BOWMAN SOLAR PROJECT

JUNE 2014

BURROWING OWL SURVEY

Goat Mountain United States Geological Survey 7.5-Minute Topographic Quadrangles San Bernardino Base and Meridian
Township 2 North, Range 6 East, Sections 9, 10, 14, 15 and 16

Assessor Parcel Number
0630-351-01,-02,-03,-04,-05,-06,-07,-08,-09,-10,-11,-12,-13,-14,-15

Conditional Use Permit Number
P201400196

Owner
sPower
2 Embarcadero Center, Suite 410
San Francisco, CA 94111
(415) 692-7579

Prepared By
Lenny Malo MS, Lincoln Hulse BS, Erin Serra BS, Onkar Singh BS,
Ben Zamora BS, Mikaila Negrete MS, and Ken Hashagen BS

NOREAS
Environmental Engineering and Science

16361 Scientific Way, Irvine, CA 92618
(949) 467-9100

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1.0 EXECUTIVE SUMMARY

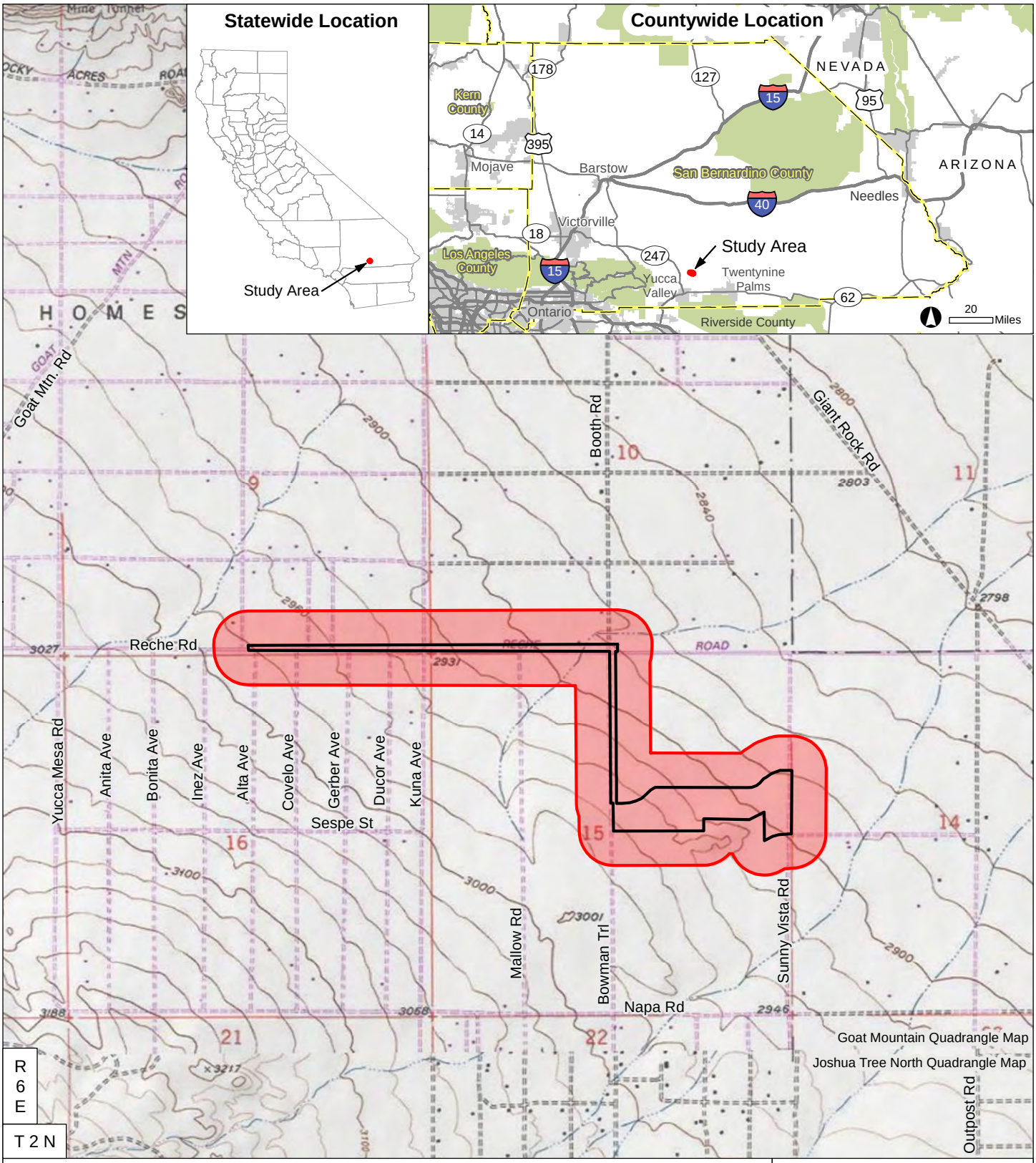
sPower, LLC (sPower) is an independent solar power producer and developer of distributed solar assets for utilities that are both municipally and investor owned. sPower strives to be a leader in wholesale solar power generation and the process of developing, building, and operating Solar Generating Facilities (SGFs). sPower is proposing to develop the Bowman Solar Project east of Yucca Valley, California (hereafter referred to as the Project) (Figure 1). This report provides the methods, assumptions, and results of focused surveys for Burrowing Owl (*Athene cunicularia*) conducted within the limits of the Project. For the purposes of this report, the "study area" includes the Project's proposed ground disturbance footprint (Project Site) and a buffer (Figure 2).

Two vegetation communities/land cover types were observed within the study area: Creosote Bush Scrub and Developed/Disturbed Lands. No Burrowing Owls were observed within the Project Site. Nonetheless, several Burrowing Owls were observed utilizing four active burrows located outside the Project Site boundaries. Given the extent of anthropogenic influences within the study area (e.g., abundance of trash from illegal dumping, cleared and graded lots, and on- and off-highway vehicle / pedestrian-related traffic), it is assumed that any animals detected there are well adapted to the disturbance regime present.

2.0 PROJECT AND PROPERTY DESCRIPTION

The proposed Project's purpose is energy generation. It is located on approximately 50 acres of previously disturbed land in the County of San Bernardino (Figure 1). The proposed Project will consist of a 3 Mega Watt Alternating Current Solar Photovoltaic (PV) generating facility. The proposed generation-tie (gen-tie) line will connect the facility to Southern California Edison's (SCE) existing distribution line located to the north of the Project. The proposed facility will utilize PV technology on either fixed-tilt or tracker mounting supports.

For the purposes of this report, the "study area" includes the Project's proposed ground disturbance footprint (Project Site) and a buffer (Figure 2). The Project can be found on the Goat Mountain United States Geological Survey 7.5-Minute Topographic Quadrangle Map within the San Bernardino Base and Meridian – Township 2 North, Range 6 East, Sections 9, 10, 14, 15 and 16 (USGS 1989). The majority of the study area is disturbed creosote bush scrub and the remainder includes developed lands.



The Study Area is located on the Goat Mountain USGS 7.5-minute quadrangle map; San Bernardino Base and Meridian, Township 2 North, Range 6 East, Sections 9, 10, 14, 15 and 16. Center coordinates are: Latitude 34.261802, Longitude -116.344193.

Figure 1. Regional Location

3.0 BURROWING OWL BACKGROUND

The Burrowing Owl has been designated by the California Department of Fish and Wildlife (CDFW) as a species of special concern. "State Species of Special Concern" status applies to animals not listed for protection under the federal Endangered Species Act or the California Endangered Species Act. The designation denotes that a species is declining at a rate that could result in State listing or that a species has historically occurred in low numbers and known threats to their persistence currently exist. The designation is intended to result in "special consideration" for these animals during the environmental review and discretionary permitting processes. In addition, the designation is also intended to focus research and management attention on poorly-known, potentially at-risk species by stimulating the collection of additional information on their biology, distribution, and status.

Burrowing Owls prefer open, dry annual or perennial grasslands, agricultural and rangelands, deserts, and scrublands characterized by low-growing vegetation. Burrowing Owls also prefer areas inhabited by small mammals as they predominately depend on mammal burrows (particularly ground squirrels) for subterranean nesting. Owls can be found at elevations ranging from 200 ft. below sea level to 9,000 ft. above (CDFG 1995). Burrowing Owls commonly perch on fence posts or on mounds outside their burrows. Northern populations of Burrowing Owls are usually migratory, while more southern populations may move short distances or not at all (Haug et al. 1993, Botelho 1996). Little is known about the winter ranges of migratory populations, although migratory Burrowing Owls are believed to mix with resident populations in California during the winter months (Coulombe 1971, Haug et al. 1993).

Burrowing Owls tend to be resident where food sources are stable and available year-round (Rosenberg et al. 1998). Typically, they disperse or migrate south in areas when food becomes seasonally scarce. Burrowing Owls tend to be opportunistic feeders. Large arthropods, mainly beetles and grasshoppers, comprise a substantial portion of their diet (Rosenberg et al. 1998). Small mammals, especially mice, rats, gophers, and ground squirrels, are also important food items. Other prey animals include reptiles and amphibians, scorpions, young cottontail rabbits, bats, and birds such as sparrows and Horned Larks. Consumption of insects increases during the breeding season. Burrowing Owls hover while hunting; after catching their prey they return to perches on fence posts or the ground. Burrowing Owls are primarily active at dusk and dawn, but if necessary will hunt at any time of day (CBOC 1993, CDFG 1995; Rosenberg et al. 1998).

The breeding season for Burrowing Owls is March to late August; the season tends to last later in the northern part of the range (CBOC 1993, CDFG 1995, Klute et al. 2003). Clutch size (number of birds hatched at the same time) ranges from 1 to 12 and averages about 7 (Ehrlich 1988). The incubation period is 28–30 days (Ehrlich 1988). The female performs all the incubation and brooding (sitting on eggs to hatch them by the warmth of the body) and is believed to remain continually in the burrow while the male does all the hunting (Rosenberg et al. 1998). The young fledge (take their first flight out of the nest) at 44 days but remain near the burrow and join the adults in foraging flights at dusk (Ehrlich 1988). The maximum life span recorded for a banded bird in the wild is approximately 8.5 years (Rosenberg et al. 1998).

In resident populations, nest site fidelity is common, with many adults nesting each year in their previous year's burrow; young from the previous year often establish nest sites near (<900 ft) their natal sites (Trulio 1997,Rosenberg et al. 1998). Burrowing Owls in migratory populations also often nest in the same burrow, particularly if the previous year's breeding was successful (Belthoff and King 1997). Other birds in the same population may move to burrows near their previous year's burrow. The species

is threatened primarily by loss, degradation, and fragmentation of habitat, although they do readily inhabit anthropogenic landscapes such as agricultural fields, golf courses, and airport grasslands (Korfanta et al. 2005).

4.0 FOCUSED STUDY/SPECIES OF CONCERN

Prior to beginning field surveys, resource specialists were consulted and available information from resource management plans and relevant documents were reviewed to determine the locations and types of resources that have the potential to exist within and adjacent to the study area; resources were evaluated within several miles of the Project. The materials reviewed included, but were not limited to, the following:

- U.S. Fish and Wildlife Service (USFWS) Critical Habitat Mapper and File Data (USFWS 2014a);
- USFWS Carlsbad Field Office Species List for San Bernardino County (USFWS 2014b);
- California Natural Diversity Database maintained by the California Department of Fish and Wildlife (CDFW 2014);
- California Burrowing Owl Consortium (CBOC). 1993. Burrowing Owl Survey Protocol and Mitigation Guidelines;
- California Department of Fish and Game (CDFG). 2012. Staff Report on Burrowing Owl Mitigation;
- Biological Technical Report for the Bowman Solar Project (NOREAS 2014);
- Desert Tortoise Report for the Bowman Solar Project (NOREAS 2014a);
- Rare Plant Survey Report for the Bowman Solar Project (NOREAS 2014b); and
- Aerial Photographs (Microsoft Corporation 2014).

5.0 METHODS

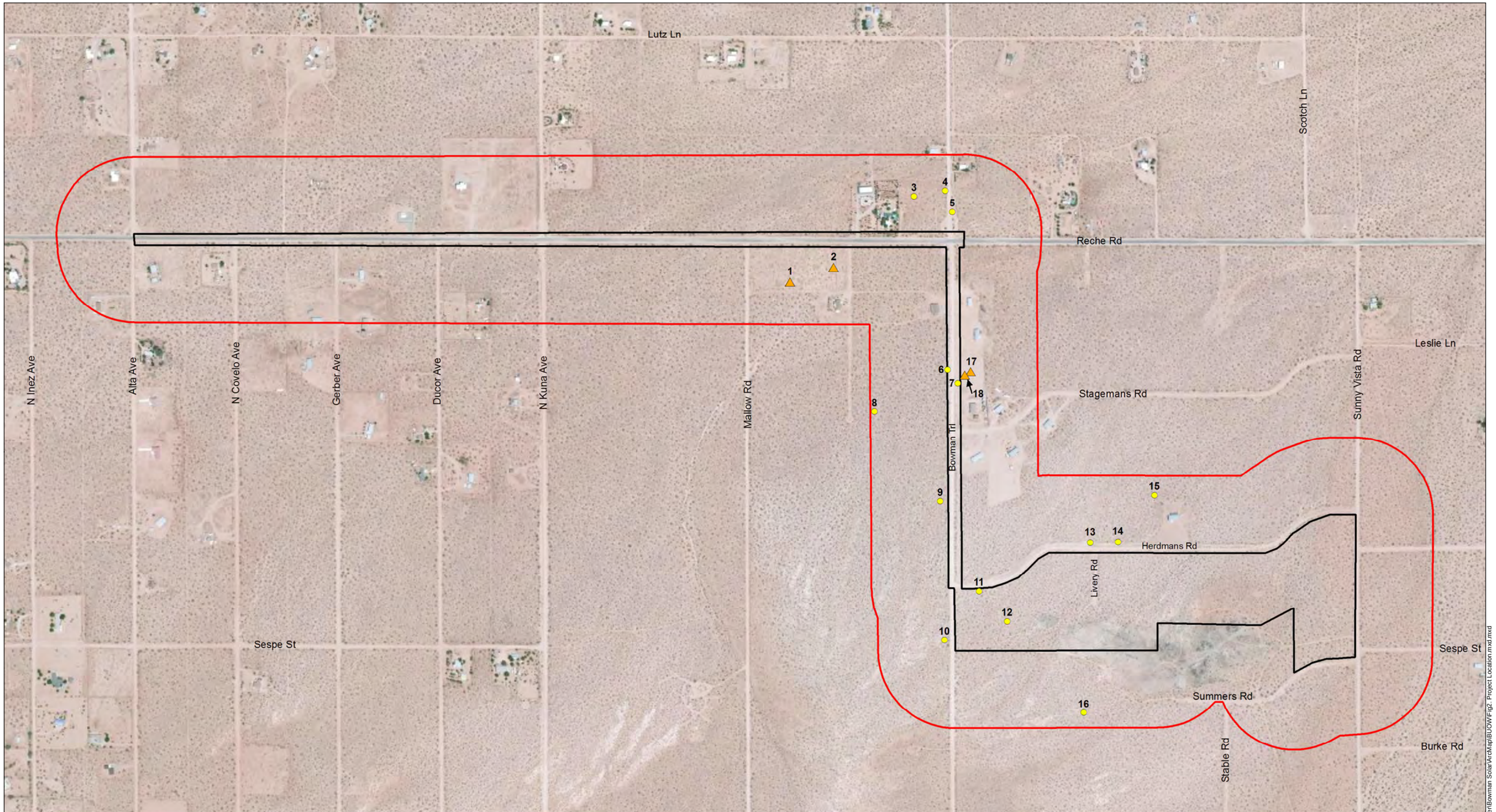
Survey methods were derived from generally accepted professional standards including the 1993 California Burrowing Owl Consortium Survey Protocol and Mitigation Guidelines (CBOC 1993), the 1995 and 2012 California Department of Fish and Game Staff Reports on Burrowing Owl Mitigation (CDFG 1995 and 2012). Accordingly, a methodical pedestrian-survey for owl burrows and sign was conducted by walking through areas of suitable habitat within study area limits (including evaluations of man-made structures, debris piles, etc.). Survey transects were spaced at approximately 100-ft intervals to allow for complete visual coverage of the study area. Where necessary, transect spacing was reduced or expanded to account for differences in terrain, vegetation density, and visibility. The presence of each observed species was based on direct observations of individual(s), sign, and/or vocalization. Avian scientific nomenclature and common names follows Sibley (2000).

Field surveys were conducted when weather conditions were conducive to observing birds. Surveys were not performed during rain, extreme temperatures, high winds (> 25 miles per hour), or dense fog. Where access was limited, observations were made from the nearest appropriate vantage points with the use of binoculars and spotting scopes. Surveys were conducted from approximately 1 hour before sunrise to 2 hours after sunset, when weather conditions were conducive to observing owls outside of burrows.

6.0 BURROWING OWL SURVEY RESULTS

Field surveys were performed on 19, 20, 21 and 22 March; 01, 02, 06, 07 and 08 May; 06 and 27 June, 2014. Weather conditions during the surveys were sunny and clear, ambient temperature ranged from 54 to 88 degrees Fahrenheit, with wind speeds averaged between 0-15 miles per hour. The majority of the Project Site consists of creosote bush scrub dominated by creosote (*Larrea tridentata*) and Burrow weed (*Ambrosia dumosa*); however substantial anthropogenic disturbances (e.g., abundance of trash, spent shell casing from historic firearms usage, and on- and off-highway vehicle / pedestrian-related traffic) were also observed. The study area lacks a perennial water source and a population of Burrowing Owl predators (e.g., coyote sign, and other raptors) was detected during survey events.

No Burrowing Owls were observed within the Project Site. However, two pairs of adult Burrowing Owls and three juvenile Burrowing Owls were observed utilizing four active burrows located outside the Project Site limits as illustrated within Figure 2. Appendix A includes representative photographs of the study area, and Appendix B includes a list of all avian species observed.



Study Area (319 acres which includes a 500-ft buffer and the Project Site)

Project Site (50 acres)

Potential Burrow Locations

Active

Inactive

0 300 600 Feet

1 inch = 600 feet

Data Source:
- BingMaps accessed Jun 2014

Map Prepared: 6-29-14

Prepared by:
NOREAS
Environmental Engineering and Science

C:\SRM\Noreas\Silverado Power\Bowman Solar\ArcMap\BUOWF\fig2. Project Location.mxd.mxd

Figure 2. Project Location

7.0 IMPACTS AND RECOMMENDATIONS

No Burrowing Owls were observed within the Project Site and given the extent of anthropogenic disturbance there; the Project Site is not considered high quality Burrowing Owl habitat. Furthermore the Project Site lacks perennial water sources and Burrowing Owl predators were observed within the study area. As a consequence, the Project would not be expected to result in the take of Burrowing Owls or their active nests.

8.0 PROPOSED MITIGATION MEASURES

The following measures are recommended as a means of avoiding and minimizing adverse impacts to Burrowing Owls that have the potential to occur within the Project Site and on adjacent lands:

- In order to comply with Section 10 of the Migratory Bird Treaty Act and relevant sections of the California Fish and Game Code, any vegetation clearing within the Project Site should take place outside of the typical avian nesting season (e.g., March 15th until September 1st) – to the maximum extent practical. If work needs to take place between March 15th and September 1st, a pre-construction survey for nesting passerines and raptors should be completed prior to the onset of Project activities. To the maximum extent practicable, a buffer zone from occupied nests should be maintained during physical ground disturbing activities. Once nesting has ended, the buffer may be removed.

- Limits of grading and construction activities shall be clearly delineated with temporary construction staking, flagging, or similar materials.

- To avoid attracting predators and nuisance species, the Project Site shall be clear of debris, where possible. All food-related trash items shall be enclosed in sealed containers and regularly removed from the Project.

- Before the start of construction activities, a qualified biologist should prepare and implement an environmental education program for construction personnel that shows deference to Burrowing Owl protection. The environmental education program will include a description, representative photographs, and legal status of Burrowing Owl, summarize the general rules and procedures that must be followed by each person on the Project to assure minimization or complete avoidance of impacts to protected biological resources and special status species, and describe the penalties for not adhering to biological compliance requirements.

The services performed and documented in this report have been conducted in a manner consistent with the level of care and skill ordinarily exercised by other professional consultants under similar circumstances. No other representations are either expressed or implied and no warranty or guarantee is included or intended in this report. Opinions relating to presence, absence, or potential for occurrence of biological resources are based on limited data and actual conditions may vary from those encountered at the times and locations where the data were obtained despite due professional care.

9.0 CERTIFICATION

I hereby certify that the statements furnished above and in the attached figures present the data and information required for this resource assessment, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief. Field work conducted for this investigation was performed by me or under my direct supervision. I certify that I have not signed a nondisclosure or consultant confidentiality agreement with the sPower or sPower's representative, and that I have no financial interest in the Project.

DATE: _____ SIGNED: _____
Lenny Malo

The following NOREAS employees performed the field work and/or participated in preparation of this report: Lenny Malo MS, Lincoln Hulse BS, Erin Serra BS, Ben Zamora BS, Onkar Singh BS, Mikaila Negrete MS, and Ken Hashagen BS.

10.0 REFERENCES

Belthoff, J. R., and R. A. King. 1997. Between-year movements and nest burrow use by burrowing owls in southwestern Idaho. Technical Report No. 97-3. Idaho Bureau of Land Management.

Botelho, E. S. 1996. Behavioral ecology and parental care of breeding western burrowing owls (*Speotyto cunicularia hupugaea*) in southern New Mexico, USA. Dissertation, New Mexico State University, Las Cruces.

California Burrowing Owl Consortium (CBOC). 1993. Burrowing Owl Survey Protocol and Mitigation Guidelines. San Francisco CA

California Department of Fish and Game (CDFG). 1995. Staff Report on Burrowing Owl Mitigation. Sacramento CA

_____. 2012. Staff Report on Burrowing Owl Mitigation. Sacramento CA

California Department of Fish and Wildlife (CDFW). 2014. RareFind California Department of Fish and Game Natural Diversity Database (CNDDB) Fontana and Devore USGS 7.5-Minute Quadrangles. Sacramento, CA: California Department of Fish and Game, Biogeographic Data Branch.

Coulombe, H. N. 1971. Behavior and population ecology of the burrowing owl, *Speotyto cunicularia*, in the Imperial Valley of California. Condor 73:162–176.

Ehrlich, P. R. 1988. The Birders Handbook: Natural History of North American Birds. Simon and Schuster Inc. New York

Haug, E. A., B. A. Millsap, and M. S. Martell. 1993. The burrowing owl (*Speotyto cunicularia*). In A. Poole and F. Gill (eds.), The Birds of North America, No. 61. Philadelphia, PA: The Academy of Natural Sciences and Washington, DC: The American Ornithologists' Union.

Klute, D. S., L. W. Ayers, M. T. Green, W. H. Howe, S. L. Jones, J. A. Shaffer, S. R. Sheffield, and T. S. Zimmerman. 2003. Status Assessment and Conservation Plan for the Western Burrowing Owl in the United States. U.S. Department of Interior, Fish and Wildlife Service, Biological Technical Publication FWS/BTP-R6001-2003, Washington, D.C.

Korfanta, N.M., D.B. McDonald, and T.C. Glenn. 2005. Burrowing owl (*Athene cunicularia*) population genetics: A comparison of North American forms and migratory habits. *Auk* 122(2): 464-478.

NOREAS 2014. Biological Technical Report for the Bowman Solar Project

NOREAS 2014a. Desert Tortoise Report for the Bowman Solar Project

NOREAS 2014b. Rare Plant Survey Report for the Bowman Solar Project

Rosenberg, D. K., J. Gervaia, H. Ober, and D. DeSante. 1998. An adaptive management plan for the burrowing owl population at Naval Air Station Lemoore, Lemoore, California.

Sibley, D.A. 2000. The Sibley Guide to Birds. Random House Press, New York, New York. 201 pp.

Trulio, L. 1997. Burrowing owl demography and habitat use at two urban sites in Santa Clara County, California. Journal of Raptor Research 9:84–89.

United States Fish and Wildlife Service (USFWS). 2014. Critical Habitat Portal. USFWS

United States Geological Service (USGS). 1989. 7.5-Minute Quadrangle Goat Mountain, California.

APPENDIX A

PHOTOGRAPH LOG

APPENDIX A

PHOTOGRAPH LOG

	**Photograph: 1, Active burrow 1.**
	**Photograph: 2, Active burrow 2.**

APPENDIX A

PHOTOGRAPH LOG

	**Photograph: 3, Active burrow 17.**
	**Photograph: 4, Active burrow 18.**

APPENDIX B

AVIAN COMPENDIUM

APPENDIX B

AVIAN COMPENDIUM

Scientific name	Common name
Falco sparverius	American Kestrel
Amphispiza bilineata	Black-throated Sparrow
Athene cunicularia	Burrowing Owl
Campylorhynchus brunneicapillu	Cactus Wren
Corvus corax	Common Raven
Streptopelia decaocto	Eurasian Collared-Dove
Sturnus vulgaris	European Starling
Callipepla gambelii	Gambel's Quail
Eremophila alpestris	Horned Lark
Carpodacus mexicanus	House Finch
Passer domesticus	House Sparrow
Picoides scalaris	Ladder-backed Woodpecker
Lanius ludovicianus	Loggerhead Shrike
Buteo jamaicensis	Red-Tailed Hawk
Sayornis saya	Say's Phoebe
Cathartes aura	Turkey Vulture
Auriparus flaviceps	Verdin
Tyrannus verticalis	Western Kingbird
Zonotrichia leucophrys	White-crowned Sparrow