Campo Verde Solar Energy Project Protocol Burrowing Owl Survey Report

Phase I, II and III Survey Report (2012 Breeding Season)

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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 be approximately 0.75 miles long (including about 0.4 miles of BLM land) crossing fallow agricultural land and native desert.
- The Proposed Gen-Tie Alternative would follow existing roads and would cross about one mile native desert (all BLM land). Both of these options are located entirely within a BLM-designated utility corridor.

The Private Land 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.

This report presents the results of protocol Burrowing Owl Surveys conducted during the 2012 breeding season. Previous surveys were conducted during the 2011 breeding season and the 2011/2012 winter (Heritage 2012).

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 yearround resident in Imperial County. Up to 70% of California's Burrowing Owls reside 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 within 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) the Private Land 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 Land 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 1.0 mile of native desert. The Alternative Gen-Tie Across BLM land would follow the existing IID S-line and would cross about 0.4 miles of native desert and 0.3 miles of fallow agriculture. 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.

4.0Survey Methods

4.1 PHASE I AND PHASE II SURVEYS

Phase I surveys were conducted in the spring of 2011 and determined that most of the study are contained suitable Burrowing Owl habitat. While initial Phase II surveys had been performed during the 2011 breeding season and the winter of 2011/2012, Phase II surveys were redone in the entire survey area in order to account for burrow loss and recruitment that may have occurred. Phase II surveys of the study area were conducted by qualified biologists during the 2012 breeding season (March).

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 and gen-tie corridors) to ensure that all suitable burrows were identified. Within agricultural lands, a combination of vehicular and pedestrian surveys was conducted within suitable habitat, mainly 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 when present. "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 project 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.

Methods

Surveys were conducted at each burrow on four separate days in order to minimize the likelihood of false-negative results (CBOC 1993).

5.0Survey 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 II surveys were conducted during the spring of 2012. **Table 1** lists dates, times, weather, and the project components evaluated for the Phase II surveys. Two-hundred and fifty-seven (248) potentially suitable burrows were initially identified during the Phase II surveys. Over the course of the Phase III surveys, 40 of these burrows had been collapsed, filled in or otherwise made unsuitable. Therefore, the final count of potentially suitable burrows within the project area was 208. The final 208 potentially suitable burrows are depicted in **Figure 3**.

Date	Time	Weather Conditions	Project Component
March 5, 2012	1300-1750	75-81°F; mostly clear, wind <5mph	Solar Energy Facility Site and Buffer
March 6, 2012	0935-1801	57-68°F; clear, wind 5- 15mph	Solar Energy Facility Site, Non- BLM ROW Gen-tie and Buffers
March 7, 2012	0943-1630	52-63°F; mostly cloudy-clear, wind 0- 10mph	BLM ROW Gen-tie Corridors and Buffers

 Table 1. Phase I and Phase II Survey Details

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.

Date	Time	Weather Conditions
March 6, 2012	0540-0800	45-57°F; clear, wind <10mph
	0625-0816	50-52°F; mostly cloudy, wind 10-15mph
March 7, 2012		
	1603-1721	63-64°F; clear, calm
March 13, 2012	1640-1843	71-82°F; clear, wind <10mph
March 14, 2012	1645-1836	76-83°F; clear, calm
March 15, 2012	0634-0824	48-55°F; clear, calm
March 20, 2012	1657-1908	60-71°F; clear, calm
March 21, 2012	1635-1908	74-81°F; clear, calm
March 22, 2012	0638-0856	47-64°F, clear, calm
April 4, 2012	1700-1916	73-84°F, mostly clear, calm
April 5, 2012	1706-1856	77-84°F, clear, wind 10-15mph
April 6, 2011	0620-0815	46-62°F, clear, calm

 Table 2. Phase III Survey Details

There were a total of 55 active burrows identified in the study area. There were 27 active burrows within the solar energy facility and 28 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**).

For the purposes of this report, all active burrows are assumed to be attended by a pair (2) of Burrowing Owls. Cooperative breeding has not been observed in the species (Haug et al. 1993). Three owls were observed at burrow #230 on both March 6 and March 13. Subsequent surveys at this burrow (March 21 and April 4) identified only one adult owl. The third bird observed in the vicinity of burrow #230 could have been a wintering individual (>2 adults per burrow were more commonly observed during winter surveys). Alternatively, burrow #230 is located in an area of dense Burrowing Owl occupancy and this 3rd bird could have been associated with a nearby burrow. In several cases, 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	Proposed Gen-tie Corridor	Proposed Gen-tie Corridor Buffer	Gen-tie Alternative Corridor	Gen-tie Alternative Corridor Buffer	Private Gen-tie Corridor	Private Gen-tie Corridor Buffer	Total
Active	27	28	0	0	0	0	0	0	55
Inactive	51	53	5	26	14	4	0	0	153
Total	78	81	5	26	14	4	0	0	208

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







Legend

- Suitable 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



Miles

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

CAMPO	VEDDE			
CAMPO	VERDE	SULAR	PROJ	EGI

FIGURE 3 -BURROWING OWL SUITABLE BURROW LOCATIONS

Map Extent: Imperial County, California

Date: 04.18.12		Author: djb			
Maps\Figure3SuitableBurrows_Final Locations_041312.mxd					



CAMDO	VEDDE		
CAMPU	VERDE	SULAR	PROJECT

Author: djb

Selected Photos

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



Representative potentially suitable man-made burrow (Alternative Gen-Tie Across BLM Land).



Representative potentially suitable natural burrow (Proposed Gen-Tie Alternative).



Representative potentially suitable natural burrow with sign (whitewash)(Proposed Gen-Tie Alternative).



7.0 References

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Appendix A – Active Burrows - Owl Data

D ID	Desired Comment	2012 Breeding Season		
Burrow ID	Project Component	Date	# Owls	
		3/6/2012	0	
1	500-foot Facility	3/13/2012	0	
1	Buffer	3/21/2012	0	
		4/4/2012	1	
		3/6/2012	2	
2	500-foot Facility	3/13/2012	0	
3	Buffer	3/21/2012	0	
		4/4/2012	0	
		3/6/2012	0	
-	500-foot Facility	3/13/2012	0	
1	Buffer	3/21/2012	2	
		4/4/2012	1	
		3/5/2012	1	
	500-foot Facility Buffer	3/6/2012	0	
9		3/13/2012	0	
		3/21/2012	0	
		4/4/2012	0	
	500-foot Facility Buffer	3/5/2012	1	
		3/6/2012	0	
10		3/13/2012	0	
		3/21/2012	0	
		4/4/2012	0	
		3/6/2012	1	
	500-foot Facility	3/13/2012	0	
13	Buffer	3/21/2012	2	
		4/4/2012	2	
		3/6/2012	0	
	500-foot Facility	3/13/2012	0	
30	Buffer	3/21/2012	2	
		4/4/2012	2	
		3/6/2012	1	
22	500-foot Facility	3/13/2012	0	
33	Buffer	3/21/2012	0	
		4/4/2012	0	
		3/6/2012	1	
	500-foot Facility	3/13/2012	2	
35	Buffer	3/21/2012	2	
		4/4/2012	2	

Dumour ID	Project Component	2012 Breeding Season		
Burrow ID	r roject Component	Date	# Owls	
	500-foot Facility	3/6/2012	2	
40		3/13/2012	2	
7/	Buffer	3/21/2012	2	
		4/4/2012	1	
		3/6/2012	0	
52	500-foot Facility	3/13/2012	1	
32	Buffer	3/21/2012	0	
		4/4/2012	0	
		3/6/2012	2	
53	500-foot Facility	3/13/2012	2	
55	Buffer	3/21/2012	2	
		4/4/2012	2	
		3/5/2012	1	
		3/6/2012	0	
54	500-foot Facility Buffer	3/13/2012	0	
		3/21/2012	0	
		4/4/2012	0	
	500-foot Facility Buffer	3/6/2012	2	
		3/13/2012	2	
22		3/21/2012	2	
		4/4/2012	0	
	500-foot Facility	3/6/2012	0	
(0)		3/13/2012	0	
60	Buffer	3/21/2012	0	
		4/4/2012	0	
		3/6/2012	2	
	500-foot Facility	3/13/2012	2	
72	Buffer	3/21/2012	1	
		4/4/2012	2	
		3/6/2012	0	
		3/13/2012	0	
74	Solar Facility	3/21/2012	2	
		4/4/2012	2	
		3/6/2012	1	
		3/7/2012	0	
85	500-foot Facility	3/13/2012	0	
	Builer	3/21/2012	0	
		4/4/2012	0	
		3/7/2012	0	
	500-foot Facility	3/14/2012	2	
102	Buffer		1	
103	Buffer	3/20/2012	0	

Burrow ID	Project Component	2012 Breeding Season		
	I roject Component	Date	# Owls	
		3/7/2012	0	
108	500-foot Facility	3/14/2012	2	
100	Buffer	3/20/2012	1	
		4/5/2012	0	
		3/7/2012	0	
100	Solar Facility	3/14/2012	1	
109	Solar Facility	3/20/2012	0	
		4/5/2012	1	
		3/7/2012	1	
110	Color Escilito	3/14/2012	1	
110	Solar Facility	3/20/2012	0	
		4/5/2012	1	
		3/7/2012	1	
110	Solar Facility	3/14/2012	1	
112		3/20/2012	1	
		4/5/2012	0	
	Solar Facility	3/7/2012	0	
115		3/14/2012	1	
115		3/20/2012	1	
		4/5/2012	2	
		3/7/2012	0	
119	500-foot Facility Buffer	3/14/2012	0	
110		3/20/2012	2	
		4/5/2012	0	
		3/6/2012	1	
		3/7/2012	0	
120	Solar Facility	3/14/2012	0	
		3/20/2012	0	
		4/5/2012	0	
		3/7/2012	0	
107	Solor Facility	3/14/2012	0	
12/	Solal racility	3/20/2012	1	
		4/5/2012	1	
		3/7/2012	0	
120	Color Facility	3/14/2012	1	
129	Solar Facility	3/20/2012	2	
		4/5/2012	1	

Dunnau ID	Ducient Commonant	2012 Breeding Season		
Burrow ID	Project Component	Date	# Owls	
	Solar Facility	3/7/2012	1	
132		3/14/2012	2	
152	Solar Facility	3/20/2012	0	
		4/5/2012	1	
		3/7/2012	1	
133	Salar Fasilita	3/14/2012	2	
155	Solar Facility	3/20/2012	2	
		4/5/2012	0	
		3/6/2012	1	
127	Solor Eccility	3/7/2012	0	
137	Solar Facility	3/20/2012	0	
		4/5/2012	0	
		3/6/2012	0	
154	500-foot Facility Buffer	3/13/2012	1	
154		3/21/2012	1	
		4/4/2012	1	
	500-foot Facility Buffer	3/6/2012	0	
215		3/13/2012	0	
215		3/21/2012	0	
		4/4/2012	1	
		3/5/2012	1	
		3/6/2012	0	
226	Solar Facility	3/13/2012	0	
		3/21/2012	0	
		4/4/2012	0	
		3/6/2012	2	
227	500-foot Facility	3/13/2012	2	
227	Buffer	3/21/2012	2	
		4/4/2012	2	
		3/6/2012	1	
220	Solor Feelitte	3/13/2012	0	
229	Solar Facility	3/21/2012	2	
		4/4/2012	1	
		3/6/2012	2	
222	Solar Easilit	3/13/2012	2	
232	Solar Facility	3/21/2012	2	
		4/4/2012	2	
		3/6/2012	2	
22.4	500-foot Facility	3/13/2012	2	
234	Buffer	3/21/2012	0	
		4/4/2012	1	

Burrow ID	Project Component	2012 Breeding Season	
		Date	# Owls
237	Solar Facility	3/7/2012	0
		3/14/2012	2
		3/20/2012	2
		4/5/2012	0
239	Solar Facility	3/7/2012	1
		3/14/2012	2
		3/20/2012	2
		4/5/2012	1
259	Solar Facility	3/7/2012	0
		3/14/2012	1
		3/20/2012	1
		4/5/2012	1
	Solar Facility	3/7/2012	1
263		3/14/2012	1
263		3/20/2012	0
		4/5/2012	0
	Solar Facility	3/7/2012	1
264		3/14/2012	1
204		3/20/2012	1
		4/5/2012	0
	Solar Facility	3/7/2012	1
265		3/14/2012	0
		3/20/2012	0
		4/5/2012	0
268	Solar Facility	3/7/2012	0
		3/14/2012	1
		3/20/2012	0
		4/5/2012	0
	Solar Facility	3/7/2012	1
		3/14/2012	0
269		3/20/2012	0
		4/5/2012	1
	Solar Facility	3/7/2012	0
276		3/14/2012	0
		3/20/2012	1
		4/5/2012	0
324	Solar Facility	3/14/2012	1
		3/20/2012	0
		4/5/2012	0

Burrow ID	Project Component	2012 Breeding Season	
		Date	# Owls
327	500-foot Facility Buffer	3/20/2012	1
		4/5/2012	0
328	Solar Facility	3/20/2012	1
		4/5/2012	1
329	500-foot Facility Buffer	3/21/2012	2
		4/4/2012	2
330	Solar Facility	3/21/2012	2
		4/4/2012	1
331	500-foot Facility Buffer	4/4/2012	1
332	Solar Facility	4/4/2012	1
334	500-foot Facility Buffer	4/5/2012	1