BOWMAN SOLAR PROJECT

June 2014

DESERT TORTOISE SURVEY REPORT

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

Assessor Parcel Numbers
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,
Ben Zamora BS, Onkar Singh BS, Ken Hashagen BS, and Mikaila Negrete MS

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 Desert Tortoise (*Gopherus agassizii*) conducted for the Project. The Project is located within Victorville, California (Figure 1). For the purposes of this report, the "action area" includes all lands to be affected directly or indirectly by the Project, and are not merely the immediate lands involved in the action itself. Therefore the action area includes the Project's proposed ground disturbance footprint (Project Site), plus a buffer (Figure 2).

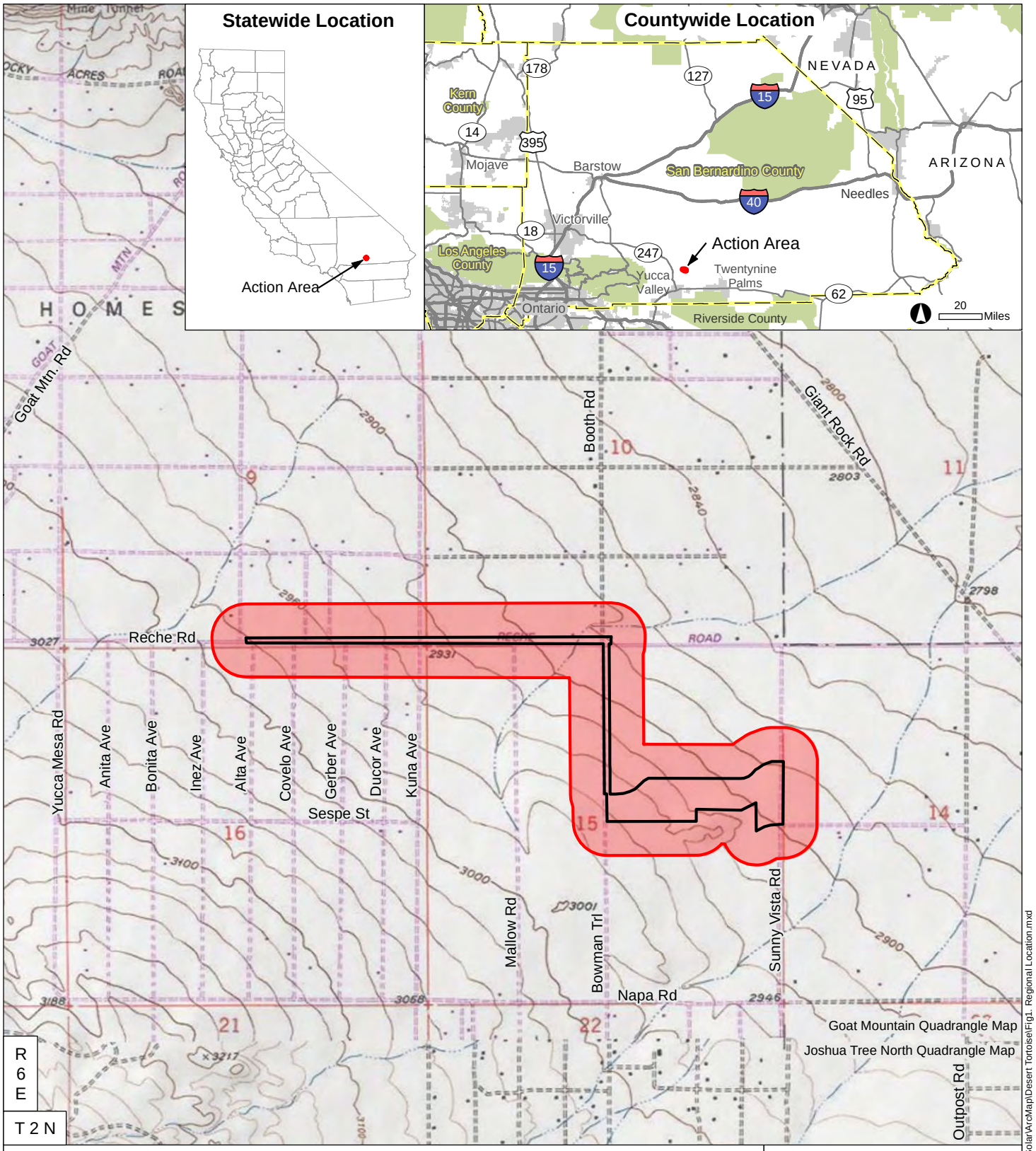
Two vegetation communities/land cover types were observed within the action area: Creosote Bush Scrub and Developed/Disturbed Lands. No Desert Tortoises were observed within the Project Site. The Project it is not collocated with any USFWS-designated critical habitat for Desert Tortoise. One Class 2 Desert Tortoise burrow was detected outside of the Project Site, north of Herdmans Road. The US Fish and Wildlife Service (USFWS) defines a Class 2 Desert Tortoise burrow as a burrow which is in good condition, and definitely Desert Tortoise; but includes no evidence of recent use. Given the extent of anthropogenic disturbance (e.g., abundance of trash, spent shell casings, and on- and off-highway vehicle and pedestrian-related traffic), any species currently using these lands are presumed to be acclimated to the disturbance regime present.

2.0 PROJECT AND PROPERTY DESCRIPTION

The proposed Project's purpose is energy generation, and 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 "action area[1]" 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 action area is disturbed creosote bush scrub; the remainder includes developed lands.

[1] The "action area" includes all lands to be affected directly or indirectly by the Project, and are not merely the immediate lands involved in the action itself.



Action Area
Project Site
County Boundary (inset)
Urban Area (inset)
Interstate or State Highway (inset)
Water Body (inset)
Park or National Forest (inset)

Data Sources:
- ESRI StreetMap North America 2010
- ESRI US Topo Maps accessed May 2014

Map Prepared: 5-30-14

The Action 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 34.262667, Longitude -116.346030.

0 1,000 2,000 Feet
1 inch = 2,000 feet

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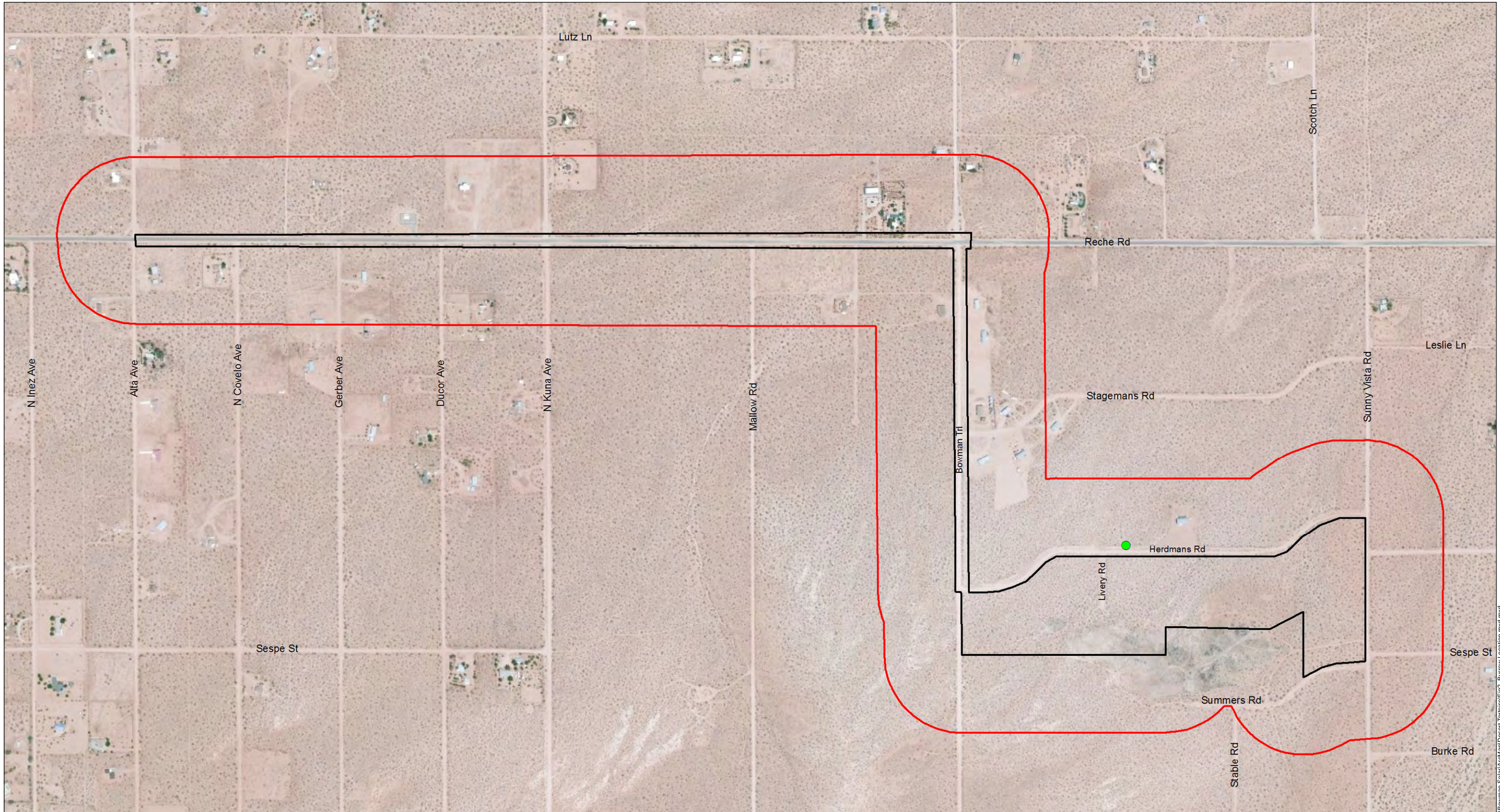
Environmental Engineering and Science

C:\SRM\Noreas\Silverado Power\Bowman Solar\ArcMap\Desert Tortoise\Fig1. Regional Location.mxd

Figure 1. Regional Location



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

Project Site (50 acres)

Burrow Location

Class Two Desert Tortoise Burrow

0 300 600 Feet

1 inch = 600 feet

Data Source:
- BingMaps accessed May 2014

Map Prepared: 5-30-14

Prepared by:
NOREAS
Environmental Engineering and Science

C:\SRM\Noreas\Silverado Power\Bowman Solar\ArcMap\Desert Tortoise\Fig2. Burrow Location.mxd.mxd

Figure 2. Burrow Location

3.0 BACKGROUND ON DESERT TORTOISE

On 2 April 1990, the US Fish and Wildlife Service (USFWS) determined the Mojave population of the Desert Tortoise to be threatened. The species was also listed as threatened under the California Endangered Species Act in 1989 and is considered a species at risk under California's Wildlife Action Plan (Bunn et al. 2006). California Department of Fish and Wildlife (CDFW) manages over 48,000 acres of land for the conservation of the Desert Tortoise and additional lands acquired as mitigation for projects that resulted in impacts to the species. The Mojave Desert Tortoise is protected by state regulations in Nevada, Arizona, and Utah, as well.

The Desert Tortoise is a large, herbivorous reptile that occurs in the Mojave and Sonoran deserts in southern California, southern Nevada, Arizona, and the southwestern tip of Utah in the U.S., as well as Sonora and northern Sinaloa in Mexico. The Mojave Desert Tortoise occurs north and west of the Colorado River in the Mojave Desert of California, Nevada, Arizona, and southwestern Utah, and in the Sonoran (Colorado) Desert in California (Luckenbach 1982).

Desert Tortoises reach 8 to 15 inches in carapace (upper shell) length and 4 to 6 inches in shell height. Hatchlings emerge from eggs at about 2 inches in length. Adults have a domed carapace and relatively flat, unhinged plastrons (lower shell). Their shells are greenish-tan to dark brown in color with tan scute (horny plate on the shell) centers. Adult Desert Tortoises weigh 8 to 15 lb. The forelimbs have heavy, claw-like scales and are flattened for digging; hind limbs are more elephantine (USFWS 1994).

Optimal habitat for the Desert Tortoise has been characterized as creosote bush scrub in which precipitation ranges from 2 to 8 inches, where a diversity of perennial plants is relatively high, and production of ephemerals is high (Luckenbach 1982, Turner 1982, Turner and Brown 1982). Soils must be friable enough for digging burrows, but firm enough so that burrows do not collapse. Desert Tortoises occur from below sea level to an elevation of 7,300 ft, but the most favorable habitat occurs at elevations of approximately 1,000 to 3,000 ft (Luckenbach 1982). Desert Tortoise can potentially survive and reproduce wherever their basic habitat requirements are met. These specifications include a sufficient amount and quality of forage species, shelter sites for protection from predators and environmental extremes, and suitable substrates for burrowing, nesting, and overwintering. Throughout most of the Mojave Region, tortoises occur most commonly on gently sloping terrain with soils ranging from sandy-gravel and with scattered shrubs, and where there is abundant inter-shrub space for growth of herbaceous plants (Gardner and Brodie 2000).

4.0 FOCUSED STUDY/SPECIES OF CONCERN

Prior to field surveys, natural resource databases, local resource management plans, aerial photos, and other readily available commercial data associated with the Project were reviewed to determine the locations and types of biological resources that have the potential to exist within the action area.

Primary data sources included, but were not limited to, the following:

- U.S. Fish and Wildlife Service Critical Habitat Mapper and File Data (USFWS 2014);
- California Natural Diversity Database maintained by the CDFW (CDFW 2014);
- U.S. Army Corps of Engineers (Corps) 16 May 2013 Tentative Tract 18036, U.S. Army Corps of Engineers Approved Jurisdictional Determination Form, SPL-2012-00461JD-BEM (Corps 2013);
- Bureau of Land Management Final Environmental Impact Report and Statement for the West Mojave Plan (BLM 2005);
- Aerial Photographs (Microsoft Corporation 2014); and
- Biological Technical Report for the Bowman Solar Project (NOREAS 2014).

5.0 METHODS

Survey techniques were derived from the USFWS protocol for *Preparing for Any Action That May Occur within the Range of the Mojave Desert Tortoise* (USFWS 2010). The field survey consisted of walking 100% coverage belt transects spaced at roughly 10-m intervals within the entire action area. Field surveys were conducted by qualified tortoise biologists[2]. Aerial maps illustrating the Project Site and action area were utilized in the field to accurately navigate. These efforts were further complemented with the use of hand-held Global Positioning Systems (GPS) to ensure precise data collection.

The action area was thoroughly investigated by walking slowly and methodically, while scanning for tortoise and their characteristic sign. Any tortoise sign (i.e., live individual, burrows, dens, pallets, scat, tracks, skeletal remains, eggshell fragments, courtship rings, drinking depressions, mineral licks, etc.) encountered was recorded with a GPS location, photographed and recorded on standardized data sheets. Current weather conditions, including ground and air temperatures, were also monitored and documented during each survey event.

The presence of any ancillary wildlife species was based on direct observation, wildlife sign (e.g., tracks, burrows, nests, scat, etc.), or vocalization. Field data compiled for observed wildlife included the scientific name, common name, general habitat, and evidence of sign when no direct observations were made. Wildlife taxonomy followed The Sibley Guide to Birds (Sibley 2000) and A Field Guide to Western Reptiles and Amphibians (Stebbins 2003).

[2] Individual(s) who have completed the CDFW-sponsored Desert Tortoise Training Workshop, logged ≥ 200 hours surveying for Desert Tortoise, and been previously approved by regulatory agencies to inventory and monitor the species in its native habitat.

6.0 DESERT TORTOISE SURVEY RESULTS

Field surveys were performed on 18, 19, 20, 21, and 22 March, and 2, 6 and 7 May 2014. Weather conditions during the surveys were sunny and clear, ambient temperature ranged from 54 to 79 degrees Fahrenheit, with wind speeds between 5-15 miles per hour.

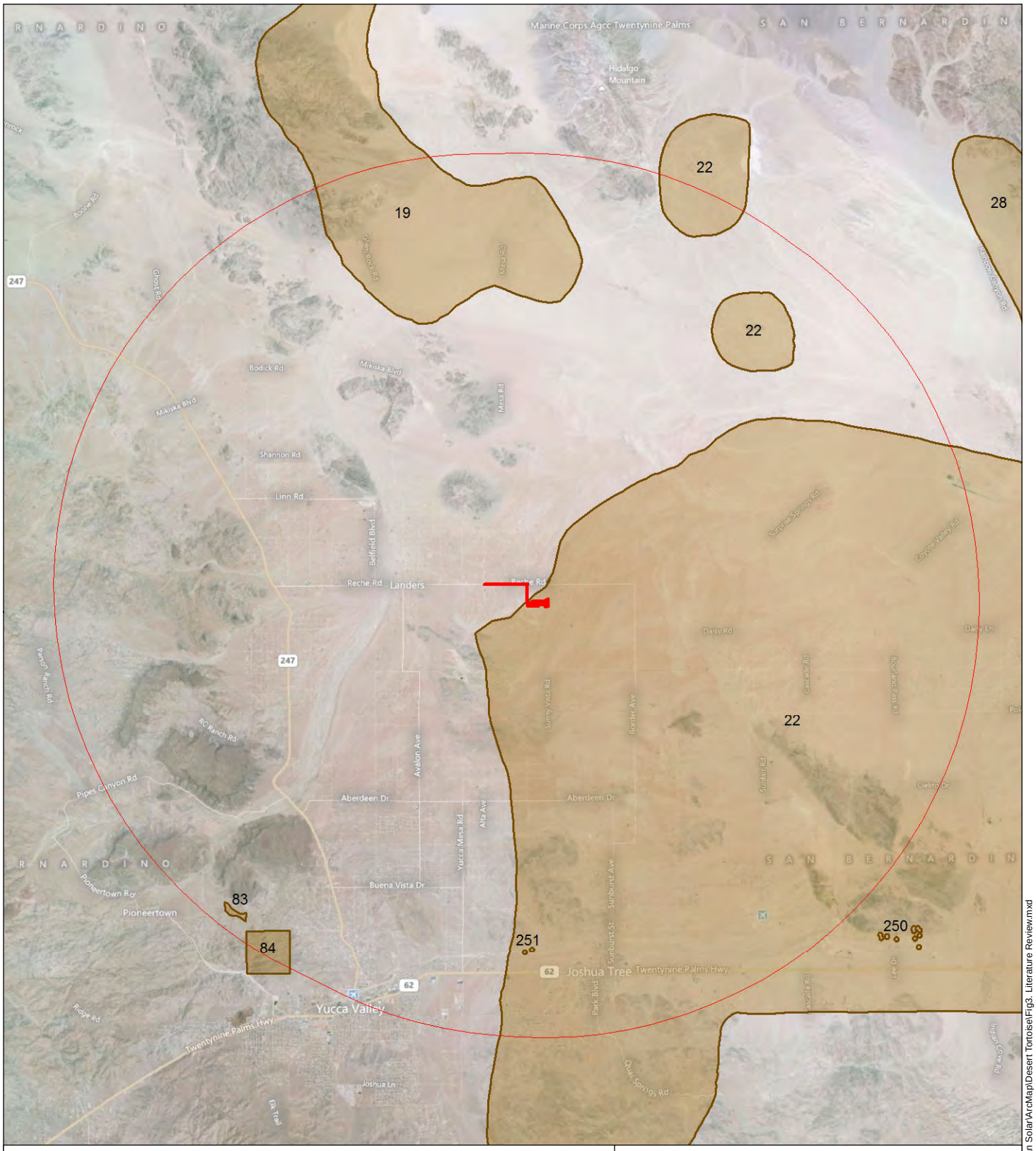
The action area is heavily disturbed, with evidence of on- and off -highway vehicle use. It supports creosote bush scrub vegetation; dominated by widely spaced creosote (*Larrea tridentata*) and Burrow weed (*Ambriosa dumosa*), with bare ground between them. The majority of the bare ground includes lands that have been disked, cleared, or otherwise altered by human activities.

No individual tortoises were observed during census efforts, and the action area does not include USFWS critical habitat. Historically the Desert Tortoise has been documented within the action area and region by the California Natural Diversity Database (CNDDB)(Table1 and Figure 3). Please note that CNDDB collects information from a wide variety of sources and makes this data available in a standardized text and graphic format. The different sizes of circles and polygons that their data is presented within (Figure 3), indicate the level of location detail provided in the source document(s) to the State. The CNDDB currently use 10 graphic accuracy classes which range from 1 (i.e., a specific bounded area with an 80 meter radius) to 10 (e.g., a non-specific, circular feature with an 8000 meter or 5 mile radius). Occurrence No. 22 is a non-specific bounded area or polygon which was used because the supporting dataset failed to define precisely where the element(s) was detected and therefore it was assigned an Accuracy Class of 3. As a consequence, a large geographic area has been mapped for Occurrence No. 22 since the exact location of the tortoise occurrences cannot be pinpointed.

Table 1. California Natural Diversity Database Historical Occurrences of Desert Tortoise

Occurrence Number	Date Observed	Distance from the Action Area to the Occurrence
19	5/20/1991	6.2 miles North
22	6/19/1991	Occurrence within Action Area
28	5/13/1991	12.7 miles Northeast
83	3/29/1988	9.4 miles Southwest
84	4/29/1994	9.2 miles Southwest
250	4/23/2008	10.8 miles Southeast
251	3/24/2008	7.9 miles South

The Project Site is also within the Bureau of Land Management's Western Mojave Recovery Unit G (Figure 4, BLM 2005). More specifically, a Class 2 Desert Tortoise burrow was detected outside of the Project Site and north of Herdmans Road within the action area (Figure 2). The US Fish and Wildlife Service (USFWS) defines a Class 2 Desert Tortoise burrow as a burrow which is in good condition, and definitely utilized by Desert Tortoise; but includes no evidence of recent use. A list of incidental wildlife species observed is included within Appendix A, Appendix B contains representative photographs of the action area, and Appendix C includes a Project specific US Fish and Wildlife Service Desert Tortoise Data Sheet.



Project Site

10-Mile Radius Around the Project Site

Desert Tortoise with Occurrence Number

Data Sources:
- Bing accessed May 2014, imagery date: May 2010

Note: Resource specialists were consulted and readily available commercial data from resource management plans and other relevant documents were reviewed to determine the locations and types of resources that have the potential to exist in the region.

0 1 2 Miles

1:200,000

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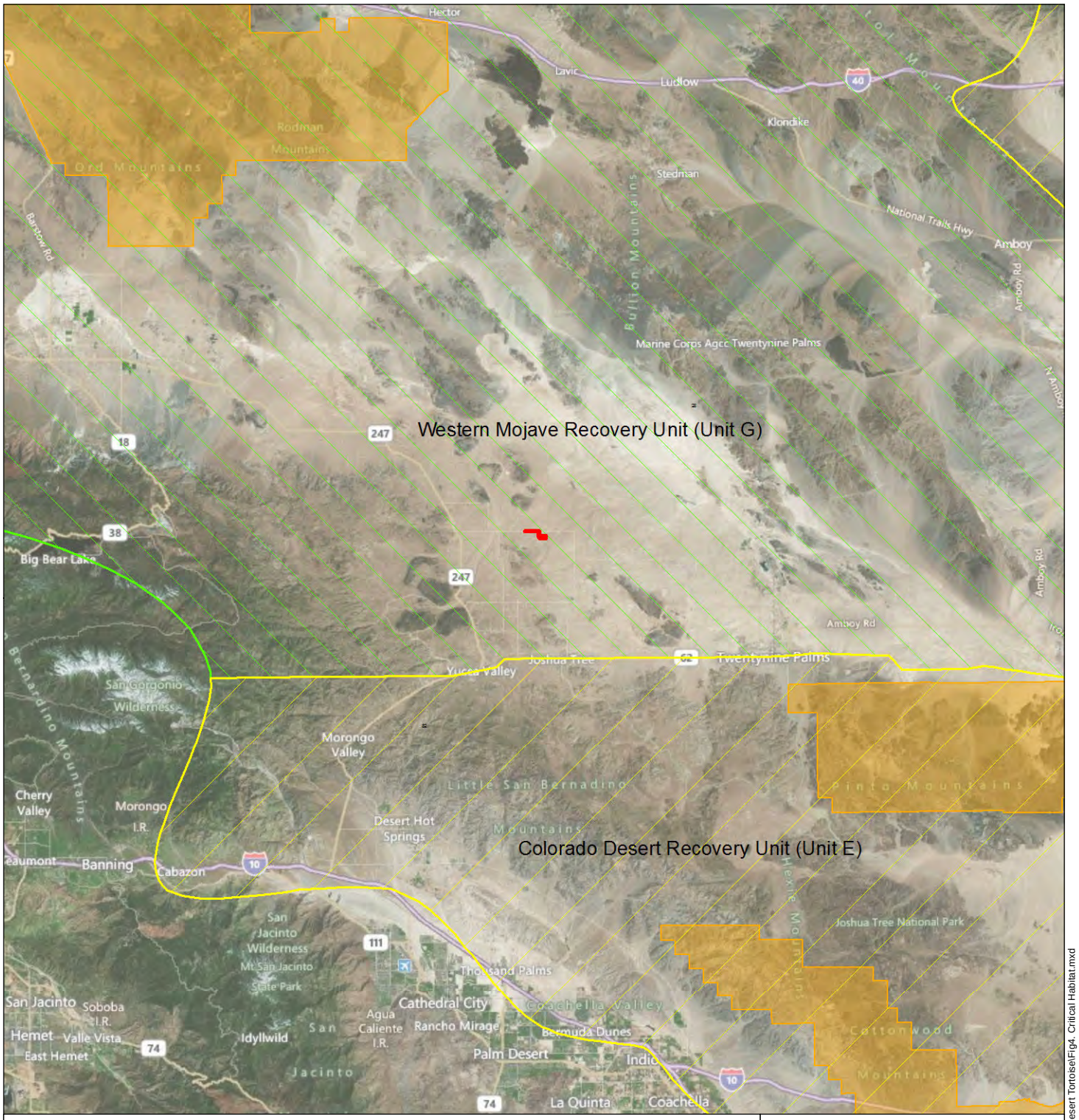
Figure 3. Literature Review



Project Site

Desert Tortoise (*Gopherus agassizii*)

Critical Habitat

Colorado Desert Recovery Unit (Unit E)

Western Mojave Recovery Unit (Unit G)

0 5 10 Miles

1 inch = 10 miles

Data Sources:
- Bing accessed Jun 2014
- US Fish and Wildlife Service critical habitat accessed May 2014, data date: Apr 2014
- US Fish and Wildlife Service Revised Recovery Plan for the Mojave Population of the Desert Tortoise (*Gopherus agassizii*) [May 2011]

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Figure 4. Critical Habitat

7.0 IMPACTS AND RECOMMENDATIONS

The majority of the Project Site consists of creosote bush scrub. Given the extent of anthropogenic disturbance any species currently using these lands are presumed to be acclimated to the disturbance regime present. No Desert Tortoises were observed within the Project Site, and the habitat quality on site is low. Therefore, the Project seems unlikely to affect the species.

Although the Project has potential to impact lands that could be utilized by Desert Tortoise as functional habitat, focused census efforts for the species have been negative. For that reason, there is no presumption that the Project would result in the loss of individual Desert Tortoise, or that it would adversely affect local or regional populations of them.

Future development is anticipated and planned throughout the region as well. The proposed Project shall comply with all applicable codes, laws, ordinances, and regulations to minimize or avoid adverse effects to state and federally-listed animals, or species proposed for listing to the greatest extent practical. Furthermore, any other projects – even if not planned at the present time, would also be required to comply with the same local, state, and federal codes, ordinances, laws, and other required regulations. Therefore, this Project's incremental contribution to cumulative effects on Desert Tortoise is not expected to be considerable either.

8.0 PROPOSED MITIGATION MEASURES

The following measures are recommended as a means of avoiding and minimizing adverse impacts to Desert Tortoise and other biological resources within the region:

- 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 Desert Tortoise. The environmental education program will include a description, representative photographs, and legal status of Desert Tortoise, 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 the penalties for not adhering to biological compliance requirements.

- A pre-activity clearance survey for Desert Tortoise should be performed prior to initiating ground disturbing activities within the Project Site. After the survey has been completed, a Desert Tortoise exclusion fence - installed per the US Fish and Wildlife Service published guidelines, should be installed around the Project Site to prevent animals from wandering into the construction footprint. If a tortoise is found, activities should be modified to avoid injuring or harming it, and the appropriate regulatory agencies should be notified.

- To the extent possible, activities should be scheduled to reduce potential adverse effects to tortoise (typically targeting activities during their inactivity period of November 1 to March 1). If construction and operation activities must occur during the tortoise activity period, activities within the Project Site should be monitored by a qualified desert tortoise biologist when they are most likely to result in injurious encounters with tortoises. The biologist should watch for tortoises wandering into construction areas when substantial mobilization/demobilization efforts are underway, check under staged vehicles and equipment, etc.

- Take, possession, or harassment of a Desert Tortoise is prohibited by State and federal law.

- Project features that might trap or entangle Desert Tortoises, such as open trenches, pits, open pipes, etc. should be covered daily during the tortoise active season or modified to prevent animal entrapment.

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 sPower or sPower's representative, and that I have no financial interest in the Project.

DATE: _____6/19/2014_____ SIGNED: _____

Report Author

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, Ken Hashagen, BS, and Mikaila Negrete MS

10.0 REFERENCES

Bunn, D., A. Mummert, R. Anderson, K. Gilardi, M. Hoshovsky, S. Shanks, and K. Stahle. 2006. California Wildlife: Conservation Challenges (California's Wildlife Action Plan). Prepared for the California Department of Fish and Game by the Wildlife Health Center, University of California, Davis.

CDFW (California Department of Fish and Wildlife). 2014. RareFind. California Department of Fish and Game, Natural Diversity Database (CNDDB). Sacramento, CA: California Department of Fish and Game, Biogeographic Data Branch.

CNPS (California Native Plant Society). 2014. CNPS Electronic Inventory of Rare and Endangered Plants: CNPS.

Gardner, T. J. and E. D. Brodie, Jr. 2000. The occupation of steep slopes by desert tortoises (Gopherus agassizii) in the western Mojave Desert: A description of occupied habitats, habitat use, and desert tortoise density.

Halfpenny, J.C. 2000. Scats and Tracks of the Desert Southwest, A Field Guide to the Signs of 70 Wildlife Species. Helena, MT: Falcon Publishing, Inc.

Holland, R.F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California (California Department of Fish and Game, The Resources Agency, ed), p. 156. Sacramento, CA.

Luckenbach, R.A. 1982. Ecology and management of the desert tortoise (Gopherus agassizii) in California. In R.B. Bury (ed.). North American Tortoises: Conservation and Ecology.

Microsoft Corporation. 2014. Bing Maps Aerial Imagery. Redmond, WA

NOREAS Inc. 2014 Clean Water Act Section 404 jurisdiction within the Mojave and southern Mojave Watershed basins of California (NOREAS 2014)

Sibley, D.A. 2000. National Audubon Society. The Sibley Guide to Birds. New York, NY: Alfred A. Knopf, Inc.

Stebbins, R.C. 2003. A Field Guide to Western Reptiles and Amphibians. New York, NY: Houghton Mifflin.

Turner, R.M. 1982. Mohave desert scrub. In: Biotic communities of the American southwest-United States and Mexico. D. E. Brown, editor. Special issue of desert plants, volume 4. Pages 157-168.

Turner, R.M. and D.E. Brown. 1982. Pages 181-221 in D.E. Brown (ed).Sonoran desert scrub. In: Biotic communities of the American southwest-United States and Mexico. Special issue of desert plants, volume 4.

United States Army Corps of Engineers. 2013. Tentative Tract 18036, U.S. Army Corps of Engineers Approved Jurisdictional Determination Form, SPL-2012-00461JD-BEM. (Corps 2013).

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

United States Fish and Wildlife Service (USFWS). 1994. Desert tortoise (Mojave population) recovery plan. U.S. Fish and Wildlife Service, Portland, Oregon.

United States Fish and Wildlife Service. (USFWS). 2010. United States Fish and Wildlife Service, Preparing for Any Action That May Occur within The Range of the Mojave Desert Tortoise (*Gopherus agassizii*). Ventura, CA.

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

USFWS (United States Fish and Wildlife Service). 2014b. Carlsbad Fish and Wildlife Office. Endangered and Threatened Species List. In: U.S. Department of the Interior, editor. Carlsbad, CA: USFWS.

APPENDIX A

Wildlife Observations Within the Action Area

Scientific name	Common name
Reptiles	
Uta stansburiana	Common Side-blotched Lizard
Cnemidophorus tigris	Western Whiptail
Callisaurus draconoides	Zebra-tailed Lizard
Gopherus agassizii	Desert Tortoise (Sign)
Birds	
Falco sparverius	American Kestrel
Amphispiza bilineata	Black-throated Sparrow
Athene cunicularia	Burrowing Owl
Corvus corax	Common Raven
Streptopelia decaocto	Eurasian Collared-Dove
Callipepla gambelii	Gambel's Quail
Eremophila alpestris	Horned Lark
Carpodacus mexicanus	House Finch
Passer domesticus	House Sparrow
Buteo jamaicensis	Red-Tailed Hawk
Sayornis saya	Say's Phoebe
Cathartes aura	Turkey Vulture
Auriparus flaviceps	Verdin
Zonotrichia leucophrys	White-crowned Sparrow
Mammals	
Ammospermophilus leucurus	Antelope Ground Squirrel
Lepus californicus	Black-tailed Jackrabbit

APPENDIX B

PHOTOGRAPHIC LOG

	**Photograph: 1** **Facing South East**
	**Photograph: 2** **Facing North East**

	**Photograph: 3** **Desert Tortoise Burrow**
	**Photograph: 4** **Desert Tortoise Scat**

APPENDIX C

US FISH AND WILDLIFE SERVICE DESERT TORTOISIE DATA SHEET

USFWS DESERT TORTOISE PRE-PROJECT SURVEY DATA SHEET

Date of survey: 03/19/14 (month, day, year) Survey biologist(s): Onkar Singh, Ben Zamora

Site description: Con Dios Solar (project name and size; general location)

County: San Bernad. Quad: Landers Location: (UTM coordinates, lat-long, and/or TRS; map datum)

Transect #: ____ Transect length: ____ Type of survey: BUOW (acres to be surveyed; 100% coverage/probabilistic sampling)

GPS Start-point: 561447/ 3791409 (easting, northing, elevation in meters) Start time: 0705 am/pm

GPS End-point: 560785/ 3791255 (easting, northing, elevation in meters) End time: 3:02 am/pm

Start Temp: 11 °C Weather: Clear 0% cloud, vis >2mi End Temp: 24 °C

Live Tortoises

Detection number	GPS location Easting	Northing	Time	Tortoise location (*in burrow*: all of tortoise beneath plane of burrow opening, or *not in burrow*)	Approx MCL >160-mm? (*Yes, No or Unknown*)	Existing tag # and color, if present
1						
2						
3						
4						
5						
6						
7						
8						

Tortoise Sign (burrows[1], scats, carcasses, etc)

Detection number	GPS location Easting	Northing	Type of sign (*burrows, scats, carcass, etc*)	Description and comments
1	560836	3791251	Burrow / Scat	-Class 2 Burrow - 240mm - .75m deep + -DETO scat in burrow.
2				-PHOTO 100 - Burrow PHOTO 101 - DETO scat
3				-BUOW sign also present
4				-Unique ID - Trimble DETO PT #1 taken on 3/21 (GPS File - "CONDIOS_032114_05")
5				
6				
7				
8				

[1] **See section 4.1.2 for information on burrow condition class and photographing burrows**