2011	0		
11	500-foot Facility Buffer	3/30/2011	0		
		3/31/2011	2		
		4/5/2011	0		
		4/6/2011	0		
12	500-foot Facility Buffer	3/30/2011	0		
		3/31/2011	0		
		4/5/2011	1		
		4/6/2011	1		
13	500-foot Facility Buffer	3/30/2011	0		
		3/31/2011	2		
		4/5/2011	1		
		4/6/2011	1		

Burrow ID	Project Component	2011 Breeding Season		2011/2012 Winter Resident	
		Date	# Owls	Date	# Owls
16	500-foot Facility Buffer	3/30/2011	0		
		3/31/2011	2		
		4/5/2011	2		
		4/6/2011	2		
21	500-foot Facility Buffer	3/30/2011	0		
		3/31/2011	1		
		4/5/2011	0		
		4/6/2011	0		
22	500-foot Facility Buffer	3/30/2011	0		
		3/31/2011	2		
		4/5/2011	0		
		4/6/2011	0		
29	500-foot Facility Buffer	3/30/2011	0		
		3/31/2011	0		
		4/5/2011	2		
		4/6/2011	2		
30	500-foot Facility Buffer	3/30/2011	1		
		3/31/2011	0		
		4/5/2011	0		
		4/6/2011	0		
32	500-foot Facility Buffer	3/30/2011	0		
		3/31/2011	1		
		4/5/2011	1		
		4/6/2011	0		
35	500-foot Facility Buffer	3/30/2011	2	12/7/2011	0
		3/31/2011	0	12/19/2011	1
		4/5/2011	2	1/5/2012	0
		4/6/2011	2	1/25/2012	1
42	500-foot Facility Buffer	3/30/2011	1		
		3/31/2011	0		
		4/5/2011	0		
		4/6/2011	0		
45	500-foot Facility Buffer	3/30/2011	2		
		3/31/2011	2		
		4/5/2011	2		
		4/6/2011	2		
46	500-foot Facility Buffer	3/30/2011	2		
		3/31/2011	2		
		4/5/2011	2		
		4/6/2011	1		
49	500-foot Facility Buffer	3/30/2011	2	12/7/2011	2
		3/31/2011	2	12/19/2011	1
		4/5/2011	2	1/5/2012	0
		4/6/2011	1	1/25/2012	2

Burrow ID	Project Component	2011 Breeding Season		2011/2012 Winter Resident	
		Date	# Owls	Date	# Owls
50	500-foot Facility Buffer	3/30/2011	0		
		3/31/2011	2		
		4/5/2011	0		
		4/6/2011	0		
52	500-foot Facility Buffer	3/30/2011	1	12/14/2011	0
		3/31/2011	1	12/19/2011	0
		4/5/2011	2	1/5/2012	1
		4/6/2011	1	1/25/2012	0
53	500-foot Facility Buffer	3/28/2011	1	12/7/2011	0
		3/30/2011	0	12/19/2011	0
		3/31/2011	1	1/5/2012	1
		4/5/2011	0	1/25/2012	0
		4/6/2011	1		
54	500-foot Facility Buffer	3/28/2011	1		
		3/30/2011	2		
		3/31/2011	2		
		4/5/2011	2		
		4/6/2011	2		
55	500-foot Facility Buffer	3/28/2011	1	12/7/2011	0
		3/30/2011	2	12/19/2011	1
		3/31/2011	1	1/5/2012	0
		4/5/2011	1	1/25/2012	1
		4/6/2011	2		
56	500-foot Facility Buffer	3/28/2011	0		
		3/30/2011	1		
		3/31/2011	0		
		4/5/2011	0		
		4/6/2011	0		
58	Solar Facility	3/30/2011	0		
		3/31/2011	0		
		4/5/2011	1		
		4/6/2011	1		
61	500-foot Facility Buffer	3/28/2011	2	12/7/2011	0
		3/31/2011	2	12/19/2011	0
		4/5/2011	2	1/5/2012	1
		4/6/2011	2	1/25/2012	1
		4/7/2011	2		
62	500-foot Facility Buffer	3/28/2011	1		
		3/30/2011	1		
		3/31/2011	0		
		4/5/2011	1		
		4/6/2011	0		

Burrow ID	Project Component	2011 Breeding Season		2011/2012 Winter Resident	
		Date	# Owls	Date	# Owls
63	500-foot Facility Buffer	3/28/2011	0		
		3/30/2011	0		
		3/31/2011	1		
		4/5/2011	0		
		4/6/2011	0		
66	500-foot Facility Buffer	3/28/2011	1		
		3/30/2011	0		
		3/31/2011	0		
		4/5/2011	0		
		4/6/2011	0		
67	500-foot Facility Buffer	3/28/2011	1	12/7/2011	5
		3/30/2011	1	12/19/2011	4
		3/31/2011	0	1/5/2012	0
		4/5/2011	1	1/25/2012	3
		4/6/2011	1		
68	500-foot Facility Buffer	3/28/2011	2		
		3/30/2011	2		
		3/31/2011	1		
		4/5/2011	2		
		4/6/2011	2		
69	500-foot Facility Buffer			12/7/2011	0
				12/19/2011	0
				1/6/2012	1
				1/25/2012	0
70	500-foot Facility Buffer	3/28/2011	1		
		3/30/2011	0		
		3/31/2011	0		
		4/5/2011	0		
		4/6/2011	0		
72	Solar Facility	3/28/2011	1	12/7/2011	1
		3/30/2011	0	12/19/2011	1
		3/31/2011	0	1/6/2012	1
		4/5/2011	0	1/25/2012	2
		4/6/2011	0		
73	Solar Facility	3/28/2011	1		
		3/30/2011	0		
		3/31/2011	0		
		4/5/2011	0		
		4/6/2011	0		
74	Solar Facility	3/28/2011	1	12/7/2011	0
		3/30/2011	2	12/19/2011	1
		3/31/2011	2	1/6/2012	0
		4/5/2011	2	1/25/2012	1
		4/6/2011	2		
82	500-foot Facility Buffer	3/30/2011	0		
		3/31/2011	0		
		4/4/2011	1		
		4/5/2011	1		

Burrow ID	Project Component	2011 Breeding Season		2011/2012 Winter Resident	
		Date	# Owls	Date	# Owls
85	Solar Facility	3/30/2011	1	12/7/2011	0
		3/31/2011	1	12/20/2011	0
		4/4/2011	1	1/6/2012	1
		4/5/2011	0	1/23/2012	0
94	Solar Facility	3/30/2011	2		
		3/31/2011	2		
		4/4/2011	1		
		4/5/2011	2		
96	Solar Facility	3/30/2011	0		
		3/31/2011	0		
		4/4/2011	0		
		4/5/2011	2		
98	Solar Facility	3/30/2011	2		
		3/31/2011	2		
		4/5/2011	1		
		4/6/2011	1		
99	500-foot Facility Buffer	3/30/2011	2		
		3/31/2011	2		
		4/4/2011	2		
		4/5/2011	2		
		4/6/2011	2		
102	500-foot Facility Buffer			12/7/2011	0
				12/19/2011	1
				1/5/2012	1
				1/23/2012	0
103	500-foot Facility Buffer	3/31/2011	0	12/7/2011	0
		4/1/2011	0	12/19/2011	1
		4/4/2011	2	1/5/2012	0
		4/5/2011	1	1/23/2012	0
109	Solar Facility	3/31/2011	2	12/7/2011	1
		4/1/2011	2	12/19/2011	0
		4/4/2011	1	1/6/2012	0
		4/5/2011	1	1/23/2012	0
110	Solar Facility	3/31/2011	1	12/7/2011	1
		4/1/2011	1	12/19/2011	0
		4/4/2011	1	1/6/2012	0
		4/5/2011	1	1/23/2012	0
111	Solar Facility	3/31/2011	2	12/7/2011	2
		4/1/2011	2	12/20/2011	0
		4/4/2011	2	1/6/2012	1
		4/5/2011	2	1/23/2012	0

Burrow ID	Project Component	2011 Breeding Season		2011/2012 Winter Resident	
		Date	# Owls	Date	# Owls
112	Solar Facility	3/31/2011	0		
		4/1/2011	1		
		4/4/2011	2		
		4/5/2011	1		
114	Solar Facility	3/31/2011	0		
		4/1/2011	0		
		4/4/2011	1		
		4/5/2011	0		
115	Solar Facility	3/31/2011	1		
		4/1/2011	2		
		4/4/2011	1		
		4/5/2011	1		
118	Solar Facility	3/29/2011	1		
		3/31/2011	0		
		4/1/2011	0		
		4/4/2011	0		
		4/5/2011	0		
123	Solar Facility			12/7/2011	0
				12/20/2011	1
				1/6/2012	0
				1/23/2012	0
127	Solar Facility	3/29/2011	2	12/7/2011	1
		3/31/2011	2	12/20/2011	0
		4/1/2011	2	1/6/2012	0
		4/4/2011	1	1/23/2012	0
		4/5/2011	1		
128	Solar Facility			12/7/2011	1
				12/20/2011	0
				1/6/2012	0
				1/23/2012	0
129	Solar Facility	3/29/2011	2		
		3/31/2011	2		
		4/1/2011	1		
		4/4/2011	1		
		4/5/2011	1		

Burrow ID	Project Component	2011 Breeding Season		2011/2012 Winter Resident	
		Date	# Owls	Date	# Owls
130	Solar Facility			12/7/2011	0
				12/20/2011	1
				1/6/2012	0
				1/23/2012	0
131	Solar Facility			12/7/2011	0
				12/20/2011	0
				1/6/2012	1
				1/23/2012	0
132	Solar Facility	3/29/2011	0	12/7/2011	0
		3/31/2011	0	12/20/2011	0
		4/1/2011	1	1/6/2012	0
		4/4/2011	0	1/23/2012	1
		4/5/2011	0		
137	500-foot Facility Buffer			12/7/2011	1
				12/20/2011	0
				1/6/2012	0
				1/23/2012	0
138	Solar Facility	3/29/2011	0		
		3/31/2011	0		
		4/1/2011	0		
		4/4/2011	0		
		4/5/2011	1		
141	500-foot Facility Buffer	3/29/2011	2		
		3/31/2011	0		
		4/1/2011	1		
		4/4/2011	0		
		4/5/2011	1		
145	Solar Facility	3/29/2011	1	12/7/2011	1
		3/31/2011	1	12/20/2011	1
		4/1/2011	2	1/6/2012	1
		4/4/2011	0	1/23/2012	0
		4/5/2011	0		
146	Solar Facility	3/30/2011	2		
		3/31/2011	0		
		4/4/2011	0		
		4/5/2011	1		

Burrow ID	Project Component	2011 Breeding Season		2011/2012 Winter Resident	
		Date	# Owls	Date	# Owls
147	500-foot Facility Buffer	3/30/2011	2	12/7/2011	0
		3/31/2011	2	12/19/2011	1
		4/5/2011	2	1/5/2012	0
		4/6/2011	2		
149	500-foot Facility Buffer	3/31/2011	2	12/7/2011	1
		4/5/2011	0	12/19/2011	0
		4/6/2011	0	1/5/2012	0
		4/7/2011	0	1/25/2012	0
150	Solar Facility	3/31/2011	1		
		4/5/2011	0		
		4/6/2011	0		
		4/7/2011	0		
151	500-foot Facility Buffer	4/1/2011	2	12/7/2012	0
		4/4/2011	1	12/19/2011	1
		4/5/2011	1	1/6/2012	1
		4/6/2011	1	1/23/2012	0
153	Solar Facility	3/30/2011	2	12/7/2012	1
		3/31/2011	1	12/19/2011	0
		4/4/2011	0	1/6/2012	0
		4/5/2011	1	1/23/2012	0
154	500-foot Facility Buffer	4/6/2011	1		
172	500-foot Non-BLM Gen-tie Buffer			12/7/2011	1
				12/20/2011	0
				1/6/2012	0

Burrow ID	Project Component	2011 Breeding Season		2011/2012 Winter Resident	
		Date	# Owls	Date	# Owls
174	500-foot Non-BLM Gen-tie Buffer			12/7/2011	0
				12/20/2011	0
				1/6/2012	1
				1/23/2012	0
196				12/7/2011	1
				12/19/2011	0
				1/5/2012	0
				1/25/2012	0
198				12/7/2011	1
				12/19/2011	0
199				12/7/2011	1
				12/19/2011	0
				1/5/2012	2
				1/25/2012	0
200				12/7/2011	1
				12/19/2011	0
				1/5/2012	0
				1/25/2012	0
202				12/19/2011	1
				1/6/2012	0
				1/25/2012	0
203				1/5/2012	0
				1/23/2012	0
204				12/20/2011	1
				1/6/2012	1
				1/25/2012	0
205				1/5/2012	2
				1/25/2012	1

APPENDIX 2 – JURISDICTIONAL WATERS REPORT

Campo Verde Solar Project Jurisdictional Waters Report

January 2012

Contents

Figures

Appendices

INTRODUCTION

Campo Verde Solar Project

The Campo Verde Solar Project (Project) is a proposed solar photovoltaic (PV) energy-generating facility located in Imperial County approximately 7 miles southwest of the community of El Centro, California. **Figure 1** shows the general location of the project.

The Project is being developed to sell its electricity and all renewable and environmental attributes to an electric utility purchaser under a long-term contract to help meet California RPS goals. The applicant has a long-term Power Purchase Agreement (PPA) with San Diego Gas and Electric (SDG&E) to purchase output from the Project.

The Project Site is south of I-8, west of Drew Road, and northeast of the Westside Main Canal. **Figure 2** shows the boundary of the Site and the included parcels which total approximately 1,990 acres. These private lands are currently used for agriculture.

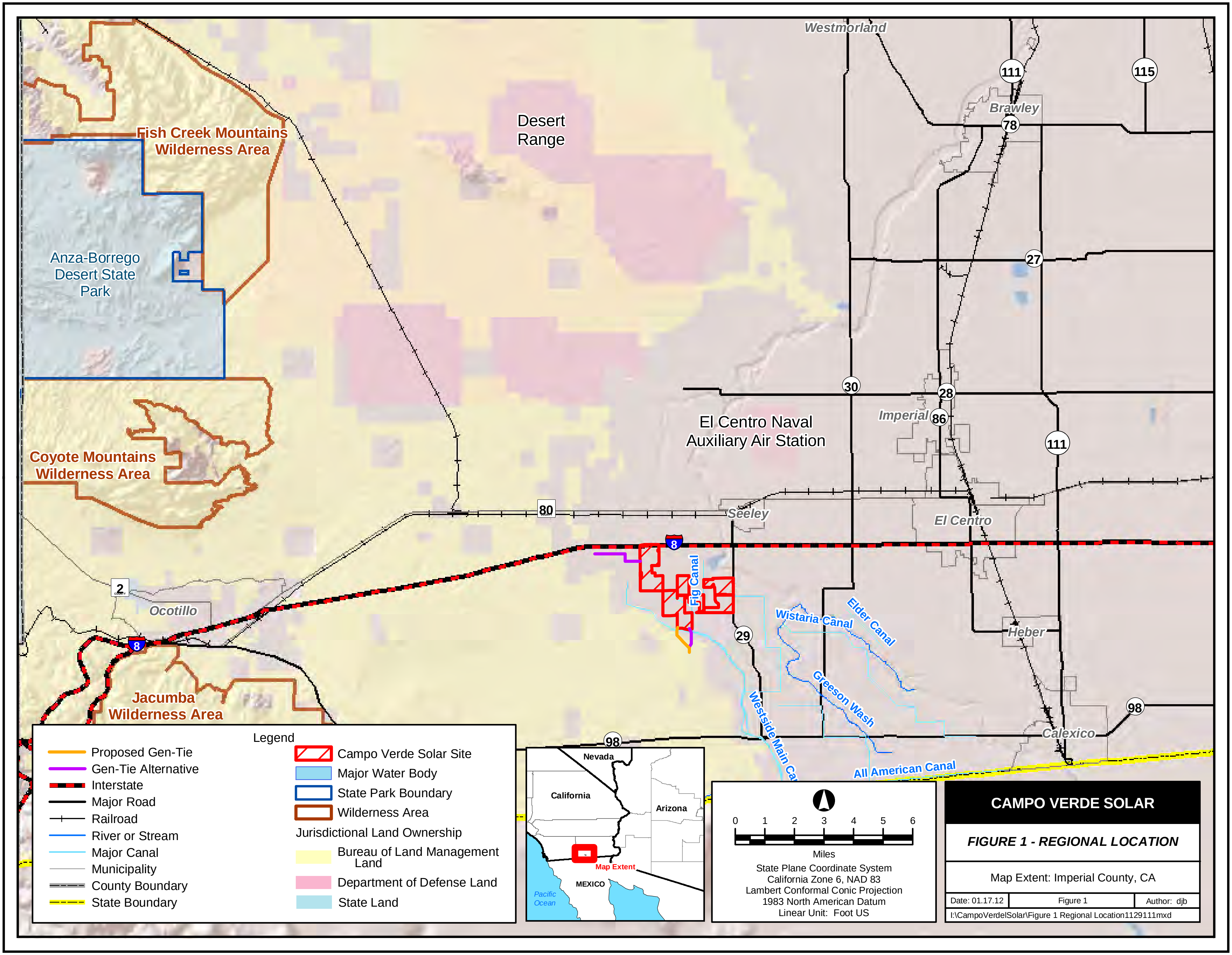
The Project would use First Solar PV modules that are generally non-reflective and convert sunlight into direct current (DC) electricity. The DC output of multiple rows of PV modules is collected through one or more combiner boxes and directed to an inverter that converts the DC electricity to alternating current (AC) electricity. From the inverter, the generated energy flows to a transformer where it is stepped up to distribution level voltage (approximately 34.5 kV). Multiple transformers are connected in parallel via 34.5 kV lines to the Project substation, where the power will be stepped up to 230 kV.

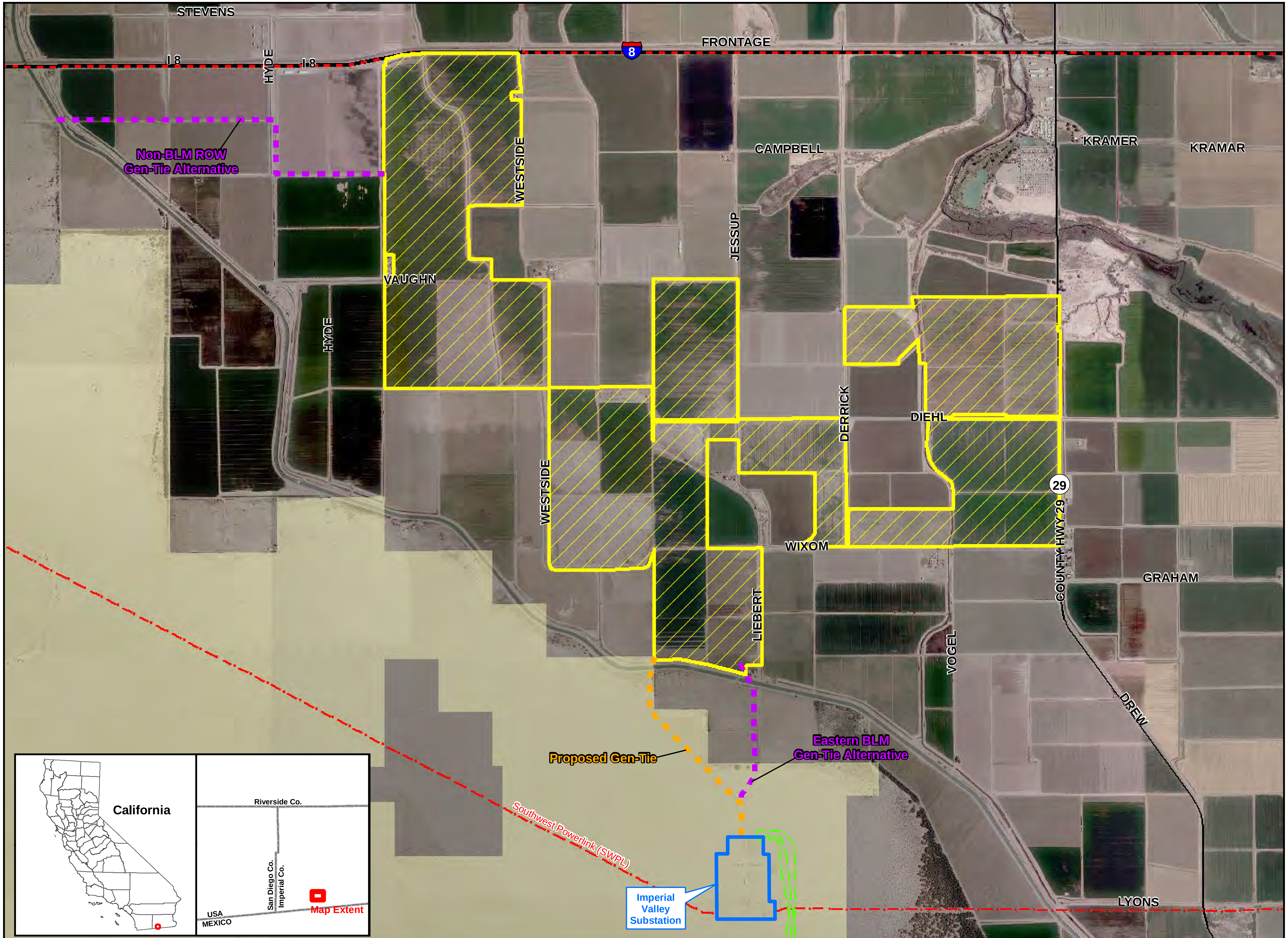
The Project is proposed to be constructed on lands that are presently farmed using flood irrigation. Water is delivered to fields using a series of delivery canals. Excess irrigation water and storm water are drained from the site by a series of ditches and drains that ultimately flow to the Salton Sea by way of the New River. Specific characteristics of the man-made irrigation features in the Project Area may cause some of them to be subject to federal jurisdiction under Section 404 of the Clean Water Act and/or subject to state jurisdiction under Sections 1600 *et seq.* of the Fish and Game Code, as described below. This report documents the occurrence of all drainages within the Project area, including gen-tie line alternatives, to determine their jurisdictional status under these federal and state authorities (**Figure 2**). For purposes of this report, drainages include all ephemeral, seasonal and permanent water bodies, including man-made canals and drains used for agricultural irrigation.

Transmission Interconnection: Gen-tie Line Alternatives

The Project will be interconnected to the regional transmission system via a new gen-tie line constructed to the Imperial Valley Substation. This interconnection will be accomplished via one of three potential gen-tie options – two requiring rights-of-way (ROWs) across federal lands managed by the Bureau of Land Management (BLM) and one private land gen-tie alternative that would provide the necessary interconnection without requiring ROW authorization from BLM.

The two gen-tie line alternatives that would cross BLM lands would be located entirely within a BLM-designated utility corridor. Each alternative would originate at the Project substation/switchyard at the southern end of the Project site and would go south to the Imperial Valley Substation. Either of these two


Westmorland
111
115
Brawley
78
Desert
Range
Fish Creek Mountains
Wilderness Area
Anza-Borrego
Desert State
Park
27
30
28
Imperial
86
El Centro Naval
Auxiliary Air Station
111
Coyote Mountains
Wilderness Area
80
Seeley
El Centro
8
Fig Canal
2
Ocotillo
8
Wistaria Canal
Elder Canal
29
Heber
Greeson Wash
Westside Main Canal
Jacumba
Wilderness Area
98
98
Calexico
All American Canal
Legend
Proposed Gen-Tie
Gen-Tie Alternative
Interstate
Major Road
Railroad
River or Stream
Major Canal
Municipality
County Boundary
State Boundary
Campo Verde Solar Site
Major Water Body
State Park Boundary
Wilderness Area
Jurisdictional Land Ownership
Bureau of Land Management Land
Department of Defense Land
State Land
Nevada
California
Arizona
Map Extent
MEXICO
Pacific Ocean
0 1 2 3 4 5 6
Miles
State Plane Coordinate System
California Zone 6, NAD 83
Lambert Conformal Conic Projection
1983 North American Datum
Linear Unit: Foot US
CAMPO VERDE SOLAR
FIGURE 1 - REGIONAL LOCATION
Map Extent: Imperial County, CA
Date: 01.17.12
Figure 1
Author: djb
I:\CampoVerdelSolar\Figure 1 Regional Location1129111mxd



CAMPO VERDE SOLAR PROJECT

FIGURE 2 - PROJECT LOCATION

Map Extent: Imperial County, California

Date: 01.17.12 | Author: djb

...Maps\Figure2BTRProjectLocation.mxd

alternatives would be built as a double-circuit 230 kV line. The right-of-way (ROW) width would be 160 feet (**Figure 2**).

- The Eastern BLM Alternative would follow the existing IID S-line and would cross about 0.4 miles of BLM land.
- The Western BLM Alternative would follow existing roads and would cross about 0.9 miles of BLM land.

The Non-BLM Gen-tie Alternative being considered is to develop a single-circuit 230 kV line originating from the western side of the Project site. It would cross approximately 2.25 miles of private lands to the west and would utilize available capacity on a line that has an approved right-of-way to the Imperial Valley Substation (**Figure 2**).

In addition to any of the long-term interconnection solutions described above, a short-term electrical interconnection solution may be implemented that would involve an interconnection to IID's S Line that crosses the site. If this solution is utilized, it would provide temporary interconnection to the grid and would be replaced by the permanent interconnection into the Imperial Valley Substation when completed.

Field Surveys

The Project area was evaluated for drainage features during field visits performed on April 4-5, 2011, October 25-27, 2011 and December 19-20, 2011. Additional information was gathered using a Geographic Information System (GIS) and aerial imagery. Determinations regarding the potential jurisdictional status of the various features located within the Project area are based on the applicable federal and state laws and regulations and associated guidance documents.

PHYSICAL SETTING

Campo Verde Solar Project

The parcels on which the Project would be constructed are currently active agriculture lands growing crops such as wheat, alfalfa, and Bermuda grass. Irrigation water is supplied by a complex, engineered system of concrete-lined canals and lateral canals operated and maintained by the Imperial Irrigation District (IID). The concrete-lined canals and lateral canals are used to deliver water to multiple farm fields and typically contain water at all times except during maintenance periods.

The farm fields are large (typically 80 acres) flat fields graded for flood irrigation. When a field is irrigated, an allocated quantity of water is allowed to flow from the IID delivery canal to a smaller ditch (locally referred to as a "head ditch"), which distributes the water evenly across the field. The head ditches are either earthen or concrete-lined. Another ditch (locally referred to as a "tail ditch") is located at the opposite, lower elevation side of the field. The tail ditch collects any excess irrigation water and directs it to an IID-operated and maintained drain. All of the tail ditches on the Project site are earthen and are frequently rebuilt after the fields are plowed and disked.

Gen-tie Line

The two BLM Gen-tie line alternatives (eastern and western) would originate on the south end of the Campo Verde Solar Facility and extend to the Imperial Valley Substation.

The Eastern BLM Alternative would be approximately 0.8 miles in length. The northern 0.4 miles of this alternative would cross fallow agricultural lands between the Westside Main Canal and the northern boundary of BLM managed lands. Approximately 0.4 miles of this alternative would cross disturbed native desert lands managed by the BLM. These lands are primarily dominated by Creosote Bush (*Larrea tridentata*)–White Bursage (*Ambrosia dumosa*) Scrub, with small inclusions of Disturbed Stabilized Desert Dunes and Athel (*Tamarix aphylla*) Tamarisk (*Tamarix ramosissima*) Type Woodland.

The Western BLM Alternative would be approximately 1.0 mile in length and would cross approximately 0.9 miles of disturbed native desert lands managed by the BLM (immediately after crossing the Westside Main Canal). These lands are dominated by disturbed and undisturbed Creosote Bush–White Bursage Scrub, Disturbed Stabilized Desert Dunes, Athel Tamarisk Type Woodland, and Fallow Agriculture.

Only one drainage feature was identified on lands managed by the BLM (#91; Westside Main Canal). No features were identified in native (non-agricultural) habitats and, for this reason, these areas are not discussed further in this document.

The Private Gen-tie Alternative would cross approximately 1.75 miles of active agricultural lands similar in nature to the Campo Verde Solar Facility project area. These lands contain a mix of active agriculture, roads, and irrigation infrastructure, as described above.

ARMY CORPS OF ENGINEERS JURISDICTION

The U.S. Army Corps of Engineers (ACOE) has jurisdiction over wetlands and other “waters of the United States” that are subject Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act. Typically, these waters include naturally occurring traditional navigable waters (TNWs), relatively permanent waters (RPWs), and/or ephemeral waters with a significant nexus to a TNW. Man-made drainages constructed wholly in uplands are typically only considered jurisdictional if they are RPWs. The most recent guidance on the topic states that “relatively permanent waters typically flow year-round or have continuous flow at least seasonally (e.g. typically three months)” (EPA and ACOE 2008). Conversely, man-made drainages constructed solely in uplands that are not RPWs are generally not federally jurisdictional.

With respect to non-tidal waters, federal jurisdiction over non-wetlands extends to the “Ordinary High Water Mark” (OHWM). 33 C.F.R. § 328.4(c)(1). The Ordinary High Water (OHW) zone in low-gradient, alluvial ephemeral/intermittent channel forms in the Arid West is defined as the active floodplain. The dynamics of arid channel forms and the transitory nature of traditional OHWM indicators in arid environments render the limit of the active floodplain the only reliable and repeatable feature in terms of OHW zone delineation. The extent of flood model outputs for effective discharges (5 to 10 year events in arid channels) aligns well with the boundaries of the active floodplain (ACOE 2008).

OHWM indicators identified during visits to the Project area and on aerial photography were used to determine the potential jurisdictional status of drainage features in the project area. Changes in particle size, water staining, changes in vegetation cover/species, changes in slope from the active floodplain to the low terrace, shelving, and discernible bed and bank were the most common indicators used to delineate OHWMs in the Project area. OHWM forms were completed for all non-ephemeral features in the project area (i.e., RPWs). Because the potentially jurisdictional features in the Project area are man-made RPWs, the OHW zone was typically delineated using direct measure of OHWM indicators rather than the extent of the active floodplain because irrigation features with controlled flows do not support true active floodplains. Data forms are provided in **Appendix D**.

Jurisdictional Features

A total of 118 surface water conveyance features were evaluated to determine potential federal jurisdiction. **Table 1** summarizes the findings of this evaluation. Details related to the drainage features and locations are provided in the **Drainage Descriptions** section. A mapbook depicting the location of all drainage features evaluated can be found in **Appendix C**.

Table 1 - Summary of Potential Federally Jurisdictional Waters

	Potentially Jurisdictional	Not Jurisdictional	Total
Number of Drainages	20	98	118

A total of 20 features were identified as potentially subject to federal jurisdiction. All features within the Project area are man-made features constructed wholly within uplands that are used for agricultural irrigation (supply and drainage). Typically the head ditches used to irrigate individual fields, as well as the tail ditches used to drain individual fields, convey water for only a few days at a time (i.e., during periodic and infrequent irrigation events) and, therefore, do not meet the definition of a RPW (requiring flow year-round or continuous flow at least seasonally [e.g. typically three months]). The larger, IID-maintained, concrete-lined canals and lateral canals used to convey water to multiple fields convey water for most of the year and would likely be considered subject to federal jurisdiction under the RPW definition. Similarly, the larger IID-maintained drains that collect tail water from multiple fields convey water for most of the year and would likely be considered subject to federal jurisdiction under the same RPW definition.

CALIFORNIA DEPARTMENT OF FISH AND GAME JURISDICTION

The California Department of Fish and Game (CDFG) generally takes jurisdiction over all stream features, including drains and canals. The CDFG's jurisdiction extends from the top of bank to the opposite top of bank on these features, or to the limits of riparian vegetation if this vegetation extends beyond the top of the banks. Wetlands need to meet only one of the three ACOE criteria (wetland vegetation, wetland hydrology, and/or hydric soils) to be considered CDFG jurisdictional wetlands.

Under Section 1600 of the California Fish and Game Code, CDFG's jurisdiction includes "…bed, channel or bank of any river, stream or lake designated by the department in which there is any time an existing fish or wildlife resource or from which these resources derive benefit…" Canals, aqueducts, irrigation ditches, and other means of water conveyance can also be considered streams if they support aquatic life, riparian vegetation or stream dependent terrestrial benefit (Cylinder 1995).

Jurisdictional Features

Generally speaking, most canals, head ditches and tail ditches do not support riparian habitat. Larger drains, however, typically do support some riparian habitat and are often considered subject to CDFG jurisdiction. Guidance from Magdalena Rodriguez at CDFG (2011) indicated that several commonly occurring water conveyance types would not be considered jurisdictional: concrete head ditches only conveying water to a single field, and small tail ditches draining only a single field.

Drainage features in the Project area were considered potentially jurisdictional if they exhibited a naturally occurring bed and bank, riparian vegetation potentially providing wildlife habitat, and/or evidence of regular flow.

A total of 118 surface water conveyance features in the Project area were evaluated for potential jurisdictional status**.** **Table 2** summarizes the findings of the evaluation. Detailed drainage descriptions and evaluations are provided in the **Drainage Descriptions** section.

Table 2 – Summary of Potential State Jurisdictional Waters

	Potentially Jurisdictional	**Not Jurisdictional**	**Total**
Number of Drainages	23	95	118

A total of 23 features were identified as potentially state jurisdictional. All features within the Campo Verde Project Area are man-made features constructed wholly within uplands; these features are used for agricultural irrigation (supply and drainage). Typically the head ditches used to irrigate individual fields, as well as the tail ditches used to drain individual fields, convey water for only a few days (during periodic and infrequent irrigation events) at a time and, therefore, do not meet CDFG's definition of a jurisdictional water. The larger, IID-maintained, concrete-lined canals and lateral canals used to convey water to multiple fields convey water for most of the year, sometimes support riparian vegetation and/or fisheries, and would likely be considered CDFG jurisdictional. Similarly, the larger IID-maintained drains that collect tail water from multiple fields convey water for most of the year and would likely be considered CDFG jurisdictional.

DRAINAGE DESCRIPTIONS

Drainage #1

Mapbook Pages: F-2
Photographs: 1
ACOE Jurisdiction: Potentially Jurisdictional
CDFG Jurisdiction: Potentially Jurisdictional
Feature Type: Lateral Canal
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
8	4

Jurisdictional Evaluation:
Wormwood Lateral 7: Carries water from Wormwood Canal to multiple Head Ditches. No riparian vegetation is present. Likely carries water for most of the year. OHWM indicator was water staining.

Drainage #2

Mapbook Pages: E-2, F-2
Photographs: 2, 5
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
2	0

Jurisdictional Evaluation:
Small Tail Ditch, drains a single field. Flows into Fig Drain (Drainage #6) via a box culvert and underground pipe. No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #3 (Reserved – No conveyance assigned this number)

Drainage #4

Mapbook Pages: E-2, F-2
Photographs: 3, 4
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete/Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Head Ditch, carries water from Wormwood Lateral 7 (Drainage #1; via Gate 94) to irrigate a single field. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #5

Mapbook Pages: E-2
Photographs: 6
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
8	0

Jurisdictional Evaluation:
Small Tail Ditch, drains a single field. Flows into Fig Drain (Drainage #6). No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #6

Mapbook Pages: E-1, E-2
Photographs: 7, 8, 17, 18
ACOE Jurisdiction: Potentially Jurisdictional
CDFG Jurisdiction: Potentially Jurisdictional
Feature Type: Drain
Riparian Vegetation: Yes
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
80	25

Jurisdictional Evaluation:
Fig Drain: Large drain, collects tail-water from several Tail Ditches. Riparian vegetation is present along much of the feature. Likely flows for most of the year, if not year-round. OHWM indicators include presence of bed and bank, change in vegetation cover and change in slope. Drains to Fig Lagoon then the New River, and eventually to the Salton Sea.

Drainage #7

Mapbook Pages: E-2, F-2
Photographs: 9
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: Limited
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Tail Ditch, drains a single field. Flows into Fig Drain (Drainage #6). Limited riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #8

Mapbook Pages: F-1 F-2
Photographs: 10

ACOE Jurisdiction: Potentially Jurisdictional
CDFG Jurisdiction: Potentially Jurisdictional
Feature Type: Canal
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
14	10

Jurisdictional Evaluation:
Wormwood Canal: Carries water to multiple lateral canals and Head Ditches. Limited riparian vegetation is present along much of the feature. Likely carries water year-round. OHWM indicator was water staining.

Drainage #9

Mapbook Pages: E-1 E-2, F-1
Photographs: 12
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Head Ditch, carries water from Wormwood Canal (Drainage #8; via Gate 92) to irrigate two fields. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #10

Mapbook Pages: E-1, E-2
Photographs: 14
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: Limited
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
12	10

Jurisdictional Evaluation:
Tail Ditch, drains two fields. Flows into Fig Drain (Drainage #6) via Drainage #14. No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #11A

Mapbook Pages: F-1
Photographs: 162
ACOE Jurisdiction: Potentially Jurisdictional
CDFG Jurisdiction: Potentially Jurisdictional
Feature Type: Head Ditch/Wetland
Riparian Vegetation: Yes
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
25	20

Jurisdictional Evaluation:
Apparently defunct Head Ditch with wetland vegetation, carried water from Wormwood Canal (Drainage #8; via Gate 90) to irrigate a single field. Wetland/riparian vegetation is present. This segment appears to be collecting water leaking from nearby canals and head ditches. Delineation was based on the extent of hydrophytic vegetation (outside the limits of inundation/saturation).

Drainage #11B

Mapbook Pages: E-1, F-1
Photographs: 15
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Potentially Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: Limited
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
10	4

Jurisdictional Evaluation:
Apparently defunct Head Ditch, carried water from Wormwood Canal (Drainage #8; via Gate 90) to irrigate a single field. Limited riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #12

Mapbook Pages: F-1
Photographs: 11, 13
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None; arrow weed scrub adjacent
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Head Ditch, carries water from Wormwood Canal (Drainage #8; via Gate 90A) to irrigate a single field. No riparian vegetation is present in feature, some arrow weed scrub is present adjacent to feature. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #13

Mapbook Pages: E-1
Photographs: 16
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
5	2

Jurisdictional Evaluation:
Tail Ditch, drains a single field. Flows into Fig Drain (Drainage #6) via Drainage #14. No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #14

Mapbook Pages: E-1
Photographs: 19
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Potentially Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: Limited
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Tail Ditch, drains several fields. Flows into Fig Drain (Drainage #6). Limited riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #15

Mapbook Pages: E-1, E-2
Photographs: 20
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Tail Ditch, drains a single field. Flows into Fig Drain (Drainage #6) via Drainage #14. No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #16

Mapbook Pages: E-1, E-2
Photographs: 21
ACOE Jurisdiction: Potentially Jurisdictional
CDFG Jurisdiction: Potentially Jurisdictional
Feature Type: Drain
Riparian Vegetation: Yes
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
30	10

Jurisdictional Evaluation:
Diehl Drain: Large drain, collects tail-water from several Tail Ditches. Riparian vegetation is present along much of the feature. Likely flows for most of the year, if not year-round. OHWM indicators include presence of bed and bank, change in vegetation cover and change in slope. Drains to Fig Drain, then to Fig Lagoon, the New River, and eventually to the Salton Sea.

Drainage #17

Mapbook Pages: E-1
Photographs: 22
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
4	2

Jurisdictional Evaluation:
Tail Ditch, drains a single field. Flows into Diehl Drain (Drainage #16). No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #18

Mapbook Pages: E-1
Photographs: 23
ACOE Jurisdiction: Not Jurisdictional

CDFG Jurisdiction:	Not Jurisdictional
Feature Type:	Head Ditch
Riparian Vegetation:	None
Substrate:	Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Head Ditch, carries water from Fig Canal (Drainage #22; via Gate 9) to irrigate a single field. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #19

Mapbook Pages:	E-2
Photographs:	24
ACOE Jurisdiction:	Not Jurisdictional
CDFG Jurisdiction:	Not Jurisdictional
Feature Type:	Tail Ditch
Riparian Vegetation:	None
Substrate:	Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
4	2

Jurisdictional Evaluation:
Tail Ditch, drains a single field. Flows into Diehl Drain (Drainage #16). No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #20

Mapbook Pages:	E-2
Photographs:	25
ACOE Jurisdiction:	Not Jurisdictional
CDFG Jurisdiction:	Not Jurisdictional
Feature Type:	Head Ditch
Riparian Vegetation:	None
Substrate:	Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Head Ditch, carries water from Fig Canal (Drainage #22; via Gate 2A) to irrigate a single field. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #21

Mapbook Pages: E-2
Photographs: 26
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
4	2

Jurisdictional Evaluation:
Tail Ditch, drains a single field. Flows into Fig Drain (Drainage #6). No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #22

Mapbook Pages: D-2, E-1, E-2
Photographs: 40, 41
ACOE Jurisdiction: Potentially Jurisdictional
CDFG Jurisdiction: Potentially Jurisdictional
Feature Type: Canal
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
14	10

Jurisdictional Evaluation:
Fig Canal: Flows from Fern Canal (via Gate Fig), carries water to multiple lateral canals and Head Ditches. No riparian vegetation is present along much of the feature. Likely carries water year-round. OHWM indicator was water staining.

Drainage #23

Mapbook Pages: E-2
Photographs: 42
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Head Ditch, carries water from Fig Canal (Drainage #22; via Gate 1) to irrigate a single field. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #24

Mapbook Pages: E-2
Photographs: 43
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	3

Jurisdictional Evaluation:
Tail Ditch, drains a single field. Flows into Diehl Drain (Drainage #16). No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #25

Mapbook Pages: D-2, E-2
Photographs: 44
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Head Ditch, carries water from Fig Canal (Drainage #22; via Gate 5) to irrigate a single field. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #26

Mapbook Pages: D-2, E-2
Photographs: 45
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	3

Jurisdictional Evaluation:
Tail Ditch, drains a single field. Flows into Wixom Drain (Drainage #27). No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #27

Mapbook Pages: D-1, D-2
Photographs: 46, 47, 50, 51, 146, 147
ACOE Jurisdiction: Potentially Jurisdictional
CDFG Jurisdiction: Potentially Jurisdictional
Feature Type: Drain
Riparian Vegetation: Yes
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
25	12

Jurisdictional Evaluation:
Wixom Drain: Large drain, collects tail-water from several Tail Ditches. Riparian vegetation is present along much of the feature. Likely flows for most of the year, if not year-round. OHWM indicators include presence of bed and bank, change in vegetation cover and change in slope. Drains to Wetland (Drainage #63), then to Fig Lagoon, the New River, and eventually to the Salton Sea.

Drainage #28 (Reserved – No conveyance assigned this number)

Drainage #29

Mapbook Pages: D-1, D-2
Photographs: 49
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	3

Jurisdictional Evaluation:
Small Tail Ditch, drains a single field. Flows into Wixom Drain (Drainage #27). No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #30

Mapbook Pages: E-1
Photographs: 52, 53
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Head Ditch, carries water from Fig Canal (Drainage #22; via Gate 10) to irrigate a single field. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #31

Mapbook Pages: D-1, D-2
Photographs: 54, 55
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Head Ditch, carries water from Fern Canal (Drainage #33; via Gate 7) to irrigate a single field. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #32

Mapbook Pages: D-1
Photographs: 57
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Head Ditch, carries water from Fern Canal (Drainage #33; via Gate 12) to irrigate a single field. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #33

Mapbook Pages: D-1, D-2, D-3
Photographs: 56
ACOE Jurisdiction: Potentially Jurisdictional
CDFG Jurisdiction: Potentially Jurisdictional
Feature Type: Canal
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
16	12

Jurisdictional Evaluation:
Fern Canal: Flows from Westside Main (Drainage #91; via Gate Fern), carries water to multiple lateral canals and Head Ditches. No riparian vegetation is present along much of the feature. Likely carries water year-round. OHWM indicator was water staining.

Drainage #34

Mapbook Pages: D-1
Photographs: 60
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
8	2

Jurisdictional Evaluation:
Tail Ditch, drains a single field. Flows into Dixie 3C Drain (Drainage #58). No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #35

Mapbook Pages: C-2
Photographs: 61
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
5	2

Jurisdictional Evaluation:
Tail Ditch, drains a single field. Flows into Dixie 3C Drain (Drainage #58) via a culvert. No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #36

Mapbook Pages: C-2
Photographs: 62
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Head Ditch, carries water from Fern Canal (Drainage #33; via Gate 14) to irrigate a single field. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #37

Mapbook Pages: C-2, C-3
Photographs: 63
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
5	2

Jurisdictional Evaluation:
Tail Ditch, drains a single field. Flows into Dixie 3A Drain (Drainage #49). No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #38

Mapbook Pages: D-1
Photographs: 65

ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Head Ditch, carries water from Fern Canal (Drainage #33; via Gate 13A) to irrigate a single field. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #39

Mapbook Pages: C-3, D-1
Photographs: 64
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
5	3

Jurisdictional Evaluation:
Head Ditch, carries water from Fern Canal (Drainage #33; via Gate 11) to irrigate a single field. Connected to Feature #40. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #40

Mapbook Pages: D-1, D-2
Photographs: 66
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete/Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
5	3

Jurisdictional Evaluation:
Defunct Head Ditch, formerly carried water from Fern Canal (Drainage #33; via Gate 11) to irrigate a single field. Connected to Feature #39. No riparian vegetation is present Head Ditches typically convey

water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #41

Mapbook Pages: C-3, D-2
Photographs: 67
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
4	2

Jurisdictional Evaluation:
Small Tail Ditch, drains a single field. Flows into Dixie 3A Drain (Drainage #49). No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #42

Mapbook Pages: C-3, D-2
Photographs: 68
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	3

Jurisdictional Evaluation:
Tail Ditch, drains a single field. Flows into Dixie 3A Drain (Drainage #49). No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #43

Mapbook Pages: D-1, D-2
Photographs: 69
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Head Ditch, carries water from Fern Canal (Drainage #33; via Gate 8) to irrigate a single field. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #44

Mapbook Pages: D-2
Photographs: 70
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
5	3

Jurisdictional Evaluation:
Tail Ditch, drains a single field. Flows into Dixie 3A Drain (Drainage #49). No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #45

Mapbook Pages: D-2, D-3
Photographs: 71
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
5	3

Jurisdictional Evaluation:
Tail Ditch, drains a single field. Flows into Dixie 3A Drain (Drainage #49). No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #46

Mapbook Pages: D-3
Photographs: 72
ACOE Jurisdiction: Not Jurisdictional

CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Head Ditch, carries water from Westside Main (Drainage #91; via unnumbered gate); Unclear if this feature is used for field irrigation or to control overflow from canal system. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events); overflow control patterns may be different. They are typically dry (non-RPW).

Drainage #47

Mapbook Pages: D-2, D-3
Photographs: 73
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete/Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Head Ditch, carries water from Drainage #46, via Gate 11A, to irrigate two fields. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW). Southeastern spur of feature is earthen, rest of feature is concrete.

Drainage #48

Mapbook Pages: D-2, D-3
Photographs: 74, 75
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
5	2

Jurisdictional Evaluation:
Isolated Tail Ditch, drains a single field. No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #49

Mapbook Pages: C-1, C-2, C-3, C-4, D-2
Photographs: 76, 77
ACOE Jurisdiction: Potentially Jurisdictional
CDFG Jurisdiction: Potentially Jurisdictional
Feature Type: Drain
Riparian Vegetation: Yes
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
50	35

Jurisdictional Evaluation:
Dixie 3A Drain: Large drain, collects tail-water from several Tail Ditches. Riparian vegetation is present along much of the feature. Likely flows for most of the year, if not year-round. OHWM indicators include presence of bed and bank, change in vegetation cover and change in slope. Drains to the New River and eventually to the Salton Sea.

Drainage #50

Mapbook Pages: C-3
Photographs: 78
ACOE Jurisdiction: Potentially Jurisdictional
CDFG Jurisdiction: Potentially Jurisdictional
Feature Type: Wetland (Defunct Drain)
Riparian Vegetation: Yes
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
30	15

Jurisdictional Evaluation:
Defunct Drain, now a wetland; water backs up from Dixie 3A Drain (Feature #49). Riparian/wetland vegetation is present along feature. Likely saturated/inundated for most of the year, if not year-round. Delineated based on extend of riparian vegetation or top of bank (larger than saturated/indundated area).

Drainage #51

Mapbook Pages: C-2, C-3
Photographs: 79
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Tail Ditch, drains a single field. Flows into Dixie 3A Drain (Drainage #49). No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #52

Mapbook Pages: C-2, C-3
Photographs: 80
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Head Ditch, carries water from Fern Canal (Drainage #33), via Drainage #77, to irrigate a single field. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #53

Mapbook Pages: C-2
Photographs: 81
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: Limited
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
5	2

Jurisdictional Evaluation:
Tail Ditch, drains a single field. Flows into Dixie 3A Drain (Drainage #49), via a culvert. Limited riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #54

Mapbook Pages: C-2, C-3
Photographs: 82
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional

Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	3

Jurisdictional Evaluation:
Tail Ditch, drains a single field. Drains into culverts at both ends. No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #55

Mapbook Pages: C-1, C-2, C-3
Photographs: 83, 86
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
7	5

Jurisdictional Evaluation:
Head Ditch, carries water from Westside Main (Drainage #91) to irrigate a two fields. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #56

Mapbook Pages: C-1, C-2
Photographs: 84, 143
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
10	6

Jurisdictional Evaluation:
Tail Ditch, drains a single field. Flows into Dixie 3A Drain (Drainage #49) at several locations. No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #57

Mapbook Pages: C-1, C-2
Photographs: 85
ACOE Jurisdiction: Potentially Jurisdictional
CDFG Jurisdiction: Potentially Jurisdictional
Feature Type: Drain
Riparian Vegetation: Yes
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
50	25

Jurisdictional Evaluation:
Westside Drain: Large drain, collects tail-water from several Tail Ditches. Riparian vegetation is present along much of the feature. Likely flows for most of the year, if not year-round. OHWM indicators include presence of bed and bank, change in vegetation cover and change in slope. Drains to Dixie 3A Drain (Drainage #49) then to the New River and eventually to the Salton Sea.

Drainage #58

Mapbook Pages: C-2, D-1
Photographs: 58, 59, 88, 145
ACOE Jurisdiction: Potentially Jurisdictional
CDFG Jurisdiction: Potentially Jurisdictional
Feature Type: Drain
Riparian Vegetation: Yes
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
50	25

Jurisdictional Evaluation:
Dixie 3C Drain: Large drain, collects tail-water from several Tail Ditches. Riparian vegetation is present along much of the feature. Likely flows for most of the year, if not year-round. OHWM indicators include presence of bed and bank, change in vegetation cover and change in slope. Drains to Dixie 3A Drain (Drainage #49) then to the New River and eventually to the Salton Sea.

Drainage #59

Mapbook Pages: C-1, C-2
Photographs: 89
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Head Ditch, carries water from unnumbered Fern Lateral Canal (Drainage #61; via Gate 25) to irrigate a single field. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #60

Mapbook Pages: C-1
Photographs: 92
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Head Ditch, carries water from unnumbered Fern Lateral Canal (Drainage #61; via Gate 26) to irrigate a single field. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #61

Mapbook Pages: C-1
Photographs: 90
ACOE Jurisdiction: Potentially Jurisdictional
CDFG Jurisdiction: Potentially Jurisdictional
Feature Type: Lateral Canal
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
8	6

Jurisdictional Evaluation:
Unnumbered Fern Lateral: Carries water from Fern Canal to multiple Head Ditches. No riparian vegetation is present. Likely carries water for most of the year. OHWM indicator was water staining.

Drainage #62

Mapbook Pages: C-1, C-2
Photographs: 93
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional

Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
8	4

Jurisdictional Evaluation:
Tail Ditch, drains a single field. Flows into Dixie 3A Drain (Drainage #49) via a culvert. No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #63 (Reserved – No conveyance assigned this number)

Drainage #64

Mapbook Pages: F-1, F-2
Photographs: 95, 96
ACOE Jurisdiction: Potentially Jurisdictional
CDFG Jurisdiction: Potentially Jurisdictional
Feature Type: Drain
Riparian Vegetation: Yes
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
35	20

Jurisdictional Evaluation:
Wormwood 7 Drain: Large drain, collects tail-water from several Tail Ditches. Riparian vegetation is present along much of the feature. Likely flows for most of the year, if not year-round. OHWM indicators include presence of bed and bank, change in vegetation cover and change in slope. Drains to the New River and eventually to the Salton Sea.

Drainage #65

Mapbook Pages: F-1
Photographs: 97
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	3

Jurisdictional Evaluation:
Head Ditch, carries water from Wormwood Canal (Drainage #8; via Drainage #11 and an unnumbered Gate) to irrigate a single field. No riparian vegetation is present Head Ditches typically convey water for

only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #66

Mapbook Pages: E-1
Photographs: 98
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
5	2

Jurisdictional Evaluation:
Tail Ditch, drains a single field. Flows into Fig Drain (Drainage #6). No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #67

Mapbook Pages: E-1
Photographs: 99
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Tail Ditch, drains a single field. Flows into Fig Drain (Drainage #6). No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #68

Mapbook Pages: E-1
Photographs: 100
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
5	2

Jurisdictional Evaluation:
Isolated Tail Ditch, drains a single field. No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #69 (Reserved – No conveyance assigned this number)

Drainage #70 (Reserved – No conveyance assigned this number)

Drainage #71 (Reserved – No conveyance assigned this number)

Drainage #72

Mapbook Pages: D-1
Photographs: 104
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
7	5

Jurisdictional Evaluation:
Head Ditch, carries water to irrigate a single field. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #73

Mapbook Pages: D-1
Photographs: 105
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
2	1

Jurisdictional Evaluation:
Small, isolated Tail Ditch, drains a single field. No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #74

Mapbook Pages: D-1
Photographs: 106
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Head Ditch, carries water from Fern Canal (Drainage #33) via Gate 15 to irrigate a single field. No riparian vegetation is present Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #75 (Reserved – No conveyance assigned this number)

Drainage #76

Mapbook Pages: C-2
Photographs: 107
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Head Ditch, carries water from Drainage #77 to Drainage #52. Does not irrigate any fields; only serves as a connector. No riparian vegetation is present Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW). Likely has flow pattern identical to Drainage #52.

Drainage #77

Mapbook Pages: C-2
Photographs: 108
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None

Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Head Ditch, carries water from Fern Canal (Drainage #33) to irrigate a single field. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #78

Mapbook Pages: C-1
Photographs: 109
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Road Ditch
Riparian Vegetation: Limited
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Road Ditch, carries surface runoff from Interstate-8. Flows to Westside Drain (Drainage #57). Limited riparian vegetation is present. Typically only flows during and immediately after precipitation events (non-RPW).

Drainage #79

Mapbook Pages: C-1, C-2
Photographs: 110
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
5	2

Jurisdictional Evaluation:
Tail Ditch, drains a single field. Flows into Westside Drain (Drainage #57). No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #80

Mapbook Pages: B-2, C-2
Photographs: 111
ACOE Jurisdiction: Not Jurisdictional

CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
10	6

Jurisdictional Evaluation:
Tail Ditch, drains a single field. Flows into Westside Drain (Drainage #57). No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #81

Mapbook Pages: C-2
Photographs: 112
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Head Ditch, carries water from Forget Me Not Canal (Drainage #115; via Gate 2) to irrigate a single field. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #82

Mapbook Pages: C-2
Photographs: 113
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Head Ditch, carries water from Forget Me Not Canal (Drainage #115; via Gate 1) to irrigate a single field. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #83

Mapbook Pages: C-2
Photographs: 114
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
12	1

Jurisdictional Evaluation:
Small Tail Ditch, drains a single field. Flows into Westside Drain (Drainage #57). No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #84

Mapbook Pages: C-2, C-3
Photographs: 115
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
4	1

Jurisdictional Evaluation:
Small Tail Ditch, drains a single field. Flows into Westside Drain (Drainage #57) via a culvert. No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #85

Mapbook Pages: C-3
Photographs: 116
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
3	1

Jurisdictional Evaluation:
Small Tail Ditch, drains a single field. Flows into a culvert, unclear where culvert drains to – possibly Dixie 3A Drain (Drainage #49). No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #86

Mapbook Pages: C-3
Photographs: 117
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Head Ditch, carries water to irrigate a single field. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #87

Mapbook Pages: C-3
Photographs: 118
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Head Ditch, carries water to irrigate a single field. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #88

Mapbook Pages: C-3
Photographs: 119
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
8	2

Jurisdictional Evaluation:
Tail Ditch, drains a single field. Flows into Dixie 3A Drain (Drainage #49). No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #89

Mapbook Pages: C-3
Photographs: 120
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Head Ditch (possibly defunct), carries water to irrigate a single field. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #90

Mapbook Pages: D-2, D-3
Photographs: 121
ACOE Jurisdiction: Potentially Jurisdictional
CDFG Jurisdiction: Potentially Jurisdictional
Feature Type: Drain
Riparian Vegetation: Yes
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
30	18

Jurisdictional Evaluation:
Dixie 3B Drain: Large drain, collects tail-water from several Tail Ditches. Riparian vegetation is present along much of the feature. Likely flows for most of the year, if not year-round. OHWM indicators include presence of bed and bank, change in vegetation cover and change in slope. Drains to the Dixie 3A Drain then to the New River and eventually to the Salton Sea.

Drainage #91

Mapbook Pages: A-1, D-3
Photographs: 122
ACOE Jurisdiction: Potentially Jurisdictional
CDFG Jurisdiction: Potentially Jurisdictional

Feature Type: Canal
Riparian Vegetation: Yes
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
150	120

Jurisdictional Evaluation:
Westside Main: Flows from the All-American Canal, carries water to multiple Canals, Lateral Canals and Head Ditches. Some riparian vegetation is present along much of the feature; mostly arrow weed. Carries water year-round. OHWM indicators included water staining and change in vegetation.

Drainage #92

Mapbook Pages: D-2, D-3
Photographs: 123
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
4	1

Jurisdictional Evaluation:
Small Tail Ditch, drains a single field. Flows into Wixom Drain (Drainage #27). No riparian vegetation is present along feature. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #93

Mapbook Pages: D-3
Photographs: 124
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
10	6

Jurisdictional Evaluation:
Head Ditch, carries water to irrigate a single field. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #94

Mapbook Pages: E-2, D-2
Photographs: 125
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
4	1

Jurisdictional Evaluation:
Small isolated Tail Ditch, drains a single field. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #95

Mapbook Pages: D-2
Photographs: 126
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None (*Atriplex* scrub adjacent to feature)
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Head Ditch, carries water from Fern Canal (Dranage #33, via Gate 1B) to irrigate a single field. No riparian vegetation is present Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #96

Mapbook Pages: D-2
Photographs: No Picture
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Head Ditch, carries water from Fern Canal (Dranage #33, via Gate 3) to irrigate a single field; possibly defunct. No riparian vegetation is present Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #97

Mapbook Pages: D-2, E-2
Photographs: 127
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	2

Jurisdictional Evaluation:
Tail Ditch, drains a single field. Flows to Wixom Drain (Drainage #27). Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #98

Mapbook Pages: D-2, E-2
Photographs: 128
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete/Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
8	3

Jurisdictional Evaluation:
Head Ditch, carries water from Fig Canal (Dranage #22, via Gate 3) to irrigate a single field. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #99

Mapbook Pages: E-2
Photographs: 129
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Head Ditch, carries water from Fig Canal (Dranage #22, via Gate 2) to irrigate a single field. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #100

Mapbook Pages: E-2, F-2
Photographs: 130
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
2	1

Jurisdictional Evaluation:
Small Tail Ditch, drains a single field. Flows to Fig Drain (Drainage #6). Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #101

Mapbook Pages: E-2
Photographs: 131
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
4	1

Jurisdictional Evaluation:
Small Tail Ditch, drains a single field. Flows to Diehl Drain (Drainage #16). Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #102

Mapbook Pages: E-2
Photographs: 132
ACOE Jurisdiction: Not Jurisdictional

CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Head Ditch, carries water from Fig Canal (Dranage #22, via Gate 4) to irrigate a two fields (drainage splits). No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #103

Mapbook Pages: E-2
Photographs: 133
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
2	1

Jurisdictional Evaluation:
Small isolated Tail Ditch, drains a single field. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #104

Mapbook Pages: E-2
Photographs: 134
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Head Ditch, carries water from Fig Canal (Dranage #22, via Gate 6) to irrigate a single field. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #105

Mapbook Pages: D-2, E-2
Photographs: 135
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Head Ditch, carries water from Fig Canal (Dranage #22, via Gate 7) to irrigate a single field. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #106

Mapbook Pages: D-1, E-1
Photographs: 136
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	5

Jurisdictional Evaluation:
Tail Ditch, drains a single field. Flows to Wixom Drain (Drainage #27). Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #107

Mapbook Pages: D-1, E-1
Photographs: 137
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Potentially Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: Yes
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Earthen Head Ditch, carries water from Fig Canal (Dranage #22, via Gate 8) to irrigate a single field. Riparian vegetation (arrow weed) is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #108

Mapbook Pages: D-1, E-1
Photographs: 138
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
8	3

Jurisdictional Evaluation:
Tail Ditch, drains a single field. Flows to Wixom Drain (Drainage #27). Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #109

Mapbook Pages: E-1
Photographs: 139
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
2	1

Jurisdictional Evaluation:
Small Tail Ditch, drains a single field. Flows to Diehl Drain (Drainage #16). Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #110

Mapbook Pages: B-1, B-2
Photographs: 140
ACOE Jurisdiction: Potentially Jurisdictional
CDFG Jurisdiction: Potentially Jurisdictional
Feature Type: Drain
Riparian Vegetation: Yes
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
30	15

Jurisdictional Evaluation:
Forget Me Not Drain 1: Large drain, collects tail-water from several Tail Ditches. Riparian vegetation is present along much of the feature. Likely flows for most of the year, if not year-round. OHWM indicators include presence of bed and bank, change in vegetation cover and change in slope. Drains to eventually to New River.

Drainage #111

Mapbook Pages: A-1
Photographs: 141, 142
ACOE Jurisdiction: Potentially Jurisdictional
CDFG Jurisdiction: Potentially Jurisdictional
Feature Type: Drain
Riparian Vegetation: Yes
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
40	20

Jurisdictional Evaluation:
Dixie 4 Drain: Large drain, collects tail-water from several Tail Ditches. Riparian vegetation is present along much of the feature. Likely flows for most of the year, if not year-round. OHWM indicators include presence of bed and bank, change in vegetation cover and change in slope. Drains eventually to New River.

Drainage #112 (Reserved – No conveyance assigned this number)

Drainage #113

Mapbook Pages: F-1, F-2
Photographs: 10
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Earthen Head Ditch, carries water from Wormwood Canal (Dranage #8, via Gate 88) to irrigate a single field. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #114

Mapbook Pages: A-1
Photographs: 148
ACOE Jurisdiction: Potentially Jurisdictional
CDFG Jurisdiction: Potentially Jurisdictional
Feature Type: Canal
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
20	12

Jurisdictional Evaluation:
Foxglove Canal: Flows from the Westside Main Canal (Drainage #91), carries water to multiple Lateral Canals and Head Ditches. Some riparian vegetation is present along much of the feature; mostly arrow weed. Carries water year-round. OHWM indicator was water staining.

Drainage #115

Mapbook Pages: B-1, B-2
Photographs: 149
ACOE Jurisdiction: Potentially Jurisdictional
CDFG Jurisdiction: Potentially Jurisdictional
Feature Type: Canal
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
10	6

Jurisdictional Evaluation:
Forget Me Not Canal: Flows from the Westside Main Canal (Drainage #91), carries water to multiple Lateral Canals and Head Ditches. Some riparian vegetation is present along much of the feature; mostly arrow weed. Carries water year-round. OHWM indicator was water staining.

Drainage #116

Mapbook Pages: B-1, B-2
Photographs: 150
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Lateral Canal
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
8	4

Jurisdictional Evaluation:
Forget Me Not Lateral 1: Flows from the Forget Me Not Canal (Drainage #115; via Gate Lat 1), carries water to one or two Head Ditches. No riparian vegetation. Carries water only when the Head Ditches it serves are in use (only a few days at a time, during periodic and infrequent irrigation events).

Drainage #117 (Reserved – No conveyance assigned this number)

Drainage #118

Mapbook Pages: B-2
Photographs: 152
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
8	2

Jurisdictional Evaluation:
Small Tail Ditch, drains a single field. Flows to Forget Me Not Drain 1 (Drainage #110; via a culvert). Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #119

Mapbook Pages: B-1, B-2
Photographs: 153
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Concrete Head Ditch, carries water from Forget Me Not Canal (Dranage #115, via Gate 7) to irrigate a single field. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #120 (Reserved – No conveyance assigned this number)

Drainage #121

Mapbook Pages: B-1
Photographs: 155
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch

Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
8	2

Jurisdictional Evaluation:
Small Tail Ditch, drains a single field. Flows to Forget Me Not Drain 1 (Drainage #110). Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #122

Mapbook Pages: B-1
Photographs: 156
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Earthen/Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Earthen/concrete Head Ditch, carries water to irrigate a single field. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #123

Mapbook Pages: B-1
Photographs: 157
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
12	10

Jurisdictional Evaluation:

Small Tail Ditch, drains a single field. Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #124

Mapbook Pages: A-1, B-1
Photographs: 158
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Head Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
10	4

Jurisdictional Evaluation:
Earthen Head Ditch, carries water from Foxglove Canal (Feature #114; via Gate Lat 1 and Gate 17) to irrigate a single field. No riparian vegetation is present. Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

Drainage #125

Mapbook Pages: B-1
Photographs: 159
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
4	2

Jurisdictional Evaluation:

Small Tail Ditch, drains a single field. Flows into earthen Head Ditch (Drainage #124). Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #126

Mapbook Pages: B-1
Photographs: 160
ACOE Jurisdiction: Not Jurisdictional
CDFG Jurisdiction: Not Jurisdictional
Feature Type: Tail Ditch
Riparian Vegetation: None
Substrate: Earthen

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
4	3

Jurisdictional Evaluation:

Small Tail Ditch, drains a single field. Flows into earthen Head Ditch (Drainage #124). Tail ditches typically convey water only during periodic irrigation when excess irrigation water that is not absorbed by the field drains to them. They are typically dry (non-RPW).

Drainage #127

Mapbook Pages:	A-1
Photographs:	161
ACOE Jurisdiction:	Not Jurisdictional
CDFG Jurisdiction:	Not Jurisdictional
Feature Type:	Head Ditch
Riparian Vegetation:	None
Substrate:	Concrete

Dimensions (ft.)	
Bank-to-Bank	Channel/OHWM
6	4

Jurisdictional Evaluation:
Concrete Head Ditch, carries water from Foxglove Canal (Feature #114; via Gate Lat 1 and Gate 19) to irrigate a single field. No riparian vegetation is present Head Ditches typically convey water for only a few days at a time (during periodic and infrequent irrigation events). They are typically dry (non-RPW).

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Appendix A

Drainage Data Table

Feature ID	Type	Coordinates (UTM, NAD 83 Zone 11N, m)		Jurisdictional Status		Riparian Vegetation	Substrate	Length (within Study Area; mi)	Trapezoidal Dimensions (ft)	
		Start	End	CDFG	ACOE				Bank to Bank	Channel Bottom
1	Lateral Canal	622704, 3623199	622692, 3624229	Y	Y	None	Concrete	0.64	8	4
2	Tail Ditch	622699, 3623253	621900, 3623248			None	Earthen	0.50	2	0
4	Head Ditch	622694, 3623657	621751, 3623858			None	Concrete/Earthen	0.65	6	4
5	Tail Ditch	621882, 3623282	621920, 3623575			None	Earthen	0.19	8	0
6	Drain	621880, 3623187	621601, 3625177	Y	Y	Yes	Earthen	1.30	80	25
7	Tail Ditch	622673, 3624191	621969, 3624169			Limited	Earthen	0.61	6	4
8	Canal	622767, 3624212	622667, 3624948	Y	Y	None	Concrete	0.51	14	10
9	Head Ditch	622661, 3624934 622261, 3624926	622263, 3625094 622267, 3624232			None	Concrete	0.35 0.43	6	4
10	Tail Ditch	622290, 3625091	622295, 3624217			Limited	Earthen	0.54	12	10
11A	Head Ditch	622677, 3624933	622677, 3625015	Y	Y	Yes	Earthen	0.05	25	20
11B	Head Ditch	622677, 3625015	622154, 3625155	Y		Limited	Earthen	0.42	10	4
12	Head Ditch	622667, 3624953	622666, 3625112			None	Concrete	0.10	6	4
13	Tail Ditch	621711, 3624584	621669, 3625066			None	Earthen	0.30	5	2
14	Tail Ditch	622292, 3624594	621711, 3624584	Y		Limited	Earthen	0.36	6	4
15	Tail Ditch	621713, 3624214	621711, 3624584			None	Earthen	0.23	6	4

Feature ID	Type	Coordinates (UTM, NAD 83 Zone 11N, m)		Jurisdictional Status		Riparian Vegetation	Substrate	Length (within Study Area; mi)	Trapezoidal Dimensions (ft)	
		Start	End	CDFG	ACOE				Bank to Bank	Channel Bottom
16	Drain	621117, 3624546	621117, 3624280	Y	Y	Yes	Earthen	0.90	30	10
17	Tail Ditch	621439, 3624627	621442, 3625001			None	Earthen	0.33	4	2
18	Head Ditch	621107, 3624605	621102, 3624999			None	Concrete	0.24	6	4
19	Tail Ditch	621122, 3623500	621123, 3623259			None	Earthen	0.15	4	2
20	Head Ditch	621095, 3623240	621500, 3623502			None	Concrete	0.41	6	4
21	Tail Ditch	621849, 3223249	621903, 3623490			None	Earthen	0.16	4	2
22	Canal	621082, 3624546	621082, 3624279	Y	Y	None	Concrete	1.39	14	10
23	Head Ditch	620878, 3623254	621062, 3623240			None	Concrete	0.12	6	4
24	Tail Ditch	620935, 3623766 620932, 3623719 621070, 3623719	621070, 3623767 621070, 3623722 621124, 3623783			None	Earthen	0.08 0.09 0.07	6	3
25	Head Ditch	621083, 3623802	620319, 3623789			None	Concrete	0.48	6	4
26	Tail Ditch	621075, 3624177	620290, 3624169			None	Earthen	0.29	6	3
27	Drain	620295, 3623723 620290, 3625180 620525, 3623312	620289, 3625300 620263, 3625180 620526, 3623244	Y	Y	Yes	Earthen	0.98 0.02 0.04	25	12

Feature ID	Type	Coordinates (UTM, NAD 83 Zone 11N, m) Start	End	Jurisdictional Status CDFG	ACOE	Riparian Vegetation	Substrate	Length (within Study Area; mi)	Trapezoidal Dimensions (ft) Bank to Bank	Channel Bottom
29	Tail Ditch	620256, 3625214 620270, 3624423	620240, 3624205 620295, 3624423			None	Earthen	0.64 0.02	6	3
30	Head Ditch	621060, 3625118 621059, 3625102 621108, 3624604	621007, 3625001 621078, 3625102 621082, 3624604			None	Concrete	0.08 0.01 0.02	6	4
31	Head Ditch	619682, 3624175	619645, 3625204			None	Concrete	0.65	6	4
32	Head Ditch	619244, 3624430	619249, 3624483			None	Concrete	0.04	6	4
33	Canal	620126, 3623742	620462, 3623310	Y	Y	None	Concrete	1.59	16	12
34	Tail Ditch	619645, 3624436	619626, 3625206			None	Earthen	0.48	8	2
35	Tail Ditch	618878, 3625191	618924, 3625205			None	Earthen	0.03	5	2
36	Head Ditch	618928, 3624816	618845, 3624816			None	Concrete	0.05	6	4
37	Tail Ditch	618835, 3624805	618813, 3624414			None	Earthen	0.25	5	2
38	Head Ditch	619221, 3624432	619220, 3624483			None	Concrete	0.03	6	4
39	Head Ditch	219215, 3624396	619237, 3624397			None	Concrete	0.23	5	3
40	Head Ditch	619244, 3624010	619215, 3624396			None	Concrete/Earthen	0.24	5	3
41	Tail Ditch	619235, 3624014	618877, 3623614			None	Earthen	0.48	4	2

Feature ID	Type	Coordinates (UTM, NAD 83 Zone 11N, m)		Jurisdictional Status		Riparian Vegetation	Substrate	Length (within Study Area; mi)	Trapezoidal Dimensions (ft)	
		Start	End	CDFG	ACOE				Bank to Bank	Channel Bottom
42	Tail Ditch	619252, 3624302	618844, 3623613			None	Earthen	0.69	6	3
43	Head Ditch	619611, 3624385	619653, 3623634			None	Concrete	0.47	6	4
44	Tail Ditch	619654, 3623962	619668, 3623664			None	Earthen	0.46	5	3
45	Tail Ditch	619684, 3622387	619607, 3623092			None	Earthen	0.47	5	3
46	Head Ditch	620357, 3622228	619689, 3622365			None	Concrete	0.44	6	4
47	Head Ditch	620350, 3622281	619716, 3623956			None	Concrete/Earthen	1.31	6	4
48	Tail Ditch	620451, 3622339	620433, 3623212			None	Earthen	0.54	5	2
49	Drain	619668, 3623225	617902, 3626975	Y	Y	Yes	Earthen	3.35	50	35
50	Wetland	n/a	n/a	Y	Y	Yes	Earthen	n/a	30	15
51	Tail Ditch	618516, 3624455 618451, 3625199	618462, 3625080 618438, 3624870			None	Earthen	0.56 0.22	6	4
52	Head Ditch	618709, 3625206	618827, 3624450			None	Concrete	0.52	6	4
53	Tail Ditch	618047, 3625195	618406, 3625198			Limited	Earthen	0.22	5	2
54	Tail Ditch	618036, 3624421	618032, 3625192			None	Earthen	0.48	6	3
55	Head Ditch	617580, 3624403	617876, 3626867			None	Concrete	1.77	7	5

Feature ID	Type	Coordinates (UTM, NAD 83 Zone 11N, m)		Jurisdictional Status		Riparian Vegetation	Substrate	Length (within Study Area; mi)	Trapezoidal Dimensions (ft)	
		Start	End	CDFG	ACOE				Bank to Bank	Channel Bottom
56	Tail Ditch	618265, 3625216 618378, 3625339 618237, 3625487 618235, 3625842	617899, 3626857 618408, 3625350 618258, 3625487 618254, 3625843			None	Earthen	1.26 0.02 0.01 0.01	10	6
57	Drain	617911, 3626885	617573, 3625206	Y	Y	Yes	Earthen	1.22	50	25
58	Drain	619626, 3625206	618652, 3625781	Y	Y	Yes	Earthen	0.32	50	25
59	Head Ditch	618638, 3626583	618647, 3625801			None	Concrete	0.49	6	4
60	Head Ditch	618599, 3626896	618573, 3626568			None	Concrete	0.23	6	4
61	Lateral Canal	618707, 3626582	618591, 3626983	Y	Y	None	Concrete	0.29	8	6
62	Tail Ditch	617935, 3626889	618454, 3625231			None	Earthen	1.19	8	4
64	Drain	622760, 3624958	622750, 3623216	Y	Y	Yes	Earthen	1.09	35	20
65	Head Ditch	622601, 3625193	622604, 3625122			None	Concrete	0.04	6	3
66	Tail Ditch	621634, 3625177	621614, 3625099			None	Earthen	0.06	5	2

Feature ID	Type	Coordinates (UTM, NAD 83 Zone 11N, m)		Jurisdictional Status		Riparian Vegetation	Substrate	Length (within Study Area; mi)	Trapezoidal Dimensions (ft)	
		Start	End	CDFG	ACOE				Bank to Bank	Channel Bottom
67	Tail Ditch	621118, 3625025	621625, 3625037			None	Earthen	0.31	6	4
68	Tail Ditch	621103, 3625116	621104, 3625044			None	Earthen	0.04	5	2
72	Head Ditch	620258, 3625300	620258, 3625249			None	Concrete	0.03	7	5
73	Tail Ditch	619872, 3625252	619872, 3625302			None	Earthen	0.03	2	1
74	Head Ditch	619584, 3625244	619825, 3625243			None	Concrete	0.15	6	4
76	Head Ditch	618808, 3625171	618838, 3625287			None	Concrete	0.08	6	4
77	Head Ditch	618645, 3625749 618688, 3625284	618646, 3625719 618698, 3625234			None	Concrete	0.02 0.03	6	4
78	Road Ditch	617551, 3626842	617603, 3626784			Limited	Earthen	0.05	6	4
79	Tail Ditch	617599, 3626779	617575, 3626018			None	Earthen	0.49	5	2
80	Tail Ditch	616825, 3625981	617613, 3625998			None	Earthen	0.49	10	6
81	Head Ditch	617568, 3625616	617597, 3625617			None	Concrete	0.02	6	4
82	Head Ditch	617573, 3625233	617596, 3625234			None	Concrete	0.01	6	4

Feature ID	Type	Coordinates (UTM, NAD 83 Zone 11N, m)		Jurisdictional Status		Riparian Vegetation	Substrate	Length (within Study Area; mi)	Trapezoidal Dimensions (ft)	
		Start	End	CDFG	ACOE				Bank to Bank	Channel Bottom
83	Tail Ditch	617568, 3625599	617621, 3625600			None	Earthen	0.03	12	1
84	Tail Ditch	617611, 3625181	617617, 3624424			None	Earthen	0.47	4	1
85	Tail Ditch	617640, 3624382	617641, 3624336			None	Earthen	0.03	3	1
86	Head Ditch	618031, 3624383	618032, 3624342			None	Concrete	0.03	6	4
87	Head Ditch	618050, 3624377	618051, 3624342			None	Concrete	0.02	6	4
88	Tail Ditch	618602, 3624413	618603, 3624351			None	Earthen	0.04	8	2
89	Head Ditch	618629, 3624386	618629, 3624351			None	Concrete	0.02	6	4
90	Drain	619261, 3622990	619598, 3622357	Y	Y	Yes	Earthen	0.09	30	18
91	Canal	619572, 3622316 615150, 3626451	620475, 3622202 615223, 3626330	Y	Y	Yes	Earthen	0.57 0.09	150	120
92	Tail Ditch	620526, 3623244	620540, 3622734			None	Earthen	0.37	4	1
93	Head Ditch	620507, 3622744	620540, 3622745			None	Concrete	0.02	10	6
94	Tail Ditch	620845, 3623188	620521, 3623198			None	Earthen	0.20	4	1

Feature ID	Type	Coordinates (UTM, NAD 83 Zone 11N, m)		Jurisdictional Status		Riparian Vegetation	Substrate	Length (within Study Area; mi)	Trapezoidal Dimensions (ft)	
		Start	End	CDFG	ACOE				Bank to Bank	Channel Bottom
95	Head Ditch	620071, 3623238	620458, 3623242			None	Concrete	0.24	6	4
96	Head Ditch	620237, 3623804	620126, 3623796			None	Concrete	0.05	6	4
97	Tail Ditch	620838, 3623784	620291, 3623776			None	Earthen	0.34	6	2
98	Head Ditch	620546, 3623313	620846, 3623235			None	Concrete/Earthen	0.24	8	3
99	Head Ditch	621095, 3623240	621361, 3623179			None	Concrete	0.20	6	4
100	Tail Ditch	621879, 3623215	622677, 3623222			Yes	Earthen	0.50	30	15
101	Tail Ditch	621878, 3623519	621121, 3623510			None	Earthen	0.47	4	1
102	Head Ditch	621687, 3623849 621440, 3623584	621165, 3623786 621442, 3623526			None	Concrete	0.26 0.04	6	4
103	Tail Ditch	621140, 3623815	621173, 3624183			None	Earthen	0.23	2	1
104	Head Ditch	621082, 3624206	621636, 3624209			None	Concrete	0.34	6	4
105	Head Ditch	620315, 3624199	621082, 3624206			None	Concrete	0.48	6	4
106	Tail Ditch	621047, 3624588	620294, 3624582			None	Earthen	0.04	6	5

Feature ID	Type	Coordinates (UTM, NAD 83 Zone 11N, m) Start	End	Jurisdictional Status CDFG	ACOE	Riparian Vegetation	Substrate	Length (within Study Area; mi)	Trapezoidal Dimensions (ft) Bank to Bank	Channel Bottom
107	Head Ditch	620316, 3624600 621082, 3624610	620349, 3624600 621031, 3624608	Y		Yes	Earthen	0.02 0.03	6	4
108	Tail Ditch	620291, 3624584	621051, 3624993			None	Earthen	0.47	8	3
109	Tail Ditch	621117, 3624584	621614, 3624744			None	Earthen	0.36	2	1
110	Drain	616770, 3626469	616774, 3626007	Y	Y	Yes	Earthen	0.29	30	15
111	Drain	615213, 3626452	615356, 3626332	Y	Y	Yes	Earthen	0.12	40	20
113	Head Ditch	622695, 3624226	622668, 3624901			None	Concrete	0.43	6	4
114	Canal	615185, 3626452	615292, 3626331	Y	Y	None	Concrete	0.10	20	12
115	Canal	616806, 3626469	616811, 3625944	Y	Y	None	Concrete	0.33	10	6
116	Lateral Canal	617204, 3626068	616814, 3625979			None	Concrete	0.29	8	4
118	Tail Ditch	616763, 3625983	616785, 3625951			None	Earthen	0.03	8	2
119	Head Ditch	616819, 3626468	616813, 3625996			None	Concrete	0.30	6	4
121	Tail Ditch	616018, 3626387	616771, 3626394			None	Earthen	0.47	8	2

Feature ID	Type	Coordinates (UTM, NAD 83 Zone 11N, m)		Jurisdictional Status		Riparian Vegetation	Substrate	Length (within Study Area; mi)	Trapezoidal Dimensions (ft)	
		Start	End	CDFG	ACOE				Bank to Bank	Channel Bottom
122	Head Ditch	616009, 3626338	616738, 3626403			None	Concrete/Earthen	0.49	6	4
123	Tail Ditch	615609, 3626376	615986, 3626462			None	Earthen	0.28	12	10
124	Head Ditch	615227, 3626385	615974, 3626393			None	Earthen	0.46	10	4
125	Tail Ditch	615597, 3626458	615599, 3626389			None	Earthen	0.04	4	2
126	Tail Ditch	615592, 3626387	615604, 3626334			None	Earthen	0.03	4	3
127	Head Ditch	615245, 3626452	615339, 3626385			None	Concrete	0.07	6	4

Appendix B
Photographs

Drainage #1 – Photo 1

Drainage #2 – Photo 2

Drainage #2 – Photo 5

Drainage #4 – Photo 3

Drainage #4 – Photo 4

Drainage #5 – Photo 6

Drainage #6 – Photo 7

Drainage #6 – Photo 8

Drainage #6 – Photo 17

Drainage #6 – Photo 18

Drainage #7 – Photo 9

Drainage #8 – Photo 10

Drainage #9 – Photo 12

Drainage #10 – Photo 14

Drainage 11A – Photo 162

Drainage #11B – Photo 15

Drainage #12 – Photo 11

Drainage #12 – Photo 13

Drainage #13 – Photo 16

Drainage #14 – Photo 19

Drainage #15 – Photo 20

Drainage #16 – Photo 21

Drainage #17 – Photo 22

Drainage #18 – Photo 23

Drainage #19 – Photo 24

Drainage #20 – Photo 25

Drainage #21 – Photo 26

Drainage #22 – Photo 40

Drainage #22 – Photo 41

Drainage #23 – Photo 42

Drainage #24 – Photo 43

Drainage #25 – Photo 44

Drainage #26 – Photo 45

Drainage #27 – Photo 46

Drainage #27 – Photo 47

Drainage #27 – Photo 50

Drainage #27 – Photo 51

Drainage #27 – Photo 146

Drainage #27 – Photo 147

Drainage #29 – Photo 49

Drainage #30 – Photo 52

Drainage #30 – Photo 53

Drainage #31 – Photo 54

Drainage #31 – Photo 55

Drainage #32 – Photo 57

Drainage #33 – Photo 56

Drainage #34 – Photo 60

Drainage #35 – Photo 61

Drainage #36 – Photo 62

Drainage #37 – Photo 63

Drainage #38 – Photo 65

Drainage #39 – Photo 64

Drainage #40 – Photo 66

Drainage #41 – Photo 67

Drainage #42 – Photo 68

Drainage #43 – Photo 69

Drainage #44 – Photo 70

Drainage #45 – Photo 71

Drainage #46 – Photo 72

Drainage #47 – Photo 73

Drainage #48 – Photo 74

Drainage #48 – Photo 75

Drainage #49 – Photo 76

Drainage #49 – Photo 77

Drainage #50 – Photo 78

Drainage #50 – Photo 144

Drainage #51 – Photo 79

Drainage #52 – Photo 80

Drainage #53 – Photo 81

Drainage #54 – Photo 82

Drainage #55 – Photo 83

Drainage #55 – Photo 86

Drainage #56 – Photo 84

Drainage #56 – Photo 143

Drainage #57 – Photo 85

Drainage #58 – Photo 58

Drainage #58 – Photo 59

Drainage #58 – Photo 88

Drainage #58 – Photo 145

Drainage #59 – Photo 89

Drainage #60 – Photo 92

Drainage #61 – Photo 90

Drainage #62 – Photo 93

Drainage #64 – Photo 95

Drainage #64 – Photo 96

Drainage #65 – Photo 97

Drainage #66 – Photo 98

Drainage #67 – Photo 99

Drainage #68 – Photo 100

Drainage #72 – Photo 104

Drainage #73 – Photo 105

Drainage #74 – Photo 106

Drainage #76 – Photo 107

Drainage #77 – Photo 108

Drainage #78 – Photo 109

Drainage #79 – Photo 110

Drainage #80 – Photo 111

Drainage #81 – Photo 112

Drainage #82 – Photo 113

Drainage #83 – Photo 114

Drainage #84 – Photo 115

Drainage #85 – Photo 116

Drainage #86 – Photo 117

Drainage #87 – Photo 118

Drainage #88 – Photo 119

Drainage #89 – Photo 120

Drainage #90 – Photo 121

Drainage #91 – Photo 122

Drainage #92 – Photo 123

Drainage #93 – Photo 124

Drainage #94 – Photo 125

Drainage #95 – Photo 126

Drainage #96 – No Photo – refer to Drainage #95 (Photo 126) for similar feature

Drainage #97 – Photo 127

Drainage #98 – Photo 128

Drainage #99 – Photo 129

Drainage #100 – Photo 130

Drainage #101 – Photo 131

Drainage #102 – Photo 132

Drainage #103 – Photo 133

Drainage #104 – Photo 134

Drainage #105 – Photo 135

Drainage #106 – Photo 136

Drainage #107 – Photo 137

Drainage #108 – Photo 138

Drainage #109 – Photo 139

Drainage #110 – Photo 140

Drainage #111 – Photo 141

Drainage #111 – Photo 142

Drainage #113 – Photo 10

Drainage #114 – Photo 148

Drainage #115 – Photo 149

Drainage #116 – Photo 150

Drainage #118 – Photo 152

Drainage #119 – Photo 153

Drainage #121 – Photo 155

Drainage #122 – Photo 156

Drainage #123 – Photo 157

Drainage #124 – Photo 158

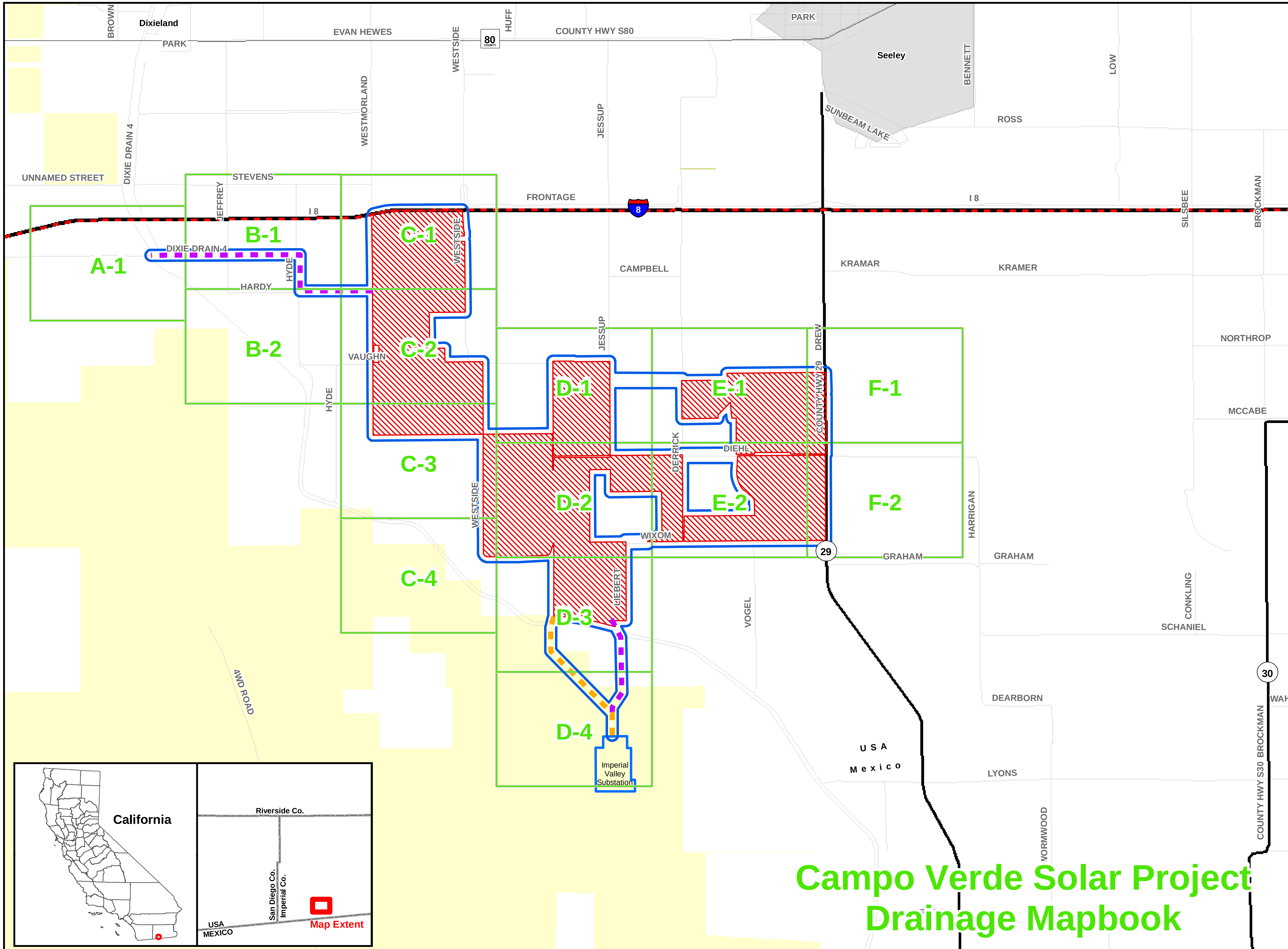
Drainage #125 – Photo 159

Drainage #126 – Photo 160

Drainage #127 – Photo 161

Appendix C
Drainage Mapbook

MAP SHEET INDEX



Proposed Gen-tie

Gen-tie Alternative

Interstate

Major Road

Road

International Boundary

Map Sheet Boundary

Approximate Campo Verde Solar Site

200 Foot Buffer of Campo Verde Boundary

Unincorporated City

Jurisdictional Land Ownership

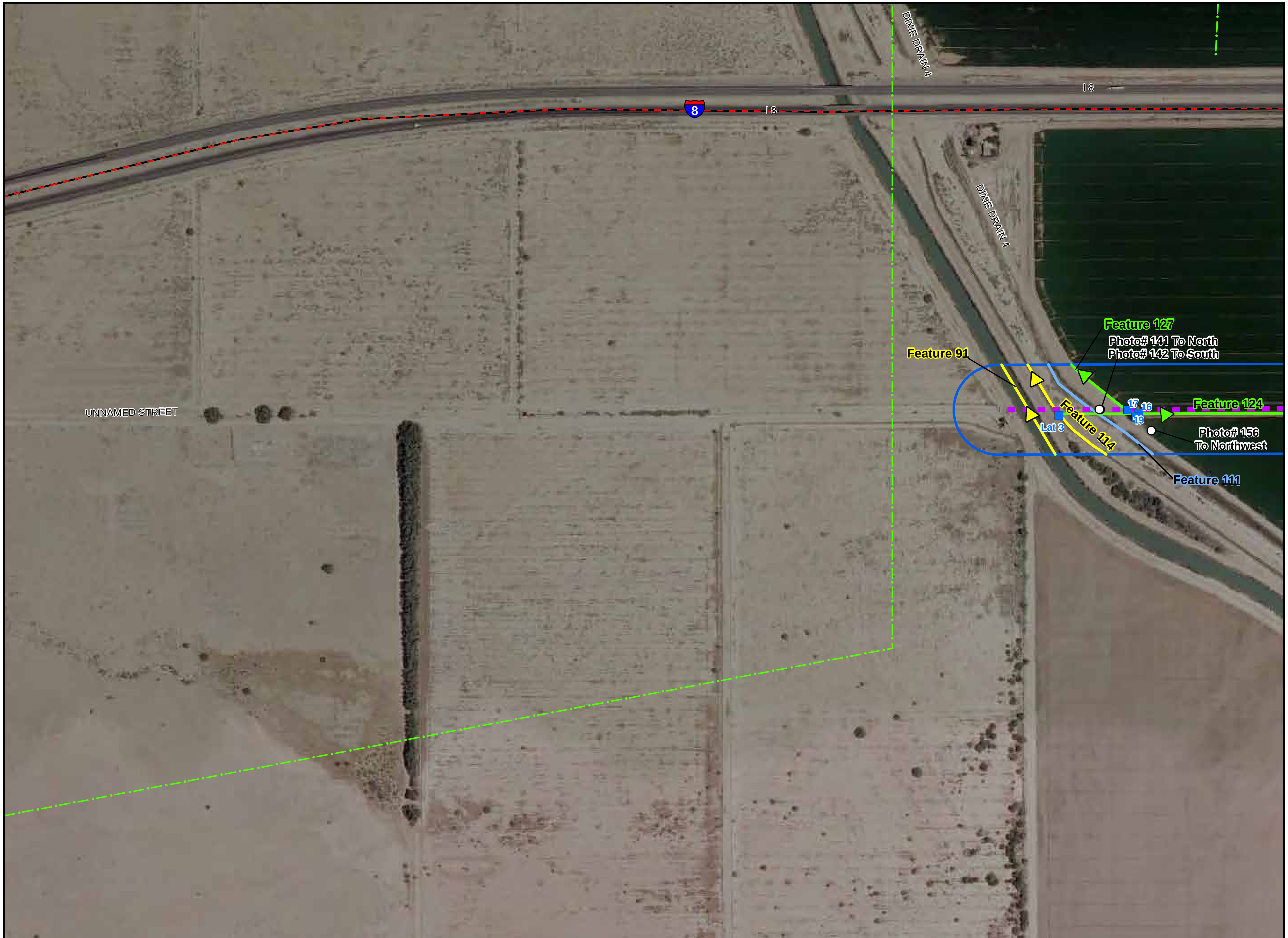
Bureau of Land Management Land

0 0.5 1

Miles

State Plane Coordinate System
California Zone 6, NAD 83
Lambert Conformal Conic Projection
1983 North American Datum
Linear Unit: Foot US

01-17-12



Campo Verde Solar Site

Surface Water Conveyance

Legend

- Photo Location
- Culvert
- Gate
- Proposed Gen-tie
- Gen-tie Alternative
- Existing 500 kV Transmission Line
- Existing 230 kV Transmission Line
- Interstate
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Surface Water Conveyance Feature

- Canal (with Flow Direction)
- Drain (with Flow Direction)
- Head Ditch (with Flow Direction)
- Tail Ditch (with Flow Direction)
- Road Ditch(with Flow Direction)
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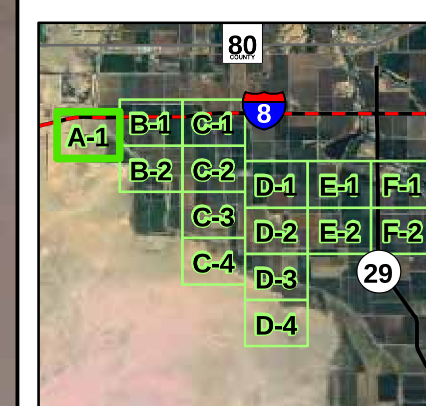
0 400 800

Feet



Page: A-1

01-17-12

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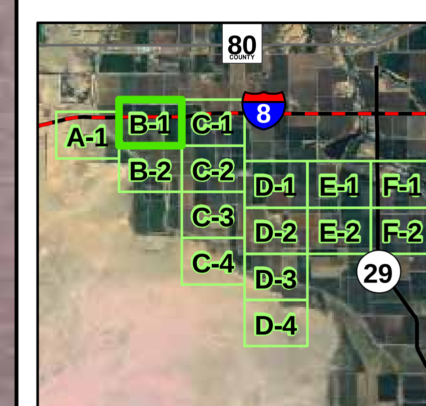
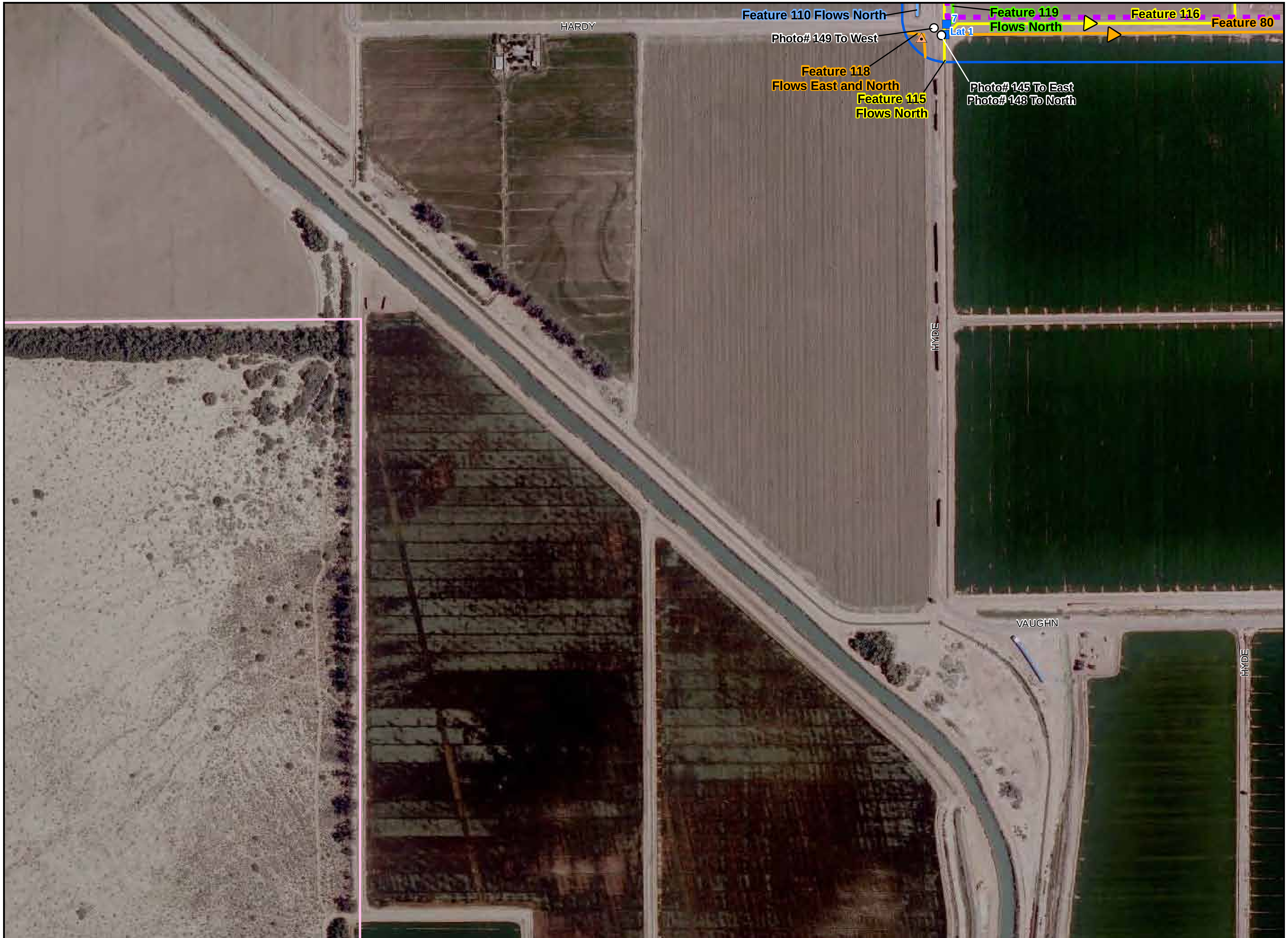
Feet



Page: B-1

01-17-12



Campo Verde Solar Site

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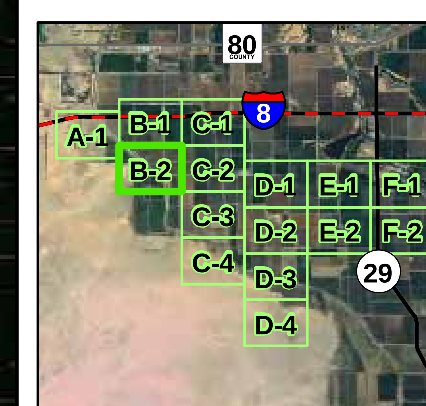
Feet

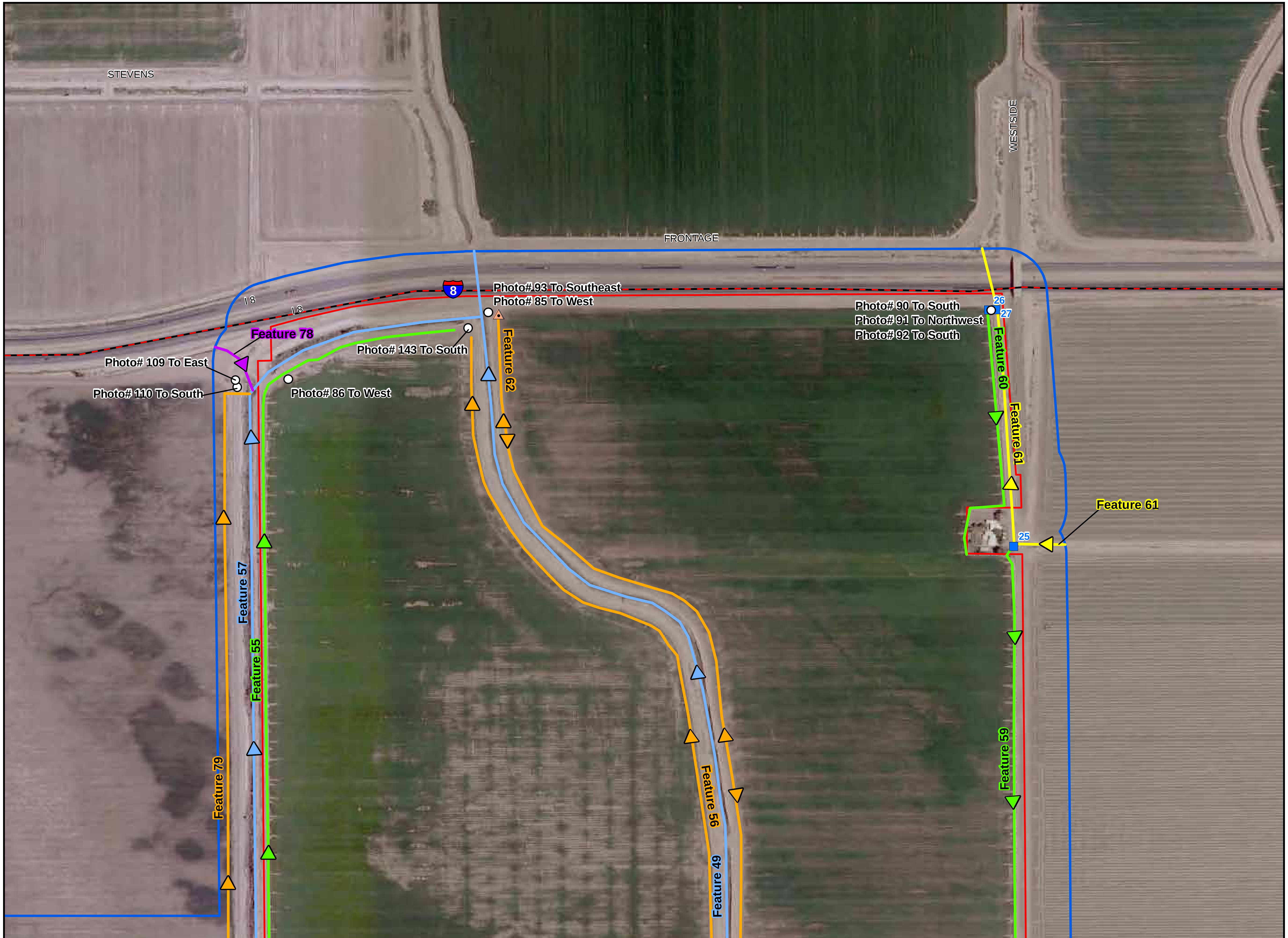


Page: B-2

01-17-12

Campo Verde Solar Site

Surface Water Conveyance



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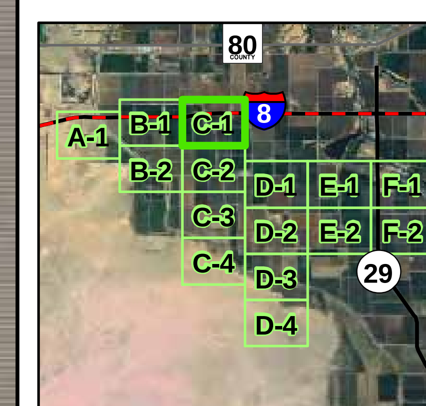
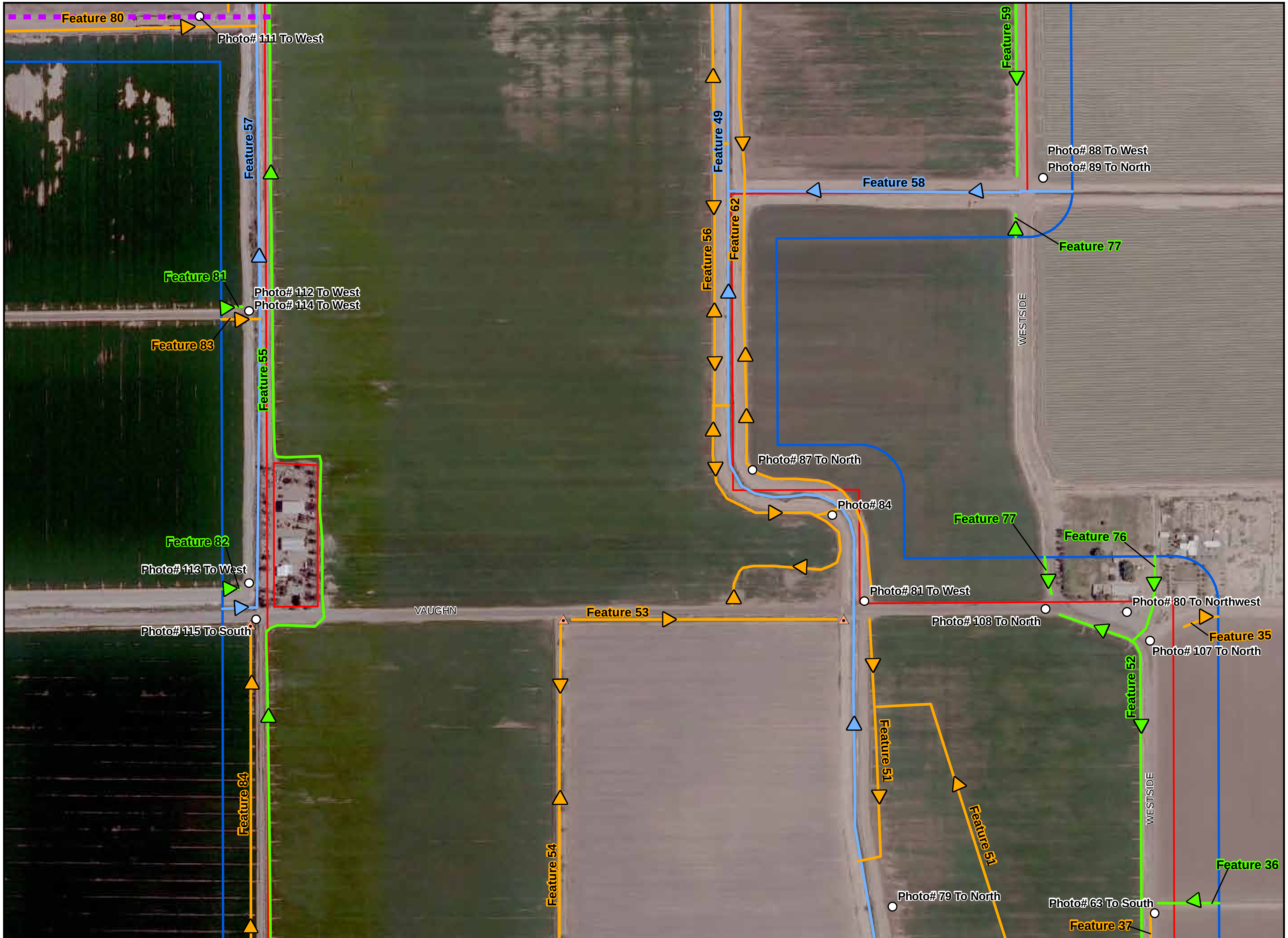
0 400 800

Feet



Page: C-1

01-17-12



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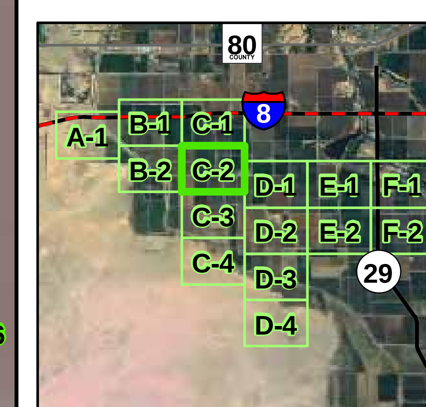
Feet



Page: C-2

01-17-12

Campo Verde Solar Site

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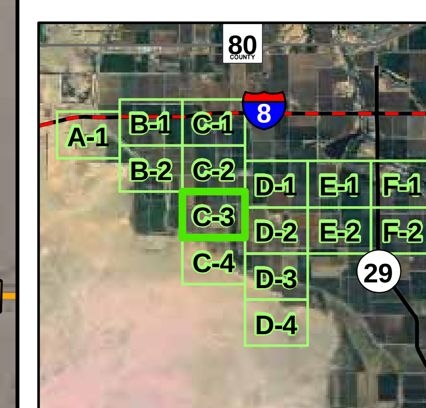

Page: C-3

01-17-12

Campo Verde Solar Site

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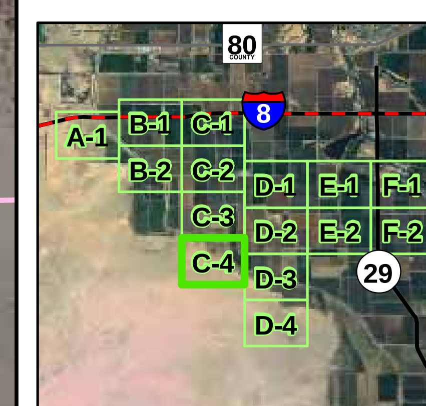
- Wetland
- Approximate Campo Verde Facility Boundary
- 200 Foot Buffer of Campo Verde Boundary
- Bureau of Land Management Land

0 400 800

Feet



Page: C-4

01-17-12

Campo Verde Solar Site

Surface Water Conveyance

Legend

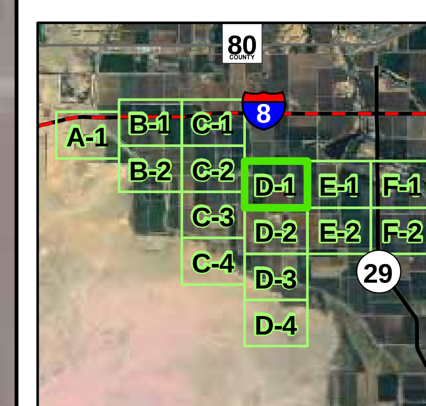
- Photo Location
- Culvert
- Gate
- Proposed Gen-tie
- Gen-tie Alternative
- Existing 500 kV Transmission Line
- Existing 230 kV Transmission Line
- Interstate
- Major Road
- International Boundary

Surface Water Conveyance Feature

- Canal (with Flow Direction)
- Drain (with Flow Direction)
- Head Ditch (with Flow Direction)
- Tail Ditch (with Flow Direction)
- Road Ditch(with Flow Direction)
- Wetland
- Approximate Campo Verde Facility Boundary
- 200 Foot Buffer of Campo Verde Boundary
- Bureau of Land Management Land

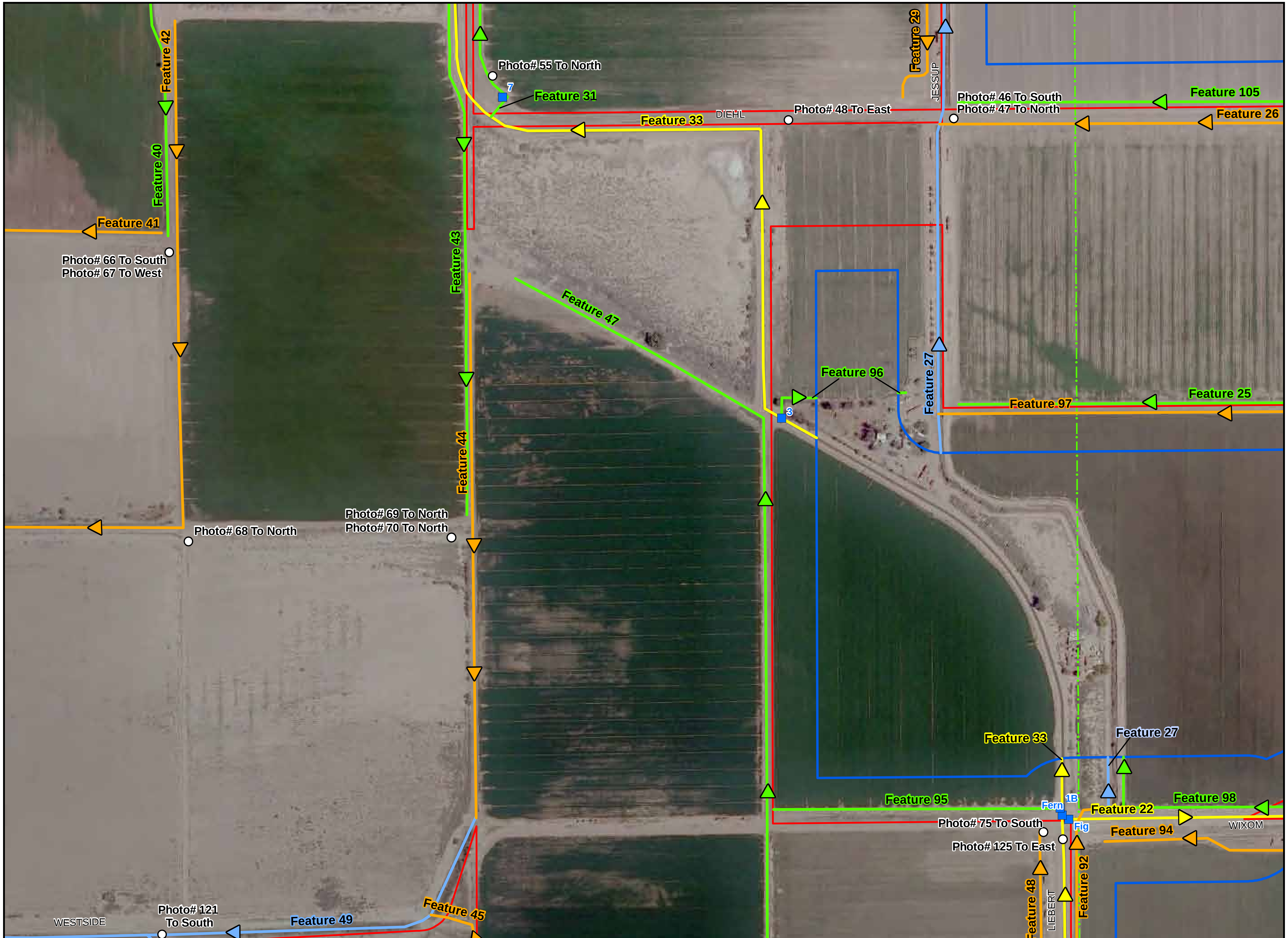
0 400 800

Feet



Page: D-1

01-17-12



Campo Verde Solar Site

Surface Water Conveyance

Legend

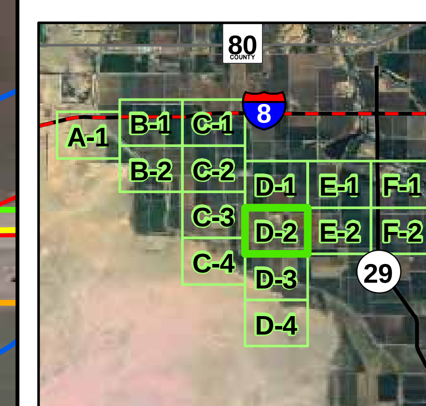
- Photo Location
- Culvert
- Gate
- Proposed Gen-tie
- Gen-tie Alternative
- Existing 500 kV Transmission Line
- Existing 230 kV Transmission Line
- Interstate
- Major Road
- International Boundary

Surface Water Conveyance Feature

- Canal (with Flow Direction)
- Drain (with Flow Direction)
- Head Ditch (with Flow Direction)
- Tail Ditch (with Flow Direction)
- Road Ditch(with Flow Direction)
- Wetland
- Approximate Campo Verde Facility Boundary
- 200 Foot Buffer of Campo Verde Boundary
- Bureau of Land Management Land

0 400 800

Feet



Page: D-2

01-17-12

Campo Verde Solar Site

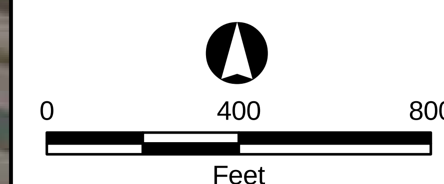
Surface Water Conveyance

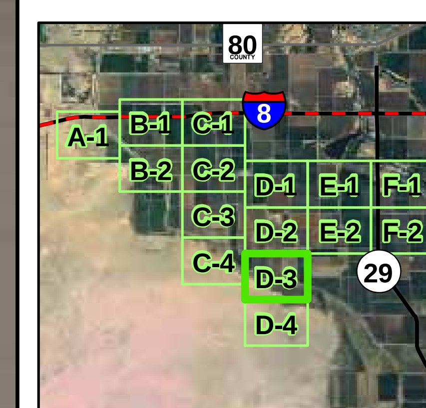
Legend

- Photo Location
- Culvert
- Gate
- Proposed Gen-tie
- Gen-tie Alternative
- Existing 500 kV Transmission Line
- Existing 230 kV Transmission Line
- Interstate
- Major Road
- International Boundary

Surface Water Conveyance Feature

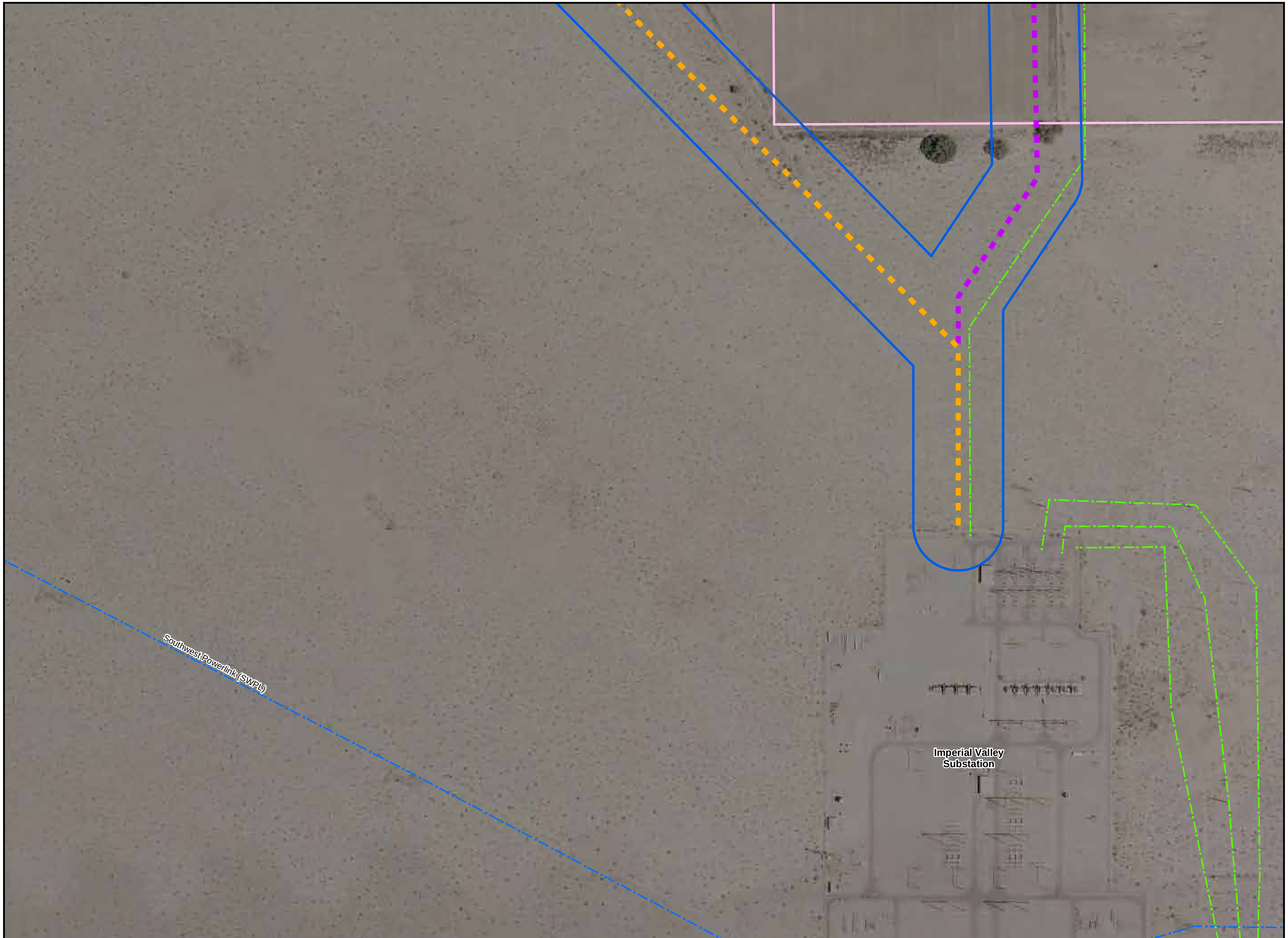
- Canal (with Flow Direction)
- Drain (with Flow Direction)
- Head Ditch (with Flow Direction)
- Tail Ditch (with Flow Direction)
- Road Ditch(with Flow Direction)
- Wetland
- Approximate Campo Verde Facility Boundary
- 200 Foot Buffer of Campo Verde Boundary
- Bureau of Land Management Land





Page: D-3

01-17-12



Campo Verde Solar Site

Surface Water Conveyance

Legend

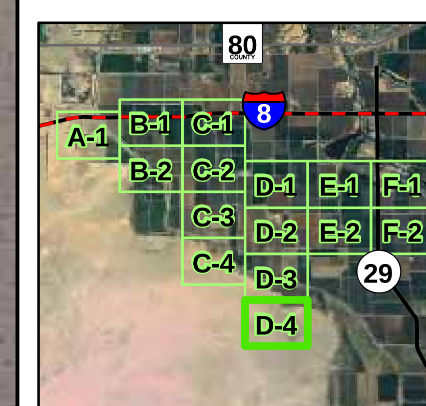
- Photo Location
- Culvert
- Gate
- Proposed Gen-tie
- Gen-tie Alternative
- Existing 500 kV Transmission Line
- Existing 230 kV Transmission Line
- Interstate
- Major Road
- International Boundary

Surface Water Conveyance Feature

- Canal (with Flow Direction)
- Drain (with Flow Direction)
- Head Ditch (with Flow Direction)
- Tail Ditch (with Flow Direction)
- Road Ditch(with Flow Direction)
- Wetland
- Approximate Campo Verde Facility Boundary
- 200 Foot Buffer of Campo Verde Boundary
- Bureau of Land Management Land

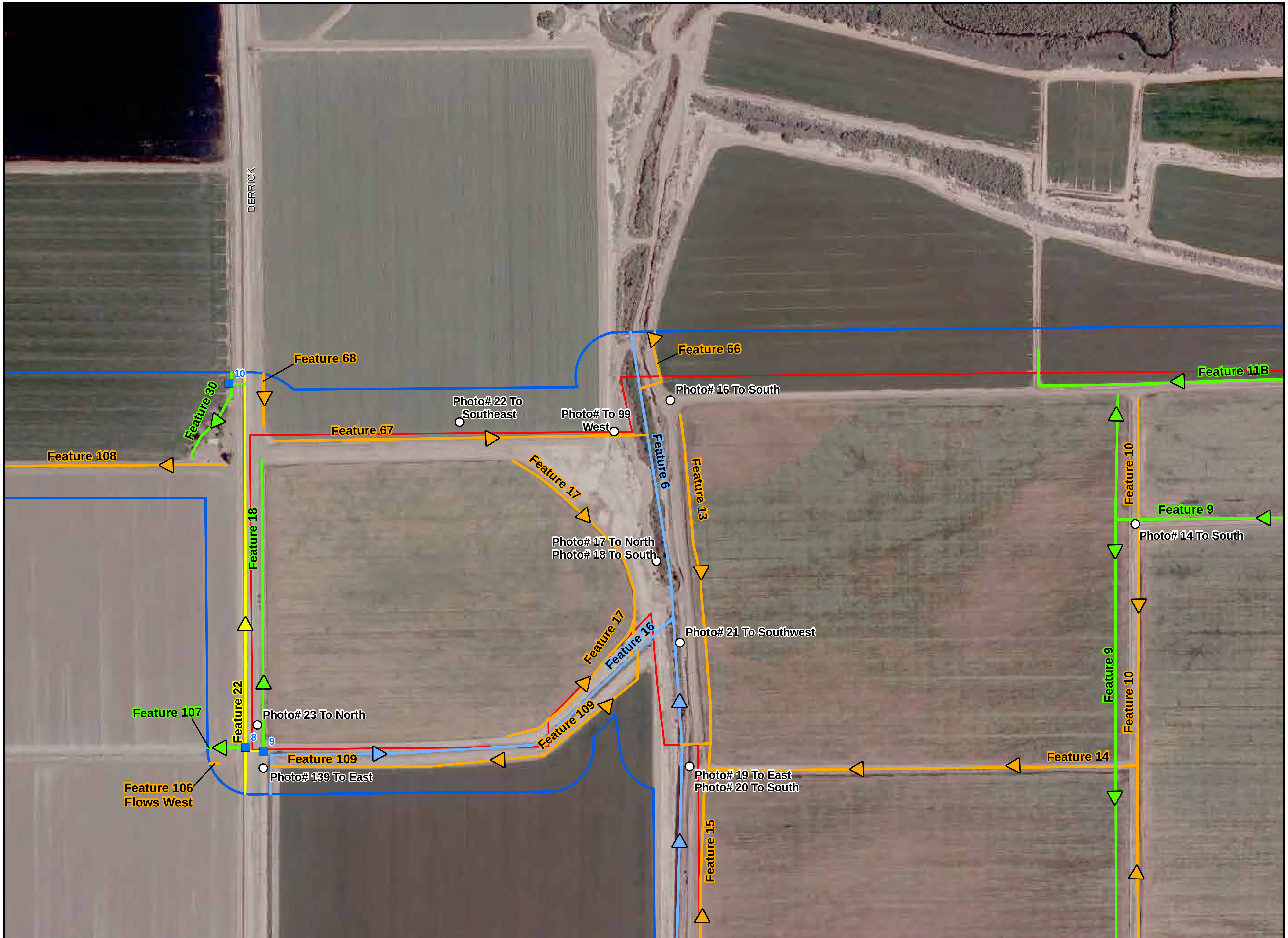
0 400 800

Feet



Page: D-4

01-17-12



Campo Verde Solar Site

Surface Water Conveyance

Legend

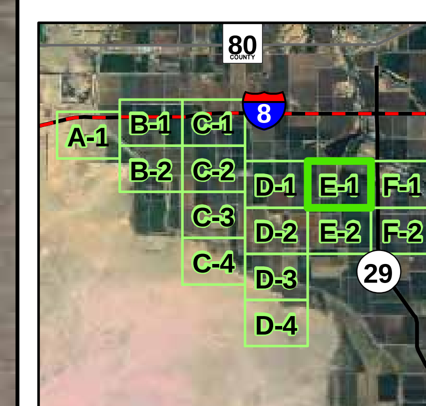
- Photo Location
- Culvert
- Gate
- Proposed Gen-tie
- Gen-tie Alternative
- Existing 500 kV Transmission Line
- Existing 230 kV Transmission Line
- Interstate
- Major Road
- International Boundary

Surface Water Conveyance Feature

- Canal (with Flow Direction)
- Drain (with Flow Direction)
- Head Ditch (with Flow Direction)
- Tail Ditch (with Flow Direction)
- Road Ditch(with Flow Direction)
- Wetland
- Approximate Campo Verde Facility Boundary
- 200 Foot Buffer of Campo Verde Boundary
- Bureau of Land Management Land

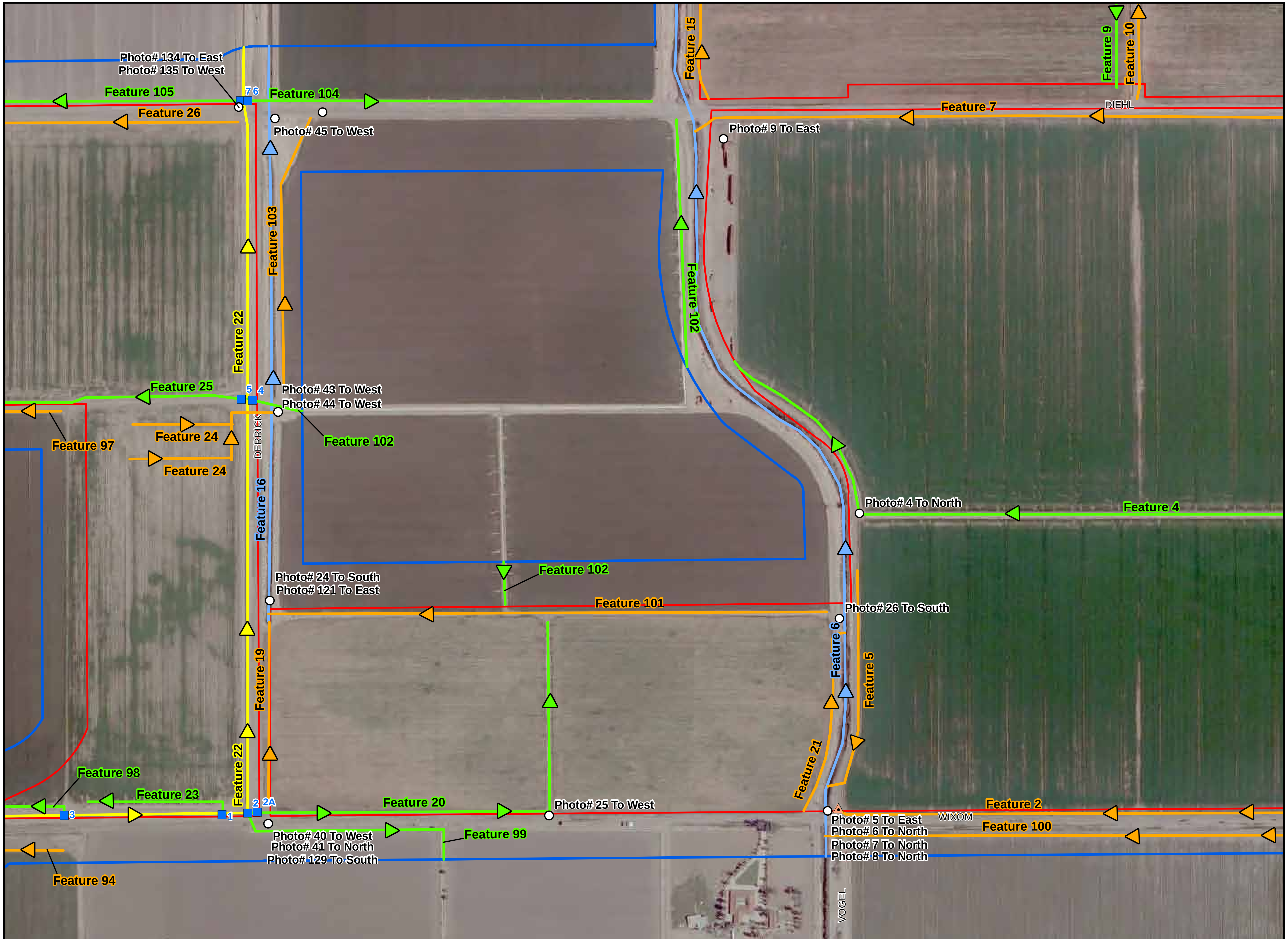
0 400 800

Feet



Page: E-1

01-17-12



Campo Verde Solar Site

Surface Water Conveyance

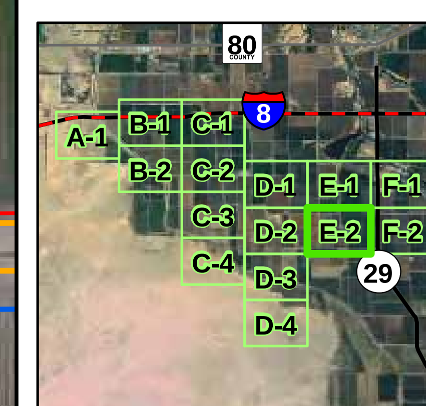
Legend

- Photo Location
- Culvert
- Gate
- Proposed Gen-tie
- Gen-tie Alternative
- Existing 500 kV Transmission Line
- Existing 230 kV Transmission Line
- Interstate
- Major Road
- International Boundary

Surface Water Conveyance Feature

- Canal (with Flow Direction)
- Drain (with Flow Direction)
- Head Ditch (with Flow Direction)
- Tail Ditch (with Flow Direction)
- Road Ditch(with Flow Direction)
- Wetland
- Approximate Campo Verde Facility Boundary
- 200 Foot Buffer of Campo Verde Boundary
- Bureau of Land Management Land

0 400 800
Feet



Page: E-2

01-17-12

Campo Verde Solar Site

Surface Water Conveyance

Legend

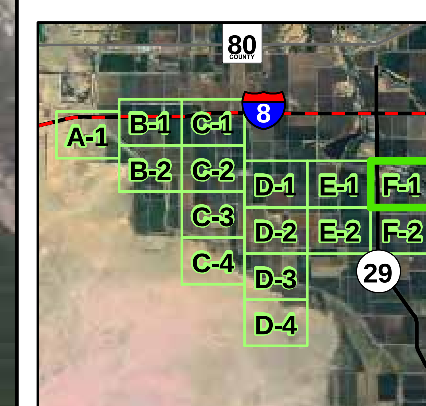
- Photo Location
- Culvert
- Gate
- Proposed Gen-tie
- Gen-tie Alternative
- Existing 500 kV Transmission Line
- Existing 230 kV Transmission Line
- Interstate
- Major Road
- International Boundary

Surface Water Conveyance Feature

- Canal (with Flow Direction)
- Drain (with Flow Direction)
- Head Ditch (with Flow Direction)
- Tail Ditch (with Flow Direction)
- Road Ditch(with Flow Direction)
- Wetland
- Approximate Campo Verde Facility Boundary
- 200 Foot Buffer of Campo Verde Boundary
- Bureau of Land Management Land

0 400 800

Feet



Page: F-1

01-17-12

Campo Verde Solar Site

Surface Water Conveyance

Legend

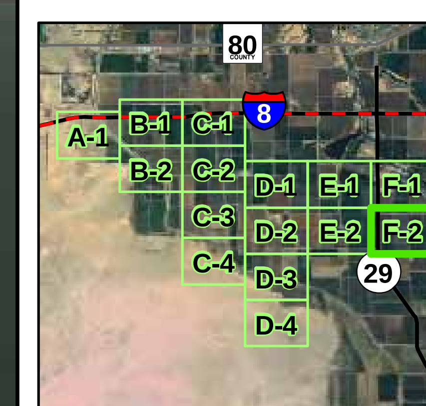
- Photo Location
- Culvert
- Gate
- Proposed Gen-tie
- Gen-tie Alternative
- Existing 500 kV Transmission Line
- Existing 230 kV Transmission Line
- Interstate
- Major Road
- International Boundary

Surface Water Conveyance Feature

- Canal (with Flow Direction)
- Drain (with Flow Direction)
- Head Ditch (with Flow Direction)
- Tail Ditch (with Flow Direction)
- Road Ditch(with Flow Direction)
- Wetland
- Approximate Campo Verde Facility Boundary
- 200 Foot Buffer of Campo Verde Boundary
- Bureau of Land Management Land

0 400 800

Feet



Page: F-2

01-17-12

Appendix D

OHWM Data Sheets

Project: Campo Verde
Project Number:
Stream: Feature 90 – Dixie 3-B Drain
Investigator(s):

Date: 10/26/11
Town:
Photo begin file# See report

Time: 1436
State: CA
Photo end file#

Y ☐ / N ☒ Do normal circumstances exist on the site?

Y ☒ / N ☐ Is the site significantly disturbed?

Location Details: Campo Verde Facility Buffer
Projection: See table in report **Datum:**
Coordinates:

Notes:
Lg. Ag drain
Wetlands entirely w/i active floodplain. Linear + narrow.
Assume JD + avoid.

Brief site description:
Active floodplain = 18 feet

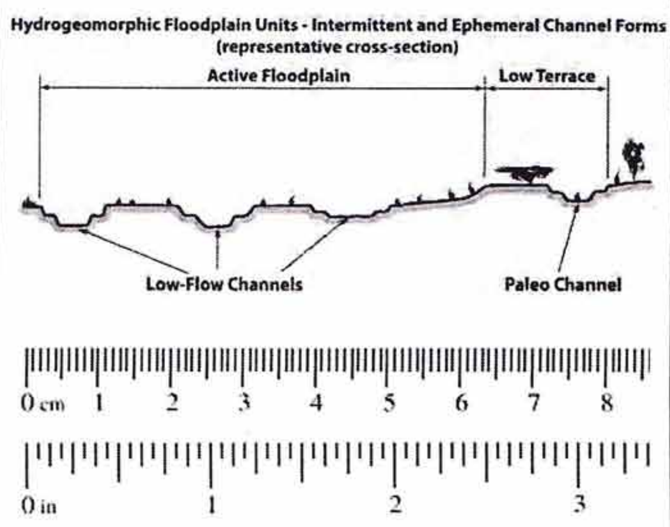
Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
  Scale:
- ☐ Geologic maps
- ☐ Vegetation maps
- ☐ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ Clinometer / level
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)		Inches (in)	Wentworth size class	
			Boulder	Gravel
	10.08	256		
			Cobble	Gravel
	2.56	64		
			Pebble	Gravel
	0.157	4		
			Granule	Gravel
	0.079	2.00		
			Very coarse sand	Sand
	0.039	1.00		
			Coarse sand	Sand
	0.020	0.50		
			Medium sand	Sand
1/2	0.0098	0.25		
			Fine sand	Sand
1/4	0.005	0.125		
			Very fine sand	Sand
1/8	0.0025	0.0625		
			Coarse silt	Silt
1/16	0.0012	0.031		
			Medium silt	Silt
1/32	0.00061	0.0156		
			Fine silt	Silt
1/64	0.00031	0.0078		
			Very fine silt	Silt
1/128	0.00015	0.0039		
			Clay	Mud



☒	**Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**
☒	**Locate the low-flow channel (lowest part of the channel). Record observations.** Characteristics of the low-flow channel: Average sediment texture: Fine silt Total veg cover: 15 % Tree: 5 % Shrub: 5 % Herb: 5 % Community successional stage: ☐ NA ☒ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: Tamarix, arrowweed Other: ☒ Typha ☐ ☐ ☐
☒	**Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.** Characteristics used to delineate the low-flow/active floodplain boundary: ☒ Change in total veg cover ☐ Tree ☐ Shrub ☒ Herb ☐ Change in overall vegetation maturity ☐ Change in dominant species present ☒ Other — ☒ Presence of bed and bank ☐ Drift and/or debris ☒ Other: Change in slope ☐ Other:
☒ N/A	**Continue walking the channel cross-section. Record observations below.** Characteristics of the low-flow channel: Average sediment texture: Total veg cover: ___ % Tree: ___ % Shrub: ___ % Herb: ___ % Community successional stage: ☐ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: Other: ☐ ☐ ☐ ☐

☒	**Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.** Characteristics used to delineate the active floodplain/ low terrace boundary: ☐ Change in average sediment texture ☒ Change in total veg cover ☒ Tree ☐ Shrub ☒ Herb ☐ Change in overall vegetation maturity ☒ Change in dominant species present ☒ Other ☒ Presence of bed and bank ☐ Drift and/or debris ☒ Other: change in slope ☐ Other: ______
☒	**Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.** Consistency of indicators used to delineate the active floodplain/low terrace boundary: Y ☐ N ☐ Change in average sediment texture absent Y ☒ N ☐ Change in total veg cover ☒ Tree ☐ Shrub ☒ Herb Y ☐ N ☐ Change in overall vegetation maturity absent Y ☒ N ☐ Change in dominant species present Y ☒ N ☐ Other: Y ☒ N ☐ Presence of bed and bank Y ☐ N ☐ Drift and/or debris Y ☒ N ☐ Other: Change in slope Y ☐ N ☐ Other: ______
☐ N/A	**If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**
☐ N/A	**Continue walking the channel cross-section. Record characteristics of the low terrace.** Characteristics of the low terrace: Average sediment texture: ______ Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: ____ % Community successional stage: ☐ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: ______ Other: ☐ ______ ☐ ______ ☐ ______ ☐ ______
☒	**If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.** Active floodplain/low terrace boundary acquired via: ☒ Mapping on aerial photograph ☒ GPS ☒ Digitized on computer ☒ Other: Field measurement

Project: Campo Verde
Project Number:
Stream: Feature 91 - Westside Main
Investigator(s): PFG / SWY

Date: 10/26/11 **Time:** 1627
Town: **State:** CA
Photo begin file# **Photo end file#**
See report

Y ☐ / N ☒ Do normal circumstances exist on the site?

Y ☒ / N ☐ Is the site significantly disturbed?

Location Details: Campo Verde Facility Buffer and Gen-tie Crossing
Projection: See table in **Datum:**
Coordinates: report

Notes: Very large main canal - unlined
Active ag lands.

Brief site description:

OHWM = 120 ft.

Checklist of resources (if available):

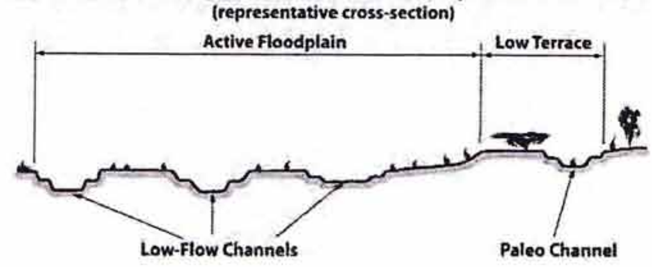
☒ Aerial photography
Dates:
☐ Topographic maps
Scale:
☐ Geologic maps
☐ Vegetation maps
☐ Soils maps
☐ Rainfall/precipitation maps
☐ Existing delineation(s) for site
☒ Global positioning system (GPS)
☐ Other studies

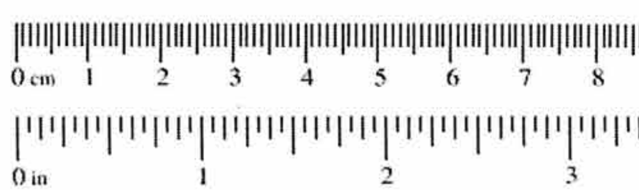
☐ Stream gage data
Gage number:
Period of record:
☐ Clinometer / level
☐ History of recent effective discharges
☐ Results of flood frequency analysis
☐ Most recent shift-adjusted rating
☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)		Inches (in)	Wentworth size class	
			Boulder	Gravel
	10.08	256		
			Cobble	
	2.56	64		
			Pebble	
	0.157	4		
			Granule	
	0.079	2.00		
			Very coarse sand	Sand
	0.039	1.00		
			Coarse sand	
	0.020	0.50		
			Medium sand	
1/2	0.0098	0.25		
			Fine sand	
1/4	0.005	0.125		
			Very fine sand	
1/8	0.0025	0.0625		
			Coarse silt	Silt
1/16	0.0012	0.031		
			Medium silt	
1/32	0.00061	0.0156		
			Fine silt	
1/64	0.00031	0.0078		
			Very fine silt	
1/128	0.00015	0.0039		
			Clay	Mud

Hydrogeomorphic Floodplain Units - Intermittent and Ephemeral Channel Forms
(representative cross-section)





☒	**Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**
☒	**Locate the low-flow channel (lowest part of the channel). Record observations.** Characteristics of the low-flow channel: Average sediment texture: unknown Total veg cover: 0 % Tree: ____ % Shrub: ____ % Herb: ____ % Community successional stage: ☒ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: n/a Other: ☐ ☐ ☐ ☐
☒ N/A	**Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.** Characteristics used to delineate the low-flow/active floodplain boundary: ☐ Change in total veg cover ☐ Tree ☐ Shrub ☐ Herb ☐ Change in overall vegetation maturity ☐ Change in dominant species present ☐ Other ☐ Presence of bed and bank ☐ Drift and/or debris ☐ Other: ____ ☐ Other: ____
☒ N/A	**Continue walking the channel cross-section. Record observations below.** Characteristics of the low-flow channel: Average sediment texture: ____ Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: ____ % Community successional stage: ☐ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: ____ Other: ☐ ☐ ☐ ☐

☒ N/A	**Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.** Characteristics used to delineate the active floodplain/ low terrace boundary: ☐ Change in average sediment texture ☐ Change in total veg cover ☐ Tree ☐ Shrub ☐ Herb ☐ Change in overall vegetation maturity ☐ Change in dominant species present ☐ Other ☐ Presence of bed and bank ☐ Drift and/or debris ☐ Other: __________ ☐ Other: __________
☐ N/A	**Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.** Consistency of indicators used to delineate the active floodplain/low terrace boundary: Y ☐ N ☐ Change in average sediment texture Y ☐ N ☐ Change in total veg cover ☐ Tree ☐ Shrub ☐ Herb Y ☐ N ☐ Change in overall vegetation maturity Y ☐ N ☐ Change in dominant species present Y ☐ N ☐ Other: Y ☐ N ☐ Presence of bed and bank Y ☐ N ☐ Drift and/or debris Y ☐ N ☐ Other: __________ Y ☐ N ☐ Other: __________
☐ N/A	**If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**
☐ N/A	**Continue walking the channel cross-section. Record characteristics of the low terrace.** Characteristics of the low terrace: Average sediment texture: __________ Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: ____ % Community successional stage: ☐ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: __________ Other: ☐ __________ ☐ __________ ☐ __________ ☐
☒	**If characteristics used to delineate the ~~active floodplain/low terrace boundary~~ OHWM were deemed reliable, acquire boundary.** Active floodplain/low terrace boundary acquired via: ☒ Mapping on aerial photograph ☒ GPS ☒ Digitized on computer ☒ Other: Field measurement of staining, dest. of veg

Project: Campo Verde | **Date:** 10/26/11 | **Time:** 1546
Project Number: | **Town:** | **State:** CA
Stream: Feature 58 – Dixie 3-C Drain | **Photo begin file#** | **Photo end file#**
Investigator(s): PFG/SWY | See report

Y ☐ / N ☒ Do normal circumstances exist on the site?

Y ☒ / N ☐ Is the site significantly disturbed?

Location Details:

Projection: See table in report. **Datum:**
Coordinates:

Notes:
Lg ag drain
Wetlands contained entirely w/i active floodplain. Narrow and linear. Assume JD + avoid

Brief site description:
Active floodplain = 25 ft.

Checklist of resources (if available):

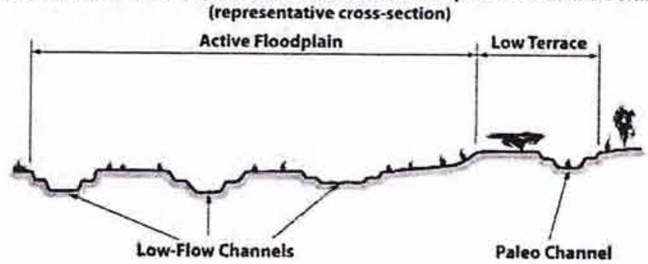
- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
  Scale:
- ☐ Geologic maps
- ☐ Vegetation maps
- ☐ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies

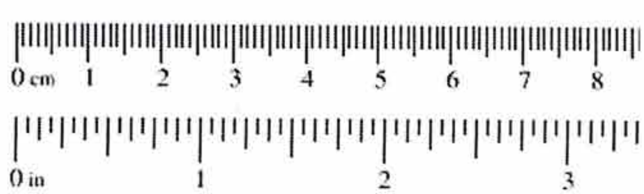
- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ Clinometer / level
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)		Inches (in)	Wentworth size class	
	10.08	256	Boulder	Gravel
	2.56	64	Cobble	Gravel
	0.157	4	Pebble	Gravel
	0.079	2.00	Granule	Gravel
	0.039	1.00	Very coarse sand	Sand
	0.020	0.50	Coarse sand	Sand
1/2	0.0098	0.25	Medium sand	Sand
1/4	0.005	0.125	Fine sand	Sand
1/8	0.0025	0.0625	Very fine sand	Sand
1/16	0.0012	0.031	Coarse silt	Silt
1/32	0.00061	0.0156	Medium silt	Silt
1/64	0.00031	0.0078	Fine silt	Silt
1/128	0.00015	0.0039	Very fine silt	Silt
			Clay	Mud

Hydrogeomorphic Floodplain Units - Intermittent and Ephemeral Channel Forms
(representative cross-section)





☒	**Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**
☒	**Locate the low-flow channel (lowest part of the channel). Record observations.** Characteristics of the low-flow channel: Average sediment texture: Fine silt Total veg cover: 5 % Tree: ___ % Shrub: ___ % Herb: 5 % Community successional stage: ☐ NA ☐ Mid (herbaceous, shrubs, saplings) ☒ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: Phragmites, grasses Other: ☐ ☐ ☐ ☐
☒	**Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.** Characteristics used to delineate the low-flow/active floodplain boundary: ☒ Change in total veg cover ☒ Tree ☐ Shrub ☒ Herb ☐ Change in overall vegetation maturity ☒ Change in dominant species present ☒ Other ☒ Presence of bed and bank ☐ Drift and/or debris ☒ Other: change in slope ☐ Other: ___
☒ N/A	**Continue walking the channel cross-section. Record observations below.** Characteristics of the low-flow channel: Average sediment texture: ___ Total veg cover: ___ % Tree: ___ % Shrub: ___ % Herb: ___ % Community successional stage: ☐ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: ___ Other: ☐ ☐ ☐ ☐

☐	**Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.** Characteristics used to delineate the active floodplain/ low terrace boundary: ☐ Change in average sediment texture ☒ Change in total veg cover ☒ Tree ☐ Shrub ☒ Herb ☐ Change in overall vegetation maturity ☐ Change in dominant species present ☒ Other ☒ Presence of bed and bank ☐ Drift and/or debris ☒ Other: change in slope ☐ Other:
☒	**Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.** Consistency of indicators used to delineate the active floodplain/low terrace boundary: Y ☐ N ☐ Change in average sediment texture Y ☒ N ☐ Change in total veg cover ☒ Tree ☐ Shrub ☒ Herb Y ☐ N ☐ Change in overall vegetation maturity Y ☐ N ☐ Change in dominant species present Y ☒ N ☐ Other: Y ☒ N ☐ Presence of bed and bank Y ☐ N ☐ Drift and/or debris Y ☒ N ☐ Other: change in slope Y ☐ N ☐ Other:
☐ N/A	**If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**
☐ N/A	**Continue walking the channel cross-section. Record characteristics of the low terrace.** Characteristics of the low terrace: Average sediment texture: ______ Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: ____ % Community successional stage: ☐ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: ______ Other: ☐ ☐ ☐ ☐
☒	**If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.** Active floodplain/low terrace boundary acquired via: ☒ Mapping on aerial photograph ☒ GPS ☒ Digitized on computer ☒ Other: Field measurement

Project: Campo Verde
Project Number:
Stream: Feature 57 – Westside Drain
Investigator(s): PFG / SWY

Date: 10/26/11 **Time:** 1527
Town: **State:** CA
Photo begin file# **Photo end file#**
See report

Y ☐ / N ☒ Do normal circumstances exist on the site?

Y ☒ / N ☐ Is the site significantly disturbed?

Location Details: Campo Verde Facility
Projection: See table in **Datum:**
Coordinates: report

Notes:
Active lg. ag. drain
Wetlands contained entirely w/i active floodplain. Narrow + linear.
Assume JD + avoid.

Brief site description:
Active floodplain = 25 ft.

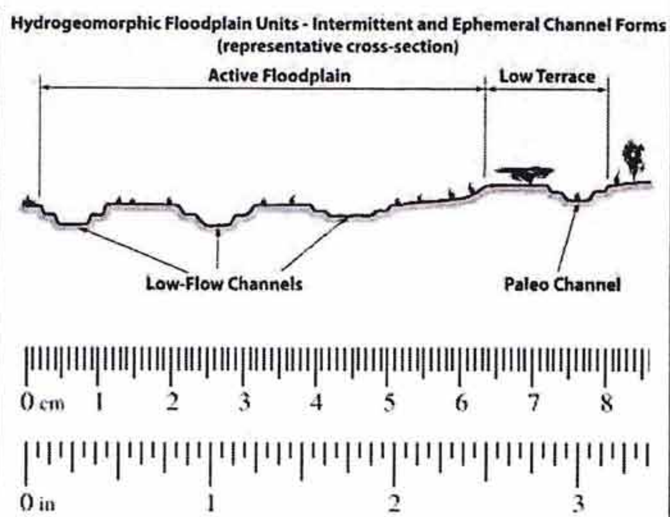
Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
  Scale:
- ☐ Geologic maps
- ☐ Vegetation maps
- ☐ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ Clinometer / level
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)		Inches (in)	Wentworth size class	
			Boulder	Gravel
	10.08	256		
			Cobble	Gravel
	2.56	64		
			Pebble	Gravel
	0.157	4		
			Granule	Gravel
	0.079	2.00		
			Very coarse sand	Sand
	0.039	1.00		
			Coarse sand	Sand
	0.020	0.50		
			Medium sand	Sand
1/2	0.0098	0.25		
			Fine sand	Sand
1/4	0.005	0.125		
			Very fine sand	Sand
1/8	0.0025	0.0625		
			Coarse silt	Silt
1/16	0.0012	0.031		
			Medium silt	Silt
1/32	0.00061	0.0156		
			Fine silt	Silt
1/64	0.00031	0.0078		
			Very fine silt	Silt
1/128	0.00015	0.0039		
			Clay	Mud



☒	**Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**
☒	**Locate the low-flow channel (lowest part of the channel). Record observations.** Characteristics of the low-flow channel: Average sediment texture: Fine silt Total veg cover: 30 % Tree: ____ % Shrub: ____ % Herb: ____ % Community successional stage: ☐ NA ☒ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: Typha, phragmites, juncus, tamarix Other: ☐ ☐ ☐ ☐
☒	**Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.** Characteristics used to delineate the low-flow/active floodplain boundary: ☒ Change in total veg cover ☐ Tree ☒ Shrub ☒ Herb ☐ Change in overall vegetation maturity ☐ Change in dominant species present ☒ Other ☒ Presence of bed and bank ☐ Drift and/or debris ☒ Other: Change in slope ☐ Other: ____
☒ N/A	**Continue walking the channel cross-section. Record observations below.** Characteristics of the low-flow channel: Average sediment texture: ____ Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: ____ % Community successional stage: ☐ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: ____ Other: ☐ ☐ ☐ ☐

☒	**Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.** Characteristics used to delineate the active floodplain/ low terrace boundary: ☐ Change in average sediment texture ☒ Change in total veg cover ☐ Tree ☒ Shrub ☐ Herb ☐ Change in overall vegetation maturity ☐ Change in dominant species present ☒ Other ☒ Presence of bed and bank ☐ Drift and/or debris ☒ Other: change in slope ☐ Other: ______
☒	**Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.** Consistency of indicators used to delineate the active floodplain/low terrace boundary: Y ☐ N ☐ Change in average sediment texture absent Y ☒ N ☐ Change in total veg cover ☐ Tree ☒ Shrub ☐ Herb Y ☐ N ☐ Change in overall vegetation maturity Y ☐ N ☐ Change in dominant species present Y ☒ N ☐ Other: Y ☒ N ☐ Presence of bed and bank Y ☐ N ☐ Drift and/or debris Y ☒ N ☐ Other: change in slope Y ☐ N ☐ Other: ______
☐ N/A	**If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**
☐ N/A	**Continue walking the channel cross-section. Record characteristics of the low terrace.** Characteristics of the low terrace: Average sediment texture: ______ Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: ____ % Community successional stage: ☐ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: ______ Other: ☐ ☐ ☐ ☐
☒	**If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.** Active floodplain/low terrace boundary acquired via: ☒ Mapping on aerial photograph ☒ GPS ☒ Digitized on computer ☒ Other: Field measurement

Project: Campo Verde
Project Number:
Stream: Feature 4a – Dixie 3-A Drain
Investigator(s): PFG / SWY

Date: 10/26/11 **Time:** 1515
Town: **State:** CA
Photo begin file# See report **Photo end file#**

Y ☐ / N ☒ Do normal circumstances exist on the site?

Y ☒ / N ☐ Is the site significantly disturbed?

Location Details: Campo Verde Facility
Projection: See table **Datum:**
Coordinates: in report

Notes:
Lg. ag drain
Intermittent wetlands contained entirely w/i active floodplain. Narrow + linear. Assume JD + avoid.

Brief site description:
Active floodplain = 35 ft.

Checklist of resources (if available):

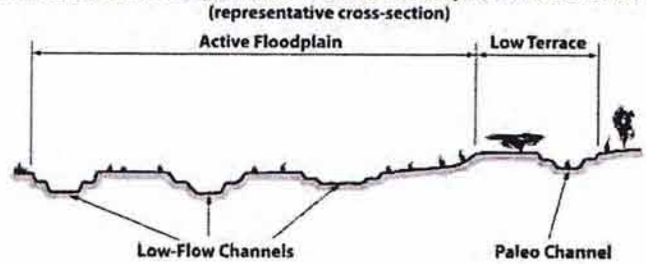
- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
  Scale:
- ☐ Geologic maps
- ☐ Vegetation maps
- ☐ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies

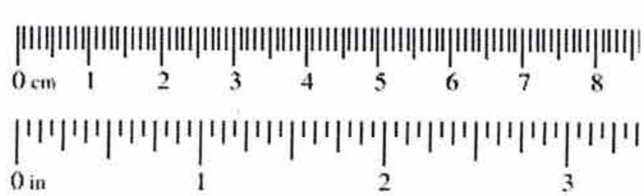
- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ Clinometer / level
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)		Inches (in)	Wentworth size class	
			Boulder	Gravel
	10.08	256		
			Cobble	
	2.56	64		
			Pebble	
	0.157	4		
			Granule	
	0.079	2.00		
			Very coarse sand	Sand
	0.039	1.00		
			Coarse sand	
	0.020	0.50		
			Medium sand	
1/2	0.0098	0.25		
			Fine sand	
1/4	0.005	0.125		
			Very fine sand	
1/8	0.0025	0.0625		
			Coarse silt	Silt
1/16	0.0012	0.031		
			Medium silt	
1/32	0.00061	0.0156		
			Fine silt	
1/64	0.00031	0.0078		
			Very fine silt	
1/128	0.00015	0.0039		
			Clay	Mud

Hydrogeomorphic Floodplain Units - Intermittent and Ephemeral Channel Forms
(representative cross-section)





☒	**Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**
☒	**Locate the low-flow channel (lowest part of the channel). Record observations.** Characteristics of the low-flow channel: Average sediment texture: Fine silt Total veg cover: 0 % Tree: ___ % Shrub: ___ % Herb: ___ % Community successional stage: ☒ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: n/a Other: ☐ ☐ ☐ ☐
☒	**Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.** Characteristics used to delineate the low-flow/active floodplain boundary: ☒ Change in total veg cover ☒ Tree ☐ Shrub ☒ Herb ☐ Change in overall vegetation maturity ☐ Change in dominant species present ☑ Other ☒ Presence of bed and bank ☐ Drift and/or debris ☒ Other: change in slope ☐ Other: ___
☒ N/A	**Continue walking the channel cross-section. Record observations below.** Characteristics of the low-flow channel: Average sediment texture: ___ Total veg cover: ___ % Tree: ___ % Shrub: ___ % Herb: ___ % Community successional stage: ☐ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: ___ Other: ☐ ☐ ☐ ☐

☒	**Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.** Characteristics used to delineate the active floodplain/ low terrace boundary: ☐ Change in average sediment texture ☒ Change in total veg cover ☒ Tree ☐ Shrub ☒ Herb ☐ Change in overall vegetation maturity ☐ Change in dominant species present ☒ Other ☒ Presence of bed and bank ☐ Drift and/or debris ☒ Other: change in slope ☐ Other: ________
☒	**Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.** Consistency of indicators used to delineate the active floodplain/low terrace boundary: Y ☐ N ☐ Change in average sediment texture absent Y ☒ N ☐ Change in total veg cover ☒ Tree ☐ Shrub ☒ Herb Y ☐ N ☐ Change in overall vegetation maturity absent Y ☐ N ☐ Change in dominant species present absent Y ☒ N ☐ Other: Y ☒ N ☐ Presence of bed and bank Y ☐ N ☐ Drift and/or debris Y ☒ N ☐ Other: change in slope Y ☐ N ☐ Other: ________
☐ N/A	**If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**
☐ N/A	**Continue walking the channel cross-section. Record characteristics of the low terrace.** Characteristics of the low terrace: Average sediment texture: ________ Total veg cover: ___ % Tree: ___ % Shrub: ___ % Herb: ___ % Community successional stage: ☐ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: ________ Other: ☐ ________ ☐ ________ ☐ ________ ☐
☒	**If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.** Active floodplain/low terrace boundary acquired via: ☒ Mapping on aerial photograph ☒ GPS ☒ Digitized on computer ☒ Other: Field measurment

Project: Campo Verde
Project Number:
Stream: Feature 61 – Lat
Investigator(s): PFG / SWY

Date: 10/26/11 **Time:** 1506
Town: **State:** CA
Photo begin file# **Photo end file#**
See report

Y ☐ / N ☒ Do normal circumstances exist on the site?

Y ☒ / N ☐ Is the site significantly disturbed?

Location Details:
Campo Verde Facility
Projection: See table in **Datum:**
Coordinates: report

Notes:
Concrete lateral canal.
Active ag lands

Brief site description:

OHWM = 6 ft.

Checklist of resources (if available):

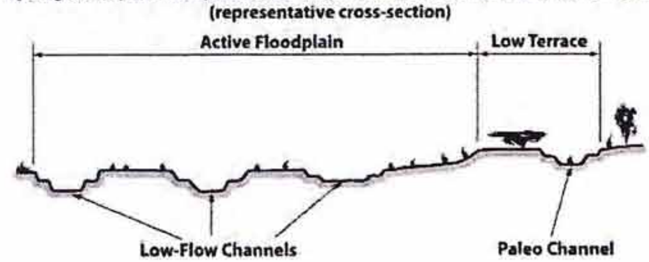
- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
  Scale:
- ☐ Geologic maps
- ☐ Vegetation maps
- ☐ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies

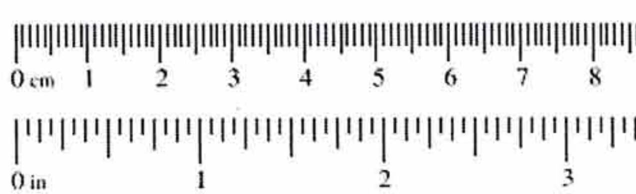
- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ Clinometer / level
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)		Inches (in)	Wentworth size class	
			Boulder	Gravel
	10.08	256		
			Cobble	
	2.56	64		
			Pebble	
	0.157	4		
			Granule	
	0.079	2.00		
			Very coarse sand	Sand
	0.039	1.00		
			Coarse sand	
	0.020	0.50		
			Medium sand	
1/2	0.0098	0.25		
			Fine sand	
1/4	0.005	0.125		
			Very fine sand	
1/8	0.0025	0.0625		
			Coarse silt	Silt
1/16	0.0012	0.031		
			Medium silt	
1/32	0.00061	0.0156		
			Fine silt	
1/64	0.00031	0.0078		
			Very fine silt	
1/128	0.00015	0.0039		
			Clay	Mud

Hydrogeomorphic Floodplain Units - Intermittent and Ephemeral Channel Forms
(representative cross-section)





☒	**Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**
☒	**Locate the low-flow channel (lowest part of the channel). Record observations.** Characteristics of the low-flow channel: Average sediment texture: concrete Total veg cover: 0 % Tree: ___ % Shrub: ___ % Herb: ___ % Community successional stage: ☒ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: n/a Other: ☐ ☐ ☐ ☐
☒ N/A	**Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.** Characteristics used to delineate the low-flow/active floodplain boundary: ☐ Change in total veg cover ☐ Tree ☐ Shrub ☐ Herb ☐ Change in overall vegetation maturity ☐ Change in dominant species present ☐ Other ☐ Presence of bed and bank ☐ Drift and/or debris ☐ Other: ___ ☐ Other: ___
☒ N/A	**Continue walking the channel cross-section. Record observations below.** Characteristics of the low-flow channel: Average sediment texture: ___ Total veg cover: ___ % Tree: ___ % Shrub: ___ % Herb: ___ % Community successional stage: ☐ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: ___ Other: ☐ ☐ ☐ ☐

☒ N/A

Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.

Characteristics used to delineate the active floodplain/ low terrace boundary:

- ☐ Change in average sediment texture
- ☐ Change in total veg cover ☐ Tree ☐ Shrub ☐ Herb
- ☐ Change in overall vegetation maturity
- ☐ Change in dominant species present
- ☐ Other
  - ☐ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: ______________
  - ☐ Other: ______________

☒ N/A

Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.

Consistency of indicators used to delineate the active floodplain/low terrace boundary:

- Y ☐ N ☐ Change in average sediment texture
- Y ☐ N ☐ Change in total veg cover ☐ Tree ☐ Shrub ☐ Herb
- Y ☐ N ☐ Change in overall vegetation maturity
- Y ☐ N ☐ Change in dominant species present
- Y ☐ N ☐ Other:
  - Y ☐ N ☐ Presence of bed and bank
  - Y ☐ N ☐ Drift and/or debris
  - Y ☐ N ☐ Other: ______________
  - Y ☐ N ☐ Other: ______________

☐ N/A

If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.

☐ N/A

Continue walking the channel cross-section. Record characteristics of the low terrace.

Characteristics of the low terrace:

Average sediment texture: ______________

Total veg cover: _____ % Tree: _____ % Shrub: _____ % Herb: _____ %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: ______________

Other: ☐ ☐ ☐ ☐

☒

If characteristics used to delineate the active ~~floodplain/low terrace boundary~~ GHWM were deemed reliable, acquire boundary.

Active floodplain/low terrace boundary acquired via:

- ☒ Mapping on aerial photograph
- ☒ Digitized on computer
- ☒ GPS
- ☒ Other: Field measurement of water staining

Project: Campo Verde **Project Number:** **Stream:** Feature 33 **Investigator(s):** PFG / SWY	**Date:** 10/26/11 **Time:** 1457 **Town:** **State:** CA **Photo begin file#** **Photo end file#** See report
Y ☐ / N ☒ Do normal circumstances exist on the site? Y ☒ / N ☐ Is the site significantly disturbed?	**Location Details:** Campo Verde Facility **Projection:** See table **Datum:** **Coordinates:** in report

Notes:
Concrete lined canal
Active ag lands

Brief site description:
OHWM = 16 ft.

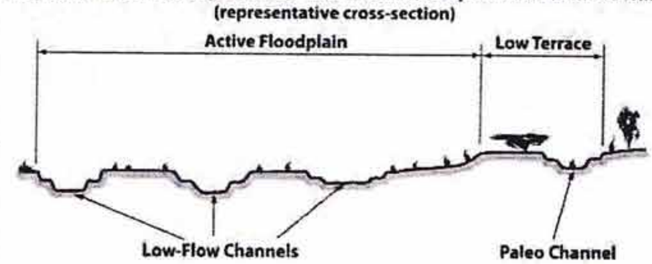
Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
  Scale:
- ☐ Geologic maps
- ☐ Vegetation maps
- ☐ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies
- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ Clinometer / level
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)	Inches (in)	Wentworth size class	
		Boulder	Gravel
10.08	256		
		Cobble	Gravel
2.56	64		
		Pebble	Gravel
0.157	4		
		Granule	Gravel
0.079	2.00		
		Very coarse sand	Sand
0.039	1.00		
		Coarse sand	Sand
0.020	0.50		
		Medium sand	Sand
1/2 0.0098	0.25		
		Fine sand	Sand
1/4 0.005	0.125		
		Very fine sand	Sand
1/8 0.0025	0.0625		
		Coarse silt	Silt
1/16 0.0012	0.031		
		Medium silt	Silt
1/32 0.00061	0.0156		
		Fine silt	Silt
1/64 0.00031	0.0078		
		Very fine silt	Silt
1/128 0.00015	0.0039		
		Clay	Mud

Hydrogeomorphic Floodplain Units - Intermittent and Ephemeral Channel Forms
(representative cross-section)



0 cm 1 2 3 4 5 6 7 8

0 in 1 2 3

☒	**Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**
☒	**Locate the low-flow channel (lowest part of the channel). Record observations.** Characteristics of the low-flow channel: Average sediment texture: concrete Total veg cover: 0 % Tree: ___ % Shrub: ___ % Herb: ___ % Community successional stage: ☒ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: n/a Other: ☐ ☐ ☐ ☐
☒ N/A	**Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.** Characteristics used to delineate the low-flow/active floodplain boundary: ☐ Change in total veg cover ☐ Tree ☐ Shrub ☐ Herb ☐ Change in overall vegetation maturity ☐ Change in dominant species present ☐ Other ☐ Presence of bed and bank ☐ Drift and/or debris ☐ Other: ___ ☐ Other: ___
☒ N/A	**Continue walking the channel cross-section. Record observations below.** Characteristics of the low-flow channel: Average sediment texture: ___ Total veg cover: ___ % Tree: ___ % Shrub: ___ % Herb: ___ % Community successional stage: ☐ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: ___ Other: ☐ ☐ ☐ ☐

☒ N/A

Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.

Characteristics used to delineate the active floodplain/ low terrace boundary:

- ☐ Change in average sediment texture
- ☐ Change in total veg cover ☐ Tree ☐ Shrub ☐ Herb
- ☐ Change in overall vegetation maturity
- ☐ Change in dominant species present
- ☐ Other
  - ☐ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: ____________________
  - ☐ Other: ____________________

☐ N/A

Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.

Consistency of indicators used to delineate the active floodplain/low terrace boundary:

- Y ☐ N ☐ Change in average sediment texture
- Y ☐ N ☐ Change in total veg cover ☐ Tree ☐ Shrub ☐ Herb
- Y ☐ N ☐ Change in overall vegetation maturity
- Y ☐ N ☐ Change in dominant species present
- Y ☐ N ☐ Other:
  - Y ☐ N ☐ Presence of bed and bank
  - Y ☐ N ☐ Drift and/or debris
  - Y ☐ N ☐ Other: ____________________
  - Y ☐ N ☐ Other: ____________________

☐ N/A

If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.

☐ N/A

Continue walking the channel cross-section. Record characteristics of the low terrace.

Characteristics of the low terrace:

Average sediment texture: ____________________

Total veg cover: _____ % Tree: _____ % Shrub: _____ % Herb: _____ %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: ____________________

Other:

- ☐ ____________________
- ☐ ____________________
- ☐ ____________________
- ☐ ____________________

☒

If characteristics used to delineate the ~~active floodplain/low terrace boundary~~ OHWM were deemed reliable, acquire boundary.

Active floodplain/low terrace boundary acquired via:

- ☒ Mapping on aerial photograph
- ☒ Digitized on computer
- ☒ GPS
- ☐ Other: Field measurement of water staining

Project: Campo Verde		**Date:** 10/26/11	**Time:** 1444
Project Number:		**Town:**	**State:** CA
Stream: Feature 27 - Wixom Drain		**Photo begin file#**	**Photo end file#**
Investigator(s): PFG / SWY		PG449N , 4525	
Y ☐ / N ☒ Do normal circumstances exist on the site?		**Location Details:** Campo Verde Facility	
Y ☒ / N ☐ Is the site significantly disturbed?		**Projection:** See table in report	**Datum:**
		Coordinates:	

Notes:
Lg. ag. drain.
Sm wetlands contained entirely w/i low-flow channel for northern ~1,200 ft.
Narrow + linear. Assume JD + avoid

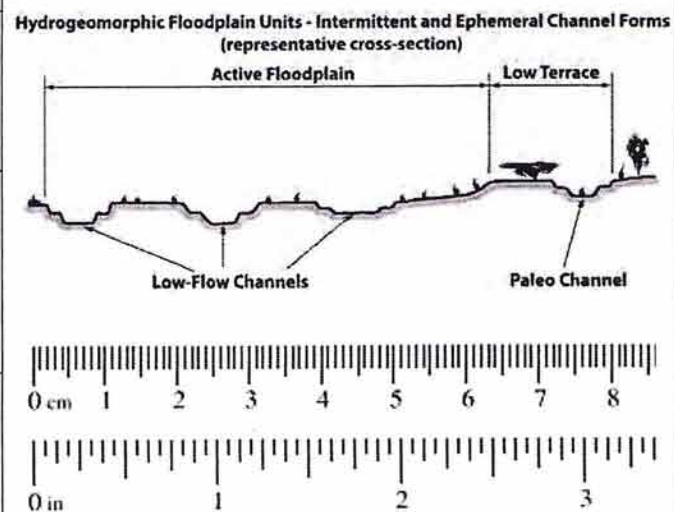
Brief site description:
Active floodplain = 12

Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
  Scale:
- ☐ Geologic maps
- ☐ Vegetation maps
- ☐ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies
- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ Clinometer / level
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)		Inches (in)	Wentworth size class	
			Boulder	Gravel
	10.08	256		
			Cobble	Gravel
	2.56	64		
			Pebble	Gravel
	0.157	4		
			Granule	Gravel
	0.079	2.00		
			Very coarse sand	Sand
	0.039	1.00		
			Coarse sand	Sand
	0.020	0.50		
			Medium sand	Sand
1/2	0.0098	0.25		
			Fine sand	Sand
1/4	0.005	0.125		
			Very fine sand	Sand
1/8	0.0025	0.0625		
			Coarse silt	Silt
1/16	0.0012	0.031		
			Medium silt	Silt
1/32	0.00061	0.0156		
			Fine silt	Silt
1/64	0.00031	0.0078		
			Very fine silt	Silt
1/128	0.00015	0.0039		
			Clay	Mud



<table>
<tr><td>☒</td><td>Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.</td></tr>
<tr><td>☒</td><td>Locate the low-flow channel (lowest part of the channel). Record observations.
Characteristics of the low-flow channel:
Average sediment texture: Fine silt
Total veg cover: 0 % Tree: ___ % Shrub: ___ % Herb: ___ %
Community successional stage:
☒ NA ☐ Mid (herbaceous, shrubs, saplings)
☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees)
Dominant species present: n/a
Other: ☐
☐
☐
☐</td></tr>
<tr><td>☒</td><td>Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.
Characteristics used to delineate the low-flow/active floodplain boundary:
☒ Change in total veg cover ☒ Tree ☐ Shrub ☒ Herb
☐ Change in overall vegetation maturity
☐ Change in dominant species present
☒ Other ☒ Presence of bed and bank
☐ Drift and/or debris
☒ Other: change in slope
☐ Other: ___</td></tr>
<tr><td>☐
N/A</td><td>Continue walking the channel cross-section. Record observations below.
Characteristics of the low-flow channel:
Average sediment texture: ___
Total veg cover: ___ % Tree: ___ % Shrub: ___ % Herb: ___ %
Community successional stage:
☐ NA ☐ Mid (herbaceous, shrubs, saplings)
☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees)
Dominant species present: ___
Other: ☐
☐
☐
☐</td></tr>
</table>

☒	**Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.** Characteristics used to delineate the active floodplain/ low terrace boundary: ☐ Change in average sediment texture ☒ Change in total veg cover ☒ Tree ☐ Shrub ☒ Herb ☐ Change in overall vegetation maturity ☐ Change in dominant species present ☐ Other ☐ Presence of bed and bank ☐ Drift and/or debris ☐ Other: ______ ☐ Other: ______
☒	**Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.** Consistency of indicators used to delineate the active floodplain/low terrace boundary: Y ☐ N ☐ Change in average sediment texture absent Y ☒ N ☐ Change in total veg cover ☒ Tree ☐ Shrub ☒ Herb Y ☐ N ☐ Change in overall vegetation maturity absent Y ☐ N ☐ Change in dominant species present absent Y ☐ N ☐ Other: Y ☒ N ☐ Presence of bed and bank Y ☐ N ☐ Drift and/or debris Y ☒ N ☐ Other: change in slope Y ☐ N ☐ Other: ______
☐ N/A	**If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**
☐ N/A	**Continue walking the channel cross-section. Record characteristics of the low terrace.** Characteristics of the low terrace: Average sediment texture: ______ Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: ____ % Community successional stage: ☐ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: ______ Other: ☐ ______ ☐ ______ ☐ ______ ☐ ______
☒	**If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.** Active floodplain/low terrace boundary acquired via: ☒ Mapping on aerial photograph ☒ GPS ☒ Digitized on computer ☒ Other: Field measurement

Project: Campo Verde	**Date:** 10/26/11 **Time:** 1412
Project Number:	**Town:** **State:** CA
Stream: Feature 22 – Fig Canal	**Photo begin file#** **Photo end file#**
Investigator(s):	See report
Y ☐ / N ☒ Do normal circumstances exist on the site?	**Location Details:** Campo Verde Facility
Y ☒ / N ☐ Is the site significantly disturbed?	**Projection:** See table **Datum:**
	Coordinates: in report

Notes:

Concrete lined canal

OHWM = 10

Brief site description:

Active ag land

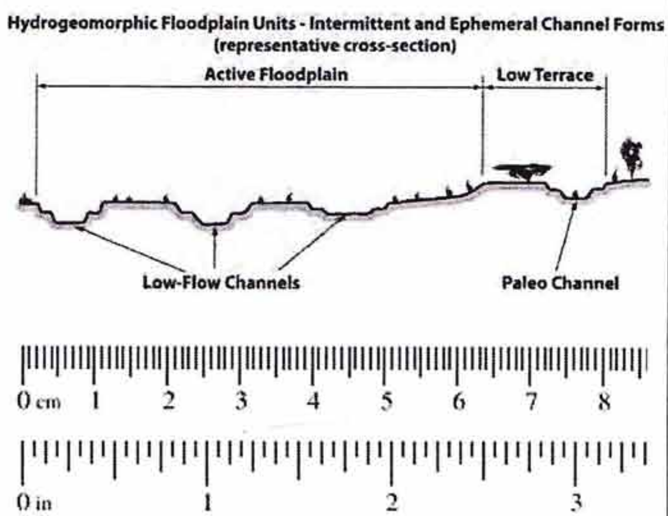
Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
  Scale:
- ☐ Geologic maps
- ☐ Vegetation maps
- ☐ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ Clinometer / level
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)	Inches (in)	Wentworth size class	
		Boulder	Gravel
10.08	256		
		Cobble	
2.56	64		
		Pebble	
0.157	4		
		Granule	
0.079	2.00		
		Very coarse sand	Sand
0.039	1.00		
		Coarse sand	
0.020	0.50		
		Medium sand	
1/2 0.0098	0.25		
		Fine sand	
1/4 0.005	0.125		
		Very fine sand	
1/8 — 0.0025	0.0625		
		Coarse silt	Silt
1/16 0.0012	0.031		
		Medium silt	
1/32 0.00061	0.0156		
		Fine silt	
1/64 0.00031	0.0078		
		Very fine silt	
1/128 — 0.00015	0.0039		
		Clay	Mud



☒	**Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**
☒	**Locate the low-flow channel (lowest part of the channel). Record observations.** Characteristics of the low-flow channel: Average sediment texture: Concrete Total veg cover: 0 % Tree: ____% Shrub: ____% Herb: ____% Community successional stage: ☒ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: n/a Other: ☐ ☐ ☐ ☐
☒ N/A	**Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.** Characteristics used to delineate the low-flow/active floodplain boundary: ☐ Change in total veg cover ☐ Tree ☐ Shrub ☐ Herb ☐ Change in overall vegetation maturity ☐ Change in dominant species present ☐ Other ☐ Presence of bed and bank ☐ Drift and/or debris ☐ Other: ________ ☐ Other: ________
☐ N/A	**Continue walking the channel cross-section. Record observations below.** Characteristics of the low-flow channel: Average sediment texture: ________ Total veg cover: ____% Tree: ____% Shrub: ____% Herb: ____% Community successional stage: ☐ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: ________ Other: ☐ ☐ ☐ ☐

☒ N/A	**Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.** Characteristics used to delineate the active floodplain/ low terrace boundary: ☐ Change in average sediment texture ☐ Change in total veg cover ☐ Tree ☐ Shrub ☐ Herb ☐ Change in overall vegetation maturity ☐ Change in dominant species present ☐ Other ☐ Presence of bed and bank ☐ Drift and/or debris ☐ Other: ________ ☐ Other: ________
☐ N/A	**Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.** Consistency of indicators used to delineate the active floodplain/low terrace boundary: Y ☐ N ☐ Change in average sediment texture Y ☐ N ☐ Change in total veg cover ☐ Tree ☐ Shrub ☐ Herb Y ☐ N ☐ Change in overall vegetation maturity Y ☐ N ☐ Change in dominant species present Y ☐ N ☐ Other: Y ☐ N ☐ Presence of bed and bank Y ☐ N ☐ Drift and/or debris Y ☐ N ☐ Other: ________ Y ☐ N ☐ Other: ________
☐ N/A	**If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**
☐ N/A	**Continue walking the channel cross-section. Record characteristics of the low terrace.** Characteristics of the low terrace: Average sediment texture: ________ Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: ____ % Community successional stage: ☐ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: ________ Other: ☐ ____ ☐ ____ ☐ ____ ☐ ____
☒	**If characteristics used to delineate the ~~active floodplain/low terrace boundary~~ OHWM were deemed reliable, acquire boundary.** Active floodplain/low terrace boundary acquired via: ☒ Mapping on aerial photograph ☒ GPS ☒ Digitized on computer ☒ Other: Field measurement of water staining

Project: Campo Verde **Project Number:** **Stream:** Feature 16 – Dichl Drain **Investigator(s):** PFG / SY	**Date:** 10/26/11 **Time:** 1404 **Town:** **State:** CA **Photo begin file#** **Photo end file#** See report
Y ☐ / N ☒ Do normal circumstances exist on the site? Y ☒ / N ☐ Is the site significantly disturbed?	**Location Details:** Campo Verde Facility **Projection:** see table **Datum:** **Coordinates:** Report

Notes:

Lg. ag drain.
Flows into Fig Lagoon North of project Area

Brief site description:

Active floodplain = 10ft

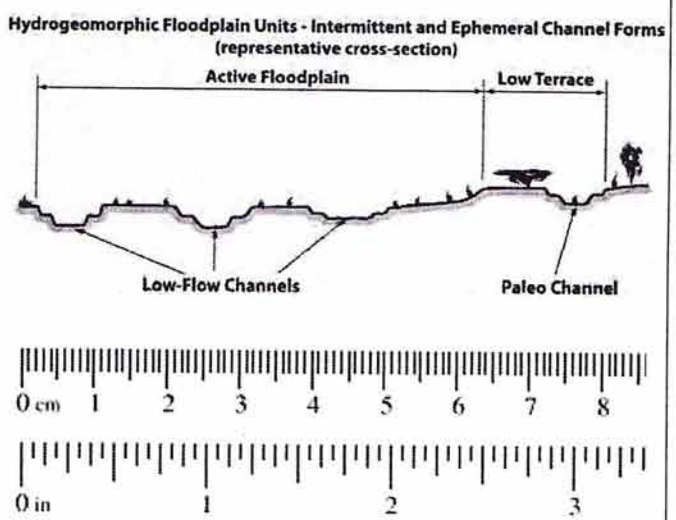
Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
  Scale:
- ☐ Geologic maps
- ☐ Vegetation maps
- ☐ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ Clinometer / level
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)		Inches (in)	Wentworth size class	
			Boulder	Gravel
	10.08	256		
			Cobble	Gravel
	2.56	64		
			Pebble	Gravel
	0.157	4		
			Granule	Gravel
	0.079	2.00		
			Very coarse sand	Sand
	0.039	1.00		
			Coarse sand	Sand
	0.020	0.50		
			Medium sand	Sand
1/2	0.0098	0.25		
			Fine sand	Sand
1/4	0.005	0.125		
			Very fine sand	Sand
1/8	0.0025	0.0625		
			Coarse silt	Silt
1/16	0.0012	0.031		
			Medium silt	Silt
1/32	0.00061	0.0156		
			Fine silt	Silt
1/64	0.00031	0.0078		
			Very fine silt	Silt
1/128	0.00015	0.0039		
			Clay	Mud



[x]	**Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**
[x]	**Locate the low-flow channel (lowest part of the channel). Record observations.** Characteristics of the low-flow channel: Average sediment texture: Fine silt Total veg cover: 0 % Tree: ____% Shrub: ____% Herb: ____% Community successional stage: [x] NA [ ] Early (herbaceous & seedlings) [ ] Mid (herbaceous, shrubs, saplings) [ ] Late (herbaceous, shrubs, mature trees) Dominant species present: n/a Other: [ ] [ ] [ ] [ ]
[x]	**Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.** Characteristics used to delineate the low-flow/active floodplain boundary: [x] Change in total veg cover [ ] Tree [ ] Shrub [x] Herb [ ] Change in overall vegetation maturity [ ] Change in dominant species present [x] Other [x] Presence of bed and bank [ ] Drift and/or debris [x] Other: change in slope [ ] Other: ____
[ ] N/A	**Continue walking the channel cross-section. Record observations below.** Characteristics of the low-flow channel: Average sediment texture: ____ Total veg cover: ____% Tree: ____% Shrub: ____% Herb: ____% Community successional stage: [ ] NA [ ] Early (herbaceous & seedlings) [ ] Mid (herbaceous, shrubs, saplings) [ ] Late (herbaceous, shrubs, mature trees) Dominant species present: ____ Other: [ ] [ ] [ ] [ ]

☒	**Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.** Characteristics used to delineate the active floodplain/ low terrace boundary: ☐ Change in average sediment texture ☒ Change in total veg cover ☐ Tree ☐ Shrub ☒ Herb ☐ Change in overall vegetation maturity ☐ Change in dominant species present ☒ Other ☒ Presence of bed and bank ☐ Drift and/or debris ☒ Other: change in slope ☐ Other:
☒	**Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.** Consistency of indicators used to delineate the active floodplain/low terrace boundary: Y ☐ N ☐ Change in average sediment texture absent Y ☒ N ☐ Change in total veg cover ☐ Tree ☐ Shrub ☒ Herb Y ☐ N ☐ Change in overall vegetation maturity absent Y ☐ N ☐ Change in dominant species present absent Y ☐ N ☐ Other: Y ☒ N ☐ Presence of bed and bank Y ☐ N ☐ Drift and/or debris Y ☒ N ☐ Other: change in slope Y ☐ N ☐ Other:
☐ N/A	**If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**
☐ N/A	**Continue walking the channel cross-section. Record characteristics of the low terrace.** Characteristics of the low terrace: Average sediment texture: ____ Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: ____ % Community successional stage: ☐ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: ____ Other: ☐ ☐ ☐ ☐
☒	**If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.** Active floodplain/low terrace boundary acquired via: ☒ Mapping on aerial photograph ☒ GPS ☒ Digitized on computer ☒ Other: Field Measurement

Project: Campo Verde **Project Number:** **Stream:** Fig Drain **Investigator(s):** PFG/SY	**Date:** 10/26/11 **Time:** 1354 **Town:** **State:** CA **Photo begin file#** **Photo end file#** See report
Y ☐ / N ☒ Do normal circumstances exist on the site? Y ☒ / N ☐ Is the site significantly disturbed?	**Location Details:** Campo Verde Facility **Projection:** See table in **Datum:** **Coordinates:** report

Notes:
lg. ag. drain
Flows to Fig Lagoon N of project area

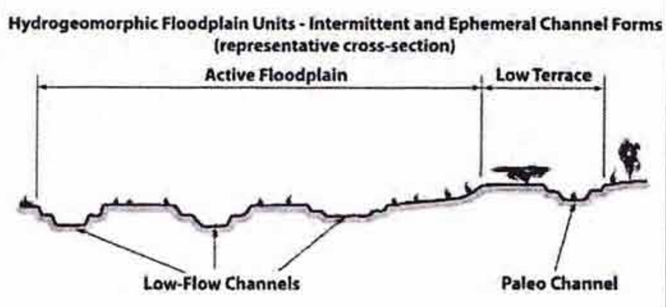
Brief site description:
Active Floodplain = 25 ft.

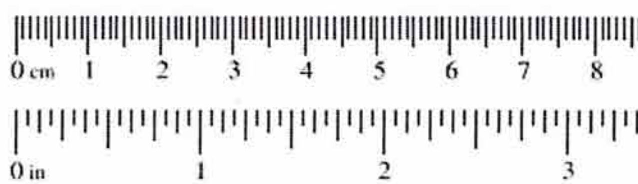
Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
  Scale:
- ☐ Geologic maps
- ☐ Vegetation maps
- ☐ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies
- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ Clinometer / level
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)	Inches (in)	Wentworth size class	
		Boulder	Gravel
10.08	256	Cobble	
2.56	64	Pebble	
0.157	4	Granule	
0.079	2.00	Very coarse sand	Sand
0.039	1.00	Coarse sand	
0.020	0.50	Medium sand	
1/2 0.0098	0.25	Fine sand	
1/4 0.005	0.125	Very fine sand	
1/8 0.0025	0.0625	Coarse silt	Silt
1/16 0.0012	0.031	Medium silt	
1/32 0.00061	0.0156	Fine silt	
1/64 0.00031	0.0078	Very fine silt	
1/128 0.00015	0.0039	Clay	Mud





☒	**Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**
☒	**Locate the low-flow channel (lowest part of the channel). Record observations.** Characteristics of the low-flow channel: Average sediment texture: Fine silt Total veg cover: 0 % Tree: ____ % Shrub: ____ % Herb: ____ % Community successional stage: ☒ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: n/a Other: ☐ ☐ ☐ ☐
☒	**Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.** Characteristics used to delineate the low-flow/active floodplain boundary: ☒ Change in total veg cover ☐ Tree ☒ Shrub ☒ Herb ☐ Change in overall vegetation maturity ☐ Change in dominant species present ☒ Other ☒ Presence of bed and bank ☐ Drift and/or debris ☒ Other: change in slope ☐ Other: ____
☒ N/A	**Continue walking the channel cross-section. Record observations below.** Characteristics of the low-flow channel: Average sediment texture: ____ Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: ____ % Community successional stage: ☐ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: ____ Other: ☐ ☐ ☐ ☐

☒	**Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.** Characteristics used to delineate the active floodplain/ low terrace boundary: ☐ Change in average sediment texture ☒ Change in total veg cover ☐ Tree ☒ Shrub ☒ Herb ☐ Change in overall vegetation maturity ☐ Change in dominant species present ☒ Other ☒ Presence of bed and bank ☐ Drift and/or debris ☒ Other: change in slope ☐ Other: ______
☒	**Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.** Consistency of indicators used to delineate the active floodplain/low terrace boundary: Y ☐ N ☐ Change in average sediment texture absent Y ☒ N ☐ Change in total veg cover ☐ Tree ☒ Shrub ☒ Herb Y ☐ N ☐ Change in overall vegetation maturity absent Y ☐ N ☐ Change in dominant species present absent Y ☒ N ☐ Other: Y ☒ N ☐ Presence of bed and bank Y ☐ N ☐ Drift and/or debris Y ☒ N ☐ Other: change in slope Y ☐ N ☐ Other: ______
☐ N/A	**If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**
☐ N/A	**Continue walking the channel cross-section. Record characteristics of the low terrace.** Characteristics of the low terrace: Average sediment texture: ______ Total veg cover: ___ % Tree: ___ % Shrub: ___ % Herb: ___ % Community successional stage: ☐ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: ______ Other: ☐ ______ ☐ ______ ☐ ______ ☐ ______
☒	**If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.** Active floodplain/low terrace boundary acquired via: ☒ Mapping on aerial photograph ☒ GPS ☒ Digitized on computer ☒ Other: Field measurement

Project: Campo Verde
Project Number:
Stream: Feature 1 - Wormwood Lat 7
Investigator(s): PFG/SWY

Date: 10/26/11
Town:
Photo begin file#
See report
Time: 1345
State: CA
Photo end file#

Y ☐ / N ☒ Do normal circumstances exist on the site?

Y ☒ / N ☐ Is the site significantly disturbed?

Location Details:
Campo Verde Facility
Projection: See table in report **Datum:**
Coordinates:

Notes:
OHWM = 4 ft
No veg; concrete lined
Active Ag.

Brief site description:

Wormwood Lat 7

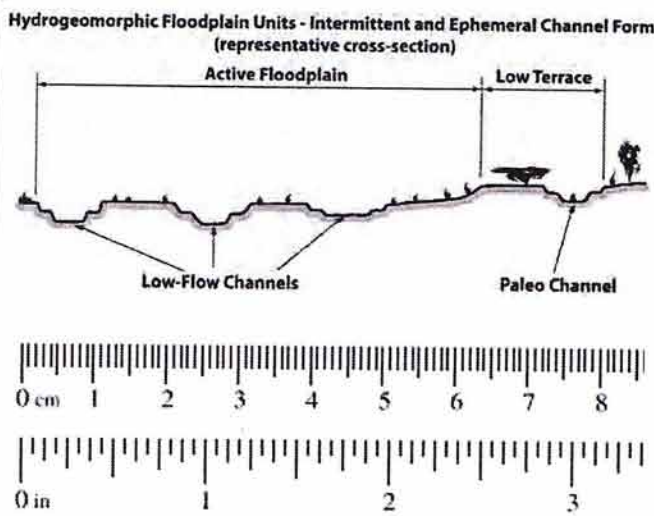
Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
  Scale:
- ☐ Geologic maps
- ☐ Vegetation maps
- ☐ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ Clinometer / level
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)		Inches (in)	Wentworth size class	
	10.08	256	Boulder	Gravel
	2.56	64	Cobble	Gravel
	0.157	4	Pebble	Gravel
	0.079	2.00	Granule	Gravel
	0.039	1.00	Very coarse sand	Sand
	0.020	0.50	Coarse sand	Sand
1/2	0.0098	0.25	Medium sand	Sand
1/4	0.005	0.125	Fine sand	Sand
1/8	0.0025	0.0625	Very fine sand	Sand
1/16	0.0012	0.031	Coarse silt	Silt
1/32	0.00061	0.0156	Medium silt	Silt
1/64	0.00031	0.0078	Fine silt	Silt
1/128	0.00015	0.0039	Very fine silt	Silt
			Clay	Mud



☒	**Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**
☒	**Locate the low-flow channel (lowest part of the channel). Record observations.** Characteristics of the low-flow channel: Average sediment texture: Concrete Total veg cover: 0 % Tree: ___ % Shrub: ___ % Herb: ___ % Community successional stage: ☒ NA ☐ Early (herbaceous & seedlings) ☐ Mid (herbaceous, shrubs, saplings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: n/a Other: ☐ ☐ ☐ ☐
☒ N/A	**Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.** Characteristics used to delineate the low-flow/active floodplain boundary: ☐ Change in total veg cover ☐ Tree ☐ Shrub ☐ Herb ☐ Change in overall vegetation maturity ☐ Change in dominant species present ☐ Other ☐ Presence of bed and bank ☐ Drift and/or debris ☐ Other: ___ ☐ Other: ___
☒	**Continue walking the channel cross-section. Record observations below.** Characteristics of the low-flow channel: Average sediment texture: Concrete Total veg cover: 0 % Tree: ___ % Shrub: ___ % Herb: ___ % Community successional stage: ☒ NA ☐ Early (herbaceous & seedlings) ☐ Mid (herbaceous, shrubs, saplings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: n/a Other: ☐ ☐ ☐ ☐

☒ N/A

Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.

Characteristics used to delineate the active floodplain/ low terrace boundary:

- ☐ Change in average sediment texture
- ☐ Change in total veg cover ☐ Tree ☐ Shrub ☐ Herb
- ☐ Change in overall vegetation maturity
- ☐ Change in dominant species present
- ☐ Other
  - ☐ Presence of bed and bank
  - ☐ Drift and/or debris
  - ☐ Other: ____________
  - ☐ Other: ____________

☒ N/A

Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.

Consistency of indicators used to delineate the active floodplain/low terrace boundary:

- Y ☐ N ☐ Change in average sediment texture
- Y ☐ N ☐ Change in total veg cover ☐ Tree ☐ Shrub ☐ Herb
- Y ☐ N ☐ Change in overall vegetation maturity
- Y ☐ N ☐ Change in dominant species present
- Y ☐ N ☐ Other:
  - Y ☐ N ☐ Presence of bed and bank
  - Y ☐ N ☐ Drift and/or debris
  - Y ☐ N ☐ Other: ____________
  - Y ☐ N ☐ Other: ____________

☐

If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.

☒ N/A

Continue walking the channel cross-section. Record characteristics of the low terrace.

Characteristics of the low terrace:

Average sediment texture: ____________

Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: ____ %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: ____________

Other:

- ☐ ____________
- ☐ ____________
- ☐ ____________
- ☐ ____________

☒

If characteristics used to delineate the ~~active floodplain/low terrace boundary~~ OHWM were deemed reliable, acquire boundary.

Active floodplain/low terrace boundary acquired via:

- ☒ Mapping on aerial photograph
- ☒ Digitized on computer
- ☒ GPS
- ☒ Other: Field measurement of water staining

Project: Campo Verde **Project Number:** **Stream:** Feature 8 - Wormwood Canal **Investigator(s):** PFG / SWY	**Date:** 10/26/11 **Time:** 1255 **Town:** **State:** CA **Photo begin file#** **Photo end file#** See photo in rpt.
Y ☐ / N ☒ Do normal circumstances exist on the site? Y ☒ / N ☐ Is the site significantly disturbed?	**Location Details:** Campo Verde Facility **Projection:** See table in **Datum:** **Coordinates:** drainage report

Notes: OHWM = 10 feet
N/o vegetation, concrete Lined, active ag

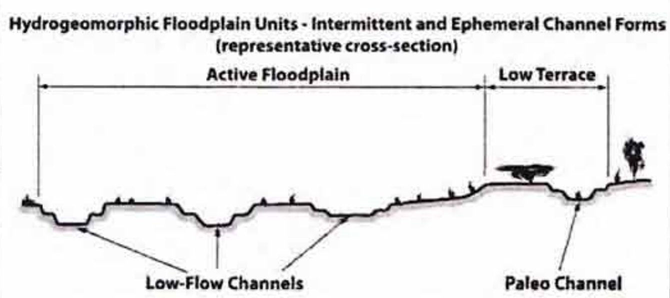
Brief site description:
Wormwood Canal

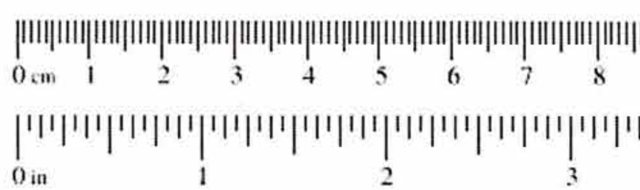
Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
  Scale:
- ☐ Geologic maps
- ☐ Vegetation maps
- ☐ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies
- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ Clinometer / level
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)		Inches (in)	Wentworth size class	
			Boulder	
	10.08	256		
			Cobble	Gravel
	2.56	64		
			Pebble	
	0.157	4		
			Granule	
	0.079	2.00		
			Very coarse sand	Sand
	0.039	1.00		
			Coarse sand	
	0.020	0.50		
			Medium sand	
1/2	0.0098	0.25		
			Fine sand	
1/4	0.005	0.125		
			Very fine sand	
1/8	0.0025	0.0625		
			Coarse silt	Silt
1/16	0.0012	0.031		
			Medium silt	
1/32	0.00061	0.0156		
			Fine silt	
1/64	0.00031	0.0078		
			Very fine silt	
1/128	0.00015	0.0039		
			Clay	Mud





☒	**Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**
☒	**Locate the low-flow channel (lowest part of the channel). Record observations.** Characteristics of the low-flow channel: Average sediment texture: Concrete Total veg cover: 0 % Tree: ____% Shrub: ____% Herb: ____% Community successional stage: ☒ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: NA Other: ☐ ☐ ☐ ☐
☒ NA	**Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.** Characteristics used to delineate the low-flow/active floodplain boundary: ☐ Change in total veg cover ☐ Tree ☐ Shrub ☐ Herb ☐ Change in overall vegetation maturity ☐ Change in dominant species present ☐ Other ☐ Presence of bed and bank ☐ Drift and/or debris ☐ Other: ____ ☐ Other: ____
☒	**Continue walking the channel cross-section. Record observations below.** Characteristics of the low-flow channel: Average sediment texture: Concrete Total veg cover: 0 % Tree: ____% Shrub: ____% Herb: ____% Community successional stage: ☒ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: N/A Other: ☐ ☐ ☐ ☐

☒ NA	**Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.** Characteristics used to delineate the active floodplain/ low terrace boundary: ☐ Change in average sediment texture ☐ Change in total veg cover ☐ Tree ☐ Shrub ☐ Herb ☐ Change in overall vegetation maturity ☐ Change in dominant species present ☐ Other ☐ Presence of bed and bank ☐ Drift and/or debris ☐ Other: ____ ☐ Other: ____
☒ NA	**Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.** Consistency of indicators used to delineate the active floodplain/low terrace boundary: Y ☐ N ☐ Change in average sediment texture Y ☐ N ☐ Change in total veg cover ☐ Tree ☐ Shrub ☐ Herb Y ☐ N ☐ Change in overall vegetation maturity Y ☐ N ☐ Change in dominant species present Y ☐ N ☐ Other: Y ☐ N ☐ Presence of bed and bank Y ☐ N ☐ Drift and/or debris Y ☐ N ☐ Other: ____ Y ☐ N ☐ Other: ____
☐	**If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**
☒ NA	**Continue walking the channel cross-section. Record characteristics of the low terrace.** Characteristics of the low terrace: Average sediment texture: ____ Total veg cover: ____% Tree: ____% Shrub: ____% Herb: ____% Community successional stage: ☐ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: ____ Other: ☐ ____ ☐ ____ ☐ ____ ☐
☒	**If characteristics used to delineate the ~~active floodplain/low terrace~~ OHWM boundary were deemed reliable, acquire boundary.** Active floodplain/low terrace boundary acquired via: ☒ Mapping on aerial photograph ☒ GPS ☒ Digitized on computer ☒ Other: Field measurement of water staining

Project: Campo Verde
Project Number:
Stream: Feature 64-Wormwood 7 Drain
Investigator(s): PEG / SWY

Date: 10/26/11 **Time:** 1315
Town: **State:** CA
Photo begin file# **Photo end file#**
See photo in report

Y ☐ / N ☒ Do normal circumstances exist on the site?

Y ☒ / N ☐ Is the site significantly disturbed?

Location Details: Campo Verde Facility Buffer

Projection: See table in **Datum:**
Coordinates: drainage report

Notes: Large ag drain, drains many fields, wetlands along much of drain; narrow and linear - assume SD + avoid. Flows into New River approximately 740 meters to NE of project boundary.

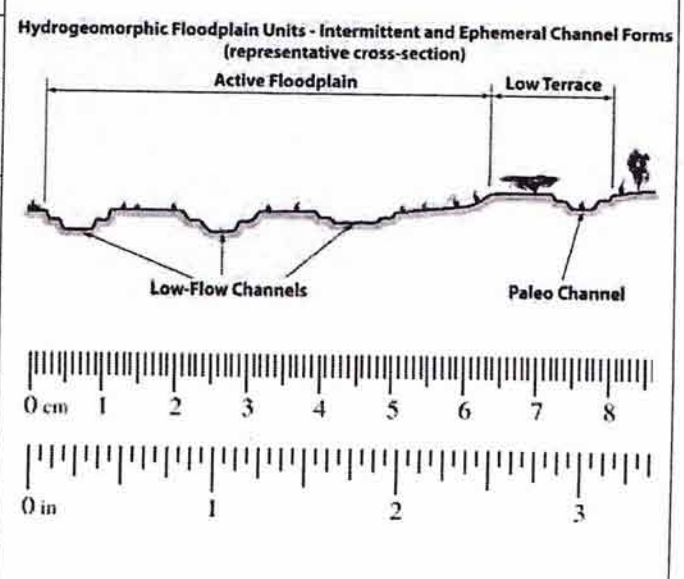
Brief site description:
Active floodplain 20 feet.

Checklist of resources (if available):

- ☒ Aerial photography
  - Dates:
- ☐ Topographic maps
  - Scale:
- ☐ Geologic maps
- ☐ Vegetation maps
- ☐ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies
- ☐ Stream gage data
  - Gage number:
  - Period of record:
  - ☐ Clinometer / level
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)	Inches (in)	Wentworth size class	
		Boulder	Gravel
10.08	256		
		Cobble	
2.56	64		
		Pebble	
0.157	4		
		Granule	
0.079	2.00		
		Very coarse sand	Sand
0.039	1.00		
		Coarse sand	
0.020	0.50		
		Medium sand	
1/2 0.0098	0.25		
		Fine sand	
1/4 0.005	0.125		
		Very fine sand	
1/8 0.0025	0.0625		
		Coarse silt	Silt
1/16 0.0012	0.031		
		Medium silt	
1/32 0.00061	0.0156		
		Fine silt	
1/64 0.00031	0.0078		
		Very fine silt	
1/128 0.00015	0.0039		
		Clay	Mud



☒	**Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**
☒	**Locate the low-flow channel (lowest part of the channel). Record observations.** Characteristics of the low-flow channel: Average sediment texture: Fine Silt Total veg cover: 0 % Tree: ___ % Shrub: ___ % Herb: ___ % Community successional stage: ☒ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: NA Other: ☐ ☐ ☐ ☐
☒	**Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.** Characteristics used to delineate the low-flow/active floodplain boundary: ☒ Change in total veg cover ☐ Tree ☐ Shrub ☒ Herb ☐ Change in overall vegetation maturity ☐ Change in dominant species present ☒ Other ☒ Presence of bed and bank ☐ Drift and/or debris ☒ Other: Change in slope ☐ Other: ___
☒ NA	**Continue walking the channel cross-section. Record observations below.** Characteristics of the low-flow channel: Average sediment texture: ___ Total veg cover: ___ % Tree: ___ % Shrub: ___ % Herb: ___ % Community successional stage: ☐ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: ___ Other: ☐ ☐ ☐ ☐

[X] **Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.**

Characteristics used to delineate the active floodplain/ low terrace boundary:

- [ ] Change in average sediment texture
- [X] Change in total veg cover — [ ] Tree [ ] Shrub [X] Herb
- [ ] Change in overall vegetation maturity
- [ ] Change in dominant species present
- [X] Other
  - [X] Presence of bed and bank
  - [ ] Drift and/or debris
  - [X] Other: Steep bank
  - [ ] Other: ______

[X] **Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.**

Consistency of indicators used to delineate the active floodplain/low terrace boundary:

- Y [ ] N [ ] Change in average sediment texture
- Y [X] N [ ] Change in total veg cover — [ ] Tree [ ] Shrub [X] Herb
- Y [ ] N [ ] Change in overall vegetation maturity absent
- Y [ ] N [ ] Change in dominant species present
- Y [X] N [ ] Other:
  - Y [X] N [ ] Presence of bed and bank
  - Y [ ] N [ ] Drift and/or debris
  - Y [X] N [ ] Other: Steep bank
  - Y [ ] N [ ] Other: ______

[ ] NA **If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**

[ ] NA **Continue walking the channel cross-section. Record characteristics of the low terrace.**

Characteristics of the low terrace:

Average sediment texture: ______

Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: ____ %

Community successional stage:

- [ ] NA
- [ ] Early (herbaceous & seedlings)
- [ ] Mid (herbaceous, shrubs, saplings)
- [ ] Late (herbaceous, shrubs, mature trees)

Dominant species present: ______

Other:

- [ ] ______
- [ ] ______
- [ ] ______
- [ ] ______

[X] **If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.**

Active floodplain/low terrace boundary acquired via:

- [X] Mapping on aerial photograph
- [X] Digitized on computer
- [X] GPS
- [X] Other: Field measurement

Project: Campo Verde Solar Project **Project Number:** **Stream:** Foxglove Canal, #114 **Investigator(s):** SY / PFG	**Date:** 12/7/11 **Time:** 1228 **Town:** El Centro, **State:** CA **Photo begin file#** See rpt. **Photo end file#**
Y ☐ / N ☒ Do normal circumstances exist on the site? Y ☒ / N ☐ Is the site significantly disturbed?	**Location Details:** Non-BLM ROW Gen-tie Alt Buffer **Projection:** See rpt. **Datum:** **Coordinates:**

Notes:
No vegetation; concrete canal

OHWM = 12'

Brief site description:
Active agricultural lands – canal excavated in uplands.

Checklist of resources (if available):

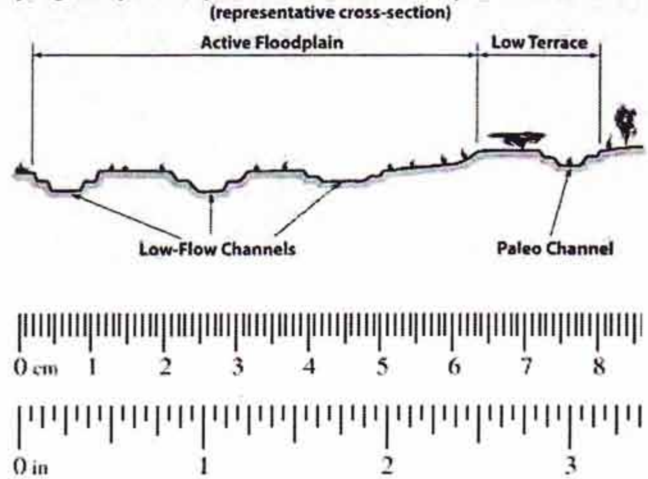
- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
  Scale:
- ☐ Geologic maps
- ☒ Vegetation maps
- ☐ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ Clinometer / level
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)	Inches (in)	Wentworth size class	
		Boulder	Gravel
10.08	256	Cobble	Gravel
2.56	64	Pebble	Gravel
0.157	4	Granule	Gravel
0.079	2.00	Very coarse sand	Sand
0.039	1.00	Coarse sand	Sand
0.020	0.50	Medium sand	Sand
1/2 0.0098	0.25	Fine sand	Sand
1/4 0.005	0.125	Very fine sand	Sand
1/8 0.0025	0.0625	Coarse silt	Silt
1/16 0.0012	0.031	Medium silt	Silt
1/32 0.00061	0.0156	Fine silt	Silt
1/64 0.00031	0.0078	Very fine silt	Silt
1/128 0.00015	0.0039	Clay	Mud

Hydrogeomorphic Floodplain Units - Intermittent and Ephemeral Channel Forms (representative cross-section)



☒	**Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**
☒	**Locate the low-flow channel (lowest part of the channel). Record observations.** Characteristics of the low-flow channel: Average sediment texture: concrete Total veg cover: 0 % Tree: ___ % Shrub: ___ % Herb: ___ % Community successional stage: ☒ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: none Other: ☐ ☐ ☐ ☐
☒	**Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.** Characteristics used to delineate the low-flow/active floodplain boundary: ☐ Change in total veg cover ☐ Tree ☐ Shrub ☐ Herb ☐ Change in overall vegetation maturity ☐ Change in dominant species present ☒ Other ☒ Presence of bed and bank ☐ Drift and/or debris ☒ Other: Staining ☐ Other:
☒	**Continue walking the channel cross-section. Record observations below.** Characteristics of the low-flow channel: Average sediment texture: concrete Total veg cover: 0 % Tree: ___ % Shrub: ___ % Herb: ___ % Community successional stage: ☒ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: none Other: ☐ ☐ ☐ ☐

☒ N/A	**Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.** Characteristics used to delineate the active floodplain/ low terrace boundary: ☐ Change in average sediment texture ☐ Change in total veg cover ☐ Tree ☐ Shrub ☐ Herb ☐ Change in overall vegetation maturity ☐ Change in dominant species present ☐ Other ☐ Presence of bed and bank ☐ Drift and/or debris ☐ Other: ______ ☐ Other: ______
☒ N/A	**Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.** Consistency of indicators used to delineate the active floodplain/low terrace boundary: Y ☐ N ☐ Change in average sediment texture Y ☐ N ☐ Change in total veg cover ☐ Tree ☐ Shrub ☐ Herb Y ☐ N ☐ Change in overall vegetation maturity Y ☐ N ☐ Change in dominant species present Y ☐ N ☐ Other: Y ☐ N ☐ Presence of bed and bank Y ☐ N ☐ Drift and/or debris Y ☐ N ☐ Other: ______ Y ☐ N ☐ Other: ______
☒ N/A	**If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**
☒ N/A	**Continue walking the channel cross-section. Record characteristics of the low terrace.** Characteristics of the low terrace: Average sediment texture: ______ Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: ____ % Community successional stage: ☐ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: ______ Other: ☐ ☐ ☐ ☐
☐	**If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.** Active floodplain/low terrace boundary acquired via: ☐ Mapping on aerial photograph ☐ GPS ☐ Digitized on computer ☒ Other: Field measurement of OHWM

Indicators: Staining

Project: Campo Verde Solar Project
Project Number:
Stream: Forget Me Not Canal, #115
Investigator(s): SY / PFG

Date: 12/7/11 **Time:** 1238
Town: El Centro **State:** CA
Photo begin file# **Photo end file#**
See rpt.

Y ☐ / N ☒ Do normal circumstances exist on the site?

Y ☒ / N ☐ Is the site significantly disturbed?

Location Details:
Non-BLM ROW Gen-tie Alternative
Projection: See rpt. **Datum:**
Coordinates:

Notes:

No vegetation; concrete canal

OHWM = 6

Brief site description:

Active agricultural land - canal excavated in uplands

Checklist of resources (if available):

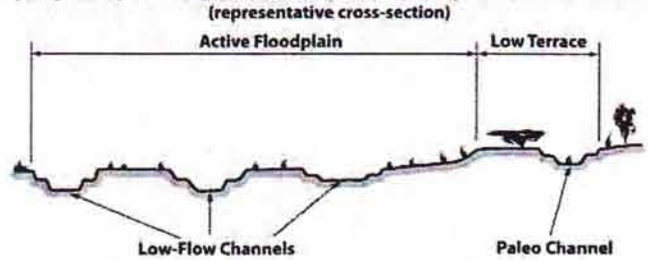
- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
  Scale:
- ☐ Geologic maps
- ☒ Vegetation maps
- ☐ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies

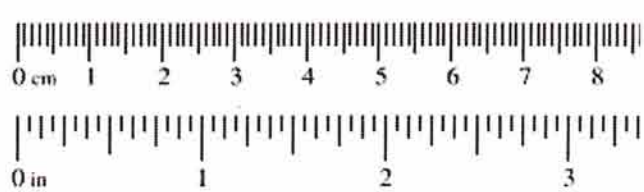
- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ Clinometer / level
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)		Inches (in)	Wentworth size class	
			Boulder	Gravel
	10.08	256		
			Cobble	Gravel
	2.56	64		
			Pebble	Gravel
	0.157	4		
			Granule	Gravel
	0.079	2.00		
			Very coarse sand	Sand
	0.039	1.00		
			Coarse sand	Sand
	0.020	0.50		
			Medium sand	Sand
1/2	0.0098	0.25		
			Fine sand	Sand
1/4	0.005	0.125		
			Very fine sand	Sand
1/8	0.0025	0.0625		
			Coarse silt	Silt
1/16	0.0012	0.031		
			Medium silt	Silt
1/32	0.00061	0.0156		
			Fine silt	Silt
1/64	0.00031	0.0078		
			Very fine silt	Silt
1/128	0.00015	0.0039		
			Clay	Mud

Hydrogeomorphic Floodplain Units - Intermittent and Ephemeral Channel Forms
(representative cross-section)





☒	**Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**
☒	**Locate the low-flow channel (lowest part of the channel). Record observations.** Characteristics of the low-flow channel: Average sediment texture: Concrete Total veg cover: 0 % Tree: ___ % Shrub: ___ % Herb: ___ % Community successional stage: ☒ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: none Other: ☐ ☐ ☐ ☐
☒	**Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.** Characteristics used to delineate the low-flow/active floodplain boundary: ☐ Change in total veg cover ☐ Tree ☐ Shrub ☐ Herb ☐ Change in overall vegetation maturity ☐ Change in dominant species present ☒ Other ☒ Presence of bed and bank ☐ Drift and/or debris ☒ Other: water staining ☐ Other: ___
☒	**Continue walking the channel cross-section. Record observations below.** Characteristics of the low-flow channel: Average sediment texture: Concrete Total veg cover: 0 % Tree: ___ % Shrub: ___ % Herb: ___ % Community successional stage: ☒ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: none Other: ☐ ☐ ☐ ☐

☒ N/A	**Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.** Characteristics used to delineate the active floodplain/ low terrace boundary: ☐ Change in average sediment texture ☐ Change in total veg cover ☐ Tree ☐ Shrub ☐ Herb ☐ Change in overall vegetation maturity ☐ Change in dominant species present ☐ Other ☐ Presence of bed and bank ☐ Drift and/or debris ☐ Other: ____ ☐ Other: ____
☒ N/A	**Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.** Consistency of indicators used to delineate the active floodplain/low terrace boundary: Y ☐ N ☐ Change in average sediment texture Y ☐ N ☐ Change in total veg cover ☐ Tree ☐ Shrub ☐ Herb Y ☐ N ☐ Change in overall vegetation maturity Y ☐ N ☐ Change in dominant species present Y ☐ N ☐ Other: Y ☐ N ☐ Presence of bed and bank Y ☐ N ☐ Drift and/or debris Y ☐ N ☐ Other: ____ Y ☐ N ☐ Other: ____
☒ N/A	**If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**
☒ N/A	**Continue walking the channel cross-section. Record characteristics of the low terrace.** Characteristics of the low terrace: Average sediment texture: ____ Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: ____ % Community successional stage: ☐ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: ____ Other: ☐ ____ ☐ ____ ☐ ____ ☐ ____
☒	**If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.** Active floodplain/low terrace boundary acquired via: ☐ Mapping on aerial photograph ☐ GPS ☐ Digitized on computer ☒ Other: Field measurement of OHWM

Indicators: staining

Project: Campo Verde Solar Project **Project Number:** **Stream:** Forget Me Not 1 Drain, #110 **Investigator(s):** SY / PFG	**Date:** 12/7/11 **Time:** 1249 **Town:** El Centro **State:** CA **Photo begin file#** See rpt **Photo end file#**
Y ☐ / N ☒ Do normal circumstances exist on the site? Y ☒ / N ☐ Is the site significantly disturbed?	**Location Details:** Non-BLM ROW Gen-tie Alt. **Projection:** **Datum:** **Coordinates:** See rpt.

Notes:

Ag drain, drains several fields
Drains eventually to New River
OHWM = 15'

Brief site description:

Active agricultural lands – excavated in uplands.

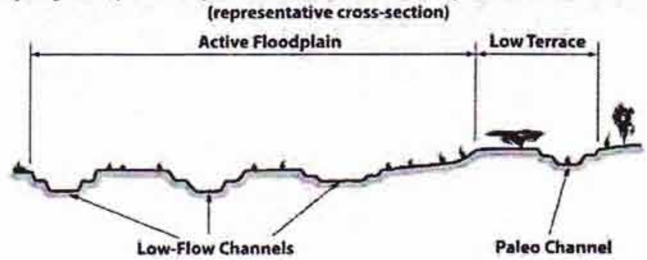
Checklist of resources (if available):

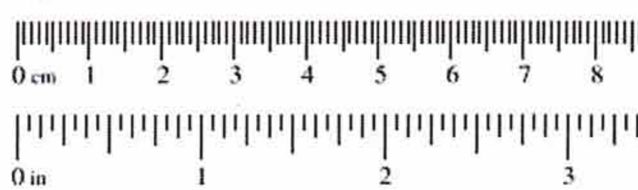
- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
  Scale:
- ☐ Geologic maps
- ☒ Vegetation maps
- ☐ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies
- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ Clinometer / level
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

	Millimeters (mm)	Inches (in)	Wentworth size class	
			Boulder	Gravel
	10.08	256		
			Cobble	
	2.56	64		
			Pebble	
	0.157	4		
			Granule	
	0.079	2.00		
			Very coarse sand	Sand
	0.039	1.00		
			Coarse sand	
	0.020	0.50		
			Medium sand	
1/2	0.0098	0.25		
			Fine sand	
1/4	0.005	0.125		
			Very fine sand	
1/8	0.0025	0.0625		
			Coarse silt	Silt
1/16	0.0012	0.031		
			Medium silt	
1/32	0.00061	0.0156		
			Fine silt	
1/64	0.00031	0.0078		
			Very fine silt	
1/128	0.00015	0.0039		
			Clay	Mud

Hydrogeomorphic Floodplain Units - Intermittent and Ephemeral Channel Forms
(representative cross-section)





☒	**Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**
☒	**Locate the low-flow channel (lowest part of the channel). Record observations.** Characteristics of the low-flow channel: Average sediment texture: silt Total veg cover: 90 % Tree: 0 % Shrub: 50 % Herb: 40 % Community successional stage: ☐ NA ☒ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: Tamarisk, arrow weed, typha, phragmites Other: ☐ ☐ ☐ ☐
☒	**Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.** Characteristics used to delineate the low-flow/active floodplain boundary: ☒ Change in total veg cover ☐ Tree ☒ Shrub ☒ Herb ☐ Change in overall vegetation maturity ☐ Change in dominant species present ☒ Other ☒ Presence of bed and bank ☐ Drift and/or debris ☐ Other: ____ ☐ Other: ____
☒	**Continue walking the channel cross-section. Record observations below.** Characteristics of the low-flow channel: Average sediment texture: silt Total veg cover: 90 % Tree: 0 % Shrub: 50 % Herb: 40 % Community successional stage: ☐ NA ☒ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: Tamarisk, arrow weed, typha, phragmites Other: ☐ ☐ ☐ ☐

☒	**Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.** Characteristics used to delineate the active floodplain/ low terrace boundary: ☐ Change in average sediment texture ☒ Change in total veg cover ☐ Tree ☒ Shrub ☒ Herb ☐ Change in overall vegetation maturity ☒ Change in dominant species present ☒ Other ☒ Presence of bed and bank ☐ Drift and/or debris ☐ Other: ________ ☐ Other: ________
☒	**Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.** Consistency of indicators used to delineate the active floodplain/low terrace boundary: Y ☐ N ☐ Change in average sediment texture Y ☒ N ☐ Change in total veg cover ☐ Tree ☒ Shrub ☒ Herb Y ☐ N ☐ Change in overall vegetation maturity Y ☒ N ☐ Change in dominant species present Y ☒ N ☐ Other: Y ☒ N ☐ Presence of bed and bank Y ☐ N ☐ Drift and/or debris Y ☐ N ☐ Other: ________ Y ☐ N ☐ Other: ________
☐ N/A	**If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**
☐ N/A	**Continue walking the channel cross-section. Record characteristics of the low terrace.** Characteristics of the low terrace: Average sediment texture: ________ Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: ____ % Community successional stage: ☐ NA ☐ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: ________ Other: ☐ ________ ☐ ________ ☐ ________ ☐ ________
☒	**If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.** Active floodplain/low terrace boundary acquired via: ☐ Mapping on aerial photograph ☐ GPS ☐ Digitized on computer ☒ Other: Field measurement of OHWM

Indicators: change in veg, bed + bank, staining

Project: Campo Verde Solar Project
Project Number:
Stream: #110 Dixie 4 Drain
Investigator(s): SY, PFG

Date: 12/7/11 **Time:** 1318
Town: El Centro **State:** CA
Photo begin file# **Photo end file#**
See Rpt

Y ☐ / N ☒ Do normal circumstances exist on the site?

Y ☒ / N ☐ Is the site significantly disturbed?

Location Details:
Non-BLM ROW Gen-tie Alt.
Projection: See rpt. **Datum:**
Coordinates:

Notes:
Agricultural drain - drains multiple fields.
Flows eventually to New River
OHWM = 20

Brief site description:
Active agricultural lands; excavated entirely in uplands

Checklist of resources (if available):

☒ Aerial photography
Dates:
☐ Topographic maps
Scale:
☐ Geologic maps
☒ Vegetation maps
☐ Soils maps
☐ Rainfall/precipitation maps
☐ Existing delineation(s) for site
☒ Global positioning system (GPS)
☐ Other studies

☐ Stream gage data
Gage number:
Period of record:
☐ Clinometer / level
☐ History of recent effective discharges
☐ Results of flood frequency analysis
☐ Most recent shift-adjusted rating
☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)	Inches (in)	Wentworth size class	
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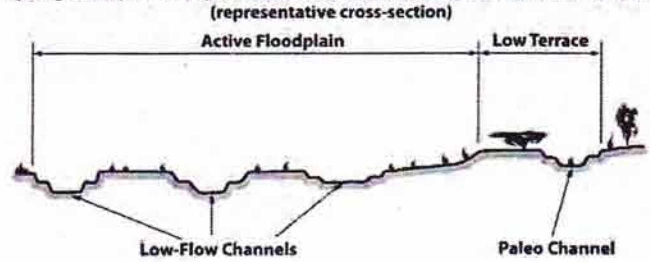
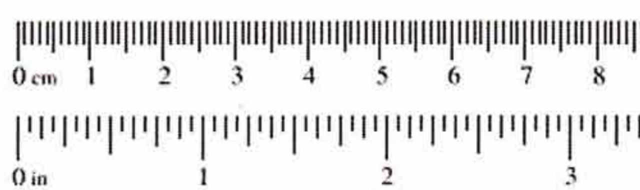
10.08	256		
		Cobble	Gravel
2.56	64		
		Pebble	Gravel
0.157	4		
		Granule	Gravel
0.079	2.00		
		Very coarse sand	Sand
0.039	1.00		
		Coarse sand	Sand
0.020	0.50		
		Medium sand	Sand
1/2 0.0098	0.25		
		Fine sand	Sand
1/4 0.005	0.125		
		Very fine sand	Sand
1/8 0.0025	0.0625		
		Coarse silt	Silt
1/16 0.0012	0.031		
		Medium silt	Silt
1/32 0.00061	0.0156		
		Fine silt	Silt
1/64 0.00031	0.0078		
		Very fine silt	Silt
1/128 0.00015	0.0039		
		Clay	Mud

Hydrogeomorphic Floodplain Units - Intermittent and Ephemeral Channel Forms
(representative cross-section)





☒	**Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**
☐	**Locate the low-flow channel (lowest part of the channel). Record observations.** Characteristics of the low-flow channel: Average sediment texture: Silt Total veg cover: 80 % Tree: 0 % Shrub: 55 % Herb: 25 % Community successional stage: ☐ NA ☒ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: Arrow weed, typha, tamarisk Other: ☐ ☐ ☐ ☐
☒	**Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.** Characteristics used to delineate the low-flow/active floodplain boundary: ☒ Change in total veg cover ☐ Tree ☒ Shrub ☒ Herb ☐ Change in overall vegetation maturity ☒ Change in dominant species present ☒ Other ☒ Presence of bed and bank ☐ Drift and/or debris ☒ Other: staining ☐ Other:
☒	**Continue walking the channel cross-section. Record observations below.** Characteristics of the low-flow channel: Average sediment texture: Silt Total veg cover: 80 % Tree: 0 % Shrub: 55 % Herb: 25 % Community successional stage: ☐ NA ☒ Mid (herbaceous, shrubs, saplings) ☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees) Dominant species present: Arrow weed, typha, tamarisk Other: ☐ ☐ ☐ ☐

[x] **Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.**

Characteristics used to delineate the active floodplain/ low terrace boundary:

- [ ] Change in average sediment texture
- [x] Change in total veg cover — [ ] Tree [x] Shrub [x] Herb
- [ ] Change in overall vegetation maturity
- [x] Change in dominant species present
- [x] Other
  - [x] Presence of bed and bank
  - [ ] Drift and/or debris
  - [x] Other: staining
  - [ ] Other: ____

[x] **Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.**

Consistency of indicators used to delineate the active floodplain/low terrace boundary:

- Y [ ] N [ ] Change in average sediment texture
- Y [x] N [ ] Change in total veg cover — [ ] Tree [x] Shrub [x] Herb
- Y [ ] N [ ] Change in overall vegetation maturity
- Y [x] N [ ] Change in dominant species present
- Y [x] N [ ] Other:
  - Y [x] N [ ] Presence of bed and bank
  - Y [ ] N [ ] Drift and/or debris
  - Y [x] N [ ] Other: staining
  - Y [ ] N [ ] Other: ____

[x] N/A **If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**

[x] N/A **Continue walking the channel cross-section. Record characteristics of the low terrace.**

Characteristics of the low terrace:

Average sediment texture: ____

Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: ____ %

Community successional stage:

- [ ] NA
- [ ] Early (herbaceous & seedlings)
- [ ] Mid (herbaceous, shrubs, saplings)
- [ ] Late (herbaceous, shrubs, mature trees)

Dominant species present: ____

Other:

- [ ] ____
- [ ] ____
- [ ] ____
- [ ] ____

[x] **If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.**

Active floodplain/low terrace boundary acquired via:

- [ ] Mapping on aerial photograph
- [ ] Digitized on computer
- [ ] GPS
- [x] Other: Field measurement of OHWM

Indicators: staining, change in veg, bed + bank