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Transmittal

Date: April 11, 2006

Project No. 08080100.11

To: Mr. Bill Pfanner
Project Manager
California Energy Commission
1516 Ninth Street, MS-15
Sacramento, California 95814

Sent Via: FedEx

From: Lyndon Quon

Subject: Beacon Solar Energy Project, Section 2081 Application

Distribution:

Per your request, enclosed are nine additional copies of the Beacon Solar Energy Project's Section 2081 Incidental Take Permit Application. Additionally, one Compact Disk (CD) containing a Postscript Downloadable Format (PDF) file is also enclosed.

Document5

EDAW Inc
1420 Kettner Boulevard, Suite 500, San Diego, California 92101
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Transmittal

Date:	March 28, 2006	Project No. 08080100.11
To:	Mr. Bill Pfanner Project Manager California Energy Commission 1516 Ninth Street, MS-15 Sacramento, California 95814	Sent Via: FedEx
From:	Lyndon Quon	
Subject:	Beacon Solar Energy Project, Section 2081 Application	

Distribution:
Mr. Bill Loudermilk (CDFG)
Ms. Annette Tenneboe (CDFG)
Mr. John McCamman (CDFG)
Ms. Judy Hohman (USFWS)
Mr. Kenneth Stein (Beacon Solar)
Ms. Kimberly McCormick (Regulatory Counsel)
Ms. Sara Head (ENSR)

Enclosed for your reference is one copy of the Beacon Solar Energy Project's Section 2081 Incidental Take Permit Application. This application has been submitted to Mr. Bill Loudermilk and Ms. Annette Tenneboe of the California Department of Fish and Game's Central Region office.

Document5

FPL Energy

An FPL Group Company

March 28, 2008

Mr. Bill Loudermilk
Regional Manager, Central Region
California Department of Fish and Game
1234 E. Shaw Avenue
Fresno, CA 93710

Ms. Annette Tenneboe
California Department of Fish and Game
Conservation Office
1130 East Shaw Avenue, Suite 206
Fresno, California 93710

Dear Mr. Loudermilk and Ms. Tenneboe:

Subject: Beacon Solar Energy Project Section 2081 Application

On behalf of our subsidiary, Beacon Solar, LLC, I am pleased to submit to the California Department of Fish and Game (Department), the California Endangered Species Act (CESA) Section 2081 Application (Application), for the Beacon Solar Energy Project (BSEP). Based on your input received during the December 12, 2007, meeting held at the U.S. Fish and Wildlife Service (Service) office in Ventura, California, we have attached the final Application.

A copy of this document is also being submitted to Judy Hohman at the Service, and to Bill Pfanner at the California Energy Commission (CEC), under separate cover, in order to keep them informed on the progress of this effort. If you have any questions or comments, please contact Kenny Stein at (561) 762-5875 or Lyndon Quon at (619) 233-1454.

Sincerely,

Gary Palo
Director Development

Attachments

cc: Mr. John McCamman (CDFG Interim Director)
Judy Hohman (USFWS)
Bill Pfanner (CEC)
Kenneth Stein (Beacon Solar)
Kimberly McCormick (Regulatory Counsel)
Sara Head (ENSR)
Lyndon Quon (EDAW)

P. O. Box 14000, Juno Beach Beach, FL 33408-0420 (561) 691-7171 Fax: (561) 691-7177

Beacon Solar Energy Project

Application for Incidental Take of Threatened and Endangered Species Section 2081 of the California Endangered Species Act

In Accordance with California Code of Regulations, Title 14, Division 1, Subdivision 3, Chapter 6, Article 1, Section 783.2

Submitted to:

California Department of Fish and Game
Central Region
1234 E. Shaw
Fresno, California 93710

Contact: Annette Tenneboe

Submitted by:

Beacon Solar, LLC
700 Universe Boulevard
Juno Beach, Florida 33408

Contact: Kenneth Stein

March 28, 2008

Beacon Solar Energy Project

Application for
Incidental Take of Threatened and Endangered Species
Section 2081 of the California Endangered Species Act

CALIFORNIA CODE OF REGULATIONS
TITLE 14, NATURAL RESOURCES, DIVISION 1, FISH AND GAME COMMISSION – DEPARTMENT OF FISH AND GAME

SUBDIVISION 3. GENERAL REGULATIONS

CHAPTER 6. REGULATIONS FOR IMPLEMENTATION OF THE CALIFORNIA ENDANGERED SPECIES ACT

ARTICLE 1. TAKE PROHIBITION; PERMITS FOR INCIDENTAL TAKE OF ENDANGERED SPECIES, THREATENED SPECIES AND CANDIDATE SPECIES

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§783.2. Incidental Take Permit Applications.

(a) Permit applications. Applications for permits under this article must be submitted to the Regional Manager.

The following application for incidental take of endangered and threatened species under the California Endangered Species Act is being submitted to:

Bill Loudermilk
Regional Manager, Central Region
California Department of Fish and Game
1234 E. Shaw Avenue
Fresno, CA 93710

and

John McCamman
Interim Director
California Department of Fish and Game
1416 Ninth St.
Sacramento, CA 95814

(1) Applicant's full name, mailing address, and telephone number(s). If the applicant is a corporation, firm, partnership, association, institution, or public or private agency, the name and address of the person responsible for the project or activity requiring the permit, the president or principal officer, and the registered agent for the service of process.

Applicant:	Beacon Solar, LLC
Name and Title of Principal Officer:	Gary Palo (949) 721-1554
Mailing Address:	700 Universe Boulevard Juno Beach, Florida 33408

(2) The common and scientific names of the species to be covered by the permit and the species' status under CESA, including whether the species is the subject of rules and guidelines pursuant to Section 2112 and Section 2114 of the Fish and Game Code.

Species:	Desert tortoise, Mojave population (*Gopherus agassizii*; DT)
Status:	threatened
Species:	Mohave ground squirrel (S*permophilus mohavensis*; MGS)
Status:	threatened

(3) A complete description of the project or activity for which the permit is sought.

Beacon Solar, LLC, proposes to develop approximately 2,012 acres for a 250-megawatt solar energy facility called the Beacon Solar Energy Project (BSEP or Project). The construction phase of this Project is estimated to take approximately 25 months, while the operational lifetime of the Project is anticipated to be up to approximately 30 years. The solar array field and related power plant facilities will be located east of California State Route 14 (SR-14), while a relatively small area west of the highway is proposed to be used for interconnection with an existing Los Angeles Department of Water and Power (LADWP) high voltage transmission line at LADWP's existing Barren Ridge Switching Station.

The BSEP will utilize parabolic trough solar thermal technology based on the technology in use at existing Solar Electric Generating System (SEGS) facilities located at Harper Lake, Kramer Junction, and Daggett in the Mojave Desert. This technology involves a modular solar array field comprising many parallel rows of solar collectors normally aligned in a north-south axis.

Each solar collector has a linear parabolic-shaped reflector that focuses the sun's direct beam radiation on a receiver located at the focal point of the parabola. This linear receiver contains a heat transfer fluid (HTF), a synthetic oil that heats up to approximately 740 degrees Fahrenheit (°F) as it circulates through the receiver and returns to a series of heat exchangers where the fluid is used to generate steam that drives a steam turbine to generate electrical power. A wet cooling tower is proposed to provide cooling for the power generating equipment.

The Project includes the plant site (solar array, power generating equipment, support facilities, evaporation ponds and access roads) and the Project's linear facilities (transmission line, switchyard, and natural gas supply pipeline) (Figure 1).

Plant Site

The layout of the Project's plant site includes the solar array and power block area (i.e., where the steam turbine generator will be located), and onsite support facilities (e.g., administration building and warehouse). Onsite facilities also include three evaporation ponds in a highly disturbed area of the plant site to handle the waste stream from the Project's cooling water system. The evaporation ponds will be designed to contain any accumulated bottom solids for the life of the Project. If waste needs to be removed for pond maintenance reasons, it would be transported off site for disposal as nonhazardous waste in accordance with applicable laws and regulations. A bioremediation area is planned in a disturbed area of the plant site to handle soil contaminated with HTF. An existing dirt road off SR-14 will be upgraded (paved) to provide access to the solar array, power block, and support facilities on the plant site. An existing dirt road off SR-14 will be upgraded (paved) to provide access to the solar array, power block, and support facilities on the plant site.

Natural Gas Pipeline

A 17.6-mile, eight-inch natural gas line will be constructed to provide fuel for startup and emergency operations (Figures 2a and 2b). The pipeline will connect to an existing Southern California Gas pipeline in the California City area via Neuralia Road and California City Blvd., with a 1.8-mile segment extending from Neuralia Road into the plant site along an existing distribution line and through a cleared, ruderal area. Of the 1.8-mile segment, 1.3 miles is within the plant site, and the remaining 0.5 mile is between the plant site and Neuralia Road. This pipeline will be constructed within a 15 to 20-foot right-of-way (ROW), entirely within previously disturbed road shoulders and along disturbed access roads, thereby avoiding native vegetation. A small amount of native vegetation may be disturbed along approximately 0.25 mile of degraded habitat in the segment entering the plant from Neuralia Road.

Transmission Line and Tower Structures

LADWP's 230-kilovolt (kV) Barren Ridge Substation is located across SR-14 southwest of the BSEP plant site. Two options are being considered for interconnecting the Project to the existing Barren Ridge facility.

Option 1 would involve constructing a new, approximately 3.5-mile 230-kV transmission line (of which approximately 1.6 miles will be within the 2,012-acre plant site boundary), that would run west and southwest from the power block across SR-14 and south along an expanded LADWP ROW to the Barren Ridge Substation. Under Option 1, 0.9 mile of the transmission line (ten poles) is located in DT habitat, with 9 poles and approximately 0.8 mile of the transmission line located in potential MGS habitat west of SR-14. The minor difference is due to a small span on the east side of SR-14, immediately adjacent to the highway, which has been categorized as DT habitat, but not MGS habitat.

Option 2 would involve constructing a new, approximately 2.3-mile 230-kV transmission line (of which approximately 1.6 miles will be within the plant site boundary) to a new switching station to be constructed at the location where the Project's transmission line first meets LADWP's existing transmission ROW west of SR-14. A second, approximately one-mile 230-kV transmission line would then be constructed within the expanded LADWP ROW to the Barren Ridge Substation (Figure 2a). Under Option 2, approximately 1.5 miles of the transmission line (17 poles) are located in DT and potential MGS habitat.

Under either transmission option, each pole location would require construction of a 50-foot by 50-foot pole pad. Pole height would range from 75 to 110 feet, depending on terrain and span length. Span length would range between 440 to 560 feet, averaging about 500 feet. During construction of the transmission line, pole site work areas and pull/splicing sites would be required. The pole site work areas measure 50 feet by 50 feet. The pull sites for the transmission lines average 50 feet by 140 feet each. The splicing site for the transmission line measures 95 feet by 200 feet. There will be no grading at the pole site work areas or the pull and splicing site; rather, vegetation will be crushed. The pole site work areas, pull sites, and splicing sites within DT and potential MGS habitat would result in temporary disturbance that would be considered permanent based on slow recovery time of habitats in desert ecosystems. Under Option 1, up to 5.0 acres would be disturbed, which includes the access and spur roads, described below; under Option 2, up to 5.8 acres would be disturbed (Table 1).

Under either transmission option, the new Project transmission line would tie into the existing Inyo-Rinaldi 230-kV transmission line at the existing Barren Ridge Switching Station; however, under Option 2, a new electrical switchyard would be built in association with the Project. Up to 1.7 acres of DT and potential MGS habitat would be impacted by construction and Operations and Management (O&M) activities associated with the construction of the Option 2 switchyard and associated electrical tie-in. The switchyard is accessed from the existing graded patrol road that runs along the Inyo-Rinaldi line. Periodic maintenance activities for the transmission line could include cleaning of the line conductors and repair of equipment damaged by wind, dust, or accident. Activities could also include road and drainage structure repairs. Such activity would occur infrequently, perhaps once per year. Existing dirt roads west of SR-14 would provide construction and O&M access to transmission line structures whenever possible. Potential new access roads created under Option 1 (14 feet by 1.9 miles) would affect up to 3.2 acres; Option 2 (14 feet by 1.0 mile), would affect up to 1.7 acres. Additionally, spur roads (averaging 12 feet by 110 feet) to 10 pole sites would be created under Option 1 (up to 0.3 acre) and 17 pole sites under Option 2 (up to 0.5 acre). Tortoise-proof secure gates will be installed where access roads leave SR-14 and enter the plant site.

4) The location where the project or activity is to occur or to be conducted.

The proposed Project is located in Kern County along SR-14, approximately four miles north of the northern boundary of California City, approximately 15 miles north of the Town of Mojave, and approximately 24 miles northeast of the City of Tehachapi (Figures 2a and 2b). The site occurs at the intersection of four U.S. Geological Survey quadrangles: Mojave NE, Cinco, Cantil, and California City North. Landmarks in the area include Red Rock Canyon State Park to the north, Koehn Lake to the east-northeast, and the Desert Tortoise Natural Area to the east.

The proposed 2,012-acre plant site would be located on abandoned agricultural land that is primarily barren or vegetated with Disturbed Atriplex Scrub (Figure 3). Under both Option 1 and Option 2, the 230-kV transmission line would extend from the power block within the plant site east of the Union Pacific railroad tracks that run parallel to and east of SR-14, across the highway and west (southwest under Option 2) to a new Project-associated electrical switchyard, and then southwest parallel to the LADWP transmission lines to the Barren Ridge Switching Station (Figure 2a). The natural gas pipeline will travel along California City Blvd. and Neuralia Road, with a 0.5-mile segment extending from Neuralia Road into the northeastern area of the plant site along the disturbed corridor of an existing distribution line, and will continue for another 1.3 miles through the plant site to the power block (Figure 2a and 2b).

Table 1
Project Beacon
Project Component by Phase and Potential Impact to Listed Wildlife Habitat

Project Component	Occurrence During Project Phase		Potential Impact to Listed Wildlife Habitat			
			Option 1		Option 2	
	Construction	Operations & Maintenance	Desert Tortoise[1]	Mohave Ground Squirrel[1]	Desert Tortoise[1]	Mohave Ground Squirrel[1]
			Permanent	Permanent	Permanent	Permanent
Transmission Line						
Pole Pads	X	X	10 pads 0.6 acres	9 pads 0.6 acres	17 pads 1.0 acres	17 pads 1.0 acres
Pull Sites	X		3 sites 0.5 acres	3 sites 0.5 acres	3 sites 0.5 acres	3 sites 0.5 acres
Splice Sites	X		1 site 0.4 acres	1 site 0.4 acres	1 site 0.4 acres	1 site 0.4 acres
Switchyard	X	X	0 acres	0 acres	1.7 acres	1.7 acres
Access Road	X	X	3.2 acres	3.2 acres	1.7 acres	1.7 acres
Spur Roads	X	X	0.3 acres	0.3 acres	0.5 acres	0.5 acres
Total of Permanent Impacts			**5.0 acres**	**5.0 acres**	**5.8 acres**	**5.8 acres**
Overall Total Impact			**5.0 acres**	**5.0 acres**	**5.8 acres**	**5.8 acres**

[1] All desert tortoise habitat and potential Mohave ground squirrel habitat co-occur (i.e., the same areas that are considered desert tortoise habitat are also considered potential Mohave ground squirrel habitat, and vice versa, except for a small area east of SR-14, where 2,500 square feet (0.06 acre) of impact was classified as suitable for the desert tortoise, but not suitable for Mohave ground squirrel. The impact numbers associated with the pole pads under Option 1 are displayed as the same value (i.e., 0.6 acres), due to rounding to one decimal place.

Access to the plant site would occur from SR-14 along an upgraded existing dirt road. Access to the transmission line route west of SR-14, under either transmission line option, would be constructed using the existing LADWP transmission line access roads where possible to reduce land disturbance, with potential construction of new stub access roads from the existing access roads to each of the new transmission tower locations.

(5) An analysis of whether and to what extent the project or activity for which the permit is sought could result in the taking of species to be covered by the permit.

Desert Tortoise

The DT was listed by the U.S. Fish and Wildlife Service (USFWS) as threatened on August 20, 1980, and by the California Department of Fish and Game (Department) as threatened on August 3, 1989. Optimal DT habitat consists of Mojave Creosote Bush Scrub vegetation, supporting a variety of moisture-rich ephemeral vegetation on which the species feeds. See Attachment 2, Chapter 3 of the Biological Technical Report (BTR), for detailed description of DT natural history. Suitable DT habitat occurs outside of the plant site, west of SR-14, in the area spanned by proposed Project transmission lines, where Mojave Creosote Bush Scrub provides suitable habitat for the species. Live DTs, burrows, scat, eggshells, and carcasses were observed in 2003 (EDAW 2004) and in 2007 in this area (Figure 4). Based on these data, tortoises are known to occur within the proposed transmission line corridor west of the plant site and west of SR-14.

Protocol presence/absence surveys for DT were conducted between May 1 and May 21, 2007 in the survey area, which includes the plant site, the area between the Union Pacific railroad tracks and SR-14, and parcels west of SR-14 that were available under the terms of an option to purchase at the time surveys were conducted (Figure 4). The survey followed the guidelines published in the USFWS *Field Survey Protocol for any Non-Federal Action That May Occur within the Range of the Desert Tortoise* (protocol) (USFWS 1992), which includes five Zone of Influence (ZOI) transects outside of and parallel to the site boundary at 100, 300, 600, 1,200, and 2,400 feet (Figure 4). In addition, to comply with the recommendations of the California Energy Commission (CEC) Draft Guidelines, additional transects were surveyed at 3,960-foot (.75-mile) and 5,280-foot (one-mile) intervals from and parallel to the edge of the survey area boundary. While these additional transects are more broadly focused than the DT protocol transects and are not a formal part of the tortoise survey, they provide information on DT presence as well as on other biological resources in the area around the survey area.

The entire survey area (100 percent coverage) was surveyed according to protocol by spacing transects 10 meters apart. The survey was conducted by slowly and systematically walking linear transects while surveyors visually searched for tortoise and sign. Particular emphasis was placed on searching around the bases of shrubs and along the banks of shallow washes. The USFWS ZOI transects were surveyed in suitable and accessible off-site desert scrub habitat and therefore were not surveyed on SR-14 or at the Honda Test Track east of Neuralia Road to the east of the site. All sign, including burrows, tracks, and scat, was recorded. All sign locations were recorded using Global Positioning System (GPS) equipment. See Attachment 2, Chapter 2 of the BTR for additional details on survey methodology.

Surveys of the plant site in 2007 found only two relatively recent tortoise sign: an intact juvenile carcass that had been depredated by a raven and a deteriorated adult burrow. Two other sets of old (greater than four years since death) bone and carapace fragments were found near the southern edge of the plant site boundary. There was no evidence that tortoises currently inhabit the plant site. During subsequent work at the site, another juvenile DT carcass, also preyed upon by a raven, was observed. One live adult tortoise was also detected on the northwestern edge of the plant site boundary, along the main access road, and was likely a transient from adjacent habitat. See Attachment 2, Chapter 3 of the BTR for additional details on survey results.

In August 2007, Dr. Alice Karl assessed the plant site and immediate vicinity for DT habitat quality (Attachment 2). In her analysis, Dr. Karl defined areas with similar vegetative and soil conditions (Figure 5) and analyzed their suitability as DT habitat as follows:

Area A – The area in the southwest, identified as Fallow Agricultural-Ruderal, is largely barren of shrubs. Split-grass (*Schismus arabicu*s), plus annuals that are indicators of disturbance (*Salsola tragus, Ambrosia acanthicarpa*) are common, but split grass is the only available forage for tortoises. The soil is clay and relatively hard, although there is a shallow layer (about three inches) of depositional loamy sand over the top. This area is not tortoise habitat.

Area B – Within the barren area along the northern edge, there is a small patch of nearly monospecific allscale (*Atriplex polycarpa*) that is continuous to native habitat to the north. (This is identified as Fallow Agricultural-Disturbed Atriplex Scrub on the map.) The shrub community, while almost entirely one species, is fairly established, and about 22 to 25 percent cover. The soil is very fine and the area is replete with numerous tiny basins that obviously hold water temporarily. There is a shallow layer of depositional loamy sand over the clay lens. There is a low possibility that a tortoise could be here due to connection with native habitat to the north.

Area C – This native habitat adjacent to Area B, north of the site boundary, is fair tortoise habitat. The shrub diversity is low, comprising mostly creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*), with occasional goldenhead (*Acamptopappus sphaerocephalus*). Shrub cover is about 18 percent. The soil is generally fine and there are numerous tiny basins. This area is fair tortoise habitat. Tortoises may be here in very low numbers.

Area D – This area is similar to Area B but appears to hold less water. The annual community is also more established and filaree (*Erodium cicutarium*) covers approximately 65 percent of the surface. The substrate is composed of about 20 percent fine gravel and the soil is slightly hard. As in Area B, the site has been established almost exclusively by allscale, but there are large patches throughout the area that are devoid of vegetation. Even outside the barren patches, the allscale is represented by scattered small clumps of shrubs (a few yards in diameter) or individuals. There is a low possibility that one or two tortoises could be here because it is a sizeable patch and connected to native habitat to the west.

In the northern portion of this area and to the north, the basins become more common and the vegetation more sparse. The only tortoises here and to the north would likely be transients. An old chicken-wire fence along the northern border is mostly intact and would serve as a barrier to tortoises.

Area E – This area is nearly identical to Area D, but the barren patches are small, rather than large. There is a low possibility that a tortoise could be here because there is a connection to native habitat to the west.

Swale – This swale, where the water has been artificially diverted from the wash on site, is mostly vegetated by Russian thistle (*Salsola tragus*; an exotic annual indicative of disturbance and common in ruderal areas in this region) with some allscale and cheesebush (*Ambrosia salsola*). There are also a few scattered creosote bush and occasional other shrubs. Both the swale and connecting wash are typically dry, probably only holding water during high-intensity storms or possibly during historic agricultural practices. Each is bounded for most of both sides by nearly barren habitat, although there is some shrub cover northwest of the wash (Area D). This is not tortoise habitat.

Area F – This entire area is essentially barren and has been bladed. The maximum cover is in the northeastern corner, where there is about 1 to 2 percent shrub cover. This is not tortoise habitat.

Area G – This entire area is essentially identical to Area F. This is not tortoise habitat.

Area H (Native Habitat East of the Plant Site) – This area is Mojave Creosote Bush Scrub dominated by creosote bush and allscale, with subdominant and common winterfat (*Krascheninnikovia lanata*). Goldenhead is fairly common towards the south. Shrub cover is about 18 percent. The topography is very gently undulating and the soil, while loose-sandy, is stabilized. The substrate has no coarse particles. Toward the southern portion of this section, there is more loam in the soil and fine gravel in the substrate. This is medium-quality tortoise habitat.

Dr. Karl concluded that the BSEP plant site is not suitable for DT based on:

- Onsite habitat quality
  - Vegetation - species composition, shrub cover, shrub patchiness
  - Soil characteristics
  - Hydrology;
- Adjacent habitat quality;
- Extent and type of existing disturbance; and
- Lack of value of the habitat to long-term and current use by tortoises.

The majority of the plant site has no potential for long-term and current use by tortoises because it is either devoid of vegetation or shrub cover is less than 2 percent (Attachment 2). In areas where shrubs are regrowing, the Disturbed Atriplex Scrub is unlike the native community adjacent to the plant site. Portions of the surrounding area are native Mojave Creosote Bush Scrub, whereas the regrowth area is a nearly monotypic allscale stand. This area has patchy shrub cover with broad barren areas, has poor soil friability (i.e., fine, slightly hard soils), and shows evidence of periodic inundation by water, potentially hazardous to DTs. While there is potential that a DT could be observed in these shrub patches or in the wash that crosses the plant site, the use of these areas would be attributable to the proximity of the adjoining native habitat outside of the plant site and would likely be temporary due to the poor habitat potential within the plant site. Additionally, even the Mojave Creosote Bush Scrub north of the plant site is only poor-to-fair quality DT habitat and is substantially disrupted by historic agriculture; consequently, DT density is expected to be low in these areas.

The wash that crosses the eastern-central section of the plant site is characterized by poor shrub diversity and low shrub cover and is mostly bordered by barren land. The northern terminus is dominated by stands of exotic Russian thistle. These factors limit the wash's utility as a movement corridor. Furthermore, although good DT habitat exists south of the plant site, there

is no suitable habitat that the wash could connect to that habitat because areas north, east, and west of the wash are devoid of vegetation as a consequence of long-term agricultural use of the area and therefore are not considered DT habitat.

The plant site lies on a broad area of land that has not been used by DTs for decades due to extensive agricultural activities. Therefore, the area has had no value for DT population persistence or recovery for many years. DTs have further been excluded from the allscale-dominated regrowth community in the northern portion of the plant site by a chicken-wire perimeter fence that was originally erected to exclude rabbits from the agricultural fields. Long segments of this chicken-wire fence are intact, thus constituting an effective block to most DT movement into the plant site.

While there is a possibility that a transient DT might be observed within the plant site, this would largely be due to the proximity of native habitat outside of the area to the south of the plant site.

Mohave Ground Squirrel

The MGS was listed as threatened by the State in 1998. It inhabits desert areas, including alluvial fans, basins, and plains with deep sandy or gravelly friable soils with an abundance of native herbaceous vegetation. This species is typically associated with a variety of habitats, e.g., Mojave Creosote Bush Scrub, shadscale desert scrub, alkali scrub, and Joshua Tree Woodland. The species feeds on green vegetation and seeds but may also eat carrion. The MGS remains underground from August through February or March and is active during the spring and summer.

Focused protocol-level surveys for this species were not conducted in 2007 in the Project vicinity; however, Dr. Phil Leitner performed two habitat assessments of the Project study area, one on August 10, 2007, and one on October 15, 2007. Dr. Leitner also evaluated relevant published and unpublished data, including the California Natural Diversity Database (CNDDB), and 30 years of his personal research on the habitat requirements of the MGS (Attachment 2).

All MGS detections in the region of the proposed Project are shown in Figure 6. The CNDDB contains nine records of MGS occurrence within 10 miles of the Project site. Three locations occur in Jawbone Canyon, from a point just west of SR-14 to Blue Point. A fourth occurrence is near the southern edge of Red Rock Canyon State Park on the west side of SR-14. MGS were detected recently on Cache Creek near the western boundary of the Desert Tortoise Natural Area. Three occurrences are farther east, but within the Desert Tortoise Natural Area. There are 10

other records within 12.4 miles that have not been entered into the CNDDB (Figure 6). All of these additional detections are associated with the Desert Tortoise Natural Area.

All public lands to the west of SR-14 in the vicinity of the Project site are included in the Mohave Ground Squirrel Conservation Area as designated in the West Mojave Plan (U.S. Bureau of Land Management 2005). However, the protections associated with the Mohave Ground Squirrel Conservation Area apply only to public lands managed by the U.S. Bureau of Land Management. This designation does not apply to the private lands impacted by the Project.

There is an extensive area of Mojave Creosote Bush Scrub to the east and south of the plant site that appears to provide suitable habitat for the MGS, although there are no occurrence records and no evidence of any trapping attempts. To the north and northeast of the plant site is a wide strip of fallow agricultural land that does not provide MGS habitat. North of the plant site and east of SR-14 is a small patch of Mojave Creosote Bush Scrub. Vegetative cover here is sparse and there is very little plant diversity. At best, this offsite area is marginal habitat for the MGS. To the west of SR-14 is a wide strip of Mojave Creosote Bush Scrub on the alluvial fans reaching down from the mountains. This area is characterized by vegetation and soil conditions that are suitable for MGS.

Based upon field assessments, only a small portion of the area west of SR-14 (outside the plant site boundary) associated with the two transmission line options can be considered potential MGS habitat. The only vegetation community in the Project area capable of supporting MGS is the Mojave Creosote Bush Scrub west of SR-14. This area is located on a large alluvial fan deposited by outflows from Pine Tree Canyon. The dominant shrub species are creosote bush and white bursage. Because of disturbance from periodic surface water flows, desert senna (*Senna armata*) and cheesebush are also abundant. No winterfat or spiny hopsage (*Grayia spinosa*), two shrubs that provide important food resources for MGS (Leitner and Leitner 1998), was observed. This relatively undisturbed habitat has moderately diverse vegetation that could provide adequate forage and cover for MGS. The habitat on this portion of the survey area appears suitable for the species but is not of high quality.

The remainder of the survey area (i.e., the plant site to the east of SR-14) is unsuitable as habitat for MGS. The natural vegetation on this portion of the property was completely removed some years ago, when the land was converted to irrigated agricultural use. Most of the property is classified as Fallow Agricultural, which is barren and does not support any vegetative cover. Elsewhere on the plant site, there are three separate shrub patches made up almost entirely of allscale. These stands of allscale are mapped as Disturbed Atriplex Scrub. This is not a natural vegetation community but is essentially an allscale monoculture that has become established

since agricultural operations were abandoned. Within these patches, there is relatively low density and cover of allscale. The herbaceous layer is sparse and consists almost entirely of a few nonnative species, including filaree. MGS do occasionally consume *Atriplex* foliage and filaree seeds, but these plants do not provide the full range of food resources necessary for the species (Leitner and Leitner 1998).

A dry wash runs through the center of the plant site, from the southwest to the northeast. This habitat is not suitable for occupancy by MGS because the shrub vegetation is sparse, plant diversity is low, and there is little cover or forage appropriate for the species. In general, this wash habitat appears disturbed, with shrubs widely separated and damaged and extensive bare ground.

The plant site has no value as a movement corridor for MGS. Although dispersing juveniles might attempt to enter from adjoining creosote bush habitat, they would not be able to cross the wide bands of barren fallow agricultural land. Studies in the Coso area of Inyo County have shown that a small playa acted as a complete barrier to the dispersal movements of radio-collared juveniles (Harris and Leitner 2005).

Other Special Status Wildlife Species

In addition to DT and MGS discussed above, seven species with special status were detected within the survey area and surrounding one-mile buffer during 2007 biological surveys. Those species are American peregrine falcon (*Falco peregrinus anatum*; California listed endangered and fully protected), northern harrier (*Circus cyaneus*; Department Species of Special Concern [SSC]), western burrowing owl (*Athene cunicularia*: SSC), California horned lark (*Eremophila alpestris actia*; SSC), Le Conte's thrasher (*Toxostoma lecontei*; SSC), loggerhead shrike (*Lanius ludovicianus*; SSC), and American badger (*Taxidea taxus*; SSC). This permit application is not requesting incidental take authorization for these species because the majority of these species, with the exception of the American peregrine falcon, are either not listed as threatened or endangered, or are not likely to be listed as such within the near future. In the case of the American peregrine falcon, the species is likely either a transient or may use the area as a peripheral and occasional part of its home range. The BSEP site does not support any nesting, breeding, or foraging resources for the species, and therefore the construction and operation of the project is not anticipated to affect the American peregrine falcon. See Attachment 2 for a discussion of these species.

(6) An analysis of the impacts of the proposed taking on the species.

Table 1 lists the Project components that occur in DT and potential MGS habitat and indicates whether these components likely would impact habitat during construction and/or during O&M activities. Attachment 2 provides additional details on Project-related impacts to these species. Due to the relatively slow recovery of habitats in desert systems, all impacts are considered permanent. A description of each Project component that may impact DT and potential MGS habitat follows.

Desert Tortoise

Direct permanent impacts to the DT could potentially result from Project-related construction activities west of SR-14. Impacts include installation of 10 poles (under Option 1) or 17 poles (under Option 2) and use of temporary work areas associated with installation of the proposed 230-kV transmission line. Based on habitat assessments, 5.0 acres (under Option 1) or 5.8 acres (under Option 2) of suitable DT habitat would be directly impacted by the Project (Table 1). During construction and O&M activities, direct impacts to DT could result from vehicle strikes if tortoises attempt to cross nearby roads.

No impacts to DT are expected within the plant site boundary area due to lack of suitable habitat, although it is recognized that a low possibility exists that one or a few transient tortoises may be found in regrowth habitats that connect to native habitat off site (e.g., in the wash or in saltbush scrub).

Potential permanent indirect impacts to DT could result from increased predation by common ravens on juvenile tortoises within suitable habitat. Project design features, such as the addition of new perches in the form of transmission poles and lines and a new evaporative wastewater pond, have the potential to increase raven use of the area.

Potential indirect impacts associated with erosion and deposition from grading at the plant site would be avoided by implementation of best management practices (BMPs) to control erosion and sedimentation during construction. No impacts to tortoise populations or habitat will occur as a result of rerouting of the dry wash because the new dry wash channel is designed with the capacity and structure to contain waters that the original wash would contain, terminating where the original wash terminates and releasing waters at the same volumes and flow rates as the original wash.. Additionally, the rerouted wash channel (Figure 1) will be revegetated with native vegetation.

Mohave ground squirrel

Direct permanent impacts to potential MGS habitat could result from Project-related construction activities west of SR-14 (Attachment 2). Impacts include installation of 10 poles (under Option 1) or 17 poles (under Option 2) and use of temporary work areas associated with installation of the proposed 230-kV transmission line. Based on habitat assessments, 5.0 acres (under Option 1) or 5.8 acres (under Option 2) of potential MGS habitat would be directly impacted by the Project (Table 1). During construction, direct impacts to MGS, if present, could result from vehicle strikes or burial in burrows; vehicle strikes could occur during O&M activities if squirrels are present.

Potential indirect impacts to MGS, if present, could result from increased predation by common ravens within suitable habitat. Project design features, such as the addition of new perches in the form of transmission poles and lines and a new evaporative wastewater pond, have the potential to increase raven use of the area.

Potential indirect impacts associated with erosion and deposition from grading at the plant site would be avoided by implementation of BMPs to control erosion and sedimentation during construction. No impacts to MGS populations or habitat will occur off the Project site as a result of rerouting of the dry wash because the new dry wash channel is designed with the capacity and structure to contain waters that the original wash would contain, terminating where the original wash terminates and releasing waters at the same volumes and flow rates as the original wash. Additionally, the rerouted wash channel (Figure 1) will be revegetated with native vegetation.

(7) An analysis of whether issuance of the incidental take permit would jeopardize the continued existence of a species. This analysis shall include consideration of the species' capability to survive and reproduce, and any adverse impacts of the taking on those abilities in light of (A) known population trends; (B) known threats to the species; and (C) reasonably foreseeable impacts on the species from other related projects and activities.

Desert Tortoise

The plant site has had no value for population persistence or recovery for many years. As discussed above in Section 5, the plant site comprises a sizable block of nonhabitat that has been excluded from tortoise use for decades due to farming. Even the allscale regrowth area in the north is moderately well excluded from tortoise use by the chicken-wire perimeter fence (originally erected to keep rabbits out of the alfalfa) that has remained intact for long segments. This fence would effectively block much of the movement of tortoises onto the site. The plant

site also does not represent a corridor between habitats because it is not tortoise habitat. While it is anticipated that there would be no or very few tortoises on the plant site, any tortoises found on the site during clearance surveys would remain in the population by being placed into viable tortoise habitat, outside of the tortoise-proof fencing, but on Project property.

For either transmission line option, direct take from construction and O&M activities is likely to be minor to negligible. The loss of habitat is minor and discontinuous, occurring in small patches that are still usable, to tortoises. This habitat can also be considered degraded due to proximity to existing transmission line corridors and SR-14. Data from several studies (Nicholson 1978; Karl 1989; Boarman 1992; LaRue 1993; Marlow et al. 1997) strongly support the hypothesis that heavily traveled roads are mortality sinks for tortoises, so impacts from the highway on the local tortoise population are already likely. Finally, indirect impacts, such as increased tortoise depredation by common ravens (*Corvus conax*) attracted to the Project, are expected to be negligible due to raven control measures.

In addition to these factors, Project mitigation, especially site fencing and a preconstruction DT clearance, will avoid and/or minimize any potential impacts to DT as a result of Project activities.

Issuance of the Permit, and the resulting implementation of the proposed Project, will therefore not jeopardize the continued existence of the DT.

Mohave Ground Squirrel

Potential MGS habitat occurs west of the plant site and SR-14. Potential take of this species is being determined based on assumed presence of this species within suitable habitat within the area spanned by the proposed transmission line. Either of the transmission line route options, associated access roads, and the substation facility west of SR-14 could result in direct impacts to potential MGS habitat. However, associated loss of habitat is minor and discontinuous, occurring in small patches that are still usable, albeit degraded due to proximity to existing transmission lines and SR-14. The abandoned agricultural lands east of SR-14 do not provide suitable habitat for this species. The only shrub vegetation within the plant site consists of several patches of allscale and a narrow strip of scattered shrubs along an intermittent watercourse. This area does not provide the cover and diverse food resources that are necessary to support a MGS population (Leitner and Leitner 1998).

Although the proposed Project may affect the MGS, if present, through loss of habitat and direct take during transmission facility construction and O&M activities west of SR-14, the potential

impacts would be limited to a very small subset of the MGS population. Therefore, it is unlikely that the issuance of the Permit for the aforementioned activities would jeopardize the continued existence of the MGS in the immediate Project area or throughout the species' range.

(8) Proposed measures to minimize and fully mitigate the impacts of the proposed taking.

General Measures

The following is a list of general impact avoidance and minimization measures that would apply to all Project activities. These measures are standard practices designed to prevent environmental degradation, and the Project applicant will ensure implementation of these measures to avoid and minimize impacts to the greatest extent feasible.

GM-1. All temporary and permanent impact areas will be surveyed for DT and WBO within 30 days prior to commencement of construction activities in the survey area. Rare plant species and special status wildlife species habitat will be identified during rare plant surveys and flagged for avoidance. If construction occurs during or following a high-rainfall year, rare plant surveys will be conducted to identify and flag newly detected populations.

GM-2. The construction contractor(s)/crew(s) will be informed about the biological constraints of the project. All construction personnel who work in the survey area will attend a contractor education program, developed and presented by a project biologist prior to the commencement of construction activity. This Worker Environmental Awareness Program (WEAP) will be included in the BRMIMP. The construction crews and contractor(s) will be responsible for unauthorized impacts from construction activities to sensitive biological resources that are outside the areas defined as subject to impacts by the CEC and other agencies who must issue approvals for the Project.

GM-3. Construction crews and contractors will be responsible for working around all shrubs and trees within the construction zone to the extent feasible. Shrubs and trees will be flagged during rare plant surveys to indicate priority for avoidance.

GM-4. The anticipated impact zones, including staging areas, equipment access, and disposal or temporary placement of spoils, will be delineated with stakes and flagging prior to construction to avoid natural resources where possible. Construction-related activities outside of the impact zone will be avoided.

GM-5. New and existing roads that are planned for either construction or widening will not extend beyond the planned impact area. All vehicles passing or turning around will do so within the planned impact area or in previously disturbed areas. Where new access is required outside of existing roads or the construction zone, the route will be clearly marked (i.e., flagged and/or staked) prior to the onset of construction.

GM-6. The pipeline construction will involve nearly simultaneous trenching, laying of pipe, and backfilling so that no open trenches will be left unattended during daylight hours. Any open trenches that cannot be backfilled will be covered with steel plates at night. Biological monitors will attend pipeline construction to ensure that special status resources are avoided or moved to a safe location when necessary.

GM-7. Spoils will be stockpiled in disturbed areas presently lacking native vegetation. Stockpile areas will be marked to define the limits where stockpiling can occur.

GM-8. Best Management Practices (BMPs) will be employed to prevent loss of habitat due to erosion caused by Project-related impacts (i.e., grading or clearing for new roads). All detected erosion will be remedied within two (2) days of discovery.

GM-9. Fueling of equipment will take place within existing paved roads, and not within or adjacent to drainages or native desert habitats. Contractor equipment will be checked for leaks prior to operation and repaired as necessary.

GM-10. Construction activity will be monitored by a qualified biologist to ensure compliance with avoidance and minimization measures.

GM-11. The Project proponent is supportive of funding a monitoring program to document potential nesting ravens. The details of the funding mechanism and monitoring will be coordinated with the Department, USFWS, and CEC prior to initiation of the Project.

GM-12. A Draft Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) is included as Attachment 3. The BRMIMP comprehensively describes avoidance, minimization, and mitigation measures; document their implementation; and monitor their effectiveness. The introduction of exotic plant species will be controlled by implementation of measures described in the BRMIMP..

Desert Tortoise

Direct and indirect impacts to DT will be avoided, minimized, and fully mitigated through implementation of the following measures.

DT-1. Prior to the onset of construction, the entire plant site (east of the railroad tracks) will be enclosed with a permanent tortoise-proof fence to keep tortoises in habitat adjacent to the site from entering the site during construction and operations phases. The fencing type will be one- by two-inch vertical mesh galvanized fence material, extending at least two feet above the ground and buried at least one foot. Where burial is impossible, the mesh will be bent at a right angle toward the outside of the fence and covered with dirt, rocks, or gravel to prevent the tortoise from digging under the fence. Tortoise-proof gates will be established at all site entry points. Any utility corridors and tower locations will be temporarily fenced to prevent tortoise entry during construction. Temporary fencing will follow guidelines for permanent fencing and supporting stakes will be sufficiently spaced to maintain fence integrity. All fence construction will be monitored by qualified biologists (see DT-3, below) to ensure that no tortoises are harmed. Following installation, the fencing will be inspected monthly and during all major rainfall events. Any damage to the fencing will be repaired immediately.

DT-2. A clearance for any DTs that may be on the site east of SR-14 and the railroad tracks by virtue of connection to adjacent native habitat will be conducted in all areas with shrub cover. A minimum of two clearance passes must be completed and these must coincide with heightened tortoise activity from late March through May and during October. This will maximize the probability of finding all tortoises. It is anticipated that no or very few tortoises will be found. Any tortoises found will be translocated to a location outside of the survey area using techniques approved by Agency Representatives. Translocation should occur only when daily ground temperatures do not exceed 108 °F and air temperatures fall below 90 °F (i.e., early spring or fall), so that animals can safely find refuge in potentially unfamiliar areas without the added constraints of lethal temperatures. No tortoises will be translocated between mid-April and early October, unless ambient temperatures are favorable. If the schedule of construction requires that clearance surveys continue past the safe time to translocate tortoises (i.e., past early April), then continued searches for tortoises would include temporarily affixing found tortoises with transmitters for ease of relocating them and translocating them during autumn, at a safe time for translocation. Once the site is deemed free of DTs after two consecutive clearance passes, heavy equipment will be allowed to enter the site to perform construction activities.

West of SR-14, all tortoises will be removed from fenced construction zones to artificial burrows outside the temporary fencing. Tortoises may be moved during seasons when daily ambient

temperatures exceed lethal levels, but only late in the day when ground temperatures fall below 108 °F and air temperatures fall below 90 °F. These tortoises will be temporarily monitored to ensure that their behaviors resulting from translocation do not affect their survival.

Following site clearance, a report will be prepared by the Authorized Biologist (AB) (see GM-10) to document the clearance surveys, the capture and release locations of all tortoises found, individual tortoise data, and other relevant data. This report will be submitted to Agency Representatives.

DT-3. In the unlikely event that a tortoise is found on the site during Project Operations, the tortoise will be captured, boxed in a clean, escape-proof box, and temporarily maintained in a cool, quiet, safe location until the AB can arrive to remove it from the site, but no more than one day. The capture location will be recorded. If ambient temperatures exceed lethal levels on a daily basis, the AB will confer with the Department and USFWS representatives prior to transporting the tortoise outside the tortoise-proof fence.

DT-4. An AB and Biological Monitor(s) (BM) will be appointed to oversee compliance with the protection measures for the DT and other species. The AB or BM will be on site during fencing activities. The AB or BM will have the right to halt all activities in violation of the tortoise protection measures. Work will proceed only after hazards to the DT are removed and the species is no longer at risk, or the individual has been moved from harm's way by the AB. The AB and BM will have in their possession a copy of all the compliance measures while work is being conducted on site.

DT-5. The proponent will submit the names and statement of qualifications of all proposed ABs and BMs to the USFWS, the Department, and CEC (Agency Representatives) for review and approval at least 30 days prior to initiation of any tortoise handling, clearance, and preactivity surveys. Project activities will not begin until the ABs and BMs are approved by the aforementioned agencies. Only ABs will be allowed to handle and relocate DTs when necessary. The BMs will ensure compliance with the protection measures but will not be allowed to survey for or handle DTs. Workers will notify the AB or BM of all DT observations.

DT-6. The AB and BM will be responsible for awareness trainings, surveys, compliance monitoring, and reporting.

DT-7. Personnel will utilize established roadways (paved or unpaved) in traveling to and from the survey area and also will utilize existing tracks on site whenever possible. Cross-country vehicle and equipment use outside designated work areas will be prohibited. To minimize the

likelihood for vehicle strikes of DTs, a speed limit of 25 miles per hour will be established for travel within DT habitat.

DT-8. A trash abatement program will be established. Trash and food items will be contained in closed containers and removed daily to reduce the attractiveness to opportunistic predators such as common ravens, coyotes (*Canis latrans*), and feral dogs (*Canis lupus*).

DT-9. Workers will be prohibited from bringing pets and firearms to the site.

DT-10. As much as is feasible, parking and storage will occur within the tortoise exclusion fencing. Anytime a vehicle or construction equipment is parked for longer than two minutes in unfenced DT habitat, the ground under the vehicle will be inspected for the presence of DT before the vehicle is moved. If a DT is observed, it will be left to move on its own. If the DT does not move within 15 minutes, the AB will remove and relocate the animal to a safe location.

DT-11. All vehicles and equipment will be in proper working condition to ensure there is no potential for fugitive emissions of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials. The AB and BM will be informed of any hazardous spills within 24 hours. Hazardous spills will be immediately cleaned up and the contaminated soil will be properly disposed of at a licensed facility.

DT-12. Intentional killing or collection of either plant or wildlife species, including listed species such as the DT, in the survey area and surrounding areas will be prohibited. The AB, BM, and Agency Representatives will be notified of any such occurrences within 24 hours.

DT-13. For emergency response situations, the AB will notify the Agency Representatives within 24 hours. As a part of this response, the Agency Representatives may require additional measures to protect the DT. During any responses related to human health, fire, hazardous waste, or repairs requiring off-road vehicle and equipment use, the Agency Representatives may also require measures to recover damaged habitat.

DT-14. Water will be applied to the construction ROW, dirt roads, trenches, spoil piles, and other areas where ground disturbance has taken place to minimize dust emissions and topsoil erosion. During the DT active season, a BM will patrol these areas to ensure water does not puddle for long periods of time and attract DTs, common ravens, and other wildlife to the site.

DT-15. Upon locating a dead or injured DT, the AB will make initial notification to the Agency Representatives within 24 hours of its finding. The notification must be made by telephone and

writing to the nearest USFWS Field Office (the Ventura Field Office in this case). The report will include the date and time of the finding or incident (if known), location of the carcass, a photograph, cause of death (if known), and other pertinent information. Tortoises fatally injured as a result of Project-related activities will be submitted for necropsy as outlined in Salvaging Injured, Recently Dead, Ill, and Dying Wild, Free-Roaming Desert Tortoises (*Gopherus agassizii*) (Berry 2003). Tortoises with fewer major injuries will be transported to a nearby qualified veterinarian for treatment at the expense of the proponent. If an injured animal recovers, the offices of the Agency Representatives will be contacted for final disposition of the animal.

DT-16. On a monthly basis until construction is completed, the AB will prepare a brief report for the Agency Representatives, documenting the effectiveness and practicality of the protection measures that are in place and making recommendations for modifying the measures to enhance species protection, as needed. The report will also provide information on the overall biological resources-related activities conducted, including the worker awareness training; clearance/preactivity surveys; monitoring activities; and any observed DTs, including injuries and fatalities.

DT-17. The Project proponent will compensate for impacts to DT habitat in the area west of the plant site potentially affected during construction activities related to the transmission line. This will be accomplished either by land acquisition acceptable to the USFWS, the Department, and CEC or an assessed financial contribution calculated based on the final construction footprint. With the implementation of the Project under transmission line route Option 1, direct permanent and temporary impacts to 5.0 acres of potential DT habitat (5.8 acres if Option 2 is adopted) would be mitigated at a 1:1 ratio (Table 2). A 1:1 ratio is considered to be sufficient because: a) the documented degraded quality of habitats adjacent to well-traveled roads; and b) the minor biological significance of the small and dispersed surface disturbance resulting from construction of the transmission line. Habitat conservation generally consists of the offsite purchase of in-kind habitat of equal or greater value than that impacted. Funding for the long-term management of the land preserved will also be required. The location of the preserved land and the management program will be negotiated between the resource agencies (including the CEC) and the Project applicant.

In addition to the avoidance and minimization measures outlined above, the Project proponent would implement any measures required by the CEC, the Department and USFWS as a condition of Project certification.

Table 2
Proposed Mitigation for Permanent Impacts to Habitats for Listed Wildlife Species in the BSEP Area

Listed Species Habitat	Type of Impact	Approved Mitigation Ratio	Transmission Option 1		Transmission Option 2	
			Total Impact Acreage	Required Compensatory Mitigation Acreage	Total Impact Acreage	Required Compensatory Mitigation Acreage
Desert Tortoise	Permanent	1:1	5.0	5.0	5.8	5.8
Mohave Ground Squirrel	Permanent	2:1	5.0	10.0	5.8	11.6
Total				**10.0**[1]		**11.6**[1]

[1] Desert tortoise and potential Mohave ground squirrel habitat co-occur in the Project area; therefore, compensatory mitigation acreage will be at the greater of the two ratios.

Mohave Ground Squirrel

Direct and indirect impacts to MGS will be avoided, minimized, and fully mitigated through implementation of the following measures.

MGS-1. Mitigation requirements to avoid or minimize permanent direct impacts to the MGS will include onsite monitoring of ground disturbance activities by a qualified biologist in all areas with the potential to support the MGS. During construction activities, monthly and final compliance reports shall be provided to the Department and other relevant regulatory agencies documenting the effectiveness of mitigation measures and the level of take associated with this Project.

MGS-2. Although it is not anticipated that an MGS will be encountered within the plant site, the AB will monitor any ground disturbance in areas with the potential to support the species. If an MGS is encountered during construction monitoring, the AB will allow the MGS to escape out of harm's way if the work area is not fenced off. If the MGS is within a construction area that is fenced such that the fence poses a barrier to escape, the Department will be consulted regarding the need for a trapping effort to relocate any MGS.

MGS-3. Indirect impacts from vehicle strikes will be minimized by employee education on the proper procedures for operating vehicles on the site, including using proper vigilance to avoid wildlife, maintaining safe speed limits on access/patrol roads, and prohibiting travel off the established roadways.

MGS-4. To compensate for the direct permanent loss of 5.0 acres (5.8 acres if Option 2 is adopted) of potential MGS habitat west of SR-14, all of which is also DT habitat, land will be preserved at a 2:1 replacement ratio in a location approved by the Department and CEC (Table 2). This mitigation ratio is appropriate because the habitat quality was determined to be moderate. Funding for the long-term management of the land preserved (on a per-acre of impact basis) will be negotiated by the Department and CEC, and a fee title or conservation easement shall be granted to the Department or other Department-approved nonprofit entity.

(9) A proposed plan to monitor compliance with the minimization and mitigation measures and the effectiveness of the measures.

A Draft Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) is presented in Attachment 3.

(10) A description of the funding source and the level of funding available for implementation of the minimization and mitigation measures.

Beacon Solar, as the Project applicant, will provide financial assurances to guarantee that an adequate level of funding is available to implement all minimization, mitigation, and compensation measures identified in the California Endangered Species Act (CESA) Section 2081 permit. These funds will be used solely for implementation of the minimization, mitigation, and compensation measures associated with the Project.

Compensation Lands Acquisition

Beacon Solar shall complete acquisition of the proposed Compensation Lands prior to initiating ground-disturbing Project activities, unless financial assurance is provided to the Department in the form of an irrevocable letter of credit, a pledged savings account or another form of security ("Security") approved by the Department Office of the General Counsel, to ensure funding in the amount of $25,500 or $29,580 (if Option 2 is adopted).

The amount of the Security is calculated as follows:

1. Land acquisition costs for Compensation Lands, calculated at $1000/acre for 10.0 acres (11.6 acres if Option 2 is adopted): $10,000; or $11,600 (if Option 2 is adopted)

2. Costs of enhancing Compensation Lands, calculated at $250/acre for 10.0 acres (11.6 acres if Option 2 is adopted): $2,500; or $2,900 (if Option 2 is adopted)

3. Costs of establishing an endowment for long-term management of Compensation Lands, calculated at $1300 /acre for 10.0 acres (11.6 acres if Option 2 is adopted): $13,000 or $15,080 (if Option 2 is adopted)

If Security is provided, Beacon Solar, or a third party entity approved by the Department, CEC and USFWS, shall complete the proposed Compensation Lands acquisition within eighteen (18) months of the start of Project ground-disturbing activities. A minimum of three months prior to acquisition of the 10.0 acres (11.6 acres if Option 2 is adopted) of Compensation Lands, Beacon Solar, or a third party entity approved by the Department, CEC and USFWS, shall submit to the Department for approval a formal acquisition proposal identifying specific properties comprising the 11.6 acres that will be purchased. All of the parcels comprising the 10.0 acres (11.6 acres if Option 2 is adopted) would be approved in advance of purchase by the Department, CEC and USFWS. The Compensation Lands are expected to be acquired in the western Mojave Desert and are expected to promote conservation of both the DT and MGS.

Enhancement and Endowment Fees for Compensation Lands

Beacon Solar will pay permanent per-acre endowment fees, the amount of which will be determined by conducting a Property Analysis Record (PAR) or PAR-like analysis for the Compensation Lands to be purchased as mitigation. Following the Department's field review of the selected 10.0 acres (11.6 acres if Option 2 is adopted) of Compensation Lands, Beacon Solar, or a third party entity approved by the Department, CEC and USFWS, will work with the Department and USFWS to determine an enhancement fee as appropriate for fencing, surveys, and habitat restoration.

Compensation Lands Acquisition Conditions

In conjunction with the Beacon Solar funding obligations related to the Compensation Land actions and following the Department's field review and approval of the proposed 10.0 acres (11.6 acres if Option 2 is adopted) to be purchased, Beacon Solar, or a third party entity approved by the Department, CEC and USFWS, shall comply with the following conditions:

a) Preliminary Report: Provide a recent preliminary title report, initial hazardous materials survey report, biological analysis, and other necessary documents for the proposed 10.0-acre purchase (11.6 acres if Option 2 is adopted) [and/or conservation easement]. All documents

conveying or conserving Compensation Lands and all conditions of title/easement are subject to the approval of the Department, the California Department of General Services and, if applicable, the Fish and Game Commission.

b) Title/Conveyance: Transfer fee title to the 10.0 acres (11.6 acres if Option 2 is adopted) of Compensation Lands to the Department or an organization approved by the Department under terms approved by the Department. Convey a conservation easement on the 10.0 acres (11.6 acres if Option 2 is adopted) of Compensation Lands to the Department or an organization approved by the Department under terms approved by the Department and Beacon Solar.

c) Enhancement Fund (as necessary): Fund the initial protection and enhancement of the 10.0 acres (11.6 acres if Option 2 is adopted) by providing to the Department, or a third party entity approved by the Department, CEC and USFWS, an appropriate amount as determined by the Department field review of the land as discussed above.

d) Endowment Fund: Prior to ground-disturbing expansion Project activities, provide to the Department, or a third party entity approved by the Department, CEC and USFWS, a permanent capital endowment in the amount determined through the PAR analysis that will be conducted for the 10.0 acres (11.6 acres if Option 2 is adopted) of Compensation Lands. Interest from this amount shall be available for reinvestment into the principal and for the long-term operation, management, and protection of the Compensation Lands, including reasonable administrative overhead, biological monitoring, improvements to carrying capacity, law enforcement measures, and any other action designed to protect or improve the habitat values of the Compensation Lands. The endowment principal shall not be drawn upon unless such withdrawal is deemed necessary by the Department, or a third party entity approved by the Department, CEC and USFWS, to ensure the continued viability of the species on the 10.0 acres (11.6 acres if Option 2 is adopted). Monies received by the Department pursuant to this provision shall be deposited in a special deposit account established pursuant to Government Code §16370. The Department may pool the endowment with other endowments for the operation, management, and protection of the 10.0 acres (11.6 acres if Option 2 is adopted) for local populations of the Covered Species.

e) Security Deposit: Beacon Solar may proceed with ground-disturbing Project activities before fully performing its duties and obligations as set forth above only if Beacon Solar secures its performance by providing to the Department funding, or the Department approves administrative proof of funding, necessary to cover land acquisition and easement costs, fencing/cleanup costs and, as necessary, initial protection and enhancement of the acquired

10.0 acres (11.6 acres if Option 2 is adopted). If the Security is provided to allow the commencement of Project disturbance prior to completion of compensation actions, Beacon Solar, or a third party entity approved by the Department, CEC and USFWS, must complete the required actions no later than 18 months after the start of the ground-disturbing activities. The Security will provide that the Department, or a third party entity approved by the Department, CEC and USFWS, may draw on the principal sum if it is determined that Beacon Solar has failed to comply with the Conditions of Approval of the CESA 2081 Permit. The Security will be returned to Beacon Solar upon completion of the legal transfer of the Compensation Lands to the Department, or upon completion of an implementation agreement with a third-party mitigation banking entity, acceptable to the Department, CEC and USFWS, to acquire and/or manage the Compensation Lands.

f) Reimbursement Fund: Provide reimbursement to the Department for reasonable expenses incurred during title, easement, and documentation review; expenses incurred from other state agency reviews; and overhead related to providing Compensation Lands to the Department.

If all actions for Compensation Lands described above are not completed within 18 months of initial ground-disturbing activity, Beacon Solar shall consult with the Department and possibly develop alternate compensation land proposals subject to the above requirements.

Beacon Solar is responsible for all Compensation Lands acquisition/easement costs, including but not limited to title and document review costs, as well as expenses incurred from other state agency reviews and overhead related to providing Compensation Lands to the Department; escrow fees or costs; toxic waste clearance; and other site cleanup measures.

Biological Resources Mitigation Implementation and Monitoring Plan

Beacon Solar shall fully fund all expenditures required to implement the preceding avoidance, minimization, and mitigation measures and to monitor compliance with and effectiveness of those measures, as well as all other related costs. This is separate, and in addition to, the above Compensation Land proposed actions.

(11) Certification

I certify that the information in this application is complete and accurate to the best of my knowledge and belief. I understand that any false statement herein may subject me to suspension or revocation of this permit and to civil and criminal penalties under the laws of the State of California

Kenneth Stein, Beacon Solar, LLC

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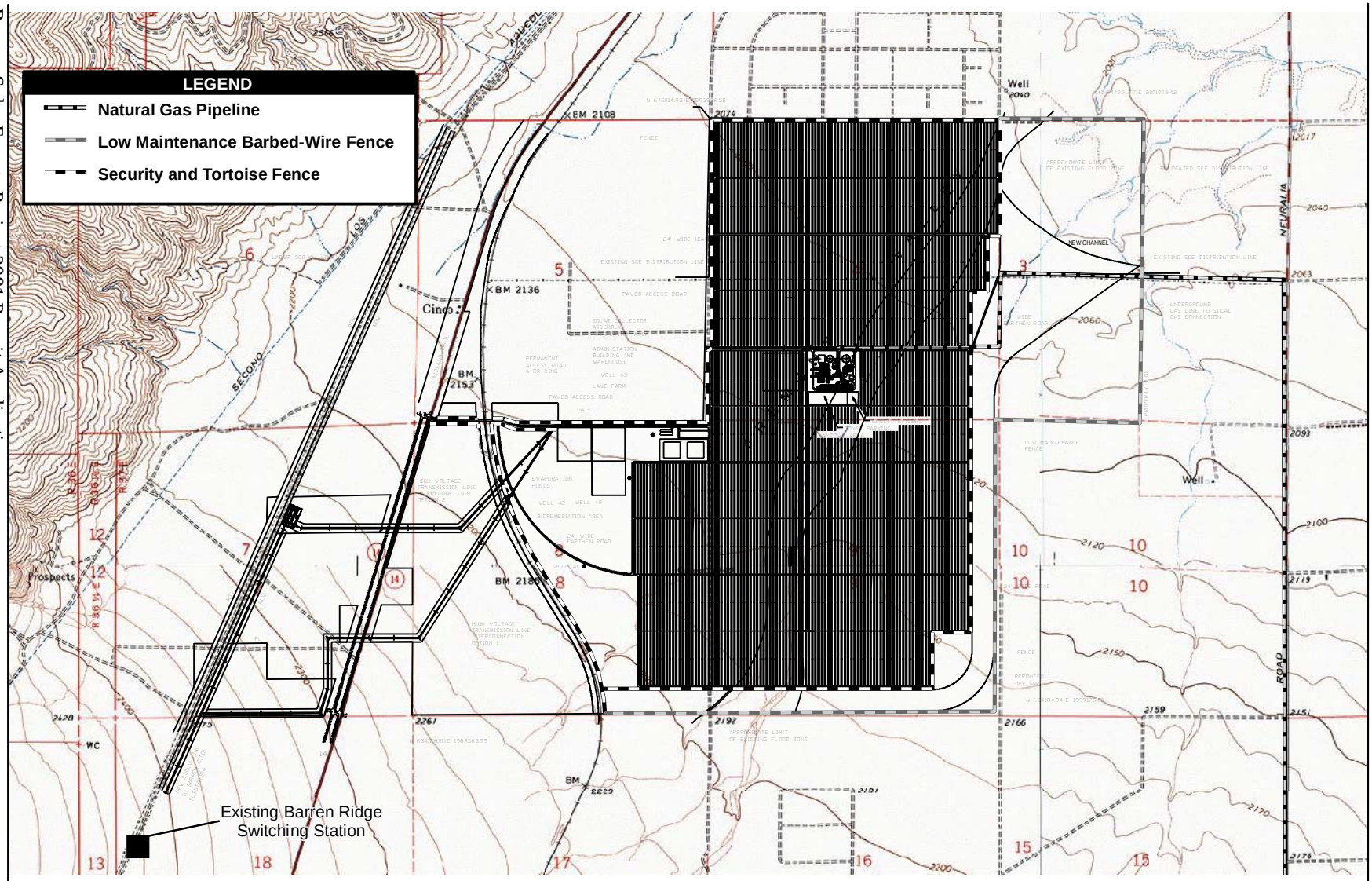
ATTACHMENT 1

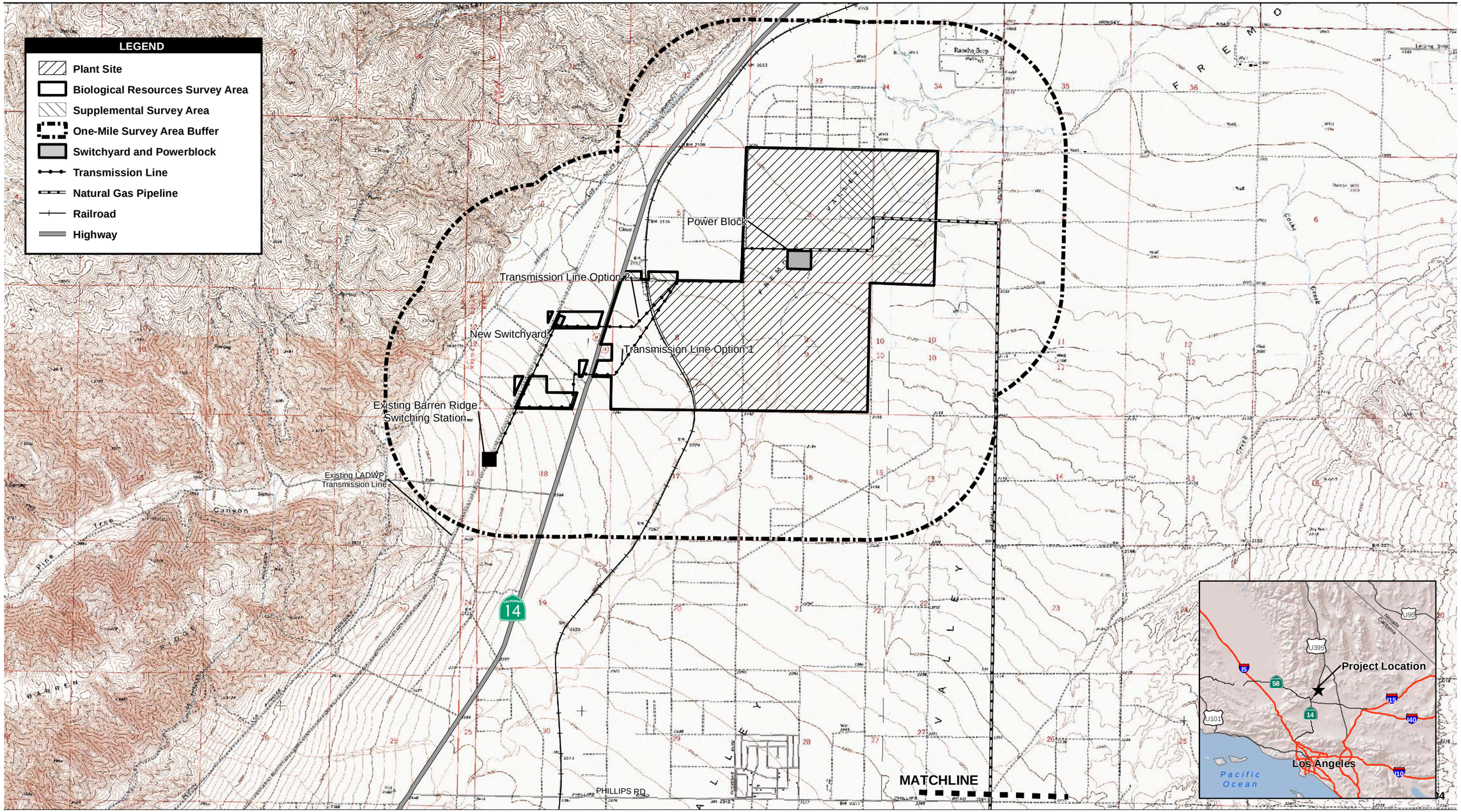
FIGURES

Beacon Solar Energy Project 2081 Permit Application



Source: USGS 2007; WorleyParsons 2007

Figure 1
Facilities Layout



Source: TetraTech 2007; Kern County 2007; USGS 2007; WorleyParsons 2008

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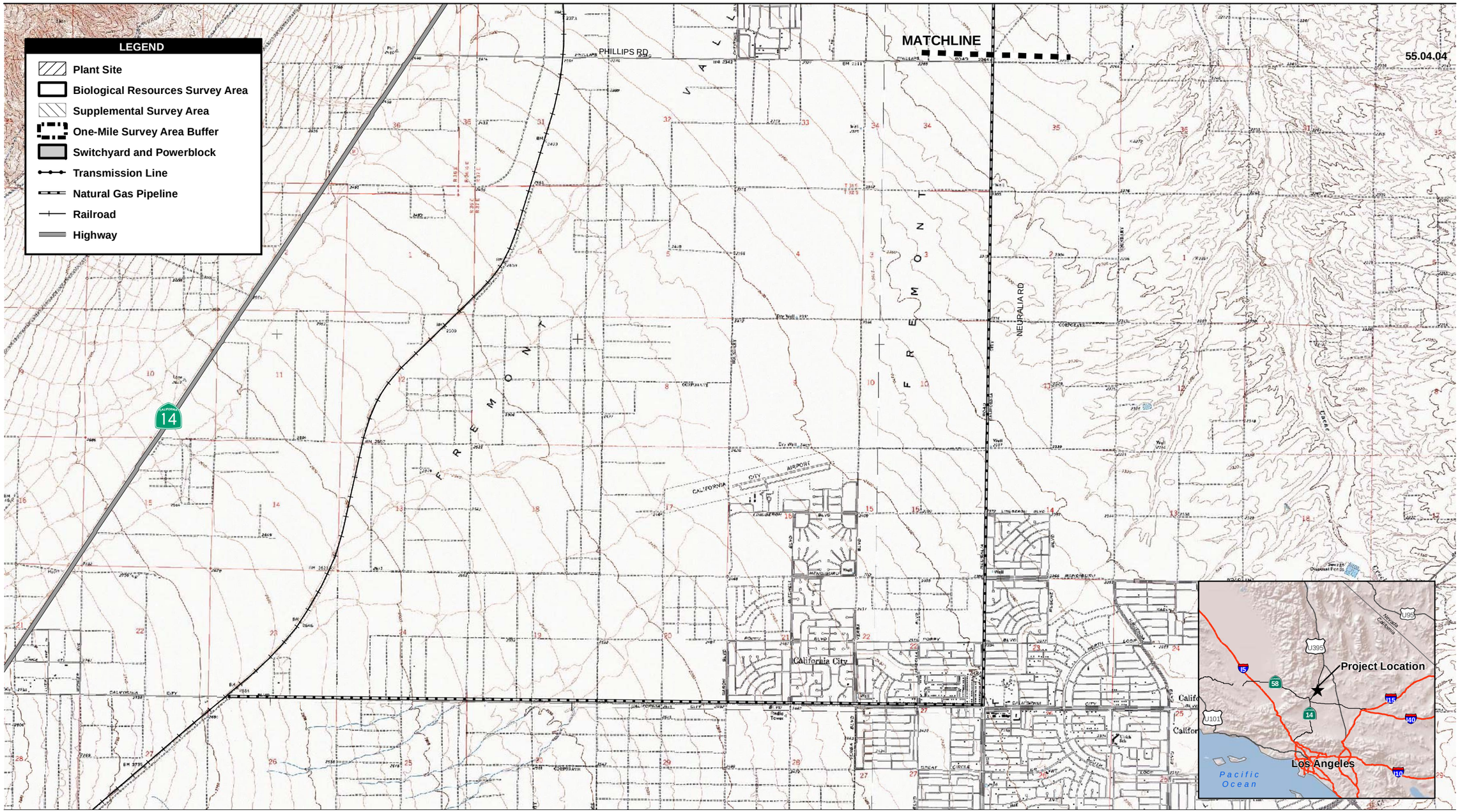
Scale: 1:48,000; 1 inch = 4,000 feet

Figure 2a
Project Site Boundary and Survey Area

Path: P:\2008\08080001 FPLE Proj Beacon Solar\5GIS\MXD\2081 Incidental Take Permit\Figure 2 Vicinity Map.mxd, 03/27/08, MorenoP



Source: TetraTech 2007; Kern County 2007; USGS 2007; WorleyParsons 2008

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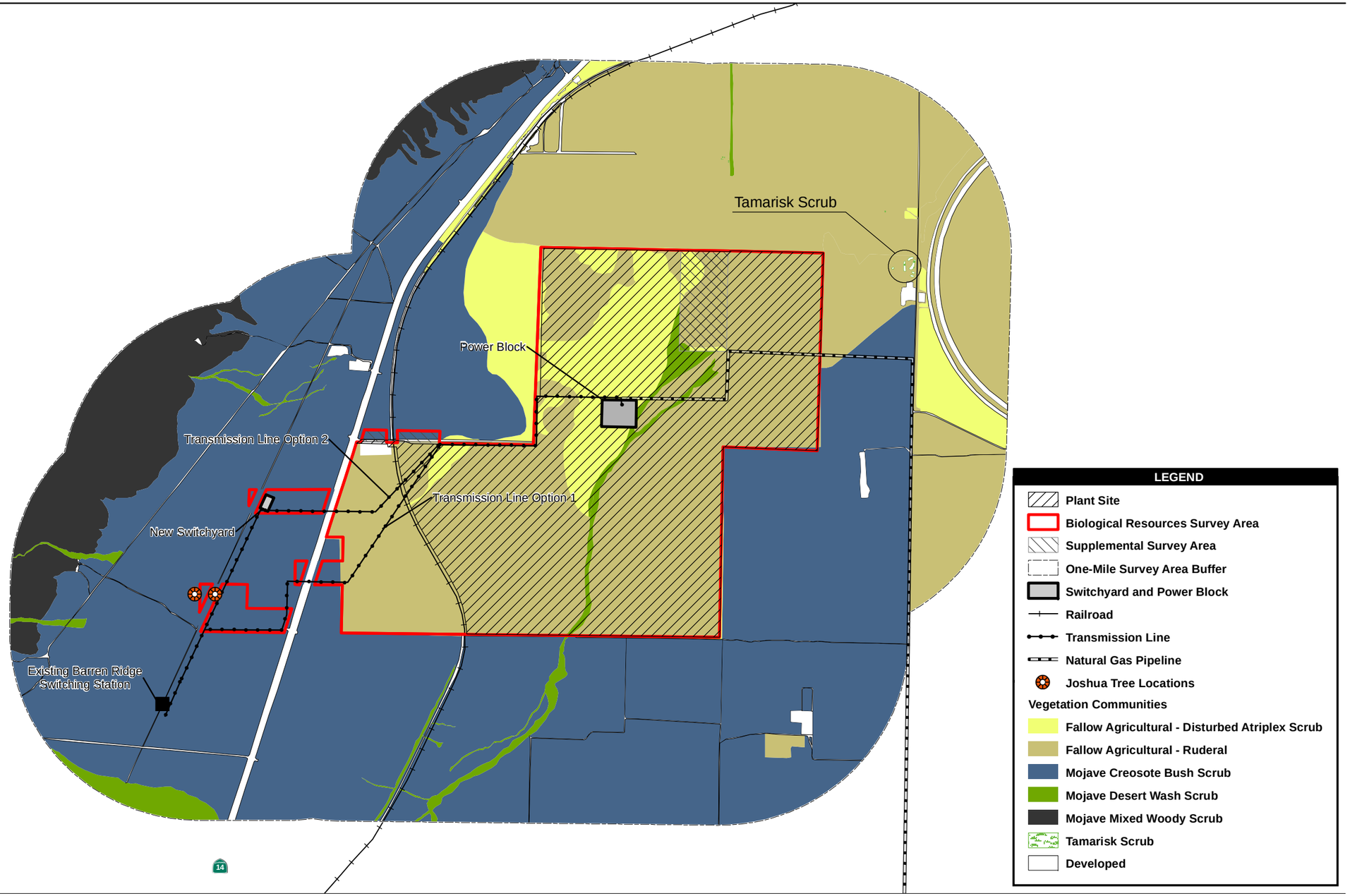
Scale: 1:48,000; 1 inch = 4,000 feet

Figure 2b
Project Site Boundary and Survey Area

Path: P:\2008\08080001 FPLE Proj Beacon Solar\5GIS\MXD\2081 Incidental Take Permit\Figure 2 Vicinity Map.mxd, 03/27/08, MorenoP



Source: NAIP 2005; EDAW 2007; TetraTech 2007; WorleyParsons 2007; Kern County 2007

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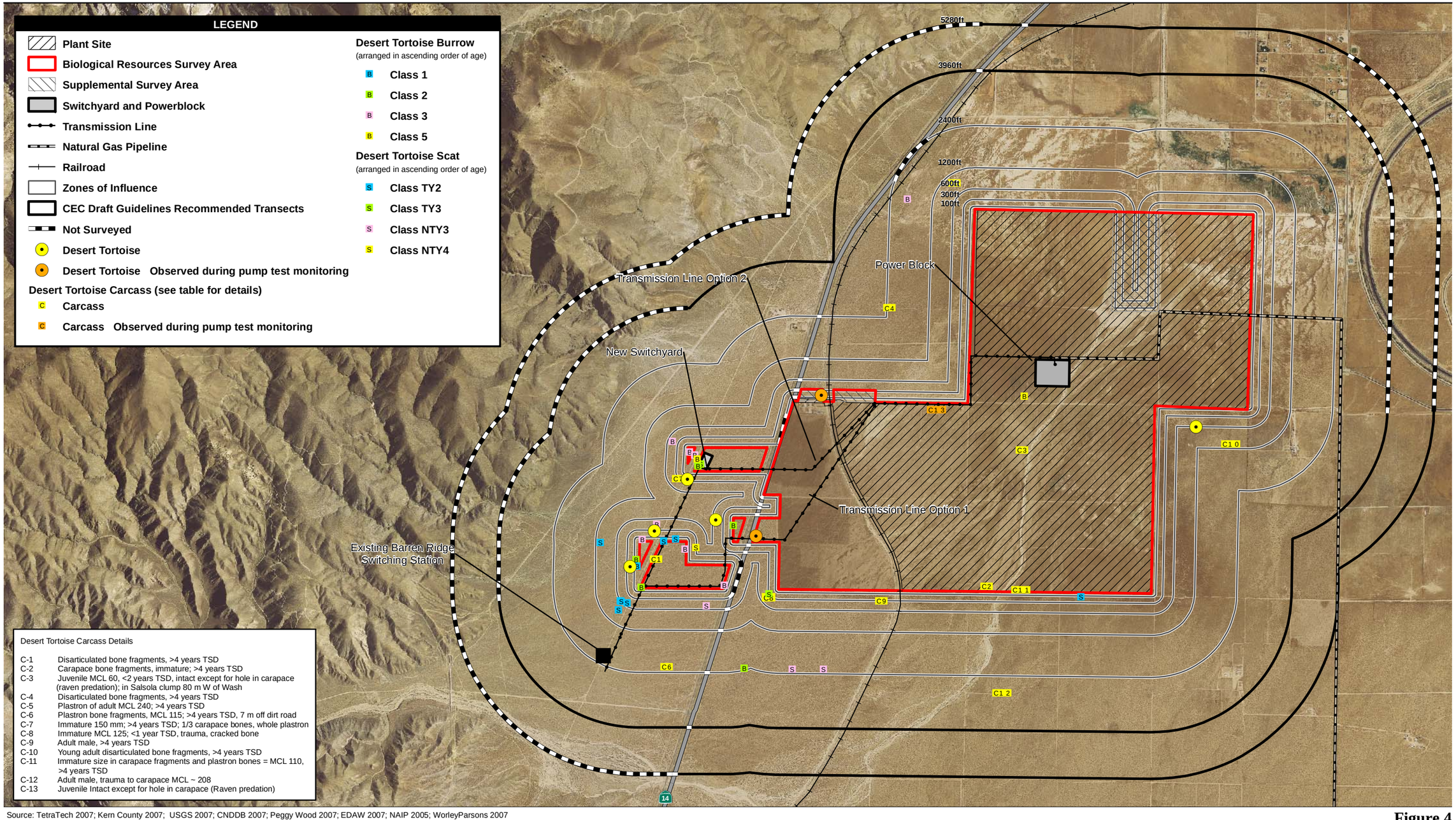
Scale: 1:36,000; 1 inch = 3,000 feet

Figure 3
Vegetation Communities

Path: P:\2008\08080001 FPLE Proj Beacon Solar\5GIS\MXD\2081 Incidental Take Permit\Figure 3 Vegetation Communities.mxd, 02/26/08, KochertE



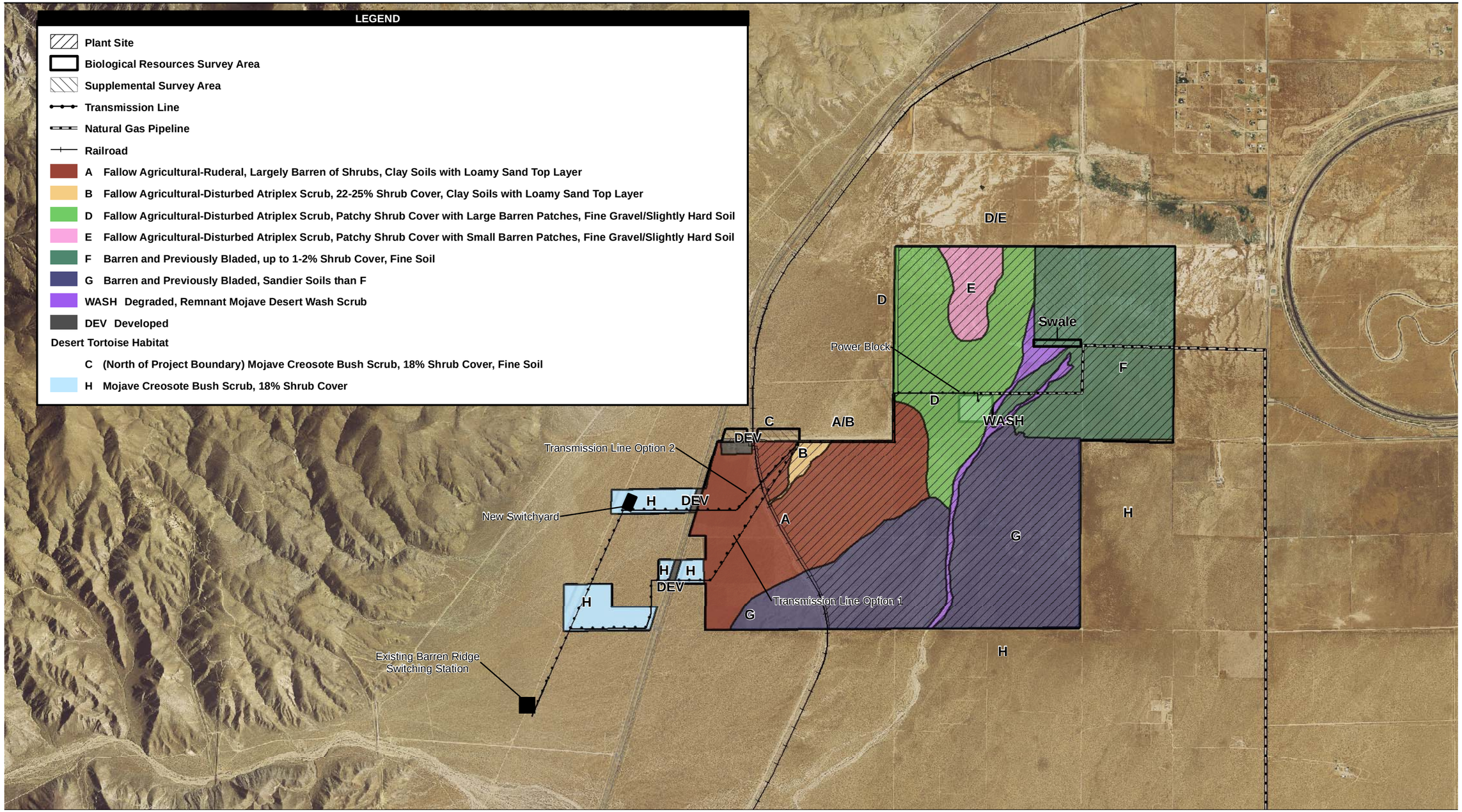
Source: TetraTech 2007; Kern County 2007; USGS 2007; CNDDB 2007; Peggy Wood 2007; EDAW 2007; NAIP 2005; WorleyParsons 2007

2,750 1,375 0 2,750 Feet

Scale: 1:33,000; 1 inch = 2,750 feet

Figure 4
Desert Tortoise and Sign from Surveys and Site Visits

Path: P:\2008\08080001 FPLE Proj Beacon Solar\5GIS\MXD\2081 Incidental Take Permit\Figure 4 DesertTortoise.mxd, 02/26/08, KochertE



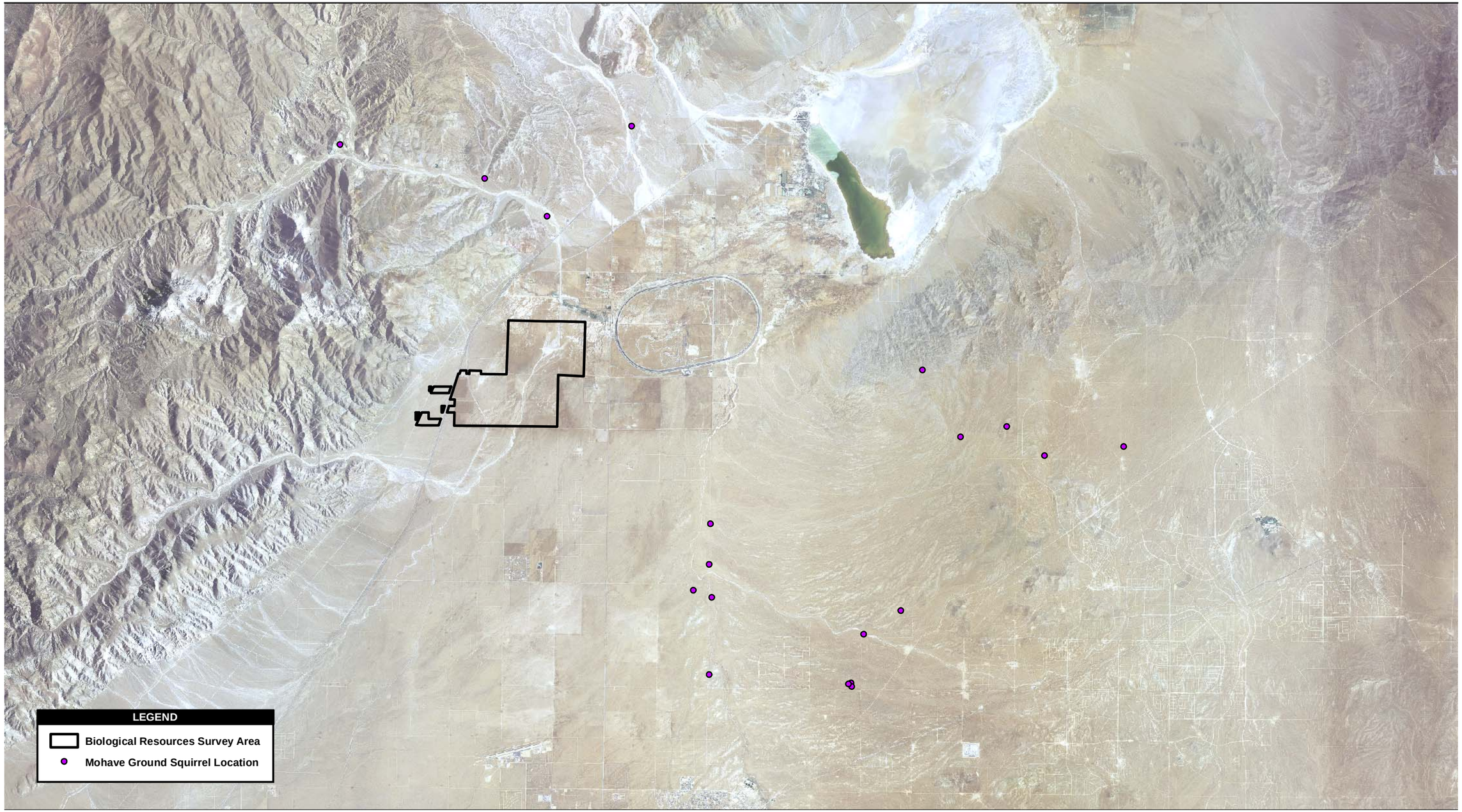
Source: NAIP 2005; EDAW 2007; WorleyParsons 2007; Alice Karl 2007

2,750 1,375 0 2,750 Feet

Scale: 1:33,000; 1 inch = 2,750 feet

Figure 5
Habitat Types in the Survey Area

Path: P:\2008\08080001 FPLE Proj Beacon Solar\5GIS\MXD\2081 Incidental Take Permit\Figure 5 Habitat Types.mxd, 02/26/08, KochertE



Source: NAIP 2005; Leitner 2007

10,000 5,000 0 10,000 Feet

Scale: 1:120,000; 1 inch = 10,000 feet

Figure 6
Known Mohave Ground Squirrel Locations

Path: P:\2008\08080001 FPLE Proj Beacon Solar\5GIS\MXD\2081 Incidental Take Permit\Figure 6 Known MGS Locations.mxd, 02/26/08, KochertE

ATTACHMENT 2

TECHNICAL REPORTS

EXCERPTS
(Chapter 2, Chapter 3, and Chapter 4)
FROM

BEACON SOLAR ENERGY PROJECT
BIOLOGICAL TECHNICAL REPORT
KERN COUNTY, CALIFORNIA

February 2008

CHAPTER 2
METHODOLOGY

2.1 DATABASE RESEARCH

2.1.1 Special Status Biological Resources

Prior to beginning field surveys, EDAW biologists consulted the California Department of Fish and Game (CDFG) California Natural Diversity Database (CNDDB) (RareFind Version 3.1.0; CDFG 2007), California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants (CNPS 2007), and the Natural Resources Conservation Service Web Soil Survey (USDA 2007). These resources were consulted to determine historic occurrence of special status plant and wildlife species and other natural resources within the proposed Beacon Solar Energy Project survey area and a surrounding one-mile buffer, as required by the CEC (Figure 4). Additionally, the U.S. Fish and Wildlife Service (USFWS) provided a letter listing special status species that they require to be considered. Species were considered to have special status if they are covered under the federal or California Endangered Species Act (ESA and CESA, respectively), a CDFG species of special concern (SSC), CDFG fully protected species, species that are covered under the Bald and Golden Eagle Protection Act (BGEPA) (USFWS 2007), or species listed by the CNPS as List 1A (presumed extinct in California), 1B (rare, threatened, and endangered in California and elsewhere), or 2 (rare, threatened, or endangered in California, but more common elsewhere). CNPS List 1A, 1B, and 2 species are considered special status plant species if they meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act) or Sections 2050 through 2098 (CESA).

Habitat conditions for special status species were evaluated with respect to conditions in the survey area, and surveys were initiated to determine presence/absence of species with the potential to occur on or near the survey area. The following special status species were identified as having the potential to occur on or near the survey area. These species are discussed in detail in the Existing Conditions section of this BTR.

Federal or State Listed (ESA or CESA)

- Mojave tarplant (*Deinandra mojavensis*) – CNPS List 1B, CESA endangered
- Mojave desert tortoise (*Gopherus agassizii*) – ESA and CESA threatened
- American peregrine falcon (*Falco peregrinus anatum*) – CESA endangered
- Mohave ground squirrel (*Spermophilus mohavensis*) – CESA threatened

CDFG Species of Special Concern or CNPS List 1A, 1B, or 2

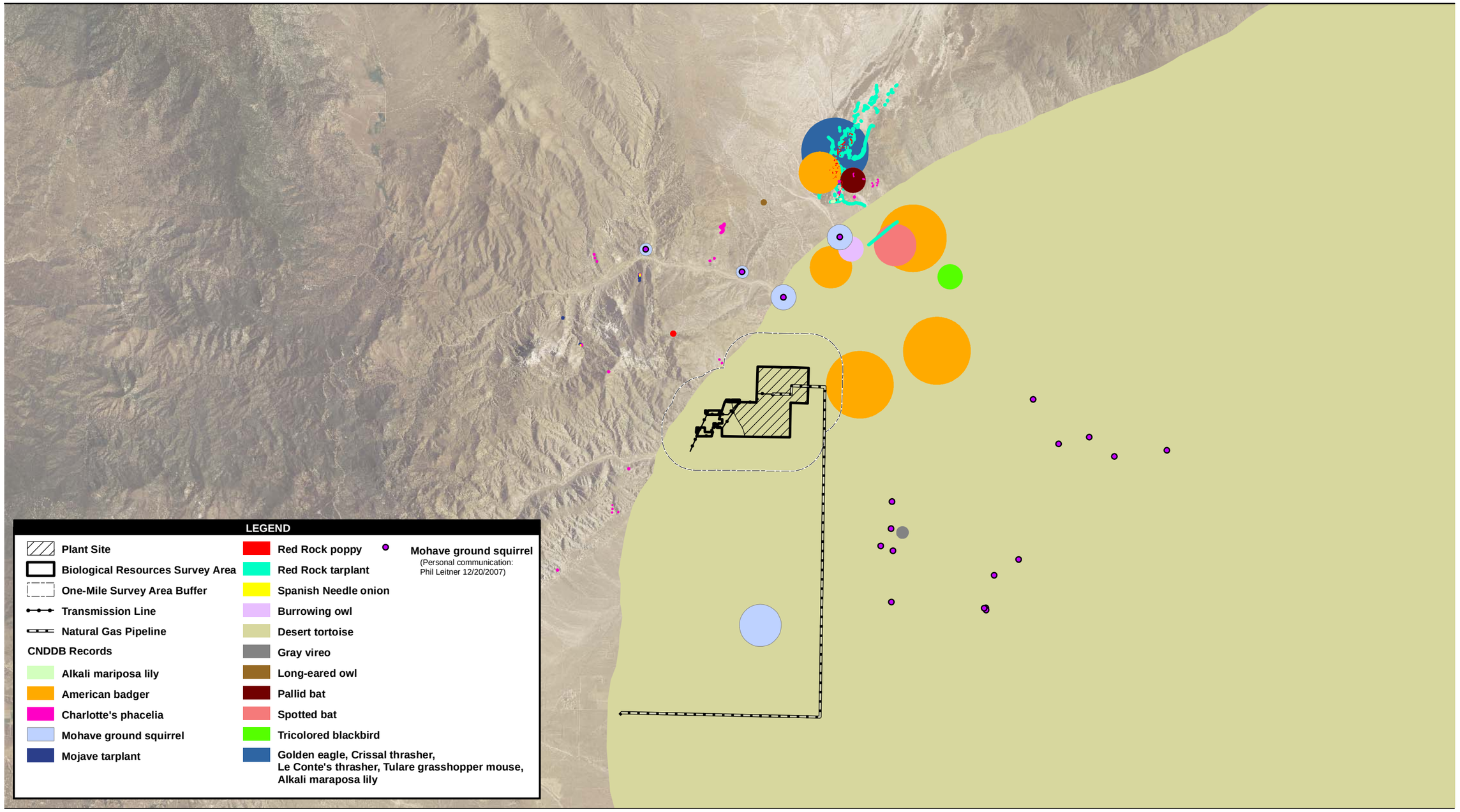
- Red Rock tarplant (*Deinandra arida*) – CNPS List 1B, CDFG rare
- Alkali mariposa lily (*Calochortus striatus*) – CNPS List 1B
- Red Rock poppy (*Eschscholzia minutiflora* ssp. *twisselmannii*) – CNPS List 1B
- Creamy blazing star (*Mentzelia tridentata*) – CNPS List 1B
- Charlotte's phacelia (*Phacelia nashiana*) – CNPS List 1B
- Northern harrier (*Circus cyaneus*) – CDFG SSC
- Western burrowing owl (*Athene cunicularia*) – CDFG SSC
- Loggerhead shrike (*Lanius ludovicianus*) – CDFG SSC
- California horned lark (*Eremophila alpestris actia*) – CDFG SSC
- Le Conte's thrasher (*Toxostoma lecontei*) – CDFG SSC
- American badger (*Taxidea taxus*) – CDFG SSC

Two special status wildlife species listed under the federal ESA were erroneously documented in the CNDDB as occurring on or near the survey area. Locations of western snowy plover (*Charadrius alexandrinus nivosus*) and San Joaquin kit fox (*Vulpes macrotis mutica*) near the site are misrepresented and/or misidentified within the CNDDB and likely were individuals from nonsensitive populations of these species (inland snowy plover and desert kit fox [*Vulpes macrotis arsipus*]) (pers. comm., Annette Tenneboe, CDFG). Therefore, protocol surveys for these two species were not considered necessary.

The West Mojave Plan (U.S. Bureau of Land Management [BLM] 2005) was consulted for maps of lands designated for the Mohave Ground Squirrel Conservation Area, documentation of sensitive vegetation communities, and to generate a base vegetation layer to be refined in the field. No working Natural Communities Conservation Plan is currently available for private lands in this area.

2.2 SURVEY PROTOCOLS

Comprehensive biological resource surveys designed to meet all applicable CEC, CDFG and USFWS requirements were conducted in the spring of 2007 and are summarized, below. Because the plant site was still being refined at the time that biological resources surveys were initiated in the spring of 2007, Beacon Solar, LLC chose to survey a large area including all property currently available for purchase that was intended to incorporate all potential facilities designs. This 2,317.2-acre survey area is generally depicted in Figure 1 as the Biological Resources Survey Area. However, after completion of those surveys, a a number of areas were added to the Project and, therefore, were not subject to 100 percent survey coverage during the



Source: Tetra Tech 2007; Kern County 2007; CNDDB 2007; NAIP 2005

15,000 7,500 0 15,000 Feet

Scale: 1:180,000; 1 inch = 15,000 feet

Figure 4
Historic Biological Resources

Path: P:\2008\08080001 FPLE Proj Beacon Solar\5GIS\MXD\Bio Technical Report\Figure 4 Historic Biological Resources.mxd, 02/26/08, KochertE

2007 surveys, but are included within the Biological Survey Area boundary and noted as Supplemental Survey Areas. These are:

- An approximately 80-acre parcel in the north-central portion of the plant site and a narrow, approximately 30-ft wide strip of land along the northeast boundary of the plant site; and

- Approximately 0.5 mile of the gas pipeline route, between the eastern edge of the plant site, extending west to Neuralia Road

The 80-acre parcel and the narrow strip of land, both within the plant site boundary, are being subject to all of the same required biological resource-related surveys in the spring of 2008 that were conducted in the spring of 2007. Like the rest of the plant site, these areas are highly disturbed from past agricultural activities and the surveys are not expected to reveal any new information that would materially affect environmental impact analyses. While neither area was subject to the same 100 percent survey coverage as the rest of the plant site in 2007, several of the required 2007 zone of influence (ZOI) transects crossed the areas and generated sufficient information to suggest that the 2008 spring surveys will yield results similar to the 2007 surveys for the rest of the plant site.

The gas pipeline will be constructed entirely within the disturbed shoulders of existing roads (or within the road bed), except for the last 1.8 miles (1.3 miles within the plant site, and 0.5 between the plant site and Neuralia Road) where the pipeline is proposed to be installed within an already-disturbed SCE distribution line right of way. Spring 2008 surveys will include that segment of the gas pipeline.

Beacon Solar believes that the areas within which the two transmission line options occur were adequately during the 2007 spring surveys since much of the land was either included in the 100 percent coverage survey area or was crossed multiple times by ZOI transects. Nevertheless, because the centerlines/footprints of those options have been more accurately defined since the 2007 spring surveys were conducted, both transmission line option routes will also be surveyed in spring 2008.

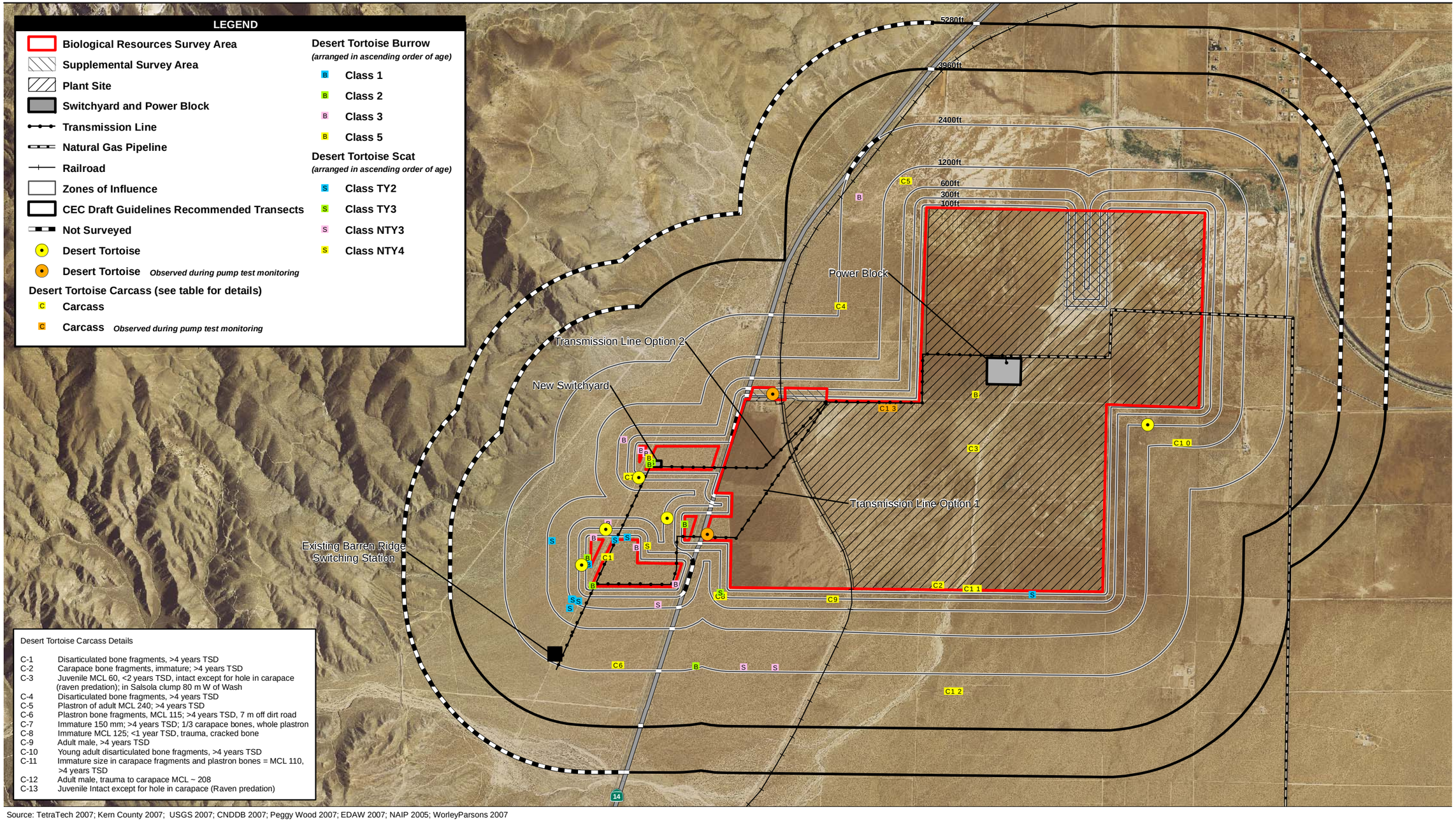
2.2.1 California Energy Commission Survey Guidelines

On May 8, 2007 at a pre-application meeting, the CEC provided Beacon Solar, LLC with Draft Recommended Biological Resources Field Survey Guidelines for Large Solar Projects, dated

May 8, 2007, (hereafter referred to as CEC Draft Guidelines). The CEC Draft Guidelines recommend that biological surveys be conducted according to established protocols within and around the proposed plant site, and additional surveys be conducted as necessary in order to ultimately cover a one-mile buffer around the plant site to evaluate suitable habitat and record occurrence and sign of special status species in this area. The CEC Draft Guidelines were also intended to evaluate potential wildlife habitat and corridors in the Project vicinity that may be disrupted as a result of Project implementation.

Because the plant site was still being refined at the time that biological resource surveys were initiated in the spring of 2007, Beacon Solar, LLC chose to survey a large area including all property currently available for purchase that was intended to incorporate all potential facilities designs. This 2,317.2-acre survey area is depicted in Figure 2 and most of the other figures in this report. Because this survey area would be subject to USFWS protocol desert tortoise surveys, including surrounding zone of influence (ZOI) transects out to 2,400 feet, the CEC agreed in the pre-application meeting that two additional transects – one at ¾ mile and one at one mile – would be appropriate for meeting the CEC Draft Guideline one-mile buffer requirement. These two additional CEC-recommended transects are depicted in Figure 5. After surveys for this report were completed, two small, (84.2 acre and 14.3 acre) parcels were added to the plant site. Although initial surveys did not entirely encompass these new parcels, they were originally included in the one-mile buffer and surveyed accordingly.

As shown in Figure 5 with dashed lines, certain sections of the ¾-mile and one-mile CEC-recommended transects were not surveyed either because the area was completely disturbed (e.g., roadways or privately-developed land), terrain was difficult to traverse, or because access to private lands was not available. In these areas, the biological resources are expected to be similar to those already documented along the completed sections of the CEC transects in the same vegetation communities. Surveys were not performed in the mountainous areas because permission to access was not granted by the owner. It was determined that any biological resources information obtained from surveying these areas is not likely to contribute materially to impact analysis. Furthermore, much of the unsurveyed area is to the west of SR-14, which is across the highway from the area where the bulk of Project facilities and activities will occur. Qualifications of field biologists involved in the Project are presented in Attachment B.



Source: TetraTech 2007; Kern County 2007; USGS 2007; CNDDB 2007; Peggy Wood 2007; EDAW 2007; NAIP 2005; WorleyParsons 2007

2,750 1,375 0 2,750 Feet

Scale: 1:33,000; 1 inch = 2,750 feet

Figure 5
Desert Tortoise and Sign

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2.2.2 Vegetation Communities and Flora

EDAW biologists Bruce Hanson, Scott McMillan, Linnea Spears-Lebrun, Josh Corona-Bennett, Jesper Pietsch, Jeannette Duffels, and Katie Hall conducted field assessments and surveys on five days (21 person-days) from May 4 through June 1, 2007 (EDAW 2007a; see Attachment C for photographic documentation). Surveys were conducted by walking or driving dirt access roads throughout the entire survey area focusing on plant species inventory, community characterization, and vegetation community mapping. Areas of native habitat, including Mojave Creosote Bush Scrub, Mojave Desert Wash Scrub, and areas of Fallow Agriculture-Disturbed Atriplex Scrub, were surveyed by pedestrian transects, with biologists walking 5 meters apart searching for rare plant occurrences. Areas of agricultural and ruderal vegetation were surveyed by walking some areas and driving the dirt access roads with emphasis on vegetation community mapping and plant species inventory. Vegetation communities are used to describe species assemblages and patterns of plants across the landscape. Vegetation communities were classified based on Holland (1986), and Sawyer and Keeler-Wolf (1995). Additionally, when necessary, vegetation community names were assigned based on characteristics observed in the field that did not readily fit into the existing nomenclature. Where appropriate, percent shrub/canopy cover was estimated for each vegetation community.

While surveying, the area was also assessed for sensitive vegetation and rare plant potential. Vegetation communities were mapped on a 1" = 200' scale aerial photo. Although very large, most of the site is dominated by just a few vegetation/cover types, so no minimum mapping unit was used in the vegetation community analysis. All botanical surveys follow the rare plant and vegetation survey guidelines provided by CNPS (CNPS 2001). Vegetation mapping was conducted out to the one-mile buffer boundary from strategic vantage points whenever direct access was not feasible.

A preliminary evaluation of the proposed 17.6-mile natural gas pipeline was performed by car on November 13, 2007 by EDAW biologist Lyndon Quon. During this survey, the width of the right-of-way (road shoulder) and surrounding vegetation was noted.

2.2.3 State Waters Streambed Delineation

On October 16, 2007 and February 27, 2008 EDAW ecologist Joshua Zinn and EDAW biologist Lance Woolley visited the site to formally delineate the boundaries of jurisdictional “waters of the state” (jurisdictional waters) within the survey area. Delineation at the site involved recording the boundaries of jurisdictional waters with a sub-foot accuracy Global Positioning

System (GPS) unit. Field data were processed using ESRI, Inc., Geographic Information Systems (GIS) software to define the location and extent of jurisdictional waters within the survey area. Features used to determine the extent of riverine jurisdictional waters include the presence of shelving and/or scour resulting in an established bank, bed, and channel of the ephemeral wash and its associated vegetation (Cowardin et al., 1979). At sites within the ephemeral wash where no diagnostic surface features occurred, subsurface characteristics were investigated to identify hydric features.

2.2.4 General Wildlife Surveys

General wildlife surveys were conducted concurrently with protocol wildlife surveys and vegetation mapping during May and June 2007 (see Attachment C for photos). All wildlife sign and sightings were recorded and special status species were mapped using Global Positioning System (GPS) units.

2.2.5 Special Status Wildlife Surveys

Surveys conducted for the Mojave desert tortoise (DT), the western burrowing owl (WBO), and the Mohave ground squirrel (MGS) are described below. Surveys for all other special status species (American peregrine falcon, northern harrier, loggerhead shrike, California horned lark, Le Conte's thrasher, and American badger) were incorporated into these protocol surveys.

Mojave Desert Tortoise

USFWS-approved biologists Andrea CurryLow, Peggy Wood, and Lindsey Spenceley conducted presence/absence surveys for DT between May 1 and May 21, 2007 (EDAW 2007b). EDAW biologist Katie Hall assisted with DT surveys for training purposes. The survey followed the guidelines published in the USFWS *Field Survey Protocol for any Non-Federal Action That May Occur within the Range of the Desert Tortoise* (protocol) (USFWS 1992), which includes five ZOI transects outside of and parallel to the site boundary at 100, 300, 600, 1,200, and 2,400 feet (Figure 5). In addition, to comply with the recommendations of the CEC Draft Guidelines, additional transects were surveyed at 3,960-foot (3/4-mile) and 5,280-foot (one-mile) intervals from and parallel to the edge of the survey area boundary. While these additional transects are more broadly focused than the DT protocol transects and are not a formal part of the tortoise survey, they provide information on DT presence as well as on other biological resources in the area around the survey area.

The entire survey area (100 percent coverage) was surveyed according to protocol by spacing transects 10 meters apart. The survey was conducted by slowly and systematically walking linear transects while surveyors visually searched for tortoise and sign. Particular emphasis was placed on searching around the bases of shrubs and along the banks of shallow washes. The USFWS ZOI transects were surveyed in suitable and accessible off-site desert scrub habitat and therefore were not surveyed on SR-14 or at the Honda Test Track east of Neuralia Road to the east of the site. All sign was recorded. Tortoises observed were measured at middle carapace length and evaluated for health. Carcasses were aged, measured (if possible), and classed using Dr. Alice Karl's *Key to Sign Classes* classification system (Attachment D; EDAW 2007b). The height and width of burrow openings were measured and burrow depth was recorded. Sign of recent use of burrows was recorded and the burrows were classed using Dr. Karl's classification system. Scat was measured and classed using Dr. Karl's classification system. All sign locations were recorded using GPS.

On August 10, 2007, Dr. Alice Karl also evaluated the survey area to characterize the habitat for its suitability for DT. Dr. Karl focused on the survey area east of SR-14 because the western side of the property is known DT habitat (i.e., DT were observed there during Project protocol surveys and the vegetation community is relatively undisturbed). During the site visit, Dr. Karl photographed and mapped habitat types within and around the survey area (Attachment E).

Mohave Ground Squirrel

A habitat field assessment was considered appropriate to determine the potential for MGS to occur in the survey area. Dr. Philip Leitner, a well known MGS expert, conducted a field assessment of habitat conditions for MGS on August 10, 2007 and October 15, 2007 (Attachment E). The entire survey area was surveyed by driving dirt access roads and walking through selected areas, focusing on the species composition and physical structure of the vegetation, soil conditions, and evidence of rodent activity. Habitat conditions immediately adjoining the survey area were also observed.

Western Burrowing Owl

Burrowing owl surveys were performed according to the protocol established by the California Burrowing Owl Consortium (CBOC) (1993) and accepted by the CDFG. In addition to the 500-foot buffer surrounding the survey area required by CBOC protocol, as noted earlier, the CEC requires a habitat evaluation within a one-mile buffer surrounding the survey area.

On May 8, 2007, EDAW biologist Lyndon Quon assessed the survey area for WBO habitat (Phase I of the CBOC protocol). A burrow survey (Phase II of the CBOC protocol) was conducted in conjunction with DT protocol surveys, during which the entire survey area was surveyed by line transects with 10-meter spacing between transects. Additionally, five transects circumnavigating the survey area, plus two additional CEC-recommended transects within the one-mile buffer, were surveyed for burrows. All burrows with potential WBO sign (white-wash, pellets, feathers, bones) were mapped using GPS units.

EDAW biologists Suellen Lynn, Barbra Calantas, Andrea CurryLow, Kyle Harper, and Katie Hall conducted four WBO burrow and presence/absence surveys between May 9 and August 3, 2007 (Phase III of the CBOC protocol; EDAW 2007c). EDAW geographic information systems (GIS) specialist Jessie Lee also assisted with data collection during surveys for post-field GIS data processing.

To locate WBOs, surveyors drove established paved and dirt roads, stopping at observation points that provided a wide view and scanned for owls and burrows with 8 to 10 power binoculars and a 20 to 40 power, 60 mm spotting scope. Vehicles were used as blinds, when possible, to minimize disturbance to owls. If burrows with sign were not visible from established roads, surveyors approached the burrows on foot, carefully verifying presence or absence of WBOs at the burrows. All WBO locations were mapped using GPS units.

CHAPTER 3
EXISTING CONDITIONS

These existing conditions represent findings within the survey area and one-mile buffer. The actual permanent impacts will be limited to the solar array/power block in the eastern section of the survey area (and east of the railroad tracks) and the transmission line corridor.

3.1 VEGETATION COMMUNITIES

A total of seven vegetation communities were mapped within the survey area and the one-mile buffer (Figure 6; see Attachment C for representative photos). The acreage of each vegetation community within the survey area and surrounding buffer area is provided in Table 1. Vegetation types are described in detail below, incorporating observations from Dr. Karl's DT habitat evaluation (Figure 7). Dr. Karl's habitat evaluation map is presented at a more detailed scale of 1:12,000 as part of Attachment E.

Table 1
Vegetation Communities and Cover Types

Vegetation Communities and Other Cover	Survey Area Acres	One-Mile Buffer Acres
Mojave Creosote Bush Scrub	111.5	5,302.1
Mojave Desert Wash Scrub	57.8	164.4
Mojave Mixed Woody Scrub	0.0	604.6
Tamarisk Scrub	0.0	1.8
Developed	70.3[1]	253.5
Fallow Agricultural-Ruderal	1,785.0	3,233.1
Fallow Agricultural-Disturbed Atriplex Scrub	352.6	1,355.9
Total acres	**2,377.2**	**10,915.4**

[1] Includes 60 acres of natural gas pipeline right-of-way.

3.1.1 Mojave Creosote Bush Scrub

Mojave Creosote Bush Scrub is an open shrub community dominated by the creosote bush (*Larrea tridentata*). While dominated by shrubs (approximately 18 percent shrub cover), this vegetation community also has a perennial and herbaceous layer apparent in years with sufficient rainfall. Other important shrubs in this community include white bursage (*Ambrosia dumosa*), box thorn (*Lycium andersonii*), silver cholla (*Opuntia echinocarpa*), and occasional Joshua trees (*Yucca brevifolia*). This community typically occurs on well-drained soils in alluvial fans,

bajadas, and upland slopes. It is one of the most widely distributed desert plant communities in the Mojave Desert from the desert floor up to about 3,500 feet, extending into northwestern Arizona and southern Utah. It is the primary habitat type in the undisturbed areas in the one-mile buffer. A total of 122.1 acres of Mojave Creosote Bush Scrub was mapped within the survey area and 5,291.5 acres in the one-mile buffer (Table 1; Figure 6).

3.1.2 Mojave Desert Wash Scrub

Mojave Desert Wash Scrub is an open shrubby community with scattered microphyllous trees and shrubs on well-drained sandy soils. This vegetation community is found in washes, arroyos, and canyons of intermittent streams throughout the Mojave Desert. The dominant plant in this community is the scale broom (*Lepidospartum squamatum*). Other shrubs occurring in this community are box thorn, bladderpod (*Isomeris arborea*), rubber rabbitbush (*Chrysothamnus nauseosus*), bladder sage (*Salazaria mexicana*), and Mormon tea (*Ephedra nevadensis* and *E. californica*).

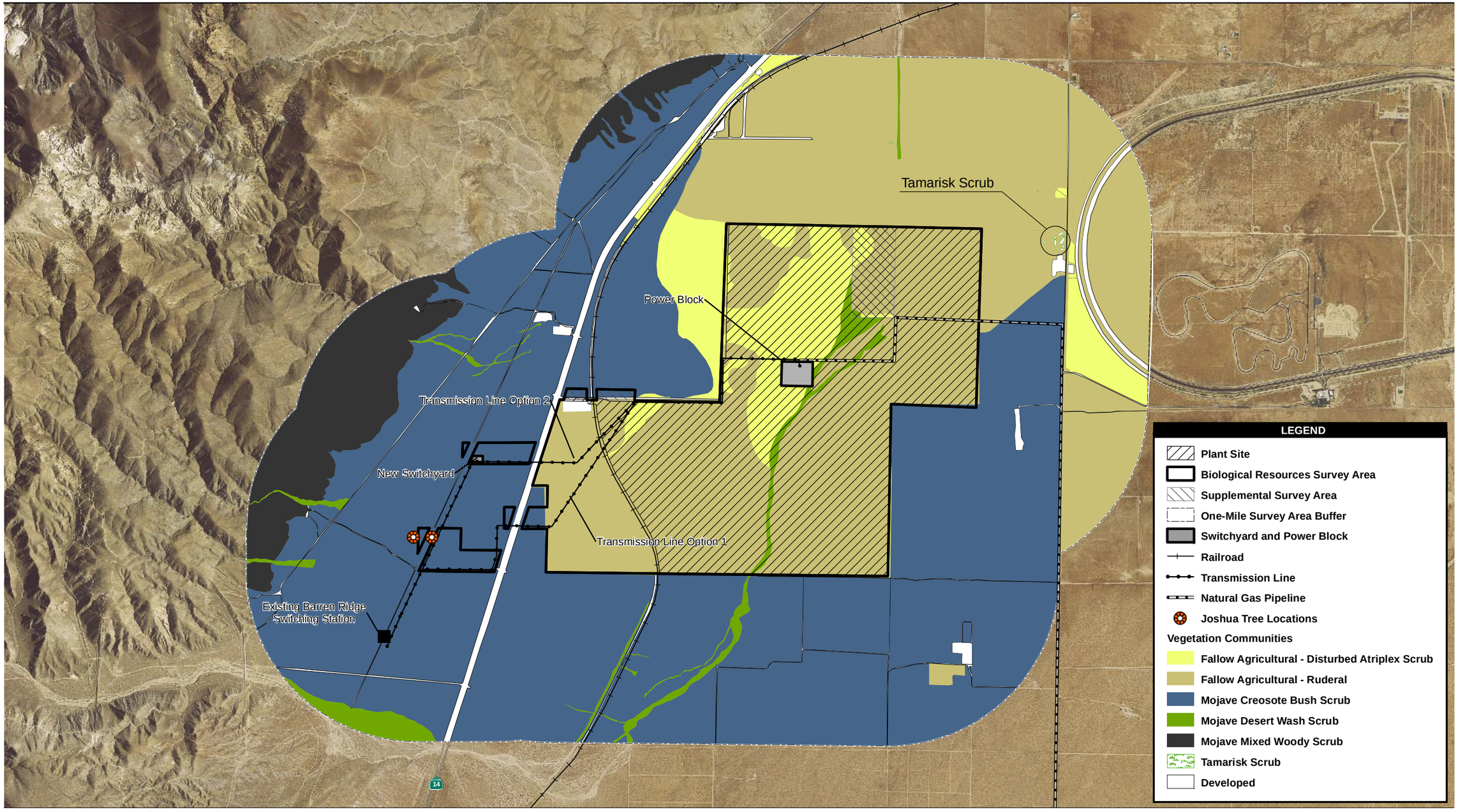
There is one main wash that trends southwest to northeast on the eastern two sections of the survey area that supports gradually reestablishing Mojave Desert Wash Scrub community. A total of 57.8 acres of Mojave Desert Wash Scrub was mapped within the survey area and 164.4 acres in the one-mile buffer (Table 1; Figure 6).

3.1.3 Mojave Mixed Woody Scrub

The Mojave mixed woody scrub occurs in areas characterized by steep, overly drained soils with extremely low water-holding capacity. The most common species of this plant community are spiny hopsage (*Grayia spinosa*), goldenhead (*Acamptopappaus sphaerocephalus*), cheesebush (*Ambrosia* [*Hymenoclea*] *salsola*), winter fat (*Kraschennikiovia lanata*), Mormon tea, and white bursage. This community is found on the western edge of the buffer where the area begins to rise in elevation. No Mojave Mixed Woody Scrub was mapped within the survey area and 604.6 acres was mapped in the one-mile buffer (Table 1; Figure 6).

3.1.4 Tamarisk Scrub

This community is dominated by tamarisk (*Tamarix ramosissima*), a nonnative shrub to small tree from Central Asia. The plant was originally introduced for erosion control and windbreak



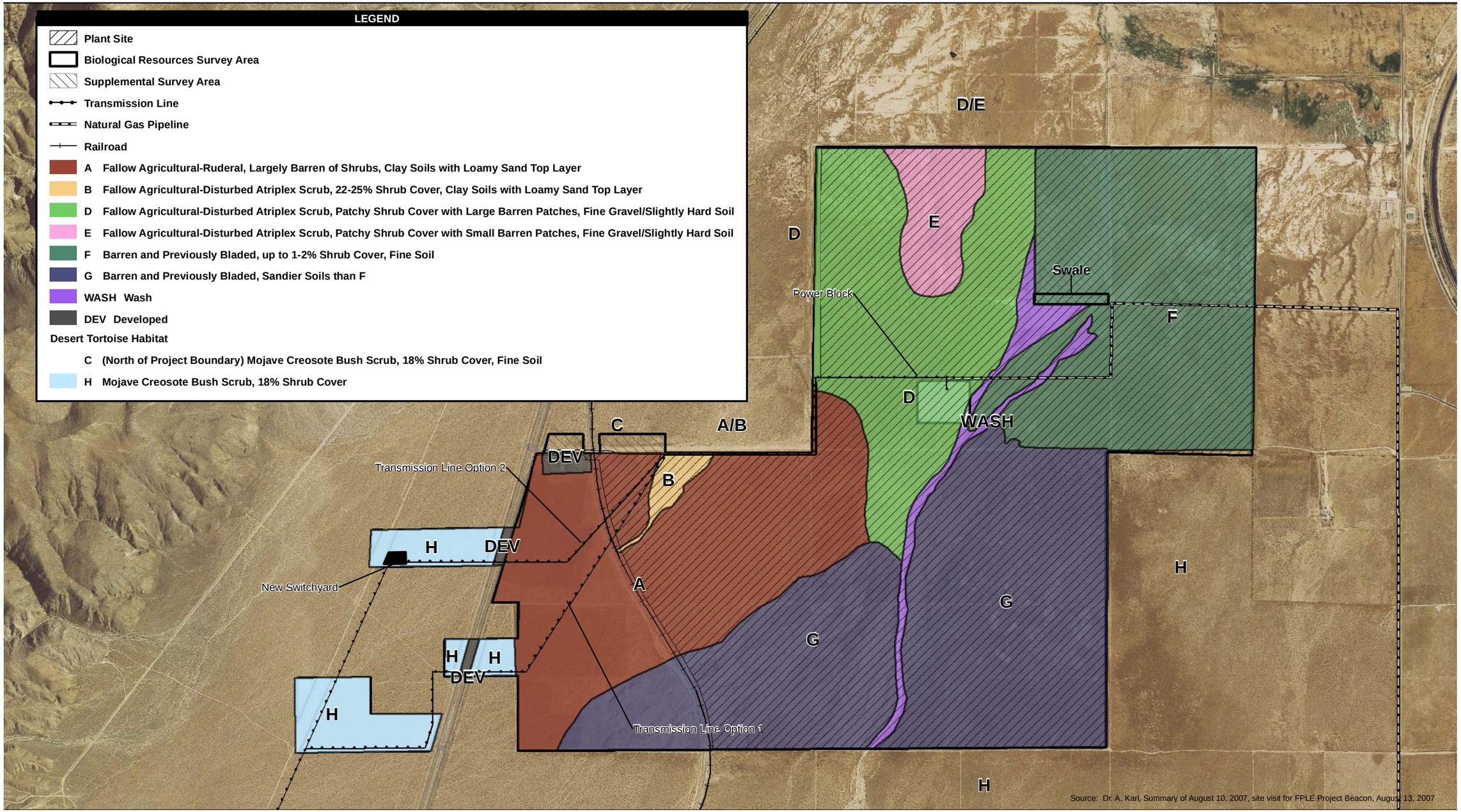
Source: NAIP 2005; EDAW 2007; TetraTech 2007; WorleyParsons 2007; Kern County 2007

3,000 1,500 0 3,000 Feet

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

Figure 6
Vegetation Communities

Path: P:\2008\08080001 FPLE Proj Beacon Solar\5GIS\MXD\Bio Technical Report\Figure 6 Vegetation Communities.mxd, 02/26/08, KochertE



Source: NAIP 2005; EDAW 2007; WorleyParsons 2007

1,750 875 0 1,750 Feet

Scale: 1:21,000; 1 inch = 1,750 feet

Figure 7
Habitat Types in the Survey Area

Path: P:\2008\08080001 FPLE Proj Beacon Solar\5GIS\MXD\Bio Technical Report\Figure 7 Habitat Types.mxd, 02/26/08, KochertE

purposes. It has become highly invasive of native habitats and can cause many detrimental effects especially in riparian communities. No Tamarisk Scrub was mapped within the survey area and 1.8 acres was mapped in the one-mile buffer (Table 1; Figure 6).

3.1.5 Developed

The areas mapped as developed include unpaved and paved roads, a rail line, canals, and other areas cleared for residential uses (Table 1). A total of 13.2 acres of Developed land was mapped within the survey area and 310.6 acres was mapped in the one-mile buffer. Additionally, 60.0 acres of Developed land was mapped in the proposed natural gas pipeline right-of-way.

3.1.6 Fallow Agricultural-Ruderal

The Fallow Agricultural-Ruderal vegetation community covers the majority of the survey area. The land was formerly used for agricultural purposes and is dominated by ruderal nonnative plants. This plant community occurs in areas that are now unable to effectively retard soil loss through wind and water erosion. Vegetation cover within this community ranges from 0 to 2 percent. The dominant plant species are Russian thistle (*Salsola tragus*), Sahara mustard (*Brassica tournefortii*), and Mediterranean schismus (*Schismus arabicus*). A total of 1,785.8 acres of Fallow Agricultural-Ruderal was mapped within the survey area and 3,232.3 acres in the one-mile buffer (Table 1; Figure 6).

3.1.7 Fallow Agricultural-Disturbed Atriplex Scrub

The Disturbed Atriplex Scrub community occurs on areas previously used for agricultural purposes but that have now become occupied with several atriplex shrub species. The dominant species is the allscale (*Atriplex polycarpa*), which is particularly effective at reoccupying abandoned agricultural lands. Other plants occurring together are shadscale (*Atriplex confertifolia*), Russian thistle, and salt heliotrope (*Heliotropium curassavicum*). Shrub cover in this vegetation community is approximately 22 to 25 percent. A total of 352.6 acres of Fallow Agricultural-Disturbed Atriplex Scrub was mapped within the survey area and 1,355.9 acres in the one-mile buffer (Table 1; Figure 6).

3.1.8 Sensitive Vegetation Communities

Sensitive vegetation communities are those that are considered rare in the region, support special status plant or animal species, or receive regulatory protection (e.g., waters, which includes

wetlands as defined by the U.S. Army Corps of Engineers [USACE] and CDFG). In addition, vegetation communities listed on the CNDDB as having the highest inventory priorities are considered sensitive (CDFG 2003). There are no sensitive vegetation communities in the survey area or in the one-mile buffer.

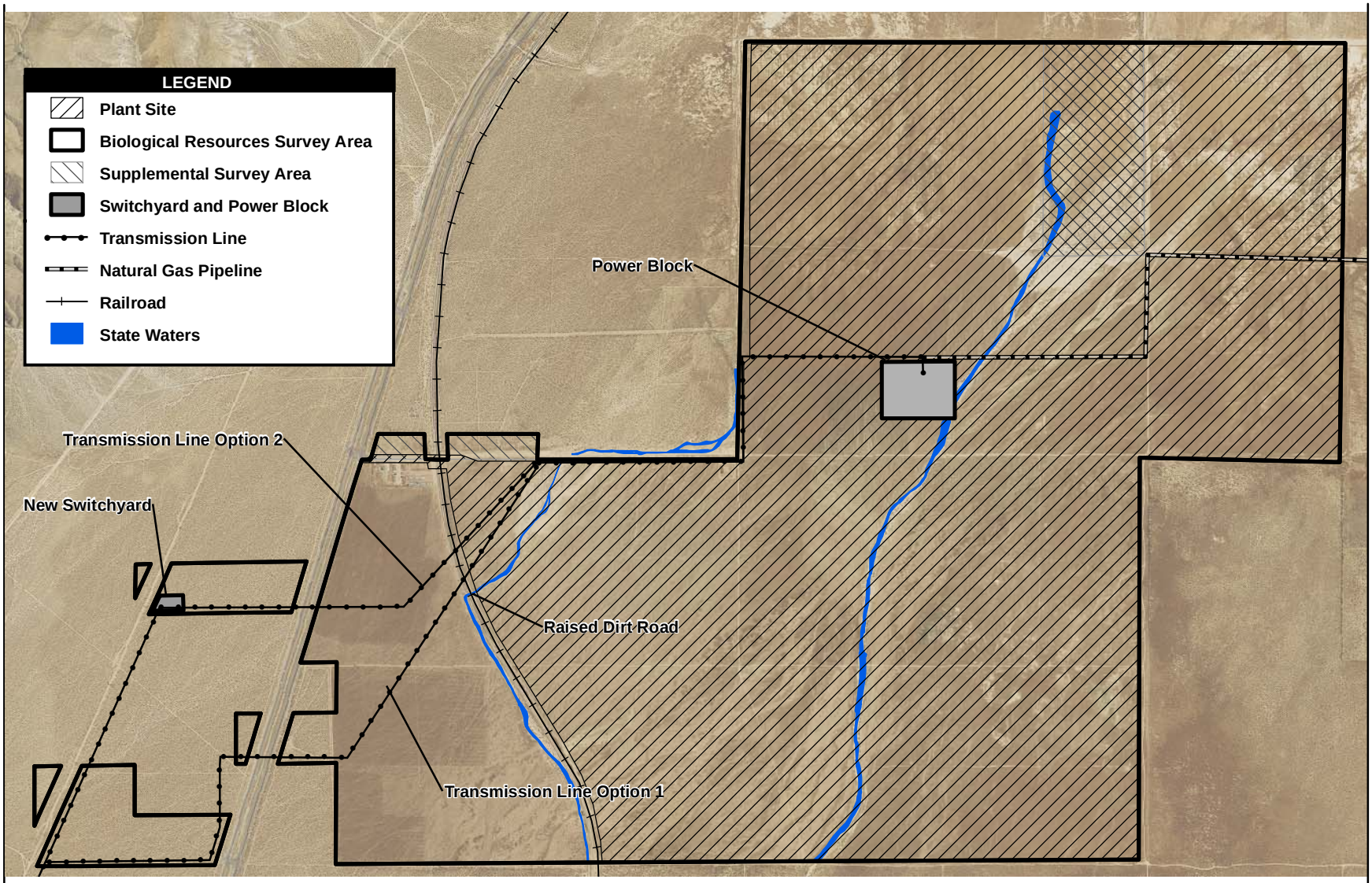
Although there were a few scattered Joshua tree individuals within and immediately adjacent to the survey area, these individuals were not numerous or dense enough to be considered as Joshua tree woodland.

3.2 WATERS OF THE STATE

Two dry desert washes within the survey area were delineated as waters of the state (Figure 8). The western wash flows approximately 6,200 feet across the survey area, south to north, parallel to and west of the railroad tracks, passing under the railroad tracks to enter the plant site and flow southwest to northeast approximately 1,800 feet to the plant site boundary. This wash is mostly unvegetated. The eastern wash flows approximately 8,150 linear feet across the survey area, from southwest to northeast, and then continues in a more dispersed pattern to Koehn Lake (Figure 8). The total area of waters of the state encompasses approximately 18.4 acres within the survey area, 13.7 acres of which occur within the plant site.

3.3 FLORA

Thirty-three plant species were documented within the survey area, eight of which are nonnative introduced species (Attachment F). No special status plant species were detected within the survey area, although three CNPS List 1a plant species (alkali mariposa lily, creamy blazing star, and Charlotte's phacelia) have a moderate potential to occur, and two other plant species (Red Rock tarplant, CDFG rare and CNPS List 1B; Red Rock poppy, CNPS List 1B) have a low potential to occur.



Source: NAIP 2005; EDAW 2007; WhorleyParsons 2007

2,000 0 2,000 Feet

Scale: 1:24,000; 1 inch = 2,000 feet

Figure 8
State Waters

3.3.1 State Rare Plant Species

Prior to the 2007 surveys, no rare plant species had been documented as occurring within the survey area or in the surrounding vicinity. Based on site-specific habitat evaluations, one state rare plant species, Red Rock tarplant, was considered to have a low potential to occur within the survey area and surrounding one-mile buffer, and one state-listed plant species, Mojave tarplant, is not expected to occur due to elevational restrictions (Table 2). Red Rock tarplant is discussed below.

Red Rock Tarplant

Red Rock tarplant was listed by CDFG as rare in 1972. The plant species has no federal listings but is recognized as List 1B by the CNPS (2007). Red Rock tarplant, an annual plant species growing to approximately 7 to 40 inches tall, is a severely restricted endemic species known only from 10 small populations within the boundaries of Red Rock Canyon State Park (Faull 2004). This species occupies seeps, springs, and seasonally moist alluvium within the Creosote Bush Scrub community.

Red Rock tarplant was not detected on-site, although low rainfall in 2007 produced conditions that were less than satisfactory for detecting this species. Red Rock tarplant is considered to have a very low potential to occur within the survey area because of its restricted endemism to the geologic substrates in combination with the mesic conditions present in Red Rock Canyon State Park. The survey area is located approximately 5.5 miles south of Red Rock Canyon; however, the topography of the survey area does not support the characteristic substrate and mesic conditions where Red Rock tarplant is found. Furthermore, the survey area lacks the preferred clay soil washes that the plant inhabits.

3.3.2 Other State Special Status Plant Species

Three species included on the CNPS List 1B (alkali mariposa lily, creamy blazing star, and Charlotte's phacelia) have a moderate potential to occur in the survey area, although they were not detected during 2007 spring surveys (Table 2). These species are most likely to be found in Mojave Creosote Bush Scrub, Mojave Desert Wash Scrub, and Fallow Agricultural-Disturbed Atriplex Scrub (Figure 6), across the central section of the survey area and surrounding the survey area to the west, south, and east. One additional species included on the CNPS List 1B, Red Rock poppy, has a low potential to occur within the survey area. Due to low annual rainfall

Table 2
Potentially Occurring Special Status Plant Species Relevant to The Beacon Solar Energy Project

Common Name Scientific Name	Sensitivity Status[1]	General Habitat Description (CNPS 2007)	Flowering Period	Probability of Occurrence[2]
Alkali mariposa lily *Calochortus striatus*	CNPS: List 1B	Chaparral, Chenopod scrub, Mojavean desert scrub, meadows and seeps, in mesic soils. Grows at elevations of 230-5,235 feet.	Geophyte that flowers April-June	Moderate potential of occurrence on-site. A small population occurs in Red Rock Canyon State Park nearby. Survey area has Chenopod scrub and Mojavean desert scrub, which are suitable habitat.
Red Rock tarplant *Deinandra arida*	CDFG: Rare CNPS: List 1B	Mojavean desert scrub in clay, volcanic tuff. Grows at elevations of 984-3,117 feet.	Annual that blooms April-November	Low potential to occur on-site due to unsuitable soils and lack of mesic conditions. Less than 10 occurrences are known from the Red Rock Canyon State Park and Last Chance Canyon in Kern County, approximately 5.5 miles north of the survey area (CDFG 2007).
Mojave tarplant *Deinandra mohavensis*	CDFG: Endangered CNPS: List 1B	Chaparral (mesic), riparian scrub. Grows at elevations of 2,790-5,250 feet.	Annual that blooms July-October	Not expected to occur on-site due to unsuitable habitat and low elevation. Four known populations occur in natural springs northeast of the survey area, characterized by mesic conditions and suitable elevations (CDFG 2007).
Red Rock poppy *Eschscholzia minutiflora* ssp. *twisselmannii*	CNPS: List 1B	Mojavean desert scrub in volcanic tuff. Grows at elevations of 2,230-4,035 feet.	Annual that flowers March-May	Low potential of occurrence on-site due to lack of suitable soils in the survey area. Possibly could occur in drainages that drain slopes from the west. Known populations are located from the Rand and El Paso mountains in Kern County.
Creamy blazing star *Mentzelia tridentata*	CNPS: List 1B	Mojavean desert scrub. Grows at elevations of from 2,297-3,806 feet.	Annual that flowers March-May	Moderate potential of occurrence on-site due to suitable habitat and range in elevation on-site. One occurrence in nearby Red Rock State Park and six occurrences in San Bernardino County (CDFG 2007).
Charlotte's phacelia *Phacelia nashiana*	CNPS: List 1B	Joshua tree woodland, Mojavean desert scrub, pinyon and juniper woodland. Grows at elevations of 1,969-7,218 feet.	Annual that blooms March-June	Moderate to high potential of occurrence on-site in suitable habitat. Known populations occur approximately 1 mile northwest and 2.25 miles southwest of the survey area in suitable habitat (CDFG 2007).

[1] **Sensitivity Status Key**
State California Department of Fish and Game (CDFG)
Other California Native Plant Society (CNPS)
1B: Considered rare, threatened, or endangered in California and elsewhere.

[2] No populations of rare plants were observed on-site during the focused survey periods, although low annual rainfall in 2007 produced less than satisfactory conditions to detect these plants if present.

in 2007, conditions to adequately assess the site for these species were less than satisfactory. Therefore, the presence or absence of these species may be determined by a future survey when suitable conditions allow for average seed germination. If drought conditions persist such that rare plant survey results would not be considered valid, the potential for these species to occur in the survey area will be estimated by evaluating known habitat associations in the survey area

3.4 FAUNA

Forty-three wildlife species were detected during general reconnaissance and protocol wildlife surveys (Attachment G). Ten of these species were reptiles, 26 were bird species, and 7 were mammal species.

Several wildlife species, including Le Conte's thrasher and flat-tailed horned lizard, were observed using the dry desert wash, which runs northeast to southwest across a large portion of the survey area. However, this wash disperses at the northern boundary of the site where the Mojave Desert Wash Scrub community gives way to Fallow Agricultural-Ruderal vegetation, thereby terminating the continuity of usable wildlife habitat that would constitute a wildlife corridor connecting to areas north of the survey area (Figure 6).

Several species of migratory birds were observed using the Disturbed Atriplex Scrub in May. Although the mountains to the west are a known flyway for migratory raptors and passerines, the survey area is located at a lower elevation and does not support the vegetation and topography that typically characterize areas that are attractive to these species during migration. The survey area occurs along a known inland shorebird migration route, connecting California's Central Valley with the Gulf of California. Although the Project's evaporation ponds have the potential to attract migratory birds, monitoring and, if necessary, mitigation measures will ensure impacts are less than significant.

Two federally and/or state listed wildlife species were detected on-site (DT and American peregrine falcon), and another has the potential to occur (MGS). All three of these species are discussed below. Six other special status wildlife species with potential to occur on-site (northern harrier, WBO, California horned lark, Le Conte's thrasher, loggerhead shrike, and American badger) are described in Table 3.

Table 3
Potentially Occurring Special Status Wildlife Species Relevant to The Beacon Solar Energy Project

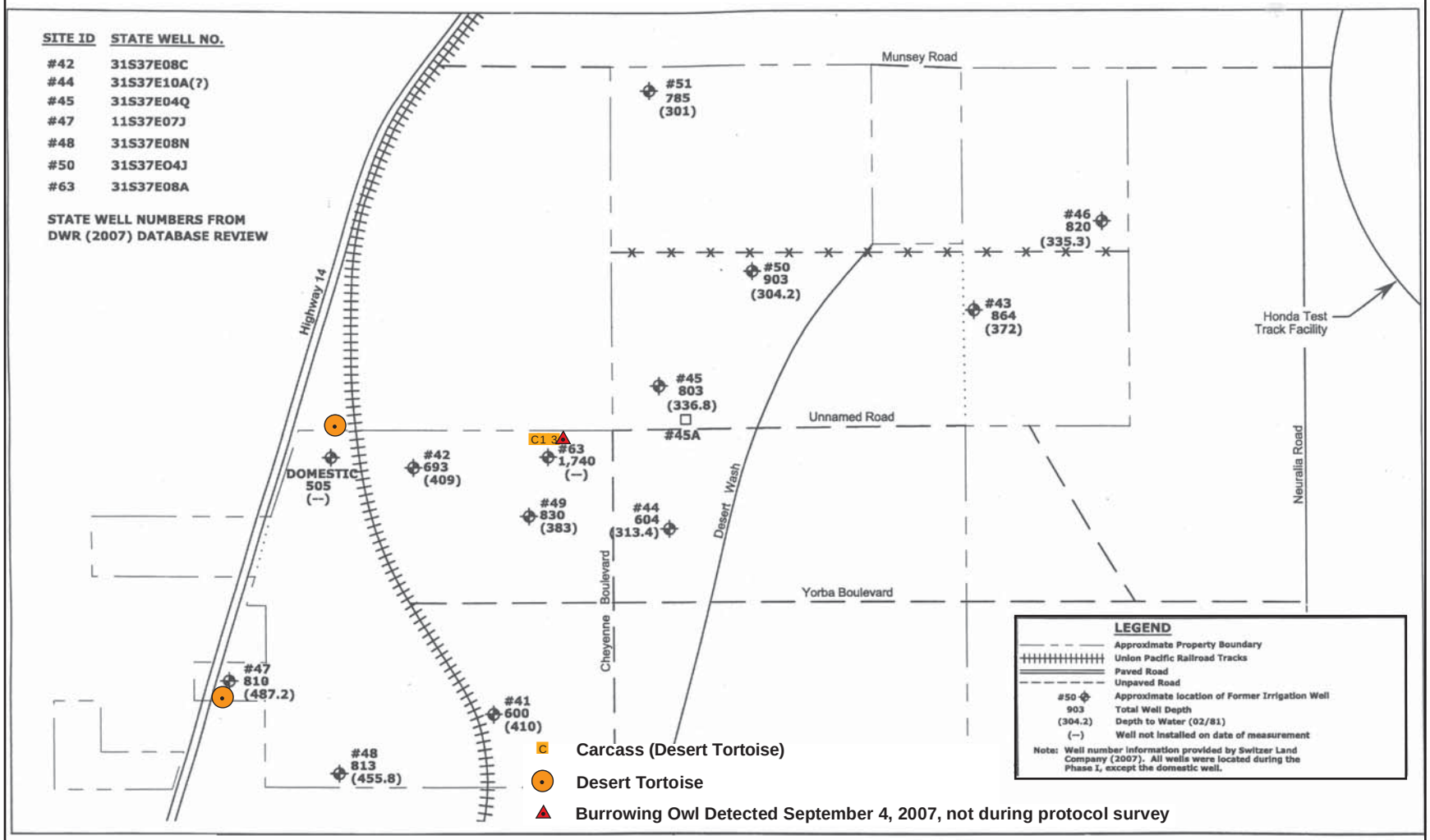
Common Name Scientific Name	Sensitivity Status[1]	Habitat Requirements	Probability of Occurring On-site
Reptiles			
Desert tortoise *Gopherus agassizii*	ESA: Threatened CESA: Threatened	Various desert scrubs and desert washes up to about 5,000 feet, but not including playas.	Detected in native habitat, in the ZOI west and east of the survey area and in the vicinity of the proposed transmission line route in May 2007. One potential burrow, one shell fragment, and one juvenile carcass were observed within the eastern section of the survey area. Two live, probable transient adult tortoises were observed during groundwater pump tests at well #47 and #48 (Figure 9).
Birds			
Northern harrier *Circus cyaneus*	CDFG: Species of Special Concern	Occurs in grasslands and agricultural fields during migration and in winter.	Detected. Two individuals were observed in the one-mile buffer northeast of the survey area during May 2007 surveys.
American peregrine falcon *Falco peregrinus anatum*	CESA: Endangered CDFG: Fully Protected	Open habitats from tundra, moorlands, steppe, and seacoasts to mountains, and open forested regions, especially where there are suitable nesting cliffs.	Detected. One individual was observed perched on a utility pole at the eastern border of the survey area during May 2007 surveys.
Western burrowing owl *Athene cunicularia*	CDFG: Species of Special Concern	Found mainly in grassland and open scrub from the seashore to foothills. Strongly associated with ground squirrel burrows.	Detected. Two individuals were observed in the survey area, one in the northeastern section and one in the western section in native habitat, and at least three other individuals were observed in the one-mile buffer during May, July, and August 2007 surveys. One additional individual was observed during a groundwater pump test at well #63 (Figure 9). Active burrows were observed near all individual observations.
California horned lark *Eremophila alpestris actia*	CDFG: Species of Special Concern	Often occurs in fields, grasslands, shores, and tundra habitats.	Detected. Multiple individuals of this species were observed frequently throughout the survey area and within the one-mile buffer within barren areas during May 2007 surveys, and were therefore not mapped.
Le Conte's thrasher *Toxostoma lecontei*	CDFG: Species of Special Concern	Inhabits areas with sparse desert scrub and uses cholla cactus for nesting.	Detected. Two individuals were observed in the eastern section of the survey area and one individual was observed in the one-mile buffer southwest of the survey area during May 2007 surveys.

Common Name Scientific Name	Sensitivity Status[1]	Habitat Requirements	Probability of Occurring On-site
Loggerhead shrike *Lanius ludovicianus*	CDFG: Species of Special Concern	Occurs in semiopen country with utility posts, wires, and trees to perch on.	Detected. Several individuals were observed throughout the eastern section of the survey area and the one-mile buffer during May 2007 surveys.
Mammals			
Mohave ground squirrel *Spermophilus mohavensis*	CESA: Threatened	Mojave desert scrub, alkali scrub, and Joshua tree woodland between 1,800 and 5,000 feet. Sandy to gravelly soils.	Moderate. Mojave Creosote Bush Scrub in the western portion of the survey area is suitable for this species. The remainder of the site does not provide suitable habitat. Mohave ground squirrels were detected approximately 2 miles north of the survey area in 1985. The species is assumed to be present in the survey area.
American badger *Taxidea taxus*	CDFG: Species of Special Concern	Coastal sage scrub, mixed chaparral, grassland, oak woodland, chamise chaparral, mixed conifer, pinyon-juniper, desert scrub, desert wash, montane meadow, open areas, and sandy soils.	Moderate. Although this species has been detected within one mile of the eastern edge of the survey area, no sign of the species was detected during surveys in May 2007. This species is considered relatively common in native habitats of the area (A. Karl, pers. comm.)

[1] **Sensitivity Status Key**

Federal Endangered Species Act (ESA)

State California Department of Fish and Game (CDFG)
California Endangered Species Act (CESA)



Source: ENSR 2007

NO SCALE

Figure 9
Incidental Special Status Species Observations During Onsite Pumping Tests

3.4.1 Federally Listed Wildlife Species

Desert Tortoise

The DT is federally listed as threatened under the ESA, with critical habitat designated by the USFWS (USFWS 1994a). The listing was initially made on August 4, 1989, by emergency rule (USFWS 1989) and by final rule on April 2, 1990 (USFWS 1990). This listing status applies to the entire population of DT, except in Arizona south and east of the Colorado River, and in Mexico. An approved recovery plan has been published by the USFWS (1994b). The DT was listed as threatened under CESA on June 22, 1989 (CFGC 1989).

The DT is widely distributed in the deserts of California, southern Nevada, extreme southwestern Utah, western and southern Arizona, and throughout most of Sonora, Mexico. Habitat consists of firm but not hard ground, usually soft sandy loams and loamy sands to allow for burrow construction. The flattened forelimbs of the DT and other gopher tortoises are capable tools for burrow construction. The species has also been found on rocky slopes. Optimal habitat consists of Creosote Bush Scrub vegetation, supporting a variety of moisture-rich ephemeral vegetation on which the species feeds. Annual precipitation within DT habitat averages between 2 and 8 inches per year. The DT is not found in areas of very cobbly soil, soil too soft for burrow construction, or in dry lakes. The species generally occurs below 4,000 feet elevation although it can be found up to 5,000 feet (Stebbins 1985). DT are usually most active early March through early June and again between September and early November. The species is herbivorous and is most active when plants are available for forage or when pooled water is available for drinking.

The DT reaches an average length of 6 to 14.6 inches, with males growing larger than females. A DT matures at approximately 15 to 18 years of age and can live 50 to 100 years. DTs normally construct nests and lay eggs from May through June. The clutch size varies from 2 to 14 eggs with an average of 3 to 5, although some eggs may not be fertile (Lawler 2000).

DTs typically have home ranges from 27 to 130 acres and these figures probably underestimate the actual area familiar to the tortoise. A home range is the area in which a DT travels, feeds, sleeps, courts, and has its burrows. Individuals commonly traverse 1,500 to 2,600 feet per day within their home range and males have been recorded to travel 0.75 square mile within their home range. The range of individual DT depends on factors such as density of food plants, size, age, and sex of the tortoise, and may extend no more than two miles from where it hatched (Lawler 2000). DTs are also known to disperse extended distances such as 2.0 miles in 16 days and 4.5 miles in 15 months (Stebbins 1985).

A single DT and several tortoise burrows, scat, and eggshells were observed at the outlet of Pine Tree Canyon, southwest of the survey area but within the assessment area for the proposed transmission line, during 2003 biological surveys in support of Barren Ridge Switching Station for the Pine Tree Wind Development project (EDAW 2004). This live tortoise was translocated. No other live DT were discovered in this area during 2003 protocol DT surveys for that project.

Five live DT were encountered during The Beacon Solar Energy Project ZOI transect surveys, all within 630 feet of the survey area where native habitat remains (Figure 5). Four of the five live tortoises found were encountered west of SR-14, in the southwest corner of the survey area. The fifth tortoise was encountered approximately 600 feet outside the eastern edge of the survey area. All were adult tortoises with middle carapace length ranging from approximately 200 to 235 millimeters. Most of the observed tortoise sign (burrows, carcasses, and scat) were also found in the southwest section of the survey area, west of SR-14. Only two recent tortoise sign were found in the eastern section of the survey area: an intact juvenile carcass that had been depredated by a raven (C3 in Figure 5) and a deteriorated adult burrow. Two other sets of old (greater than four years since death) bone and carapace fragments were found near the southern edge of the survey area (C2 and C11 in Figure 5). There was no evidence that DT currently inhabit the survey area.

Subsequent to protocol DT surveys in 2007, a DT carcass and two live DT were detected in or adjacent to the survey area. A juvenile DT carcass, preyed upon by a raven, was documented within the survey on September 4, 2007 by a biologist monitoring a groundwater pump test. Two additional live adult tortoises were detected within survey area during subsequent groundwater pump tests. One was detected on the northwest edge of the survey area along the main access road, and is likely a transient from adjacent habitat. The second live tortoise was detected at the western edge of the survey area, approximately 350 feet east of SR-14 (Figure 5).

Dr. Alice Karl's assessment of DT habitat within the survey area concluded that the survey area east of SR-14 has no value for DT conservation. This analysis was based on: habitat quality within the survey area (vegetation [species, cover, patchiness], soil characteristics, and hydrology); habitat quality in adjacent areas; geographic extent and type of existing disturbance; and temporal (long-term) extent of disturbance in the survey area.

Figure 7 presents a graphic representation of Dr. Karl's DT habitat assessment. The majority of the plant site has no potential to host tortoises because it is either devoid of vegetation or shrub cover is less than 2 percent. In areas where shrubs are regrowing, the Disturbed Atriplex Scrub is unlike the native community adjacent to the plant site. Portions of the surrounding area are

native Creosote Bush Scrub, whereas the regrowth area is a nearly monotypic allscale stand. This area is patchy with broad barren areas, has poor soil friability (i.e., fine, slightly hard soils), and shows evidence of periodic inundation by water, which is hazardous to DT. While there is potential that a DT would be observed in these shrub patches or in the wash that cross the survey area, the use of these areas would be attributable to the proximity of the adjoining native habitat outside of the plant site, and is likely to be temporary due to the poor habitat quality within the plant site. Additionally, even the Creosote Bush Scrub north of the plant site is poor-to-fair quality DT habitat, and consequently, DT density is expected to be low in these areas.

The wash that crosses the eastern-central section of the plant site is characterized by poor shrub diversity and low shrub cover, and is mostly bordered by barren land. The northern terminus (swale; Figure 7) is dominated by stands of exotic Russian thistle. Poor quality DT habitat in the wash also limits the wash's utility as a movement corridor. Furthermore, while good DT habitat occurs south of the plant site, little habitat occurs within the plant site to define a corridor that would connect with this. Areas north, east, and west of the wash are entirely devoid of vegetation as a consequence of long-term agricultural use of the area, and are therefore not considered DT habitat. The only shrub cover within the plant site occurs northwest of the wash and is discussed above.

In addition to currently containing large contiguous areas that lack DT habitat, the entire area within the plant site has been inappropriate DT habitat for decades as a consequence of agriculture-related disturbance. Therefore, the area has had no value for DT population persistence or recovery for many years. DT's have also been excluded from the allscale-dominated regrowth community within the northern portion of the plant site by a chicken-wire perimeter fence that was originally erected to exclude rabbits from the agricultural fields. Long segments of this chicken-wire fence are intact and effectively block much of the DT movement into the plant site.

In support of this analysis, no fresh sign and only one Class 5 (deteriorated) adult tortoise burrow were seen within the plant site, east of SR-14, during DT surveys. All carcasses, three of which were within the plant site and three of which were juvenile or small immature DT, could have been transported to the site (A. Karl, pers. comm.).

To ensure that no DT would be harmed by the Project in case a DT has temporarily moved into the plant site, a full clearance survey will be conducted following installation of perimeter fencing, prior to construction (see Conservation Measures; Section 6.2.5).

3.4.2 State Listed Wildlife Species

The federally listed DT is also listed as threatened under CESA. The Mohave ground squirrel (MGS), also listed as threatened under CESA, has the potential to occur in the survey area.

Mohave Ground Squirrel

The MGS was listed as threatened under CESA in 1983. It inhabits desert areas, including alluvial fans, basins, and plains with deep sandy or gravelly friable soils with an abundance of native herbaceous vegetation. This species is typically associated with a variety of habitats, e.g., Mojave Creosote Bush Scrub, shadscale desert scrub, alkali scrub, and Joshua Tree Woodland. The species feeds on green vegetation and seeds but may also eat carrion. The MGS remains underground from August through February or March and is active during the spring and summer.

The CNDDB includes nine records of MGS occurrence within 10 miles of the survey area (Figure 4). Three locations are in Jawbone Canyon, from just west of SR-14 to Blue Point. A fourth occurrence is near the southern edge of Red Rock Canyon State Park on the west side of SR-14. Two records are from Cache Creek near the western boundary of the Desert Tortoise Natural Area. Three records document occurrences of MGS further east, within the Desert Tortoise Natural Area. Ten additional records, not yet included in the CNDDB, occur within 12.4 miles of the survey area within the Desert Tortoise Natural Area. All lands to the west of SR-14 in the vicinity of the survey area are included in the Mohave Ground Squirrel Conservation Area proposed in the West Mojave Plan (BLM 2005). However, the protections associated with the Mohave Ground Squirrel Conservation Area apply only to public lands managed by the BLM.

There is an extensive area of Mojave Creosote Bush Scrub to the east and south of the survey area. It appears to provide suitable habitat for the MGS, although there are no occurrence records and no evidence of any trapping attempts. To the north and northeast of the survey area is a wide strip of fallow agricultural land that does not provide MGS habitat. North of the survey area and east of SR-14 is a small patch of Mojave Creosote Bush Scrub. Vegetative cover here is sparse and there is very little plant diversity. At best, this area is marginal habitat for the MGS.

To the west of SR-14, overlapping with a small portion of the survey area, a wide strip of Mojave Creosote Bush Scrub occurs on the alluvial fans reaching down from the mountains. This area is characterized by vegetation and soil conditions that are suitable for MGS (Figure 6).

The dominant shrub species are creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*). Because of disturbance from periodic surface water flows, desert senna (*Senna armata*) and cheesebush (*Hymenoclea salsola*) are also abundant. No winterfat (*Krascheninnikovia lanata*) or spiny hopsage (*Grayia spinosa*), two shrubs that provide important food resources for MGS (Leitner and Leitner 1998), were observed. This relatively undisturbed habitat has moderately diverse vegetation that could provide adequate forage and cover for MGS. The habitat on this portion of the survey area (approximately 116 acres) appears suitable for the species, but is not of high quality.

The remainder of the survey area is unsuitable as habitat for MGS. The survey area was used for irrigated agriculture some years ago and has since been abandoned. Much of the property (1,785 acres) is barren (Fallow Agricultural-Ruderal) and does not support any native vegetative cover. Other portions of the survey area contain patches of native allscale shrubs (Fallow Agricultural-Disturbed Atriplex Scrub) that have become established since agricultural operations ceased. In these patches, allscale makes up almost 100 percent of the low density existing shrub cover. The herbaceous layer is sparse and consists almost entirely of a few non-native species, including filaree (*Erodium cicutarum*). MGS occasionally consume *Atriplex* foliage and filaree seeds, but these plants do not provide the full range of food resources necessary for the species (Leitner and Leitner 1998). The narrow strip of Mojave Desert Wash Scrub that runs through the center of the survey area does not provide suitable MGS habitat. The vegetation here is very open and sparse, plant diversity is low, and there is little shrub cover, and forage plants utilized by MGS are almost entirely absent. In general, the wash vegetation community appears disturbed with shrubs widely separated and damaged and extensive bare ground.

With the exception of the Mojave Creosote Bush Scrub areas on the western edge of the survey area (west of SR-14), the area has no value as a movement corridor for the MGS. Although dispersing juveniles might attempt to enter from adjoining creosote bush habitat, the wide bands of barren fallow agricultural land would serve as a dispersal barrier. Studies in the Coso area of Inyo County have shown that a small playa acted as a barrier to the dispersal movements of radiocollared juveniles (Harris and Leitner 2005). This species is assumed to be present in suitable habitat west of SR-14 where Project transmission facilities will be constructed.

American Peregrine Falcon

The American peregrine falcon (*Falco peregrinus anatum*) was listed as endangered under CESA in 1971 and is a California state Fully Protected species (Table 3). In the past, the species primarily nested on cliffs, although recent nesting has been documented in old common raven

(*Corvus corax*) nests, electric utility poles, and buildings (White et al. 2002), among other unconventional sites. Peregrine falcons are frequently found along shorelines and large bodies of water, and they forage in open landscapes, often foraging up to five miles from the nest site and ranging widely during migration (White et al. 2002). Home range for this species can be up to 582 square miles. The peregrine falcon is not known to breed in the vicinity of the Beacon Solar Energy Project survey area. One American peregrine falcon was detected on the survey area boundary, perched on a utility pole, on May 11, 2007, during WBO surveys (Figure 10). Because no large bodies of water or suitable breeding structures occur near the survey area and no other sightings of this species have been recorded in this area, this individual was likely a transient or at most may use the area in the vicinity of the survey area as a peripheral and occasional part of its home range.

3.4.3 Nonlisted, Special Status Wildlife Species

In addition to the federally and state listed species discussed above, six CDFG SSC have the potential to occur within the survey area and surrounding one-mile buffer. Those species are northern harrier, WBO, California horned lark, Le Conte's thrasher, loggerhead shrike, and American badger. Results of focused surveys for WBO and American badger are presented below.

Western Burrowing Owl

The WBO is considered a SSC by the CDFG due to intensive development pressure on the species' habitat. WBO habitat consists of annual and perennial grasslands, deserts, and scrublands, characterized by low-growing vegetation (Zarn 1974; CBOC 1993). Suitable WBO habitat may also include trees and shrubs if the canopy covers less than 30 percent of the ground surface. Burrows are the essential component of WBO habitat and both natural and artificial burrows provide protection, shelter, and nests for WBO. WBOs typically use burrows made by mammals, such as ground squirrels or badgers, but also may use man-made structures, such as cement culverts; cement, asphalt or wood debris piles; or openings beneath cement or asphalt pavement.

WBOs in California are generally nonmigratory and occur mostly in the Central and Imperial Valleys, primarily in agricultural areas. Small, scattered populations occur in the Mojave desert. The West Mojave Plan documents 53 records of burrowing owls in the east Mojave desert (Campbell 2004), only 5 of which are confirmed breeding pairs. Population density seems to be correlated with prey availability, particularly small mammals (Klute et al. 2003).

The entire survey area and one-mile buffer were considered suitable WBO habitat, as assessed per Phase I of the CBOC protocol. During Phase II of the CBOC protocol surveys, a total of 27 burrows with WBO sign were identified within the survey area one-mile buffer. Fourteen burrows were detected within the survey area, including five burrows with recent WBO sign. Thirteen burrows with sign were detected within the one-mile buffer, including five burrows with recent WBO sign.

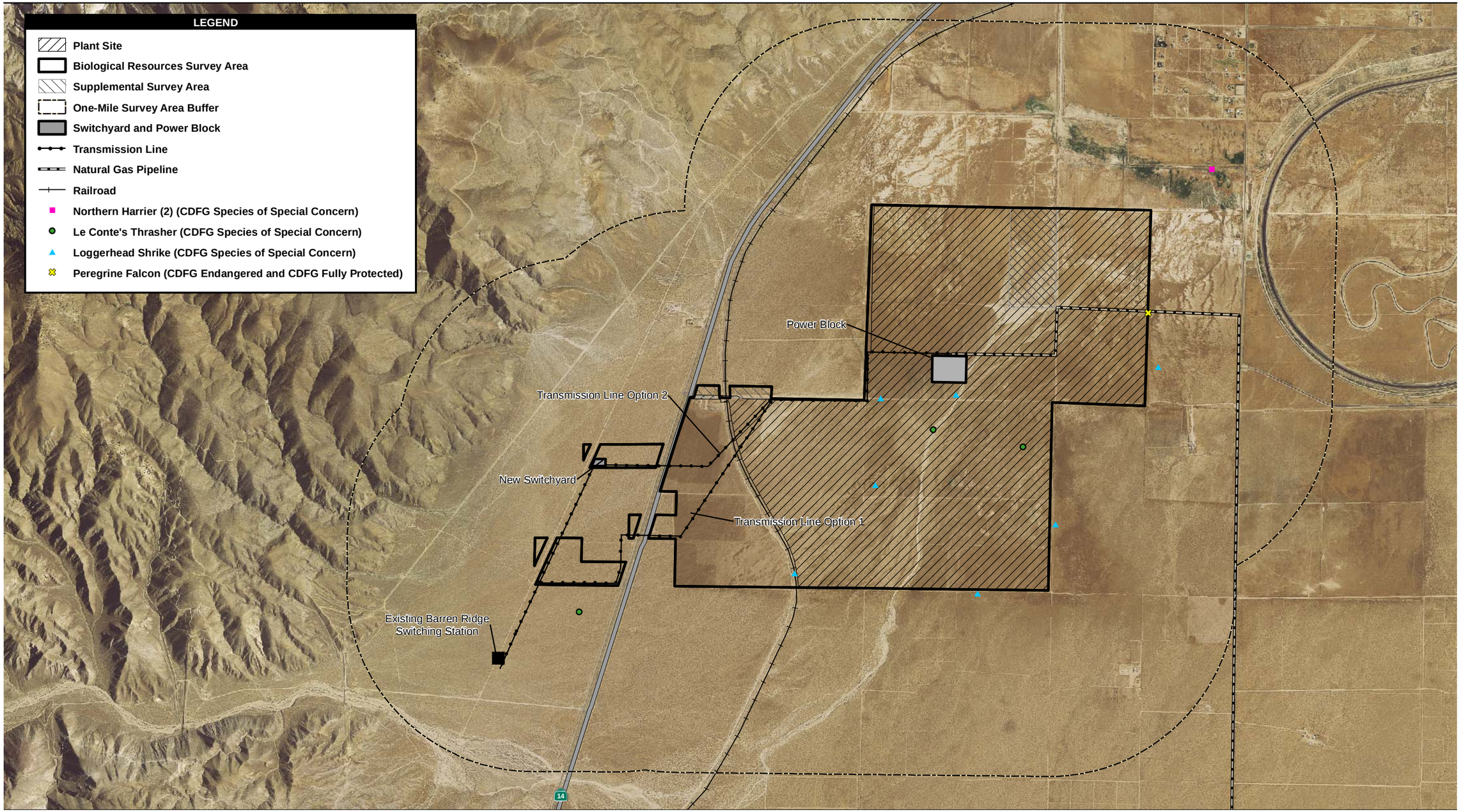
At least six WBOs were detected during focused surveys, two of which were within the survey area (Figure 11). All WBOs detected were seen within 10 meters of a burrow with recent sign. Evidence of predation was observed at two of the locations where WBOs had been detected on earlier surveys, one within the survey area. In addition to the data collected during the protocol survey, a WBO was observed on September 4, 2007, during a groundwater pump test on-site.

Northern Harrier

Northern harriers breed in open wetlands, including marshy meadows, wet lightly grazed pastures, old fields, freshwater and brackish marshes, and dry uplands including upland prairies, mesic grasslands, drained marshlands, croplands, cold desert shrub-steppe, and riparian woodland. The densest populations of northern harriers are typically associated with large tracts of undisturbed habitat dominated by thick vegetation growth (Macwhirter and Bildstein 1996). Harrier prey includes small and medium-sized mammals (primarily rodents), birds, reptiles, and frogs. Suitable habitat for this species occurs throughout the survey area. A pair of harriers was detected in the one-mile buffer northeast of the survey area during DT surveys (Figure 10).

Loggerhead Shrike

Loggerhead Shrikes inhabit edges between habitat types, grasslands, and other open habitats (Yosef 1996). Prey includes invertebrates and small vertebrates, including small mammals, birds, and reptiles. In the southern part of its range, including the survey area, loggerhead shrikes are resident and remain on permanent territories throughout the year. Outside of the breeding season, males and females defend neighboring territories which coalesce at the beginning of the nesting period. Suitable habitat for loggerhead shrike occurs throughout the survey area. Loggerhead shrikes were observed frequently during biological surveys of the survey area (Figure 10).



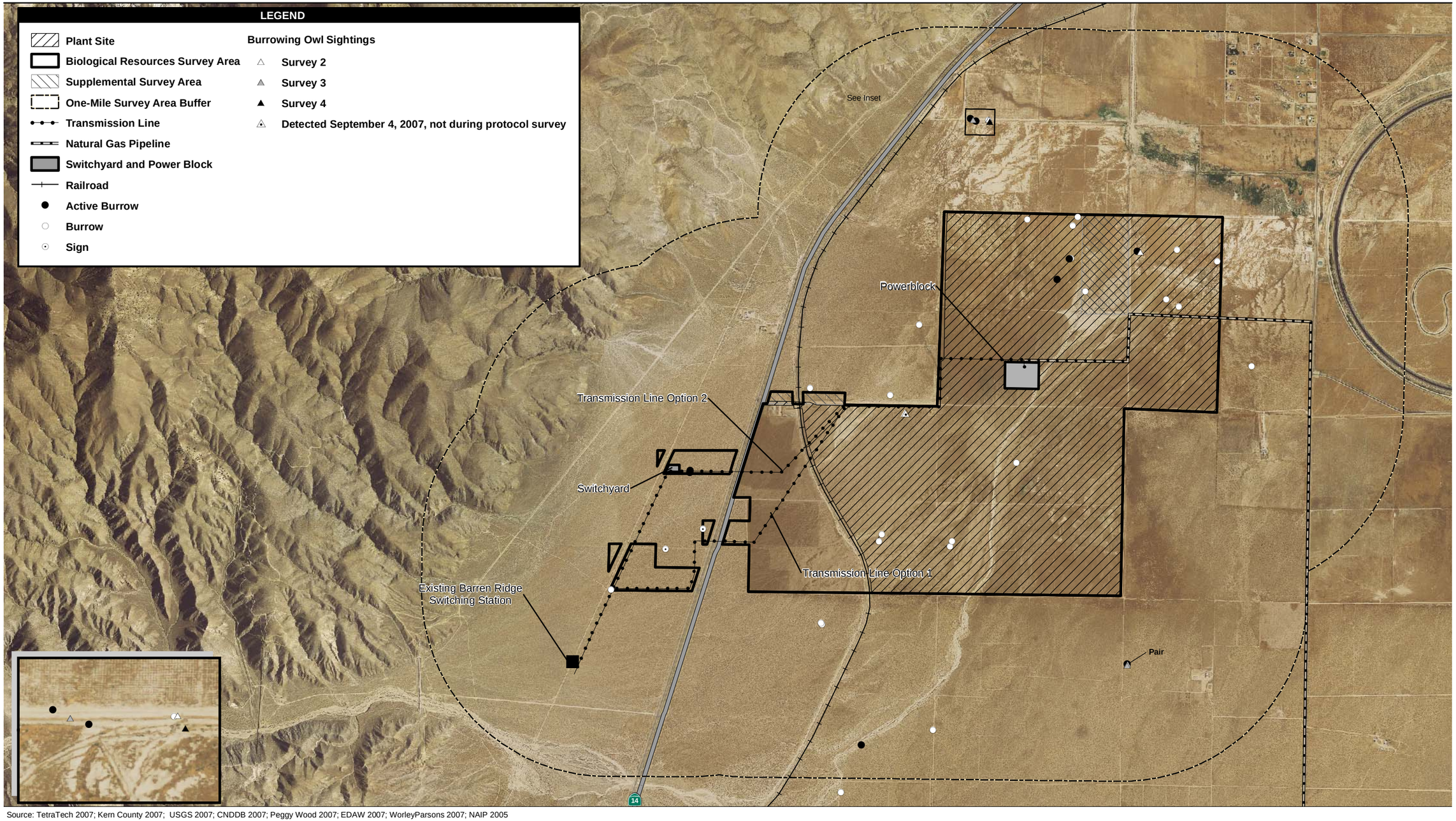
Source: TetraTech 2007; Kern County 2007; USGS 2007; CNDDB 2007; Peggy Wood 2007; EDAW 2007; WorleyParsons 2007; NAIP 2005

2,750 1,375 0 2,750 Feet

Scale: 1:33,000; 1 inch = 2,750 feet

Figure 10
Other Special Status
Biological Resources Observed

Path: P:\2008\08080001 FPLE Proj Beacon Solar\5GIS\MXD\Bio Technical Report\Figure 10 OtherSensitiveSpecies.mxd, 02/27/08, KochertE



Source: TetraTech 2007; Kern County 2007; USGS 2007; CNDDB 2007; Peggy Wood 2007; EDAW 2007; WorleyParsons 2007; NAIP 2005

2,750 1,375 0 2,750 Feet

Scale: 1:33,000; 1 inch = 2,750 feet

Figure 11
Burrowing Owls and Sign

Path: P:\2008\08080001 FPLE Proj Beacon Solar\5GIS\MXD\Bio Technical Report\Figure 11 Burrowing Owl Resources.mxd, 02/26/08, KochertE

California Horned Lark

The horned lark is a widespread bird of the open country, preferring short, sparsely vegetated prairies, deserts, and agricultural lands (Beason 1995). Adults eat primarily weed and grass seeds but they feed insects to their young. During the non-breeding season, horned larks form nomadic foraging flocks which move over a large area searching for food. During the breeding season, pairs are uniformly dispersed by territory. The species nests in shallow depressions, often lined with fine plant material, on bare ground such as plowed or fall-planted fields. The most significant threat to this subspecies is habitat destruction and fragmentation. Suitable habitat for horned lark occurs throughout the survey area. California horned larks were detected in flocks throughout the survey area in 2007 but was not mapped.

Le Conte's Thrasher

Le Conte's thrasher is an uncommon resident of the American southwest and northwestern Mexico deserts. Typical habitat consists of sparsely vegetated desert flats, dunes, alluvial fans, or gently rolling hills having a high proportion of saltbush or shadscale (*Atriplex* spp.) and/or cylindrical cholla cactus (*Opuntia* spp.) (Sheppard 1996). Shrubs are well scattered with contiguous or closed cover usually <15 m in any direction; the ground underneath is bare or with sparse patches of grasses and annuals as low ground cover. The species feeds exclusively on arthropods that it digs from litter under desert shrubs. Surface water rarely exists within several kilometers of most territories, except temporarily following infrequent rains. The species is not migratory and pairs remain together year-round. Suitable habitat for this species occurs throughout the survey area. Le Conte's thrasher was observed several times in the survey area (Figure 10).

American Badger

The badger is a resident of level, open areas in grasslands, agricultural areas, and open shrub habitats. It digs large burrows in dry, friable soils and feeds mainly on fossorial mammals: ground squirrels, gophers, rats, mice, etc. Badgers are primarily active during the day, but may become more nocturnal in close proximity to humans. The home range of male badger has been measured to be 1,327 to 1,549 acres for males and 338 to 751 acres for females in Utah (Lindzey 1978) and 400 to 600 acres in Idaho (Messick and Hornocker 1981). Mating occurs in late summer or early fall and 2 to 3 young are born 183 to 265 days later in March or April (Long 1973). Badgers are known to live 11 to 15 years (Messick and Hornocker 1981).

The American badger was not detected during surveys but has a moderate potential to occur in the survey area. This species is considered relatively common in native habitats of the area (A. Karl, pers. comm.).

3.5 CRITICAL HABITAT

The survey area does not include any designated critical habitat for any special status plant or wildlife species.

3.6 WILDLIFE MOVEMENT CORRIDORS

Wildlife movement corridors, also referred to as dispersal corridors or landscape linkages, are generally defined as linear features along with animals can travel from one habitat or resource area to another. A wildlife corridor study was not conducted as part of the BSEP since extensive, long-term species ecology, movement patterns, and dispersal behavior would be required to conclusively demonstrate if a particular site or feature of a site served as an important movement corridor. This type of data is unavailable for most of the species occurring or potentially occurring in the survey area. However, drainages, ridgelines, and other natural and manmade linear features and barriers often serve as areas that wildlife routinely use to access essential natural resources. It is assumed that wildlife species would use such features for movement if they occurred within the survey area.

The vegetated wash within the eastern section of the plant site has the potential to serve as a wildlife movement corridor. However, the wash and accompanying vegetation disperses at the northern boundary of the plant site, thus limiting the utility of this feature for cross-site movement of wildlife. No other existing linear features occur within the plant site that would provide a corridor for wildlife movement. Additionally, an existing somewhat degraded chicken-wire fence currently encompasses most of the plant site, providing a barrier to wildlife movement through the site.

CHAPTER 4
IMPACTS

In this section, Project-related impacts to vegetation communities and special status plant and animal species are analyzed. Biological resources may be either directly or indirectly impacted by a project. Direct and indirect impacts may be either permanent or temporary in nature. These impact categories are defined below.

- Direct: Any alteration, disturbance, or destruction of biological resources that would result from Project-related activities is considered a direct impact. Examples include clearing vegetation, encroaching into wetlands, diverting natural surface water flows, and the loss of individual species and/or their habitats.

- Indirect: As a result of Project-related activities, biological resources may also be affected in a manner that is not direct. Examples include elevated noise and dust levels, soil compaction, increased human activity, decreased water quality, and the introduction of invasive wildlife (domestic cats and dogs) and plants.

- Permanent: All impacts that result in the long-term or irreversible removal of biological resources are considered permanent. Examples include constructing a building or permanent road on an area containing biological resources.

- Temporary: Any impacts considered to have reversible effects on biological resources can be viewed as temporary. Examples include the generation of fugitive dust during construction; or removing vegetation for underground pipeline trenching activities and either allowing the natural vegetation to recolonize or actively revegetating the impact area. Surface disturbance that removes vegetation and disturbs the soil is considered a long-term temporary impact because of slow natural recovery in arid ecosystems. Therefore, all such impacts in the survey area are considered permanent.

Significance criteria are defined in the general context of CEQA and the National Environmental Policy Act (NEPA). Potentially significant impacts to biological resources include, but are not limited to, the following:

- Substantial impact to plant species considered by the CNPS to be rare, threatened, or endangered in California (CNPS 2007) or with strict habitat requirements and narrow

distributions; substantial impact to a sensitive natural community (i.e., community that is especially diverse; regionally uncommon; or of special concern to local, state, and federal agencies).

- Any impact to wildlife species that are federally or state listed or proposed to be listed; a substantial impact to wildlife species of special concern to CDFG, candidates for state listing, or animals fully protected in California.

- Substantial impact to habitats that serve as breeding, foraging, nesting, or migrating grounds and are limited in availability, or that serve as core habitats for regional plant and wildlife populations.

- Any impact to important riparian habitats or wetlands and any other "waters of the U.S." or "waters of the state."

4.1 ASSUMPTIONS

Assumptions employed for the calculation of direct impacts to biological resources are described below. Indirect impacts are described separately, specific to each biological resource.

4.1.1 Permanent Impacts

Solar Array, Access Roads, and Maintenance Facilities

2,012 acres of the proposed Beacon Solar Energy Project survey area east of the railroad tracks will be permanently developed to accommodate the solar array field, power generating facilities, access roads, and maintenance facilities. The entire footprint of the solar array will be graded level with a slight slope and compacted.

Transmission Line Structures

New conductor wires would transmit electrical power generated at the site to an interconnection point with the LADWP regional system west of SR-14. Two options are under consideration for interconnecting the Project to the existing LADWP Barren Ridge Switching Station.

Option 1 would involve constructing a new, approximately 3.5-mile 230-kV transmission line (of which approximately 1.6 miles will be within the plant site boundary), that would run west and southwest from the power block across SR-14 and south along an expanded LADWP right-of-

way (ROW) to the Barren Ridge Switching Station. Under Option 1, 0.9 mile of the transmission line (ten poles) are located in desert tortoise and potential Mohave ground squirrel habitat.

Option 2 would involve constructing a new, approximately 3.5-mile 230-kV transmission line (of which approximately 1.6 miles will be within the plant site boundary) to a new switching station to be constructed at the location where the Project's transmission line first meets LADWP's existing transmission ROW west of SR-14. A second, approximately one-mile 230kV transmission line would then be constructed within the expanded LADWP ROW to the Barren Ridge Switching Station (Figure 2). Under Option 2, approximately 1.5 mile of the transmission line (17 poles) are located in desert tortoise and potential Mohave ground squirrel habitat.

Under either transmission option, each pole location would require construction of a 50-foot by 50-foot pole pad. Pole height would range from 75 to 110 feet, depending on terrain and span length. Span length would range between 440 to 560 feet, averaging about 500 feet. During construction of the transmission line, pole site work areas and pull/splicing sites would be required. The pole site work areas measure 50 feet by 50 feet. The pull sites for the transmission lines average 50 feet by 140 feet each. The splicing site for the transmission line measures 95 feet by 200 feet. There will be no grading at the pole site work areas or the pull and splicing site; rather, vegetation will be crushed. The pole site work areas, pull sites, and splicing sites within desert tortoise and potential Mohave ground squirrel habitat would result in temporary disturbance that would be considered permanent based on slow recovery time of habitats in desert ecosystems. Under Option 1, up to 5.0 acres would be disturbed, which includes the access and spur roads, described below; under Option 2 (including a new switchyard), up to 5.8 acres would be disturbed (Table 1).

Under either transmission option, the new Project transmission line would tie into the existing Inyo-Rinaldi 230-kV transmission line at the existing Barren Ridge Switching Station; however, under Option 2, a new electrical switchyard would be built in association with the Project. Up to 1.7 acres of desert tortoise and potential Mohave ground squirrel habitat would be impacted by construction and Operations and Management (O&M) activities associated with the construction of the Option 2 switchyard and associated electrical tie-in. The switchyard is accessed from the existing graded patrol road that runs along the Inyo-Rinaldi line. Periodic maintenance activities for the transmission line could include cleaning of the line conductors and repair of equipment damaged by wind, dust, or accident. Activities could also include road and drainage structure repairs. Such activity would occur infrequently, perhaps once per year.

Anticipated impacts associated with the transmission line structures are summarized in Table 4.

Table 4
Estimated Natural Desert Tortoise and Mohave Ground Squirrel Habitat Acreage West of SR-14 Potentially Impacted by Transmission Line Interconnection Route

Feature	Quantity	Impact Dimensions per Feature	Square Feet	Acres
Option 1				
Pole Pad Construction	10	50' x 50'	25,000	0.6
Pull Property	3	50' x 140'	21,000	0.5
Splice Property	1	95' x 200'	19,000	0.4
Spur Roads	10	12' x 115'	13,800	0.3
Access Road	1	14' x 10,032'	140,400	3.2
Total Impact			**219,200**	**5.0**
Option 2				
Pole Pad Construction	17	50' x 50'	42,500	1.0
Pull Property	3	50' x 140'	21,000	0.5
Splice Property	1	95' x 200'	19,000	0.4
Spur Roads	17	12' x 115'	23,460	0.5
Access Road	1	14' x 5,280'	73,920	1.7
New Switchyard	1		74,052	1.7
Total Impact			**242,932**	**5.8**

New Switchyard

Under option 2, an electrical switchyard is proposed for interconnection with the existing LADWP transmission lines that cross the surveyed area west of SR-14. This switchyard will require a 1.7-acre pad. Anticipated impacts at the new switchyard are shown in Table 4.

Access

An existing dirt road off SR-14 will be upgraded (paved) to provide access to the solar array, power block, and support facilities on the plant site. Existing dirt roads west of SR-14 would provide construction and O&M access to transmission line structures whenever possible, with potential new access roads created under Option 1 (14 feet by 1.9 miles) would affect up to 3.2 acres; Option 2 (14 feet by 1.0 mile), would affect up to 1.7 acres. Additionally, spur roads (averaging 12 feet by 115 feet) to 10 pole sites under Option 1 (up to 0.3 acre) and 17 pole sites under Option 2 (up to 0.5 acre). Tortoise-proof secure gates will be installed where access roads leave SR-14 and enter the plant site.

Rerouted Desert Washes

Two existing desert washes that cross sections of the plant site will be rerouted in new, constructed channels (Figure 2). For the eastern wash, the new, revegetated channel will have an earthen bottom and will run immediately outside of the southern and eastern security fences of the plant site but inside the low-maintenance barbed-wire property fence and terminate northeast of the plant site where the existing wash currently disperses toward Koehn Lake. This new channel was designed to convey the volume and energy currently conveyed by the existing desert wash. The western, mostly unvegetated wash will be earthen bottom, and will be rerouted to pass west of the proposed evaporation ponds, follow the northern and western boundaries of the plant site, then turn east to pass through the plant site between solar arrays and terminate in the outflow of the eastern wash. The new channels will be constructed entirely within the permanent impact area within the plant site and therefore would not incur further permanent impacts.

4.1.2 Temporary Impacts

Natural Gas Pipeline

A natural gas pipeline will be constructed from California City to the solar block along California City Boulevard, Neuralia Road, and an existing dirt road that accesses the eastern edge of the plant site. This approximately 17.6-mile pipeline will occur entirely within the disturbed and developed shoulders of the existing roads and will avoid native habitat. Approximately 60.0 acres of disturbed habitat will be temporarily disturbed for the natural gas pipeline.

Construction Disturbance Areas

In addition to roads, a number of other areas associated with Project construction and operations must be cleared and graded. During the construction of the transmission line, pole site work areas (three at 50 feet x 140 feet) and splicing site work areas (one at 95 feet x 200 feet) would be required. While these are typically considered temporary impacts, they were considered permanent in calculating mitigation for the Project due to the slow recovery of native communities in desert ecosystems.

4.2 VEGETATION COMMUNITIES

4.2.1 Direct Impacts

Project-related activities would not result in significant direct impacts to sensitive vegetation communities because no sensitive vegetation communities occur in the survey area. All non-sensitive vegetation communities in the solar array area, areas associated with transmission structure footprints, access roads, equipment laydown areas, transmission line, and pipeline installation would be directly and permanently impacted (Table 5).

Table 5
Anticipated Permanent and Temporary Impacts to Plant Communities and Waters of the State in the Proposed Beacon Solar Energy Project Site

Vegetation Communities and Other Cover	Total Permanent Impact Acreage	Total Temporary Impact Acreage	Total Impact Acreage
Mojave Creosote Bush Scrub			
Option 1	4.1	0.9	5.0
Option 2	4.9	0.9	5.8
Mojave Desert Wash Scrub	59.0	0.0	59.0
Developed	7.2	60.0	67.2
Fallow Agricultural-Ruderal	1,573.8	0.9	1,574.7
Fallow Agricultural-Disturbed Atriplex Scrub	371.9	0.0	371.9
Waters of the State[1]	13.7	0.0	13.7
Total Option 1 Acres	**2,016.0[1]**	**61.8**	**2,077.8[1]**
Total Option 2 Acres	**2,016.8[1]**	**61.8**	**2,078.6[1]**

[1] Acreage of waters of the state not added to total as area is counted within other vegetation communities.

4.2.2 Indirect Impacts

Project-related activities would not result in significant indirect impacts to sensitive vegetation communities because there are no sensitive vegetation communities in the vicinity of the survey area. Potential indirect impacts to the vegetation communities surrounding the survey area would occur as a result of grading activities creating air-born dust and potential off-site sedimentation. Potential permanent, indirect impacts include spreading of exotic species in native vegetation communities such as those in transmission line corridors, wildfires caused by new transmission wires destroying or disturbing native vegetation communities, and alteration of drainage patterns. Because Project design includes rerouting the desert wash that traverses the survey area by creating an open channel along the eastern side of the site that would direct flow to an existing drainage basin northeast of the site, potential indirect impacts to downstream

vegetation communities would be minimized. However, potential wildfires and sitewide ground-disturbing activities could adversely affect vegetation communities by altering adjacent vegetation boundaries and creating disturbed areas that are more conducive to invasion of exotic species. The introduction and invasion of exotic species could potentially reduce native population growth, dispersal, and recruitment. Project design will include efforts to avoid the increase in exotic vegetation, thereby reducing the impacts to surrounding vegetation communities to a level of insignificance.

Potential temporary, indirect impacts resulting from grading include sedimentation and erosion. While detailed evaluation of these impacts will occur following completion of a more refined Project layout, a Storm Water Pollution Prevention Plan (SWPPP) and a Drainage, Erosion, and Sedimentation Control Plan (DESCP) will be prepared to comply with Regional Water Quality Control Board (RWQCB) and CEC recommendations. The SWPPP and DESCP will identify the Project design features and BMPs that will be used to effectively manage drainage-related issues (e.g., erosion and sedimentation) during construction grading and for long-term operations.

4.3 JURISDICTIONAL WATERS

4.3.1 Direct Impacts

The waters of the state that traverse the site, approximately 13.7 acres within the plant site, would be directly affected by Project development; however, these impacts would be minimized to the greatest extent feasible by re-routing the washes around Project features, revegetating the eastern new channel, and terminating both channels at the original outflow of the eastern wash. The dry desert washes extending across the survey area likely would be considered state waters.

4.3.2 Indirect Impacts

No significant indirect impact to waters of the state would occur as a result of Project-related activities because these effects would be reduced to insignificance by impact avoidance, minimization, and mitigation measures outlined in the mitigation section of this document. Potential indirect impacts to state waters surrounding the survey area would occur as a result of grading activities creating air-born dust and potentially off-site sedimentation. Potential permanent, indirect impacts include alteration of drainage patterns. Because Project design includes rerouting the desert wash that traverses the survey area by creating an open channel along the southern and eastern side of the site that would direct flows to an existing drainage basin northeast of the site, potential indirect impacts to downstream waters would be minimized.

4.4 PLANT SPECIES

4.4.1 Direct Impacts

Potential permanent, direct impacts to special status plant species, if present, may arise from implementation of the proposed Project by permanent development of the solar array, power generation and support facilities, transmission structure locations, and access roads.

Federally and State Listed Plant Species

No federally or state listed plants are considered to have the potential to occur within the survey area; therefore, no direct impacts to listed plant species would result from either Project construction or operation.

Nonlisted, Special Status Plant Species

Habitat conditions within the survey area create a moderate potential for Alkalai mariposa lily, Charlotte's phacelia, and creamy blazing star to occur within the Mojave Creosote Bush Scrub, Mojave Desert Wash Scrub, and Fallow Agricultural-Disturbed Atriplex Scrub vegetation communities (Figure 6). Red Rock tarplant and Red Rock poppy are considered to have a low potential to occur within the site. Due to low annual rainfall in 2007, conditions to adequately assess the site for these species were less than satisfactory, and therefore their absence from the site cannot be confirmed. If required, further surveys to assess the presence of these species in the survey area may be completed at a later date if average seed germination occurs in response to winter precipitation. With implementation of the impact avoidance, minimization, and mitigation measures outlined in the mitigation section of this document, the Project's direct impacts on nonlisted, special status plant species, if any, would be reduced to a level of insignificance.

4.4.2 Indirect Impacts

Potential permanent, indirect impacts to special status plant species, if present, may arise from population fragmentation and introduction of nonnative weeds. Population fragmentation could affect pollinator activity and hence gene flow. Introduction and establishment of invasive weeds within, or adjacent to, special status plant populations can adversely affect native species by

reducing growth and recruitment. Such impacts would be avoided through implementation of Project avoidance and minimization measures.

Potential temporary, indirect impacts could arise from runoff and sedimentation, erosion, fugitive dust, and unauthorized access by construction workers. Runoff, sedimentation, and erosion can adversely affect plant populations by damaging individuals or by altering site conditions sufficiently to favor other species that could competitively displace the special status species. Construction-generated fugitive dust can adversely affect plants by reducing the rates of metabolic processes such as photosynthesis and respiration. Unauthorized access by construction workers and their vehicles can trample and destroy individuals outside of, but immediately adjacent to, the proposed construction area. These impacts will be avoided, however, through implementation of Project avoidance and minimization measures.

Federally and State Listed Plant Species

Because no federally or state-listed plants have the potential to occur within the survey area, no indirect impacts to listed plant species would result from either Project construction or operation.

Nonlisted, Special Status Plant Species

As discussed above, habitat conditions within the survey area create a moderate potential for Alkalai mariposa lily, Charlotte's phacelia, and creamy blazing star to occur within the Mojave Creosote Bush Scrub, Mojave Desert Wash Scrub, and Fallow Agricultural-Disturbed Atriplex Scrub vegetation communities (Figure 6). Red Rock tarplant and Red Rock poppy are considered to have a low potential to occur within the site. Due to low annual rainfall in 2007, conditions to adequately assess the site for these species were less than satisfactory, and therefore their absence from the site cannot be confirmed. If required, further surveys to assess the presence of these species in the survey area may be completed at a later date if average seed germination occurs in response to winter precipitation. With implementation of the impact avoidance, minimization, and mitigation measures outlined in the mitigation section of this document, the Project's direct impacts on nonlisted, special status plant species, if any, would be reduced to a level of insignificance.

4.5 WILDLIFE SPECIES

4.5.1 Direct Impacts

The proposed Project could potentially result in direct impacts to special status wildlife species. For example, direct impacts could result from mortality of wildlife by crushing or vehicle collisions during construction and subsequent maintenance activities.

Federally Listed Wildlife Species – Desert Tortoise

No impacts to DT are expected within the plant site area due to lack of suitable habitat, although it is recognized that a low possibility exists that one or few transient tortoises may be found in regrowth habitats that connect to native habitat off-site (e.g., in the wash or in saltbush scrub). The vegetation regrowth community within the survey area is not DT habitat that could support the persistence or recovery of the DT population, even if one or a few tortoises are found on the site. Direct permanent and temporary impacts to the DT could potentially occur as a result of the installation of an electrical substation facility and transmission structures, which cumulatively could impact 5.0 acres (transmission Option 1) to 5.8 acres (transmission Option 2) of habitat associated with construction of these features. Temporary direct impacts to the DT could result from an increase in vehicle traffic while the Project is under construction and, consequently, an increase in vehicular strikes while tortoises are attempting to cross roads near the survey area.

Project mitigation, especially site fencing and a preconstruction DT clearance, will minimize any potential impacts to DT as a result of Project activities. Implementation of the impact avoidance, minimization, and mitigation measures outlined in the mitigation section of this document will reduce the Project's impacts on DT to a level of insignificance.

State Listed Wildlife Species - Desert Tortoise and Mohave Ground Squirrel

See above for discussion of impacts to the federally and state-listed DT. No impacts to MGS are expected to occur within the plant site due to lack of suitable habitat. However, the development of a substation facility, transmission line, access road to the plant site, and spur access roads in Mojave Creosote Bush Scrub west of SR-14 could potentially result in direct permanent and temporary impacts to 5.0 to 5.8 acres of suitable MGS habitat.

Implementation of the impact avoidance, minimization, and mitigation measures outlined in the mitigation section of this document will reduce the Project's impacts on MGS to a level of insignificance.

Nonlisted, Special Status Wildlife Species

Direct impacts to other non-listed, special status wildlife species could result from the installation of the transmission line, the establishment of work areas on-site, and wildlife mortality by crushing or vehicle collisions during Project construction and subsequent operations and maintenance activities. Direct impacts to the WBO and other birds listed under the Migratory Bird Treaty Act (MBTA) will be avoided by implementation of Project avoidance and minimization measures.

Direct impacts to WBO and other non-listed special status wildlife species could result from crushing of occupied burrows and destruction of nests; collisions with construction and maintenance vehicles; and taking of breeding and wintering habitat as a result of development of the solar array, power generation and support facilities, access roads, maintenance facilities, and transmission line and substation. Based on WBO survey data, the Project locations of the power generation and support facilities, transmission structures, access roads, and electrical substation would permanently impact three pairs of WBO. Implementation of the impact avoidance, minimization, and mitigation measures outlined in the mitigation section of this document will reduce the Project's impacts on WBO and other non-listed, special status wildlife species to a level of insignificance.

4.5.2 Indirect Impacts

The proposed Project could potentially result in temporary and permanent indirect impacts to special status wildlife species. These impacts would be reduced to insignificance by implementation of Project avoidance, minimization, and mitigation measures outlined in the mitigation section of this document. Temporary indirect impacts could result from dust accumulation on surrounding vegetation; increased ambient noise levels in adjacent plant communities; use of unnatural lighting during dawn, dusk, or nighttime construction; wildfires caused by new transmission wires destroying or disturbing habitat; accumulation of waste material in evaporation ponds; or changes in surface drainage patterns following precipitation events.

Dust accumulation on surrounding vegetation, increased ambient noise levels adjacent to construction areas, and wildfires could potentially lead to temporary, indirect impacts to special status avian species that may use the adjacent plant communities by disrupting their natural foraging patterns and destroying foraging habitat. If construction activities are conducted at night, the use of unnatural lighting could temporarily indirectly impact special status wildlife

species adjacent to construction areas by increasing possible detection by predators. Accumulated waste material in evaporation ponds could adversely affect shorebirds that stop over and use the pond during migration. Groundwater at the plant site was tested for toxic pollutants such as selenium and concentrations were found to be below accepted thresholds. If necessary, waste material will be removed and disposed of at an appropriate facility. Potential indirect impacts associated with changes in drainage patterns would be reduced to insignificance by implementation of the SWPPP and DESCP, which will include flood management procedures.

Permanent indirect impacts to special status wildlife species resulting from the proposed Project could also include: (1) habitat fragmentation, where removal of habitat elements results in separation of formerly connected habitat patches; (2) increased raptor predation on reptiles, songbirds, and small mammals resulting from an increase in perch sites provided by support structures such as transmission line towers; and (3) alteration of surface drainage patterns, which may cause differential senescence and death of plant species used by special status wildlife species. Indirect impacts from habitat fragmentation are expected to be less than significant due to the previously disturbed nature of the majority of the site, and the relatively small and discontinuous areas of native habitat that would be affected by the Project. The effects of potentially increased raptor predation on small animals and changes in surface drainage patterns on special status wildlife species are discussed further below.

Federally Listed Wildlife Species – Desert Tortoise

Indirect impacts to the DT could occur from increased common raven predation associated with the installation of new evaporation ponds and the introduction of new elevated perching sites (e.g., new transmission line towers). Biologists monitoring one groundwater pump test in September 2007 noticed 15 to 20 common ravens using the temporarily ponded water, an increase from two to five common ravens seen daily prior to the groundwater pump test. While this attraction is not within DT habitat, the movement of common ravens throughout the area and over potential DT habitat at the western edge of the survey area (e.g., between open water and transmission line perches) could increase the chances of a raven encountering and depredating a DT. Those impacts will be avoided or minimized, however, by implementation of a raven management plan. Indirect impacts to the DT from potential deposition of sediment loads during heavy rain events and flooding downstream of the site, which could impact existing DT burrows outside of the survey area, would be minimized by Project design (i.e., rerouting the desert wash and connecting to an off-site channel and grading and compacting the entire footprint of the solar array, thereby reducing on-site erosion). Similarly, indirect impacts to DT habitat by changes in

drainage patterns potentially altering off-site vegetation communities would be minimized by Project design. Implementation of the impact avoidance, minimization, and mitigation measures outlined in the mitigation section of this document will reduce the Project's indirect impacts on DT to a level of insignificance.

State Listed Wildlife Species – Desert Tortoise and Mohave Ground Squirrel

The potential indirect impacts on desert tortoise are discussed above. Indirect impacts to the MGS could occur from increased raptor and common raven predation associated with the installation of new evaporation ponds in addition to elevated perching sites, including the tower structures, the transmission lines, and support structures, as discussed above for DT. Indirect impacts to the MGS from potential deposition of sediment loads during heavy rain events and flooding downstream of the site, which could impact existing MGS habitat, would be minimized by Project design (i.e., rerouting the desert wash and connecting to an off-site channel and grading and compacting the entire footprint of the solar array, thereby reducing on-site erosion). Similarly, indirect impacts to MGS habitat by changes in drainage patterns potentially altering off-site vegetation communities would be minimized by Project design. Implementation of the impact avoidance, minimization, and mitigation measures outlined in the mitigation section of this document will reduce the Project's indirect impacts on MGS to a level of insignificance.

Nonlisted, Special Status Wildlife Species

Indirect impacts could result from increased common raven and raptor predation associated with the installation of new evaporation ponds, in addition to new elevated perching sites, including the tower structures, the transmission lines, and support structures, as discussed above for DT. Indirect impacts from potential deposition of sediment loads during heavy rain events and flooding downstream of the site, which could impact existing habitat outside of the survey area, would be minimized by Project design (i.e., rerouting the desert wash and connecting to an off-site channel and grading and compacting the entire footprint of the solar array, thereby reducing on-site erosion). Similarly, indirect impacts to habitat by changes in drainage patterns potentially altering off-site vegetation communities would be minimized by Project design. Implementation of the impact avoidance, minimization, and mitigation measures outlined in the mitigation section of this document will reduce the Project's indirect impacts on non-listed, special status wildlife species to a level of insignificance.

Direct impacts could result from mortality of wildlife by crushing or vehicle collisions during operation and maintenance activities. Project mitigation, especially site fencing, will minimize

any potential impacts to DT as a result of Project activities. Implementation of the impact avoidance, minimization, and mitigation measures outlined in Chapter 6.2 will reduce the Project's impacts on listed and special status wildlife species to a level of insignificance.

Operation of the Project may result in impacts to special status wildlife species by destruction of habitat due to wildfires caused by new transmission wires, accumulation of waste material in evaporation ponds, and attraction of avian predators, such as common ravens that are known to prey on juvenile desert tortoises, by evaporation ponds and other Project components. Depending on constituent concentrations in evaporation ponds, accumulated waste material could potentially adversely affect shorebirds that stop over and use the pond during migration.

During ongoing coordination with the USFWS and CDFG, a request was made to address the potential adverse effects of selenium levels in the evaporation pond discharge water, on wildlife species (in particular, on migratory waterfowl). The selenium discharge concentration within the evaporation ponds has been calculated at 0.0028 milligrams per liter (mg/L). Measuring the levels at which adverse effects are observable in birds is highly variable, and depends on several factors, such as species, body weight, and length of exposure, type of exposure (e.g., ingestion vs. dermal contact), the bioavailability of the compound (i.e., the ability of an organism to take up and store the compound), as well as the exposure concentration.

The U.S. Environmental Protection Agency (EPA) has published Ecological Soil Screening Levels (Eco-SSL) for selenium (2007). Although the screening levels are based on soil concentrations, the units of measure used are mg/kg, or parts per million (ppm), whereas the BSEP waste constituent concentrations are in units of mg/L (also equivalent to ppm). The Eco-SSL provides toxicology test results for bird species at a "no observable adverse effect level," (NOAEL) and at a "lowest observable adverse effect level" (LOAEL). Based on the use of surrogate species (i.e., selecting migratory birds such as the mallard [*Anas platyrhyncos*] and black-crowned night heron [*Nycticorax nycticorax*] from the Eco-SSL list of target test species), the NOAEL ranged from 0.055 ppm to 4.16 ppm (for mallard in both test cases), while the LOAEL ranged from 0.11 ppm to 8.46 ppm (for mallard in both test cases). The waste constituent concentrations that have been calculated as being discharged into the evaporation pond are 0.0028 ppm for selenium, which would be approximately 20 times lower that the most sensitive NOAEL receptor response published by the EPA (2007). Therefore, it is not anticipated that the selenium concentrations in the evaporation pond would pose an adverse condition to migratory birds. Ongoing monitoring of the evaporation ponds, as described in Section 5.3.4, would track the waste constituent concentrations of any compound of concern, and

the implementation of those pertinent mitigation measures will reduce the effects of those compounds on wildlife species to a level of insignificance.

Overall, implementation of the impact avoidance, minimization, and mitigation measures outlined in Chapter 6.2 will reduce the Project's indirect impacts on special status species to a level of insignificance.

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ATTACHMENT 3

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN

ATTACHMENT 3

DRAFT
BEACON SOLAR ENERGY PROJECT
BIOLOGICAL RESOURES MITIGATION IMPLEMENTATION AND MONITORING PLAN

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DRAFT BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN BEACON SOLAR ENERGY PROJECT

INTRODUCTION

Beacon Solar, LLC (Beacon), will adopt this Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) in accordance with California Energy Commission (CEC) Guidelines. The purpose of the BRMIMP is to ensure that the Beacon Solar Energy Project (BSEP) complies with all applicable environmental mitigation and permit requirements. Mitigation measures for the project will be adopted by Beacon, in conjunction with the certification by the CEC. These mitigation measures have been integrated into this BRMIMP. Within this document, approved mitigation measures are organized and referenced by biological issue area. Each of these measures has a numerical reference. Specific mitigation measures are identified, as well as the timing of verification and the responsible party that will ensure that each action is implemented.

Direct and indirect impacts associated with the BSEP are identified in the Incidental Take Permit Application, Application for Certification with the CEC, and the Biological Technical Report. This BRMIMP denotes whether a mitigation measure results from a significant direct or indirect impact.

Mitigation measures applicable to the BSEP include avoiding certain impacts altogether, minimizing impacts by limiting the degree or magnitude of the action and its implementation, rectifying impacts by repairing, rehabilitating, or restoring the affected environment, and/or reducing or eliminating impacts over time by preservation and maintenance operations during the life of the action. It is Beacon's responsibility to implement mitigation measures required to address potentially significant impacts resulting from the BSEP.

Table 1
Biological Resource Mitigation Measures to be Implemented by the Beacon Solar Energy Project

Mitigation Measure Number	Mitigation Measure	Timing of Verification			Verified by	
		Project Design	During Construction	Post-Construction	Name	Date
General Measures (GM)						
GM-1	All temporary and permanent impact areas will be surveyed for DT and WBO within 30 days prior to commencement of construction activities in the survey area. Rare plant species and special status wildlife species habitat will be identified during rare plant surveys and flagged for avoidance. If construction occurs during or following a high-rainfall year, rare plant surveys will be conducted to identify and flag newly detected populations.	X	X			
GM-2	The construction contractor(s)/crew(s) will be informed about the biological constraints of the Project. All construction personnel who work in the survey area will attend a contractor education program, developed and presented by a Project biologist prior to the commencement of construction activity. The construction crews and contractor(s) will be responsible for unauthorized impacts from construction activities to sensitive biological resources that are outside the areas defined as subject to impacts by the California Energy Commission (CEC) and other agencies who must issue approvals for the Project.	X	X			
GM-3	Construction crews and contractors will be responsible for working around all shrubs and trees within temporary impact zones to the extent feasible. Shrubs and trees will be flagged during pre-activity surveys to indicate priority for avoidance.	X	X			
GM-4	The anticipated impact zones, including staging areas, equipment access, and disposal or temporary placement of spoils, will be delineated with stakes and flagging prior to construction to avoid natural resources where possible. Construction-related activities outside of the impact zones will be avoided.	X	X			
GM-5	New and existing roads that are planned for either construction or widening will not extend beyond the planned impact area. All vehicles passing or turning around will do so within the planned impact area or in previously disturbed areas. Where new access is required outside of existing roads or the construction zone, the route	X	X	X		

Mitigation Measure Number	Mitigation Measure	Timing of Verification			Verified by	
		Project Design	During Construction	Post-Construction	Name	Date
	will be clearly marked (i.e., flagged and/or staked) prior to the onset of construction.					
GM-6	The pipeline construction will involve nearly simultaneous trenching, laying of pipe, and backfilling so that no open trenches will be left unattended during daylight hours. Any open trenches that cannot be backfilled will be covered with steel plates at night. Biological monitors will attend pipeline construction to ensure that special status resources are avoided or moved to a safe location when necessary. Spoils will be stockpiled in disturbed areas presently lacking native vegetation. Stockpile areas will be marked to define the limits where stockpiling can occur.	X	X			
GM-7	Best Management Practices (BMPs) will be employed to prevent loss of habitat due to erosion caused by Project-related impacts (i.e., grading or clearing for new roads). All detected erosion will be remedied within two (2) days of discovery.	X	X			
GM-8	Fueling of equipment will take place within existing paved roads, and not within or adjacent to drainages or native desert habitats. Contractor equipment will be checked for leaks prior to operation and repaired as necessary.	X	X			
GM-9	Construction activity will be monitored by a qualified biologist to ensure compliance with avoidance and minimization measures.	X	X			
GM-10	The Project proponent is supportive of funding a monitoring program to document potential nesting ravens. The details of the funding mechanism and monitoring will be coordinated with the California Department of Fish and Game (CDFG) and United States Fish and Wildlife Service (USFWS) prior to initiation of the Project.	X	X	X		
GM-11	The introduction of exotic plant species will be avoided and controlled wherever possible, and may be achieved through physical or chemical removal and prevention. Preventing exotic plants from entering the site via vehicular sources will include measures such as implementing Trackclean or other method of vehicle cleaning for vehicles coming and going from the site. Earth-moving equipment shall be cleaned prior to transport to the project site. Weed-free rice straw or other certified weed-free straw will be used for erosion control. Weed	X	X	X		

Mitigation Measure Number	Mitigation Measure	Timing of Verification			Verified by	
		Project Design	During Construction	Post-Construction	Name	Date
	populations introduced into the site during construction will be eliminated by chemical and/or mechanical means approved by the CDFG, USFWS, and CEC.					
Desert Tortoise (DT)						
DT-1	Prior to the onset of construction, the entire plant site (east of the railroad tracks) will be enclosed with a permanent tortoise-proof fence to keep tortoises in habitat adjacent to the site from entering the site during construction and operations phases. The fencing type will be one- by two-inch vertical mesh galvanized fence material, extending at least two feet above the ground and buried at least one foot. Where burial is impossible, the mesh will be bent at a right angle toward the outside of the fence and covered with dirt, rocks, or gravel to prevent the tortoise from digging under the fence. Tortoise-proof gates will be established at all site entry points. Any utility corridors and tower locations will be temporarily fenced to prevent tortoise entry during construction. Temporary fencing will follow guidelines for permanent fencing and supporting stakes will be sufficiently spaced to maintain fence integrity. All fence construction will be monitored by qualified biologists (see DT-3, below) to ensure that no tortoises are harmed. Following installation, the fencing will be inspected monthly and during all major rainfall events. Any damage to the fencing will be repaired immediately.	X	X	X		
DT-2	A clearance for any desert tortoises that may be on the site east of the railroad tracks by virtue of connection to adjacent native habitat will be conducted in all areas with shrub cover. A minimum of two clearance passes will be completed after tortoise-proof fencing is installed and these will coincide with heightened tortoise activity, from late March through May and during October. This will maximize the probability of finding all tortoises. It is anticipated that no or very few tortoises will be found. Any tortoises found will be translocated to a location outside of the survey area using techniques approved by Agency Representatives. Translocation should only occur when daily ground temperatures do not exceed 42 degrees Centigrade (°C) (i.e., early spring or fall), so that animals can safely find refuge in potentially unfamiliar areas without the added constraints of lethal	X	X			

Mitigation Measure Number	Mitigation Measure	Timing of Verification			Verified by	
		Project Design	During Construction	Post-Construction	Name	Date
	temperatures. No tortoises will be translocated between mid-April and early October, unless ambient temperatures are favorable. If the schedule of construction requires that clearance surveys continue past the safe time to translocate tortoises (i.e., past early April), then continued searches for tortoises would include temporarily affixing found tortoises with transmitters for ease of refinding them and translocating them during autumn, at a safe time for translocation. Once the site is deemed free of desert tortoises after two consecutive clearance passes, then heavy equipment will be allowed to enter the sites to perform construction activities. In the unlikely event that a tortoise is found on the site during Project Operations, the tortoise will be captured, boxed in a clean, escape-proof box, and temporarily maintained in a cool, quiet, safe location until the Authorized Biologist can arrive to remove it from the site, no more than one day. The capture location will be recorded. If ambient temperatures exceed lethal levels on a daily level, the Authorized Biologist will confer with CDFG and USFWS representatives prior to transporting the tortoise offsite.					
DT-3	West of SR-14, all tortoises will be sought and removed from fenced construction zones to artificial burrows or burrows that appear to belong to the tortoise, outside the temporary fencing. Tortoises may be moved during seasons when daily ambient temperatures exceed lethal levels, but only late in the day when ground temperatures fall below 42°C and air temperatures fall below 32°C (90°F). These tortoises will be temporarily monitored to ensure that their behaviors resulting from translocation do not affect their survival.	X	X			
DT-4	Following site clearance, a report will be prepared by the Project Authorized Biologist (see DT-3) to document the clearance surveys, the capture and release locations of all tortoises found, individual tortoise data, and other relevant data. This report will be submitted to Agency Representatives.	X	X			
DT-5	An Authorized Biologist (AB) and Biological Monitor(s) (BM) will be appointed to oversee compliance with the protection measures for the desert tortoise and other species. The AB or BM will be on site during	X	X			

Mitigation Measure Number	Mitigation Measure	Timing of Verification			Verified by	
		Project Design	During Construction	Post-Construction	Name	Date
	fencing activities. The AB or BM will have the right to halt all activities that are in violation of the tortoise protection measures. Work will proceed only after hazards to the desert tortoise are removed and the species is no longer at risk, or the individual has been moved from harm's way by the AB. The AB and BM will have in their possession a copy of all the compliance measures while work is being conducted on site. The AB and BM will be responsible for awareness trainings, surveys, compliance monitoring, and reporting.					
DT-6	The proponent will submit the names and statement of qualifications of all proposed ABs and BMs to USFWS, CDFG, and CEC (Agency Representatives) for review and approval at least 30 days prior to initiation of any tortoise handling, clearance, and pre-activity surveys. Project activities will not begin until the ABs and BMs are approved by the aforementioned agencies. Only ABs will be allowed to handle and relocate desert tortoises when necessary. Biological monitors will ensure compliance with the protection measures but will not be allowed to survey for or handle desert tortoises. Workers will notify the AB or BM of all desert tortoise observations.	X	X			
DT-7	The AB and BM will be responsible for awareness trainings, surveys, compliance monitoring, and reporting.	X	X			
DT-8	Personnel will utilize established roadways (paved or unpaved) in traveling to and from the survey area and also will utilize existing tracks on site whenever possible. Cross-country vehicle and equipment use outside designated work areas will be prohibited. To minimize the likelihood for vehicle strikes of desert tortoises, a speed limit of 25 miles per hour will be established for travel within desert tortoise habitat.	X	X	X		
DT-9	A trash abatement program will be established. Trash and food items will be contained in closed containers and removed daily to reduce the attractiveness to opportunistic predators such as common ravens, coyotes (*Canis latrans*), and feral dogs (*Canis lupus*).	X	X	X		
DT-10	Workers will be prohibited from bringing pets and firearms to the site.					

Mitigation Measure Number	Mitigation Measure	Timing of Verification			Verified by	
		Project Design	During Construction	Post-Construction	Name	Date
DT-11	As much as feasible, parking and storage will occur within the tortoise exclusion fencing. Anytime a vehicle or construction equipment is parked for longer than two minutes in unfenced desert tortoise habitat, the ground under the vehicle will be inspected for the presence of desert tortoise before it is moved. If a desert tortoise is observed, it will be left to move on its own. If it does not move within 15 minutes, the AB will remove and relocate the animal to a safe location.	X	X			
DT-12	All vehicles and equipment will be in proper working condition to ensure that there is no potential for fugitive emissions of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials. The AB and BM will be informed of any hazardous spills within 24 hours. Hazardous spills will be immediately cleaned up and the contaminated soil will be properly disposed of at a licensed facility.	X	X			
DT-13	Intentional killing or collection of either plant or wildlife species, including listed species such as the desert tortoise, in the survey area and surrounding areas will be prohibited. The AB, BM, and Agency Representatives will be notified of any such occurrences within 24 hours.	X	X	X		
DT-14	For emergency response situations, the AB will notify the Agency Representatives within 24 hours. As a part of this response, the Agency Representatives may require additional measures to protect the desert tortoise. During any responses related to human health, fire, hazardous waste, or repairs requiring off-road vehicle and equipment use, the Agency Representatives may also require measures to recover damaged habitat.		X			
DT-15	Water will be applied to the construction right-of-way, dirt roads, trenches, spoil piles, and other areas where ground disturbance has taken place to minimize dust emissions and topsoil erosion. During the desert tortoise active season, a BM will patrol these areas to ensure water does not puddle for long periods of time and attract desert tortoises, common ravens, and other wildlife to the site.		X			
DT-16	Upon locating a dead or injured desert tortoise, the AB will make initial notification to the Agency Representatives within 24 hours of its	X	X	X		

Mitigation Measure Number	Mitigation Measure	Timing of Verification			Verified by	
		Project Design	During Construction	Post-Construction	Name	Date
	finding. The notification must be made by telephone and writing to the nearest USFWS Field Office, the Ventura Field Office in this case. The report will include the date and time of the finding or incident (if known), location of the carcass, a photograph, cause of death (if known), and other pertinent information. Tortoises fatally injured as a result of Project-related activities will be submitted for necropsy as outlined in Salvaging Injured, Recently Dead, Ill, and Dying Wild, Free-Roaming Desert Tortoises (*Gopherus agassizii*). Tortoises with fewer major injuries will be transported to a nearby qualified veterinarian for treatment at the expense of the proponent. If an injured animal recovers, the offices of the Agency Representatives will be contacted for final disposition of the animal.					
DT-17	On a monthly basis until construction is completed, the AB will prepare a brief report for the Agency Representatives, documenting the effectiveness and practicality of the protection measures that are in place and making recommendations for modifying the measures to enhance species protection, as needed. The report will also provide information on the overall biological resources-related activities conducted, including the worker awareness training, clearance/ preactivity surveys, monitoring activities, and any observed desert tortoises including injuries and fatalities.	X	X			
DT-18	In addition to the measures discussed above, the Project owner will compensate for impacts to DT habitat in the area west of the plant site potentially affected during construction activities related to either of the two transmission line options. This will be accomplished either by land acquisition acceptable to USFWS, CDFG, and CEC, or an assessed financial contribution calculated based on the final construction footprint. Direct permanent and temporary impacts to 5.0 acres (Option 1) or 5.8 acres (Option 2) of potential DT habitat would be mitigated at a 1:1 ratio. Habitat conservation generally consists of the offsite purchase of in-kind habitat of equal or greater value than that impacted. Funding for the long-term management of the land preserved will also be required. The location of the preserved land and the management program would be negotiated between the resource agencies (including the CEC) and the Project applicant.	X	X			

Mitigation Measure Number	Mitigation Measure	Timing of Verification			Verified by	
		Project Design	During Construction	Post-Construction	Name	Date
Mohave Ground Squirrel (MGS)						
MGS-1	Onsite monitoring of ground disturbance activities by a qualified biologist in all areas with the potential to support the Mohave ground squirrel. During construction activities, monthly and final compliance reports shall be provided to CDFG and other relevant regulatory agencies documenting the effectiveness of mitigation measures and the level of take associated with this project.	X	X			
MGS-2	Indirect impacts from vehicle strikes will be minimized by employee education on the proper procedures for operating vehicles on the site, including using proper vigilance to avoid wildlife, maintaining safe speed limits on access/patrol roads, and prohibiting travel off the established roadways.	X	X	X		
MGS-3	The Project proposes to compensate for the potential direct permanent and temporary loss of 5.0 acres (Option 1) or 5.8 acres (Option 2) of potential MGS habitat at a ratio of 2:1. Funding for the long-term management of the land preserved (on a per-acre of impact basis) will be negotiated by CDFG and CEC, and a fee title or conservation easement shall be granted to CDFG or other CDFG-approved nonprofit entity.	X	X			

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ATTACHMENT 4

REFERENCES

REFERENCES REVIEWED AND/OR CITED

Beason, R.C., 1995. Horned Lark (*Eremophila alpestris*), The Birds of North America Online (A. Poole, editor). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/beta/species/195.

Berry, K.H., 2003. Salvaging Injured, Recently Dead, Ill, and Dying Wild, Free-roaming Desert Tortoises (*Gopherus agassizii*). Revised June 2003.

Boarman, W.I., 1994. Effectiveness of fences and culverts for protecting desert tortoises along California State Highway 58: summary of the 1993 field season. Draft. Unpub. rept. to the California Energy Commission. Contract No. 700-90-015, Phase 3, Task 3-3. 23 pp. plus appendices.

California Burrowing Owl Consortium (CBOC), 1993. Burrowing Owl Survey Protocol and Mitigation Guidelines. April 1993.

California Department of Fish and Game (Department), 1995. Staff Report on Burrowing Owl Mitigation. Memorandum dated October 17, 1995.

California Department of Fish and Game (Department), 2003. California Department of Fish and Game Wildlife Habitat Data Analysis Branch. The Vegetation Classification and Mapping Program- List of California Terrestrial Natural Communities Recognized by the California Natural Diversity Database. Available at http://www.dfg.ca.gov/whdab/pdfs/ natcomlist.pdf. September.

California Department of Fish and Game (Department), 2007. California Department of Fish and Game. RareFind 3 computer program. California Natural Diversity Database (CNDDB) Search for Beacon Solar Energy Project Area. California Department of Fish and Game, State of California Resources Agency. Sacramento, California.

California Fish and Game Commission (Department), 1989. Animals of California Declared to be Endangered or Threatened. 14 CCR § 670.5, Barclays Official California Code of Regulations Title 14. Natural Resources, Division 1, Fish and Game Commission-Department of Fish and Game, Subdivision 3. General Regulations, Chapter 3, Miscellaneous.

California Native Plant Society (CNPS), 2001. CNPS Botanical Survey Guidelines. Pages 38-40 in California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California (D.P. Tibor, editor). Sixth edition. Special Publication No. 1, California Native Plant Society, Sacramento, 387 pp.

California Native Plant Society (CNPS), 2007. Inventory of Rare and Endangered Plants of California, California Native Plant Society, Sacramento, California.

Campbell, K.F., 2004. Burrowing Owl – Species Account. Final Environmental Impact Report and Statement for the West Mojave Plan. U.S. Dept. of Interior, Bureau of Land Management. Moreno Valley, California. December 2004.

EDAW, Inc. (EDAW). In preparation. Screening Form for Low-Effect HCP Determinations, Beacon Solar Energy Project, California City, Kern County, California. Draft September 2007.

EDAW, Inc. (EDAW), 2004. Biological Technical Report/Biological Assessment for the Pine Tree Wind Development Project, Kern County, California. Draft September 2004.

EDAW, Inc. (EDAW), 2007a. Beacon Solar Energy Project Biological Technical Report, Kern County, California. November 2007.

EDAW, Inc. (EDAW), 2007b. Project Beacon Botanical Survey Report, Kern County, California. August 2007.

EDAW, Inc. (EDAW), 2007c. Report Summarizing Results of the Proposed Project Beacon Desert Tortoise Presence/Absence Surveys. August 2007.

EDAW, Inc. (EDAW), 2007d. Report Summarizing Results of the Proposed Project Beacon Burrowing Owl Presence/Absence Surveys. August 2007.

Faull, M.R., 2004. Regional Endemism in the Northwestern Mojave Desert of California as Represented by Red Rock Tarplant (*Deinandra arida)*. California State Parks, Mojave Desert Sector, 43779 North 15th Street West, Lancaster, California 93534. Oral Presentation). March.

Harris, J.H., and P. Leitner, 2005. Long-Distance Movements of Juvenile Mohave Ground Squirrels, *Spermophilus mohavensis*. Southwestern Naturalist, 50(2):188-196.

Holland, R., 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. Nongame Heritage Program, State of California Department of Fish and Game.

Karl, A. E., 1989. Investigations of the desert tortoise at the California Department of Health Services' proposed low-level radioactive waste facility site in Ward Valley, California. Unpub. rept. submitted to US Ecology and Ecological Research Services. 116 pp.

Karl, A.E., 2007. Summary of August 10, 2007 site visit for FPLE Beacon Solar Energy Project. Assessment of vegetation communities.

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.

LaRue, E.L., 1993. section 4Distribution of desert tortoise sign adjacent to Highway 395, San Bernardino County, California. Draft. Unpub. rept. from Tierra Madre Consultants to Gratten, Gersick, Karp, and Miller, Sacramento, CA. 17 pp.

Lawler, Howard, 2000. A Natural History of The Desert Tortoise, Gopherus (Xerobates) agassizii. [Online]. Available at http://www.biopark.org/destort1.html [2000].

Leitner, P., and B.M. Leitner, 1998. Coso Grazing Exclosure Monitoring Study. Mohave Ground Squirrel Study, Coso Known Geothermal Resource Area, Major Findings, 1988-1996. Final Report. 42 pp. + append.

Lindzey, F.G. Movement Patterns of Badgers in Northwestern Utah. J. Wildl. Manage. 42: 418-422.

Long, C.A., 1973. *Taxidea taxus*. Mammal. Species. No. 26. 4 pp.

Los Angeles Department of Water and Power (LADWP), 2007. Desert Tortoise Pre-Construction Survey and Monitoring Report for the Barren Ridge Switching Station

Macwhirter, R.B., and K.L. Bildstein, 1996. Northern Harrier (*Circus cyaneus*), The Birds of North America Online (A. Poole, editor). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/beta/species/210.

Marlow, R.W., K. von Seckendorff Hoff, and P. Brussard, 1997. Management of wild tortoise populations is complicated by escape or release of captives. Pp. 479-480 *in* J. van Abbema (ed.), Proceedings: Conservation, Restoration, and Management of Tortoises and Turtles – an International Conference. Joint publ. of the New York Turtle and Tortoise Society and the WCS Turtle Recovery Program.

Messick, J.P., and M.G. Nornocker, 1981. Ecology of the badger in southwestern Idaho. Wildl. Monogr. No. 76. 53 pp.

National Agriculture Imagery Program (NAIP), 2005. Online aerial imagery. http://165.221.201.14/NAIP.html

National Oceanic and Atmospheric Administration (NOAA), 2007. Electronic document, http://www.weather.gov/climate/local_data.php?wfo=hnx, accessed July 7, 2007.

Nicholson, L.L., 1978. The effects of roads on desert tortoise populations. Pp. 127-129 *in* M. Trotter (ed.) Proceedings of the 1978 Desert Tortoise Council Symposium.

Sawyer, J.O., and T. Keeler-Wolf, 1995. A Manual of California Vegetation. California Native Plant Society, Sacramento, California.

Sheppard, J.M.. 1996. Le Conte's Thrasher (*Toxostoma lecontei*), The Birds of North America Online (A. Poole, editor). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/beta/species/230.

Stebbins, R.C., 1985. A Field Guide to Western Reptiles and Amphibians. Second edition. Houghton Mifflin Co., Boston. 336 pp.

U.S. Bureau of Land Management (BLM), 2005. Final Environmental Impact Report and Statement for the West Mojave Plan. U.S. Bureau of Land Management, Moreno Valley, California.

U.S. Department of Agriculture (USDA), 2007. Natural Resources Conservation Service Web Soil Survey. Available at http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx.

U.S. Fish and Wildlife Service (USFWS). In preparation. Screening Form for Low-Effect HCP Determinations. Beacon Solar Energy Project. California City, Kern County, California. Draft September 2007.

U.S. Fish and Wildlife Service (USFWS), 1989. Endangered and Threatened Wildlife and Plants; Emergency Determination of Endangered Status for the Mojave Population of the Desert Tortoise. Federal Register 54(149):32326-32331.

U.S. Fish and Wildlife Service (USFWS), 1990. Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Mojave Population of the Desert Tortoise. Federal Register 55(63):12178-12191

U.S. Fish and Wildlife Service (USFWS), 1992. Field Survey Protocol for Any Non-Federal Action That May Occur within the Range of the Desert Tortoise.

U.S. Fish and Wildlife Service (USFWS), 1994a. Endangered and Threatened Wildlife and Plants; Determination of Critical Habitat for the Mojave Population of the Desert Tortoise. Federal Register 59(26):5820-5866.

U.S. Fish and Wildlife Service (USFWS), 1994b. The Desert Tortoise (Mojave Population) Recovery Plan. U.S. Fish and Wildlife Service, Region 1 – Lead Region, Portland, Oregon. 73 pp. + appendices.

U.S. Fish and Wildlife Service (USFWS), 2007. National Bald Eagle Management Guidelines. May 2007.

White, C.M., N.J. Clum, T.J. Cade, and W.G. Hunt, 2002. Peregrine Falcon (*Falco peregrinus*). The Birds of North America Online (A. Poole, editor). Ithaca: Cornell Laboratory of Ornithology; Retrieved from The Birds of North American Online database: http://bna.birds.cornell.edu/BNA/account/Peregrine Falcon/.

Yosef, Reuven, 1996. Loggerhead Shrike (*Lanius ludovicianus*), The Birds of North America Online (A. Poole, editor). Ithaca: Cornell Laboratory of Ornithology; Retrieved from The Birds of North American Online: http://bna.birds.cornell.edu/beta/species/231.

Zarn, M., 1974. Burrowing Owl. U.S. Department of Interior, Bureau of Land Management. Technical Note T-N 250. Denver, Colorado. 25 pp.