Volume IV: Appendices H-L

United States Department of the Interior
Bureau of Land Management

BLM

Desert Sunlight Solar Farm Project
California Desert Conservation Area Plan Amendment and Final Environmental Impact Statement

For the
Palm Springs – South Coast Field Office
Palm Springs, California

April 2011
CACA #48649

Appendix H

Biological Resources

Biological Resources Technical Report

BIOLOGICAL RESOURCES TECHNICAL REPORT
DESERT SUNLIGHT SOLAR FARM PROJECT
BLM CASE FILE NUMBER CACA-48649
RIVERSIDE COUNTY, CALIFORNIA

Prepared for
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Revised
July 20, 2010

Summary

Desert Sunlight Holdings, LLC (Sunlight) has requested a right-of-way grant from the U.S. Bureau of Land Management (BLM) to construct and operate a new solar photovoltaic (PV) energy generating facility in an unincorporated part of Riverside County, California near the community of Desert Center (BLM Case File Number CACA-48649). The solar facility, associated generation interconnection line (Gen-Tie Line), and Southern California Edison's (SCE) Red Bluff Substation are collectively referred to in this report as the Desert Sunlight Solar Farm Project (DSSF or Project).

This report presents information regarding biological resources that occur on lands associated with the Project, along with a summary of the methods and results for biological surveys and investigations that have been conducted at the DSSF Study Area. The purpose of the surveys is to provide information supporting formal consultation between BLM and U.S. Fish and Wildlife Service (USFWS) under Section 7 of the federal Endangered Species Act (ESA), and any necessary incidental take authorization from the California Department of Fish and Game (CDFG) with respect to the California Endangered Species Act (CESA). The data contained within this report also provides information to promote compliance with requirements of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA).

Beginning in 2007, initial background literature and database searches were conducted for the Project, and initial vegetation mapping and a biological constraints analysis were prepared. Between 2008 and 2010, several focused wildlife and botanical surveys were conducted throughout the Study Area, which encompasses the entire areas of potential impact associated with the Solar Farm, Gen-Tie Line, Red Bluff Substation, and all considered alternatives. Biologists from BLM and USFWS were consulted prior to conducting surveys.

These surveys confirmed the presence of a low-density desert tortoise population within the overall Study Area. Distinct concentrations of active desert tortoise sign were observed in specific portions of the Study Area. Eleven other special status wildlife species were detected during the surveys:

- American badger
- Burrowing owl
- Burro deer
- Chuckwalla
- Ferruginous hawk
- Golden eagle
- Le Conte's thrasher
- Loggerhead shrike
- Northern harrier
- Palm Springs round-tailed ground squirrel
- Swainson's Hawk

The botanical surveys revealed the presence of six special status plants species within the Study Area including:

- California ditaxis
- Crucifixion thorn
- Desert unicorn plant
- Foxtail cactus
- Las Animas colubrine
- Slender-spined althorn (crown-of-thorns)

Sensitive habitat types were identified in the Study Area including Desert Dry Wash Woodlands and unvegetated dry washes. Portions of the Study Area, associated with the Gen-Tie Line and Red Bluff Substation alternatives, overlap with the Chuckwalla Desert Wildlife Management Area (DWMA) and the Chuckwalla critical habitat unit (CHU) for desert tortoise

Table of Contents

List of Tables

List of Figures

List of Acronyms

amsl	above mean sea level
BA	Biological Assessment
BLM	U.S. Bureau of Land Management
BRTR	Biological Resources Technical Report
CDFG	California Department of Fish and Game
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CHU	Critical Habitat Unit
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CNPSEI	California Native Plant Society's Electronic Inventory
DSSF	Desert Sunlight Solar Farm
DWMA	Desert Wildlife Management Area
EIS	Environmental Impact Statement
ESA	Endangered Species Act
NECO	Northern and Eastern Colorado Coordinated Management Plan
NEPA	National Environmental Policy Act
ORV	Off-road vehicle
PV	Photovoltaic
RBSS	Red Bluff Substation
SBBM	San Bernardino Base and Meridian
SCE	Southern California Edison
SSC	Species of Special Concern
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

1.0 Introduction

1.1 Purpose of the Biological Resources Technical Report

This Biological Resources Technical Report (BRTR) provides a comprehensive summary of methods and results of biological resource surveys and investigations conducted between 2007 and 2010 within the Study Area for the Desert Sunlight Solar Farm Project (DSSF or Project) as proposed by Desert Sunlight Holdings, LLC (Sunlight). The purpose of the surveys is to support formal consultation between BLM and U.S. Fish and Wildlife Service (USFWS) under Section 7 of the Federal Endangered Species Act (FESA), and any necessary incidental take authorization from the California Department of Fish and Game (CDFG) with respect to the California Endangered Species Act (CESA). The data contained within this report also provides information to promote compliance with requirements of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA).

1.2 Organization of Project Components

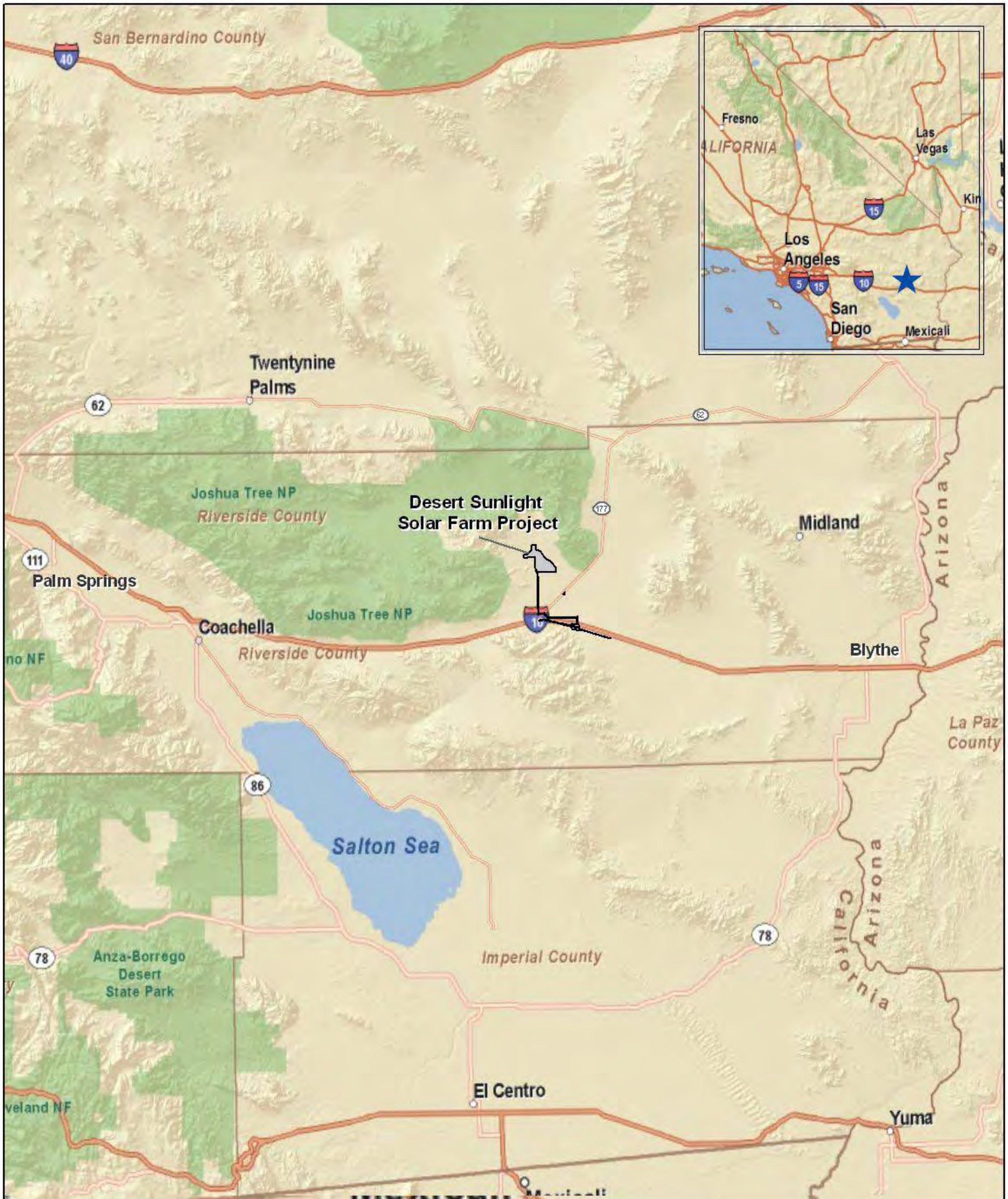
The Project includes components that would be independently constructed and maintained by Sunlight and Southern California Edison (SCE). In short, Sunlight components would include the Solar Farm, and the generation interconnection transmission line (Gen-Tie Line), and associated facilities; SCE components would include the Red Bluff Substation and associated facilities, including the telecommunications site. This report addresses all Project components and alternatives, while presenting Sunlight and SCE components separately.

1.3 Project Location

1.3.1 Sunlight Components

The Solar Farm site is located on the Victory Pass and East of Victory Pass 7.5 Minute U.S. Geological Survey (USGS) quadrangles. Elevations at the Solar Farm site range from approximately 189 to 269 meters (619 to 882 feet) above mean sea level (amsl). The Gen-Tie Line is located on the Victory Pass, Desert Center, and Corn Spring 7.5 Minute USGS quadrangles. Elevations within the Gen-Tie Line range from approximately 210 to 254 meters (690 to 833 feet) amsl.

The Solar Farm site is approximately six miles north of the rural community of Desert Center and four miles north of Lake Tamarisk, between the cities of Coachella (to the west) and Blythe (to the east) (Figure 1). The Project area contains existing transmission lines, telephone lines and pipelines, as well as dirt roads. Joshua Tree National Park is located to the north, east, and west of the area; at its closest point, the Solar Farm site is approximately 1.4 miles southwest of the national park boundary. The inactive Eagle Mountain Mine is located approximately one mile to the west of the Solar Farm site.



0 45 90 180
Miles

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Figure 1
Regional Location

Prepared by Ironwood Consulting, Inc. - May 2010

None of the Sunlight components are located within the boundaries of an Area of Critical Environmental Concern (ACEC) or designated Wilderness Area. The Solar Farm alternatives are not located within a BLM Desert Wildlife Management Area (DWMA) or USFWS-designated Critical Habitat Unit (CHU). However, three of the four Gen-Tie Line alternatives are partially located within the Chuckwalla DWMA and all four are partially located within the Chuckwalla CHU (Figure 2).

1.3.2 SCE Components

The majority of the SCE components (except the planned telecommunications site) are found south of Interstate 10 (I-10) in a rocky, undeveloped, and relatively flat land area located in the Chuckwalla Valley between I-10 and the Chuckwalla Wilderness (Figure 2). Existing transmission lines (including the Devers-Palo Verde [DPV1] line), telephone lines, gas pipelines, and dirt roads are situated in the immediate vicinity of the SCE components. The telecommunications site is a small, largely vacant, undeveloped, and relatively flat land area located along Highway 177 in the Chuckwalla Valley.

The Red Bluff Substation and associated facilities, except for the telecommunications site, are located on the Corn Spring 7.5 Minute USGS quadrangle. Elevations within the Red Bluff Substation, its distribution line and its access road range from approximately 233 to 257 meters (765 to 844 feet) amsl. The telecommunications site is located on the East of Victory Pass 7.5 Minute USGS quadrangle. The elevation of the telecommunications site is approximately 170 meters (560 feet) amsl.

The Red Bluff substation, distribution line and access road are not located within the boundaries of an ACEC or Wilderness Area; however, they are located within the Chuckwalla DWMA and CHU (Figure 2). The telecommunications site is not within an ACEC, Wilderness Area, DWMA, or CHU.

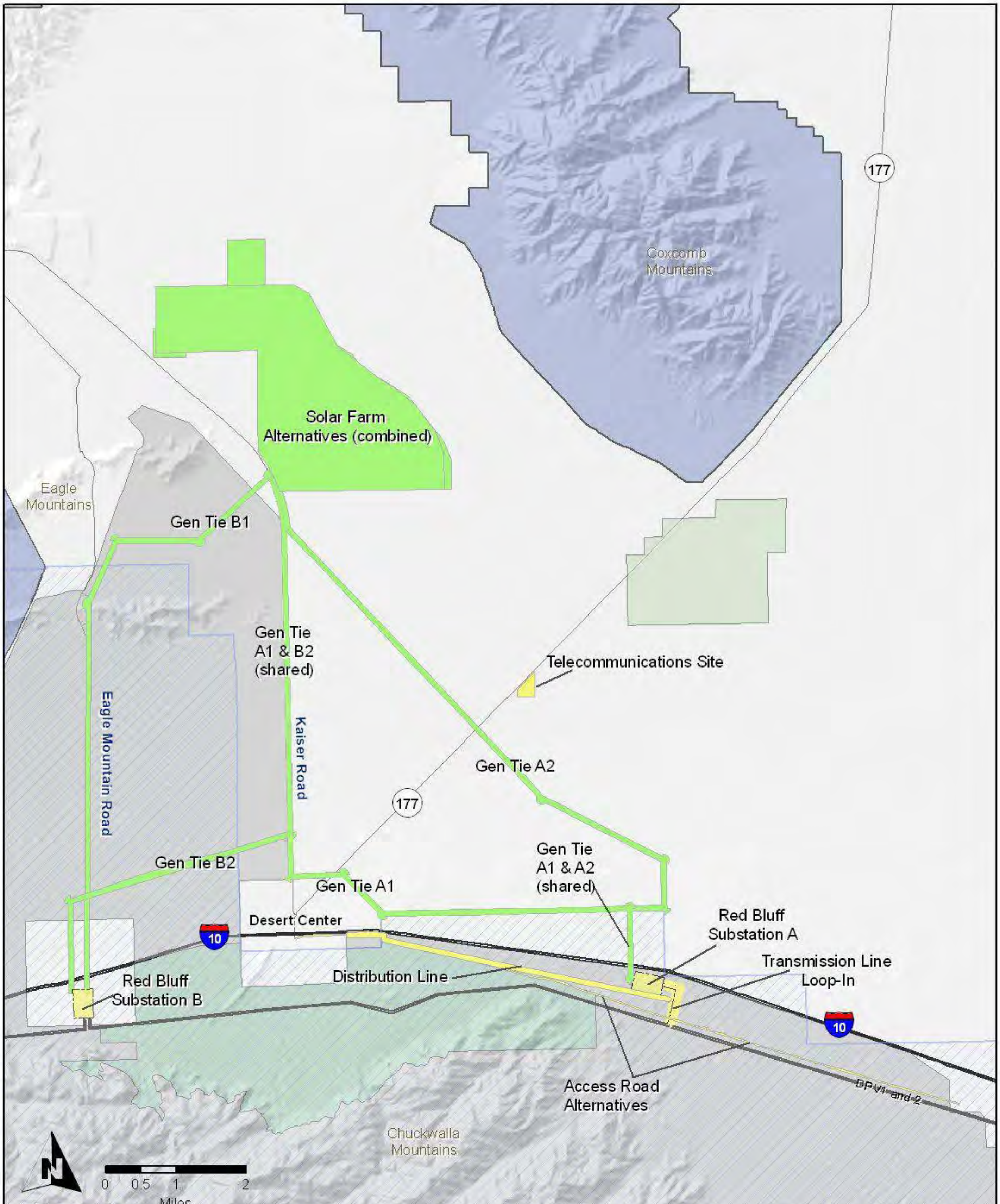
1.4 Project Summary

The Project is described in general terms below. Specific details of the Project description are included in other related documents including the Draft Environmental Impact Statement.

1.4.1 Sunlight Components

Sunlight components would include the Solar Farm and 220-kilovolt (kV) transmission line (Gen-Tie Line). The Solar Farm would consist of several main components, all located within the Project security fencing and permanent desert tortoise fencing:

- Main Generation Area - PV arrays, combining switchgear, overhead lines, and access corridors;
- Operations and Maintenance (O&M) Facility;
- Solar Energy Visitor’s Center;
- On-site substation; and
- Site Security, Fencing, and Lighting.



Sunlight Components*	Chuckwalla DWMA
Southern California Edison (SCE) Components*	Alligator Rock DWMA
Desert Tortoise Critical Habitat	Desert Lily Preserve
	Joshua Tree National Park

* Disturbance areas for linear components and telecommunications site are less than area depicted in map.

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Figure 2
Project Components
All Alternatives

Prepared by Ironwood Consulting, Inc. - July 2010

At the on-site Substation, the Solar Farm output would be stepped up to the proposed transmission system's voltage of 220 kV. The Project would interconnect with the regional transmission system via a 220-kV single-circuit Gen-Tie Line that would exit the southwestern portion of the Solar Farm Site and follow a 160-foot-wide transmission right of way (ROW) to SCE's planned Red Bluff Substation to be located south of I-10.

The Gen-Tie Line would transmit the electricity generated at the Solar Farm to the regional transmission system, via the Red Bluff Substation where the power generated at the Solar Farm would feed into SCE's existing DPV1 500-kV transmission line. Sunlight plans to use self-weathering steel monopoles for the transmission line. Poles are expected to be 135 feet tall and spaced approximately 275 to 335 meters (900 to 1,100 feet) apart.

Several alternative configurations of the Project are currently being considered, including three alternative Solar Farm layouts (A, B, and C) and four alternative Gen-Tie Line routes (A1, A2, B1, and B2) (Figure 2).

1.4.2 SCE Project Components

SCE proposes to construct the Red Bluff Substation Project to interconnect the 550-MW DSSF Project to SCE's existing DPV1 500-kV transmission line. Red Bluff Substation would consist of a 1,120 mega-volt ampere (MVA), 500/220-kV substation on approximately 30 hectares (75 acres) of land. It would interconnect the power from the Solar Farm (via the Gen-Tie line) to SCE's DPV1 transmission line, which passes near the substation site. Substation features include:

- 500/220-kV Red Bluff Substation;
- Access road to the Red Bluff Substation ;
- Transmission lines to connect the substation to the DPV1 line;
- Connection of the Gen-Tie Line into the substation;
- Modification of some existing DPV1 structures (towers) near the substation;
- Electric distribution line for substation light and power; and
- Telecommunications facility associated with the substation
- Drainage Facility.

Currently, there are two alternative Red Bluff Substation locations (A and B) (Figure 2). Red Bluff Substation A is located east of Desert Center. There are two access road alternatives under consideration for Substation A. One located between the Desert Center exit off I-10 and the substation to the east and the other located between the Corn Springs Road exit off I-10 and the substation to the west. Red Bluff Substation B is located at the southern end of Eagle Mountain Road.

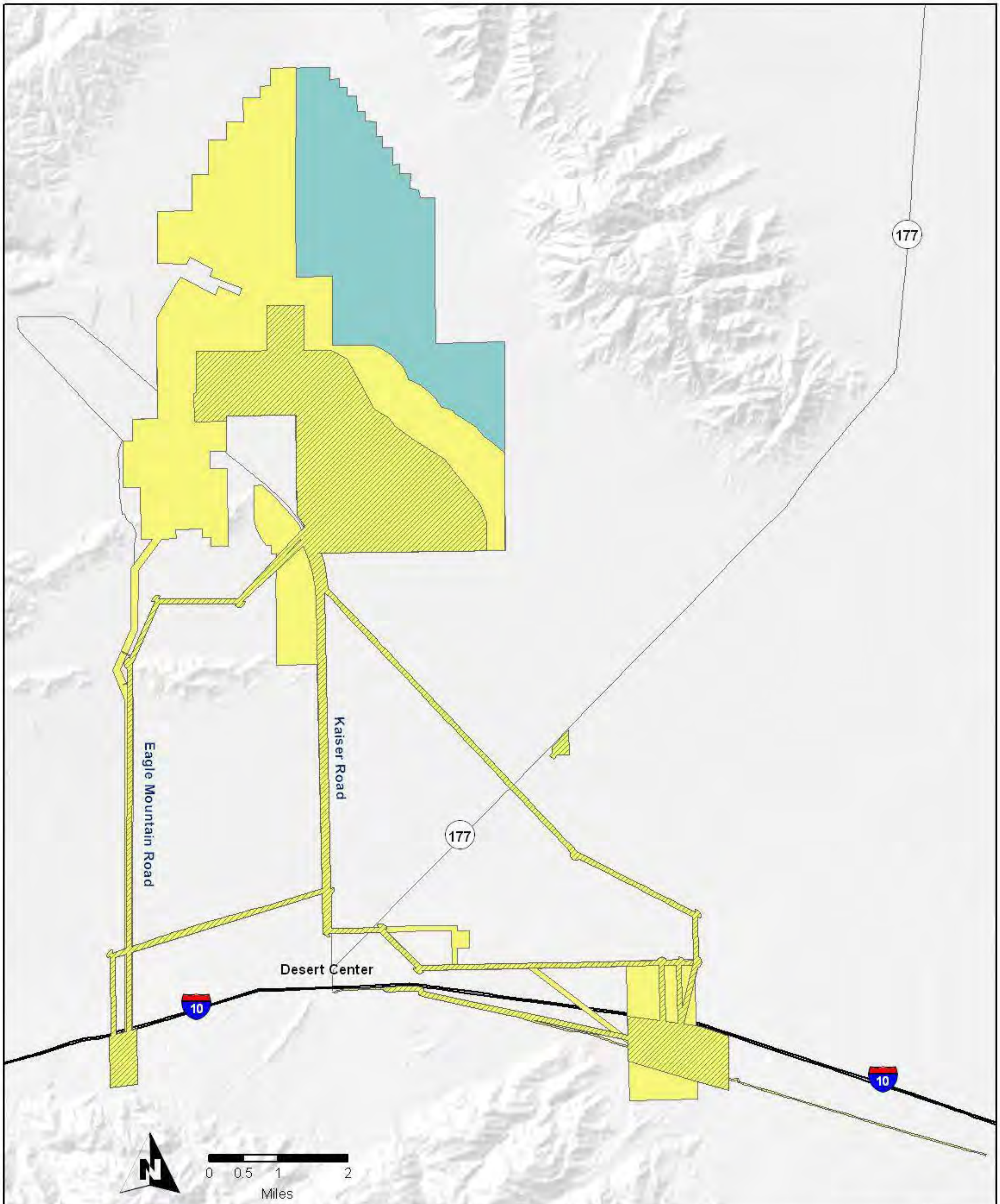
At the Red Bluff Substation, surface storm water runoff would need to be redirected around the substation, resulting in approximately 20 acres of additional land disturbance. The proposed substation would be enclosed on four sides by an eight-foot-high wall with two 24-foot-wide rolling gates. A band of at least three strands of barbed wire would be affixed near the top of the perimeter wall inside the substation and would not be visible from the outside. Once constructed, the Red Bluff Substation would be unmanned, and electrical equipment within the substation would be remotely monitored. SCE personnel would visit the Substation three to four times a month for routine maintenance purposes. Routine maintenance would include equipment testing, monitoring, and repair.

An extension of the Desert Center 12 kV circuit (Distribution Line) would be required to provide light and power for the Red Bluff Substation. Poles for the Distribution Line would be single wooden poles approximately 9 to 12 meters (29 to 39 feet) tall. The proposed access road alternatives will require approximately 1.3 acres, 14 acres, or 21 acres of disturbance, depending on the alternative selected.

A Telecommunication Site would be required in order to provide monitoring and remote operation capabilities of the electrical equipment at Red Bluff Substation, and transmission line protection. Around the Telecommunications Site, an 8-foot high berm would need to be constructed on three sides.

1.5 Study Areas

For the purpose of this report, Study Areas are defined by the area of land subjected to biological resource surveys. The Study Area for individual biological resources (e.g., vegetation communities, desert tortoise, and special status plants) varied due to changes in the proposed disturbance area as the Project evolved from 2007 to 2010. As additional Project components were designed, additional surveys were often warranted. Regular coordination among Ironwood Consulting, Inc. (Ironwood), Sunlight, and SCE ensured that all potential disturbance areas were included in the scope of surveys. All Study Areas for the Project encompassed a larger area than the proposed disturbance area. Survey buffers were applied to Project components (e.g., Gen-Tie Lines contained a 400-foot wide study corridor). This approach allowed for some degree of flexibility during final engineering design with the assurance that the final disturbance area would be covered by the respective Study Areas. As the site design became finalized, supplemental surveys were conducted in those areas likely to be affected by the Project, including both Sunlight and SCE components. Figure 3 provides the boundaries of biological resource Study Areas. Table 1 provides size and description data for the Study Areas for each biological resource and Project component.



Full Coverage - Desert Tortoise
(including other special status wildlife species)

Full Coverage - Botanical Survey

Additional Preliminary Assessment Area
(habitat assessment and vegetation mapping)

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Figure 3
Study Areas

Prepared by Ironwood Consulting, Inc. - June 2010

Table 1. Description of Study Areas

Project Component	Preliminary Assessments & Vegetation Mapping	Full Coverage Desert Tortoise Surveys[1]	Other Sensitive Wildlife Surveys	Full Coverage Botanical Study
Sunlight Components				
Solar Farm Alternatives	16,330 acres (full Study Area)	12,510 acres (original Study Area - east of Pinto Wash; and potential tortoise recipient sites)	12,510 acres (original Study Area - east of Pinto Wash; and potential tortoise recipient sites)	4,494 acres (combined footprint of Solar Farm Alternative A and B)
Gen-Tie Line Alternatives[2]	2,745 acres (400'-wide study corridor)	2,745 acres (400'-wide study corridor)[3]	2,745 acres (400'-wide study corridor)[3]	2,073 acres (400'-wide study corridor)
SCE Components				
Red Bluff Substation A[2]	1,517 acres	1,517 acres	1,517 acres	702 acres
Red Bluff Substation B[2]	199 acres	199 acres	199 acres	199 acres
Distribution Line for Red Bluff Substation A[2]	230 acres (400'-wide study corridor)	230 acres (400'-wide study corridor)	230 acres (400'-wide study corridor)	230 acres (400'-wide study corridor)
Access Roads for Red Bluff Substation A[2]	138 acres (124'-wide study corridor)	138 acres (124'-wide study corridor)	138 acres (124'-wide study corridor)	138 acres (124'-wide study corridor)
Telecommunications site	41 acres	41 acres	41 acres	41 acres

[1] Zone-of-influence transects not included in totals.

[2] Gen-Tie Line, Substation, Distribution Line, and Access Road Study Areas include small degree of overlap.

2.0 Methods

The following section describes the methods used to determine the need for focused surveys and the methods used to conduct focused biological surveys for special status species and habitats.

2.1 Special Status Species Definition

For assessment purposes in this report, a special status species has been defined as a plant or wildlife species that meets the following criteria:

- designated as either rare, threatened, or endangered by CDFG or the USFWS, and are protected under either the California or Federal Endangered Species Acts;
- candidate species being considered or proposed for listing under these same Acts;
- addressed in the Northern and Eastern Colorado Coordinated Management (NECO) Plan and Final Environmental Impact Statement (EIS) (BLM/CDFG 2002);
- State Species of Special Concern as designated by CDFG; or
- considered endangered, threatened, or rare pursuant to California Environmental Quality Act (CEQA) Guidelines, Section 15380.

2.2 Preliminary Assessment

Prior to conducting site surveys, a literature search was performed, which included a review of regional documents including the NECO Plan/EIS (BLM/CDFG 2002), the Biological Opinion (BO) for the NECO Plan/EIS (USFWS 2005), and line distance sampling data for desert tortoise collected between 2001 and 2009 in the region. Searches of the CDFG's California Natural Diversity Data Base (CNDDB) and the California Native Plant Society's Electronic Inventory (CNPSEI) were conducted to determine the special status species that have been documented in the Project vicinity. These searches included a radius of 5 miles surrounding the Study Area.

Preliminary surveys of the original Study Area were conducted on January 5 and 8, and June 14, 2007. Preliminary site visits were conducted by Kathy Simon and Kent Hughes, biologists with Ironwood Consulting, Inc (Ironwood). These field surveys collected information including:

- Characterization of plant communities;
- Assessment of listed and special status plant and animal species with potential to occur; and
- Photograph documentation of existing habitat types.

No focused surveys for special status species were conducted during the 2007 preliminary site visits. The results of the 2007 site visit were used to develop a list of species for which later focused surveys would be necessary. This list was refined through coordination with biologists at the BLM Field Office in Palm Springs and the Desert District Office in Moreno Valley (Massar 2009 and LaPre 2008).

After the 2007 preliminary surveys, environmental documents that included extensive biological survey information became available for two nearby proposed renewable energy projects, the Palen Solar Power Project and the Genesis Solar Energy Project. These projects are approximately 10 miles (Palen) and 17 miles (Genesis) southeast of the Project. These reports were reviewed to determine whether any special status species found during surveys of those project sites might be relevant to Sunlight (Solar Millennium 2009; Genesis Solar 2009). Using this information and observations in the field, a comprehensive list was generated of special status plant and animal species that have the potential to occur within the Study Area.

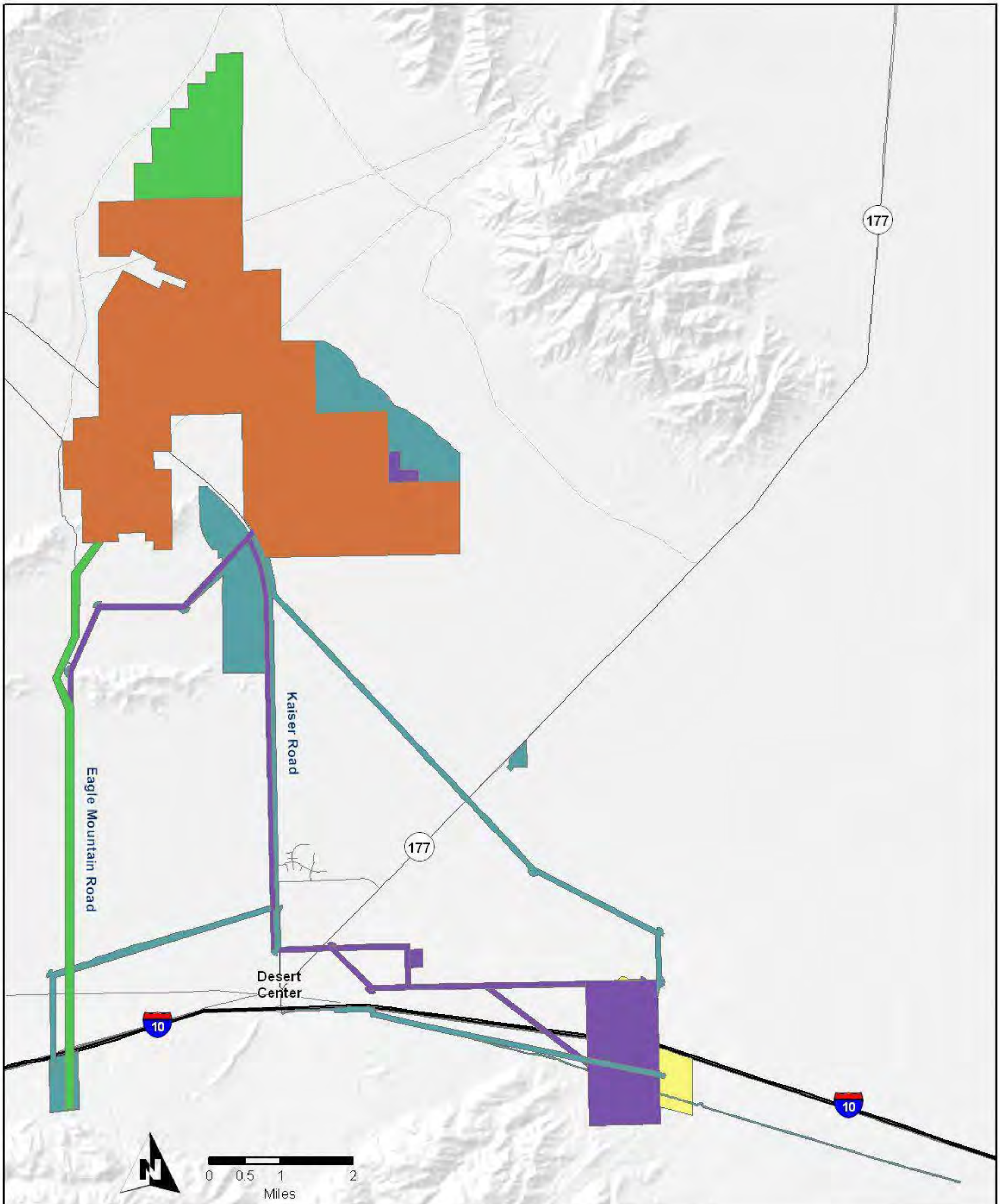
2.3 Desert Tortoise Focused Surveys

Focused desert tortoise surveys were conducted in 2008 that followed the presence-absence survey protocols described in the *Field Survey Protocol for Any Federal Action that May Occur within the Range of the Desert Tortoise* (USFWS 1992). In spring of 2009 and 2010, the USFWS issued revised survey protocols (USFWS 2009 and 2010). The full coverage survey option described in each of the protocols was essentially unchanged from the 1992 protocol, with the exception of the definition of the "action area". This concept was used by the survey team and Sunlight personnel when determining the Study Area. The revised protocols were designed to estimate the abundance and distribution of tortoises that occur within the survey area. These surveys employed belt transects approximately 10 meters (32.8 feet) wide in order to provide 100 percent (full) coverage of the entire Study Area. In addition, per the 1992 protocol, zone of influence transects were conducted at 100, 300, 600, 1200, and 2400-foot intervals from and parallel to the Study Area. Desert tortoise focused surveys were conducted by Ironwood Consulting, Inc. and associated contractors during five survey periods (Figure 4):

- March 18 and April 5, 2008;
- October 1 and 12, 2008;
- October 26 and 31, 2009;
- March 15 to April 17, 2010, and
- July 7 to 12, 2010[1].

All biologists were either highly-experienced desert tortoise surveyors or field technicians who attended field and classroom training sessions prior to conducting surveys. The BLM reviewed the resumes of all survey personnel, and approved them to conduct these surveys (LaPre 2008). The larger survey crew was divided into smaller crews of 4-6 people, with a greater number of highly-experienced people than field technicians on each crew. Each smaller group typically surveyed one square-mile section or two linear miles of proposed transmission line right-of-way until the entire surveyed portion of the Study Area was covered.

[1] Surveys were performed outside of typical spring/fall survey period due to unanticipated SCE project modifications. These surveys will be performed again during the fall 2010 or spring 2011 survey period.



Spring 2008
Fall 2008
Fall 2009
Spring 2010
Summer 2010

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Figure 4
Desert Tortoise Survey Periods

Prepared by Ironwood Consulting, Inc. - July 2010

All tortoise sign (e.g., live tortoises, shell/bone/scutes, scats, burrows/pallets, tracks, egg shell fragments, and courtship rings) were recorded. The location of all tortoise sign was recorded on a Garmin GPS unit (GPS 72, 76, or 60CSx) using a unique identification code. The code included a two-character acronym for the type of sign (e.g., TO-live tortoise, BU-burrow, SC-scat), two-character initials for the lead surveyor of the crew, and a unique sequential number. In addition to recording sign with the GPS unit, standardized paper datasheets were completed. Information for tortoise sign was recorded as shown on Table 2. All data were entered from these data sheets into a Microsoft Access database, compared with GPS data and rectified before these data were used in GIS to determine approximate abundance and distribution of desert tortoise. All records of live desert tortoise were submitted to the CDFG's CNDDB. Due to the volume of data, observations were submitted to the CNDDB in GIS shapefile format with relevant metadata and attribute information consistent with the fields found on the California Native Species Field Survey Form.

Table 2. Desert Tortoise Data Recorded

Type of Sign	Measurements	Estimates	Other
Live tortoise		Sex, age class	Location, activity
Cover site (burrow, pallet)	Width, height	Depth	Condition (active, inactive [good, fair, or poor]) and location. Each burrow was investigated by using a handheld mirror and/or flashlight to detect if a tortoise was present
Scat	Number of scats	Age class	Condition (this year or not this year), location
Shell or bone (carcass or fragments)		Sex, age class, time since death	Location
Tracks		Age	Location
Eggs or fragments		# of eggs	Condition, location
Courtship rings		Width	Location

2.4 Western Burrowing Owl Surveys

Surveys for the presence of western burrowing owls followed the Burrowing Owl Survey Protocol and Mitigation Guidelines (California Burrowing Owl Consortium 1993). The methodology includes four phases of study, as follows:

- Phase 1 - assessment of suitable habitat and potential presence of burrowing owl habitat within the site and 150-meter buffer;
- Phase 2 - burrow survey to assess and record burrows suitable for nesting;
- Phase 3 - burrowing owl surveys, census, and mapping of individual and pairs; and
- Phase 4 - summary of results and findings from the previous phases.

The Phase 1 preliminary assessment conducted in 2007 concluded that suitable habitat for western burrowing owl was present throughout the full Study Area. Phase 2 burrow surveys were conducted concurrently with full coverage desert tortoise surveys (Figure 4). The width of pedestrian transects used during the full coverage tortoise surveys were narrower than those recommended for burrowing owl surveys, resulting in more comprehensive coverage. All burrows suitable for burrowing owl use were recorded during the survey. All visual or audible detections of burrowing owls and burrowing owl sign (i.e.; active burrows, tracks, feathers, pellets, prey remains, and white-wash) were recorded on standardized datasheets. The physical location of each observation was recorded by GPS. Phase 3 surveys and final Phase 4 reporting would be conducted prior to the commencement of ground disturbing activities associated with the Project.

2.5 Special Status Wildlife Species

In addition to recording desert tortoise, surveyors recorded all wildlife species, regardless of status, that were encountered during the survey. All special status species recorded as incidental data were also recorded by GPS and assigned a unique identifier. All other species were tallied at the end of each transect and recorded throughout each day by each crew. All data was entered from these datasheets and was incorporated into the GIS system.

2.6 Habitat Mapping

In September 2009, Ironwood biologists mapped areas of dry desert wash woodlands within and adjacent to the Solar Farm site and within the Gen-Tie Line alternatives. Biologists walked the boundary of the tree line and/or high-water mark of the Pinto Wash central drainage mapping the route with GPS units. Along the Transmission Corridor alternatives, areas were mapped using GPS technology by either walking or driving these routes. GPS data and notes were combined to define an accurate representation of the width and location of Pinto Wash and additional locations of desert dry wash woodland within the Study Area.

2.7 Botanical Study

The purpose of the botanical study was to provide sufficient information on all special status plants and natural communities to meet the requirements of CEQA, CESA, and FESA. Surveys were performed to maximize the likelihood of locating special status plant species or special status natural communities within the Study Area. The primary objective was to identify all plant species within the Study Area to the taxonomic level (i.e., species, subspecies, or variety) necessary to determine rarity status. The botanical study followed the guidelines set forth by:

- Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities (CDFG 2009);
- Survey Protocols Required for NEPA/ESA Compliance for BLM Special Status Plant Species (BLM 2009); and
- Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants (USFWS 2000).

Surveys were conducted from March 15 to April 17, 2010. The survey period was scheduled to coincide with the primary blooming period for targeted special status species. The spring of 2010 followed a winter season with above-average rainfall, resulting in an increased rate of annual plant production from previous drought years. Monthly precipitation totals obtained from the Western Regional Climate Center Cooperative Observer Program for the Eagle Mountain, California station averaged for winter months October through March for the last ten years indicate that from 2007 to 2010 average precipitation amounts have been increasing every year (Figure 5). In the winter of 2009-2010, the average precipitation was 5.15 inches. However, it was evident that plant phenology was not sufficiently developed for several plant species during the initial phase of the survey period. To address this factor in plant identification, all uncertain specimens were vouchered and location data was collected for the record. All plants were eventually identified and previously uncertain specimens were confirmed.

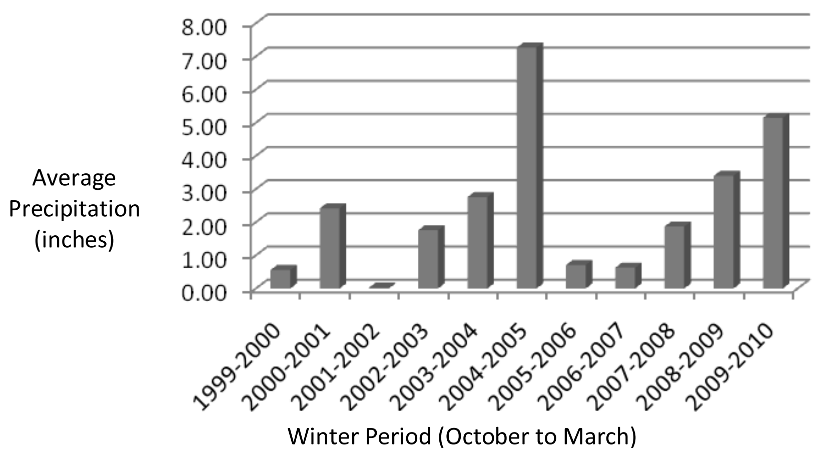


Figure 5. Precipitation Averages for Winter Months
(Source: Western Regional Climate Center - Eagle Mountain Station)

The survey team included personnel familiar with the identification of flora in the Colorado Desert of California. Assistants were trained in species identification during the early phase of the study. Resumes of all surveyors were reviewed and approved by the BLM District Biologist (LaPre 2010). Information on potential special status species was reviewed by the survey team to obtain an effective search image. Records of all plants species observed were maintained daily. A checklist was developed based on previous surveys and reviewed during each subsequent day of survey. On average, linear pedestrian transects were walked at 15-meter spacing. In areas of lower cover and diversity (e.g., desert pavement), transects were spaced further apart. In areas of greater cover and diversity, transects were spaced closer to one another. This allowed for a comprehensive survey of the Study Area. Surveyors walked at a rate of approximately 1 mile per hour. At this rate, the resulting level of effort averaged 1 person-hour per 6 acres survey area. Additional time was spent in the field and after the day survey keying plant taxonomy. If a plant of unknown identification was found, a GPS record was taken and a unique identification number was assigned so that if after proper identification, it was determined to be a special status species, the population could be revisited to collect additional data.

2.8 Baseline Sampling

Plant and wildlife sampling were performed to provide additional details of species composition and provide baseline quantitative data for future monitoring primarily associated with the Solar Farm site.

2.8.1 Selection of Sampling Locations

Fifteen sampling locations were established within and adjacent to the Solar Farm site boundaries (Figure 6). Sampling locations were randomly generated and stratified based on existing habitat types to obtain a sufficient representation of the area. The point for each sampling location represented the center or corner point of larger linear transects or grids depending on the specific methodology.

2.8.2 Plant Surveys

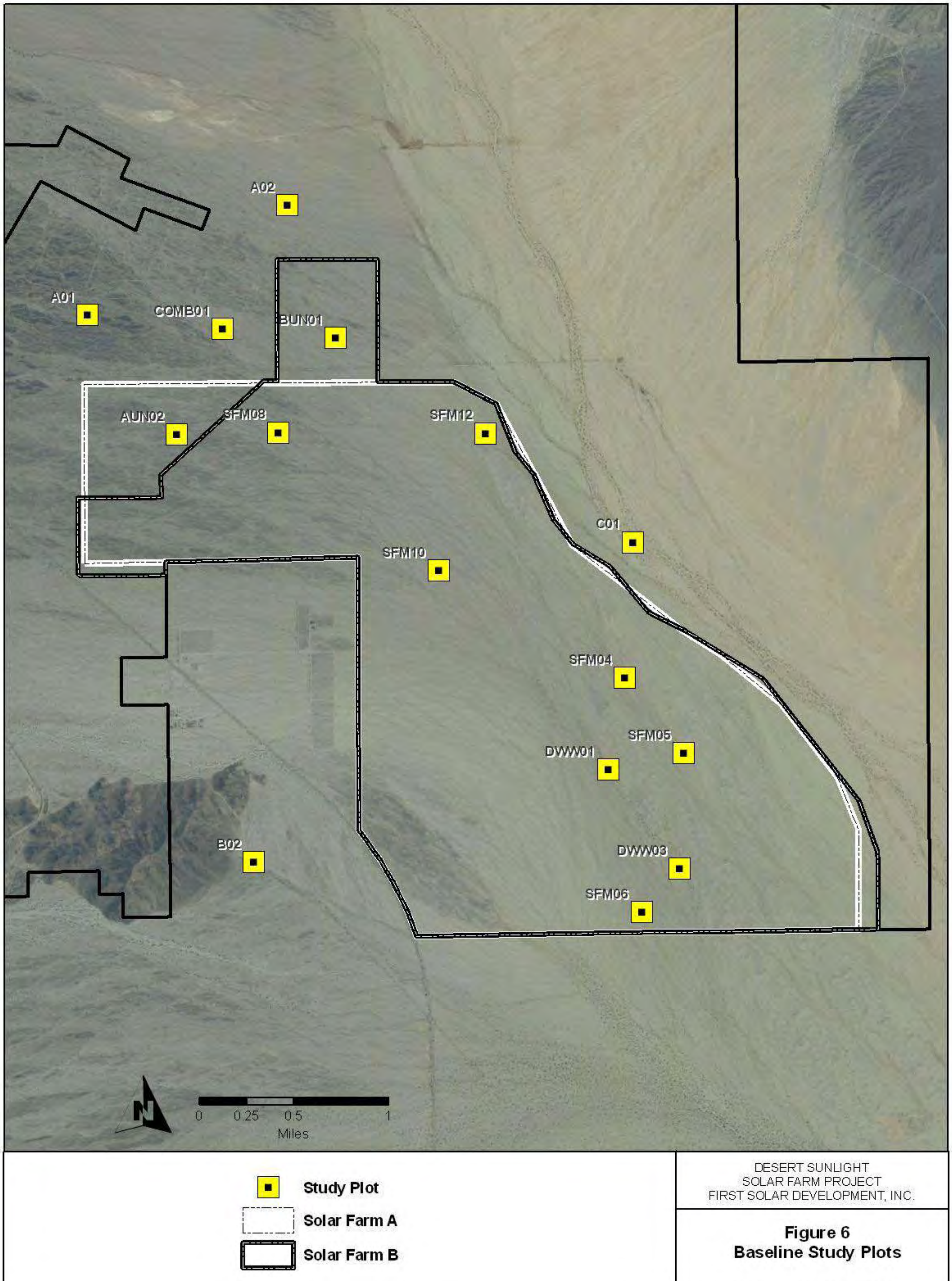
Plant surveys were conducted at all sampling locations during the peak of the blooming season in spring 2010. A point-intersect survey method was used along a 150-meter linear transect. Along this line, 100 points approximately 1.5 meters apart were observed and the species rooted at that point were recorded. This method provides an estimate of community composition and was used to estimate cover.

2.8.3 Avian Point Counts

Bird point counts were conducted at all sampling locations between April 7 and 20, 2010. Birds were sampled using point count methodology as described in Monitoring Bird Populations by Point Counts (Ralph et al. 1995). Four stations were surveyed at each sampling location, for a total of sixty stations. Avian detections were divided into three survey intervals consisting of the first three minutes, minutes 3 to 5, and minutes 5 to 10. Research suggests that the amount of time spent at a sampling location increases standard error especially at times greater than 10 minutes (Smith et al. 1997). Incidental flyovers were recorded separately from typical observations. Fall season 2010 avian point counts are scheduled to supplement the existing data.

2.8.4 Small Mammal Surveys

Trapping grids were established at all sampling locations. Narrow grids consisting of 100 large (12-inch-long) Sherman live-traps were set at each location. For most sampling locations, the sampling location point represented the southwest corner of the trapping grid. Depending on the width of the habitat being sampled, either a 4x25 or a 2x50 trap configuration was used. All traps were spaced approximately 10 meters apart. Traps were set and checked for three consecutive nights at all sampling locations. Traps were opened near sunset and checked and closed at sunrise. Traps were baited with standard small mammal bait, which includes seed and mill. All individuals captured were identified to species and released unharmed where trapped.



DESERT SUNLIGHT
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Figure 6
Baseline Study Plots

Prepared by Ironwood Consulting, Inc. - June 2010

2.9 Golden Eagle Surveys

Golden eagle surveys were conducted by Wildlife Research Institute, Inc. (WRI) for four proposed energy development projects. The Study Area included 1,600 square miles and was located in the Big Maria, Chuckwalla, Coxcomb, Eagle, Hodges, Little Chuckwalla, Little Maria, McCoy, Orocopia and Palen mountain ranges as well as the Chuckwalla Valley. Phase 1 and Phase 2 surveys for golden eagles were conducted within 10 miles of project boundaries in order to comply with the *USFWS Interim Golden Eagle Technical Guidance: Inventory and Monitoring Protocols; and Other Recommendations in Support of Golden Eagle Management and Permit Issuance* (Pagel et al. 2010). Surveys were conducted by helicopter to confirm Golden Eagle activity, occupancy, breeding status of the pairs, and fledging success. Additionally, ten other species (i.e., barn owl, bighorn sheep, common raven, Cooper's hawk, great horned owl, long-eared owl, prairie falcon, red-tailed hawk, Swainson's hawk, and turkey vultures) were recorded with GPS locations. The results of the surveys relevant to the Sunlight Project are summarized in this report.

2.10 Bat Assessment

A bat assessment was performed by Patricia Brown, Ph.D. (Brown-Berry Biological Consulting) on February 17, 2010 to assess potential bat habitat within the Solar Farm alternatives and proposed Gen-Tie Lines. Dr. Brown had previously conducted extensive bats surveys in the vicinity of the project near the Eagle Mountain Mine. Suitable habitat for several bat species (specifically those that are known to occur in the vicinity including pallid bats, western pipistrelles, and California leaf-nosed bats) was reviewed in the field. General areas that may serve as potential roosts and foraging sites were identified.

3.0 Results

3. 1 Soils and Topography

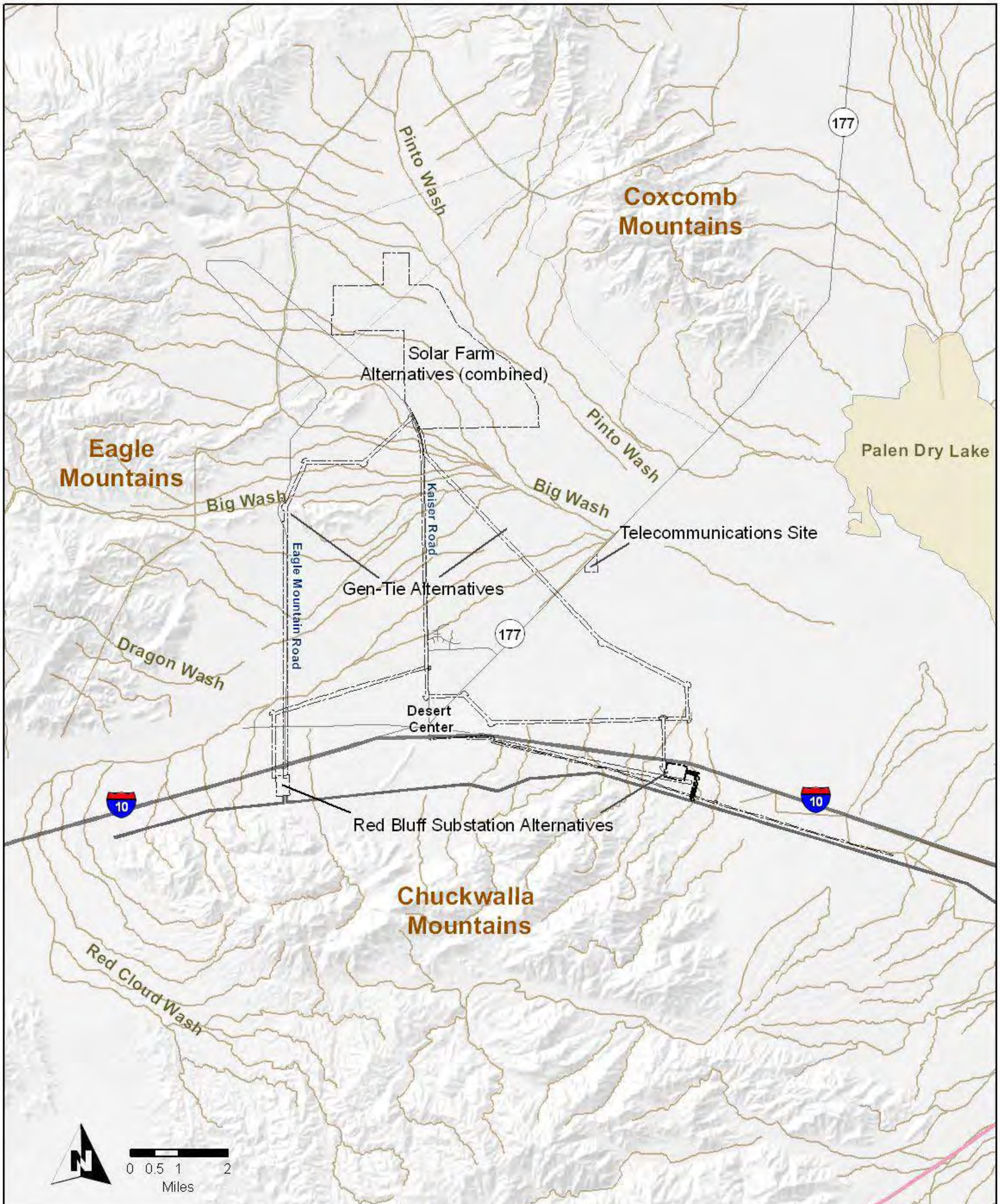
Soil mapping from Natural Resources Conservation Service (NRCS) was not available for the Study Area; however, field observations made by biologists and results of separate geotechnical studies have been summarized. Soils primarily consist of undifferentiated younger alluvium, younger alluvium with interspersed areas of weak desert pavement, and older alluvium with moderate to strong desert pavement (Earth Systems Southwest 2010). Older alluvial fan deposits are relatively diverse in soil and vegetation structure. These areas supported elevated uplands with desert pavement (manganese and iron oxidized coatings on cobbles and sand) blanket the top three to six inches of the older alluvial fan material. Drainages that occur within the older alluvial fans are relatively well-defined with well-formed banks up to several feet deep. Active younger sediments are of Holocene age and consist of fine to coarse sand, interbedded with clay, silt and gravel with no evidence of desert pavement. Topography in these areas tends to be uniform, with channel depths generally less than one foot. Slope within the Study Area ranges from 0 to 5 percent.

<u>Sunlight Components</u>

Multiple alluvial fans originate from the Eagle Mountains in the west and the Coxcomb Mountains in the east and flow into Big Wash and Pinto Wash terminating shy of Palen Dry Lake (Figure 7). Pinto Wash is located immediately east of the Solar Farm site. Big Wash runs south of the Solar Farm site crossing the Gen-Tie Line alternatives. Stabilized sand sheets and pockets of sand dune deposits are located east of the Solar Farm site, east of Pinto Wash. The Solar Farm site lacks aeolian (wind-blown) sand formations. The western extent of the Chuckwalla Valley is defined by a broad alluvial system that originates near Red Cloud Wash between the Orocopia and Chuckwalla Mountains and flows eastward through the Study Area. This system is fed by numerous alluvial fans (e.g., Dragon Wash) originating from the north and south and crosses the Gen-Tie Line alternative alignments prior to joining with the lower reaches of Big Wash.

<u>SCE Components</u>

The Red Bluff Substation A (eastern of the two substation alternatives) and related components are located at the base of the north-facing bajada of the Chuckwalla Mountains. Topography is highly varied along in this region. Broad active alluvial fans dominated by larger rock and gravelly soils are juxtaposed with upland mounds with well developed desert pavement. Several incised washes with banks up to twenty feet high and widths greater than 100 feet occur in this region. Red Bluff Substation B (the western substation alternative) Study Area consists of two distinct soil conditions: sandy soils emanating from an active alluvial fan in the southern half and a caliche outcrop in the southern half. The channels from the alluvial fan persist through the caliche outcrop resulting in well developed narrow washes, which range from only a few feet wide to over twenty feet wide. The channels flow into flood control dykes built to protect the I-10 from flooding.



Project Alternatives*

* Disturbance areas for linear components and telecommunications site are less than area depicted in map.

Hydrograph Line
(USGS National Hydrography Dataset)

DESERT SUNLIGHT
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Figure 7
Project Alternatives
Topographical Features

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3.2 Vegetation Communities

Two native vegetation communities occur within the Study Area: Sonoran Creosote Bush Scrub [Holland 1986; analogous to Creosote Bush-White Bursage Series (Sawyer and Keeler-Wolf 1995)] and Desert Dry Wash Woodland [Holland 1986; analogous to Blue Palo Verde-Ironwood-Smoke Tree Series (Sawyer and Keeler-Wolf 1995)]. Areas of disturbed, developed, and agricultural land also occur within the Study Area. A complete list of plant species occurring in these communities has been summarized by Project component (Appendix A).

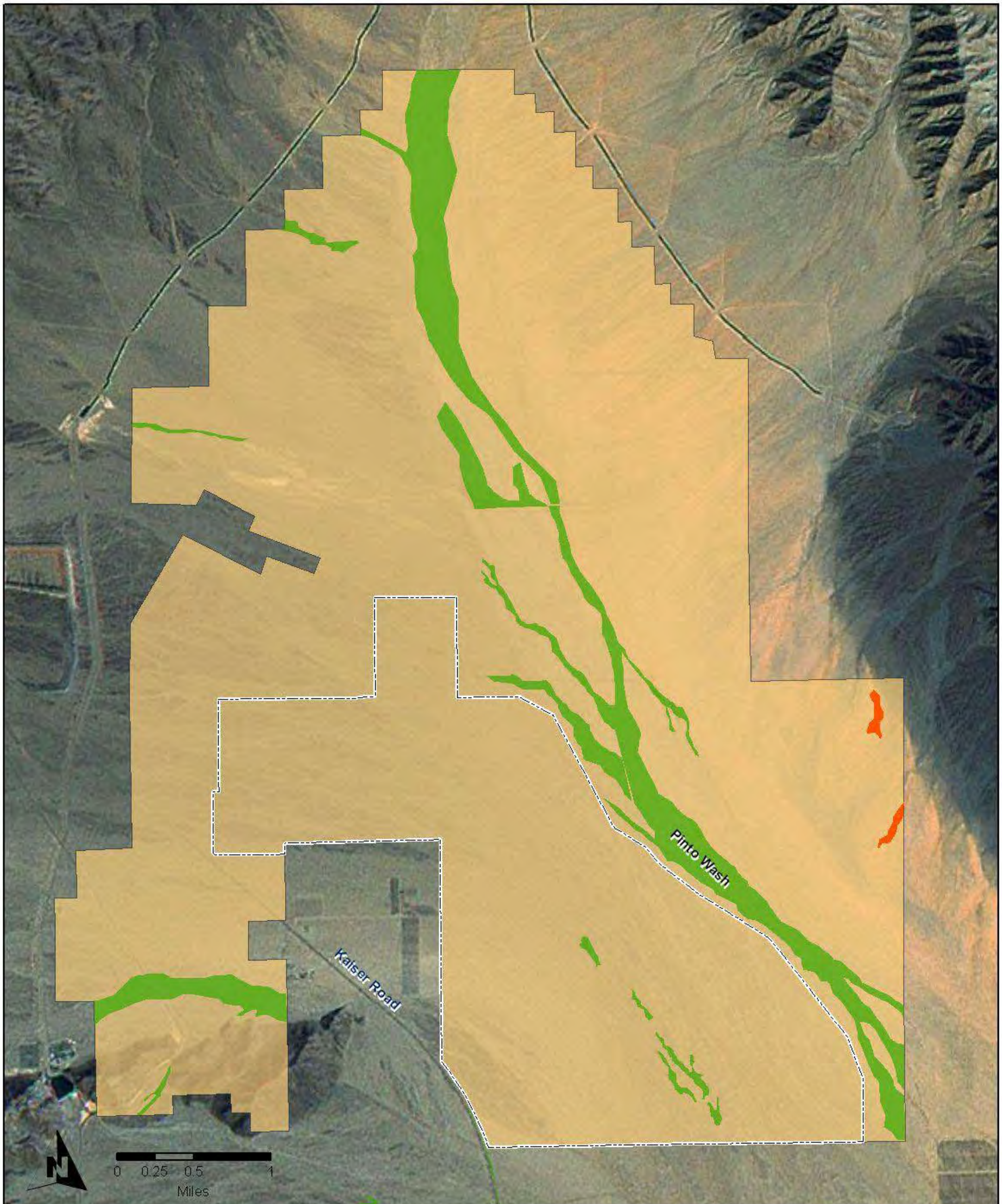
The majority of the Study Area supports a Creosote Bush Scrub community. Dominant plant species associated with this community include creosote bush (*Larrea tridentata*), burro bush (*Ambrosia dumosa*), boxthorn (*Lycium* sp.), brittlebush (*Encelia farinose*), indigo bush (*Psorothamnus* spp.), and cheesebush (*Hymenoclea salsola*). Local diversity of creosote scrub varied throughout the Study Area. This community was relatively more structurally diverse within the stable, older alluvial fan systems located in the northwestern and southwestern portions of the Solar Farm alternatives than in active alluvial fan systems located in the middle and southern extent of the Solar Farm alternatives.

The Desert Dry Wash Woodland community consists of drought-deciduous, small-leaved (microphyllous) trees, often leguminous, in association with sandy or gravelly washes with braided channels in active alluvial fans. Dominant plants species associated with this community include ironwood (*Olneya tesota*), blue palo verde (*Cercidium floridum*), and smoke tree (*Psorothamnus spinosa*). This community is considered sensitive by the California Resource Agency due its limited distribution, value to wildlife, and susceptibility to disturbance (BLM 2002 and CDFG/CWHRS 2010). The presence of water at least on a seasonal flow regime is vital for this community to persist. Dead ironwood trees can be found in the Study Area where previous disturbances, such as paved or dirt roads, have altered the natural surface flow regime.

Disturbed and developed areas either unvegetated or dominated by ruderal vegetation, are found in association with Kaiser Road, Eagle Mountain Road, Highway 177, and the I-10. Agricultural areas, mostly fallow jojoba farms, are located southeast of the Solar Farm alternatives and are crossed by Gen-Tie Line A1.

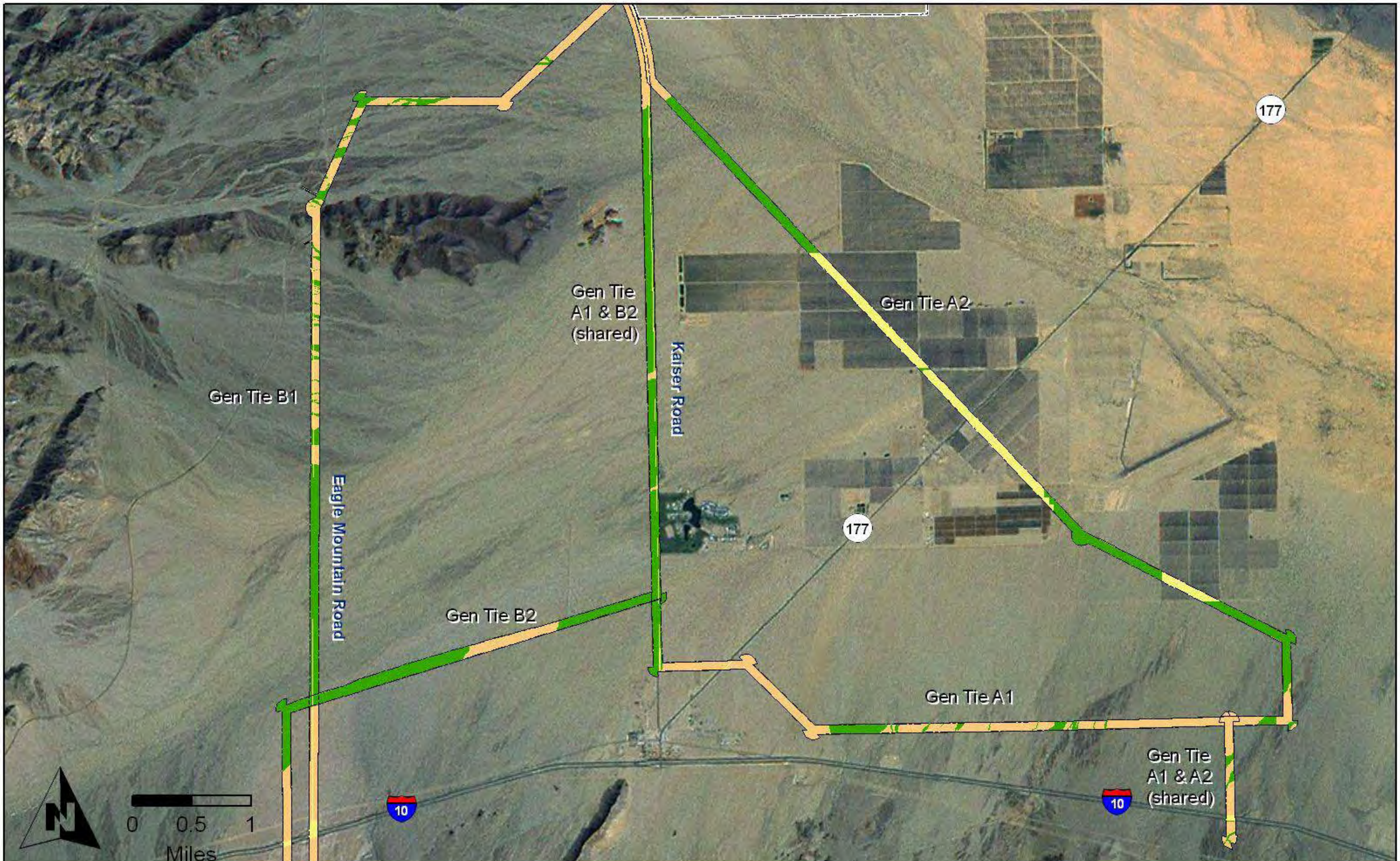
<u>Sunlight Components</u>

Vegetation communities mapped within the Study Area of the Sunlight components are shown in Figures 8 and 9. The area of each community within each Sunlight component is found in Table 3. The major alluvial systems associated with the Upper Chuckwalla Valley, Big Wash, and Dragon Wash support broad floodplains dominated by desert dry wash woodland (primarily *Olneya tesota*), which are crossed by the northern extents of the Gen-Tie Line alternatives. Pinto Wash supports dense, mature Desert Dry Wash Woodland (primarily *Cercidium floridum*), which is located outside the Solar Farm alternative eastern boundary.



Solar Farm Alternatives (combined)	**Desert Dry Wash Woodland (Blue Palo Verde-Ironwood-Smoke Tree Series)**	DESERT SUNLIGHT SOLAR FARM PROJECT DESERT SUNLIGHT HOLDINGS, LLC
	Sonoran Desert Scrub (Creosote Bush-White Bursage Series)	**Figure 8 Vegetation Communities Sunlight Components Solar Farm Alternatives**
	Aeolian Sand Dunes	

Prepared by Ironwood Consulting, Inc. - June 2010



Project Alternatives*

* Disturbance areas for linear components are less than area depicted in map.

Desert Dry Wash Woodland (Blue Palo Verde-Ironwood-Smoke Tree Series)

Sonoran Desert Scrub (Creosote Bush-White Bursage Series)

Developed/Disturbed/Agricultural

DESERT SUNLIGHT SOLAR FARM PROJECT
DESERT SUNLIGHT HOLDINGS, LLC

Figure 9
Vegetation Communities
Sunlight Components
Gen-Tie Line Alternatives

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Table 3. Vegetation Communities – Sunlight Study Area

Project Component Study Area*	Vegetation Community (acres) Sonoran Desert Scrub	Desert Dry Wash Woodland	Developed Disturbed Agriculture	Aeolian Sand Dunes	Total
Solar Farm - preliminary Study Area	15,149	1,161	0	20	16,330
Solar Farm A	4,150	35	0	0	4,185
Solar Farm B	4,208	35	0	0	4,243
Solar Farm C	3,010	35	0	0	3,045
Gen-Tie Line A1	276	289	25	0	590
Gen-Tie Line A2	126	218	162	0	506
Gen-Tie Line B1	273	160	25	0	458
Gen-Tie Line B2	120	361	21	0	502

The eastern portion of the preliminary assessment area (east of Pinto Wash), supports pockets of Sonoran desert scrub on aeolian sand deposits that have been stabilized by shrub and herbaceous vegetation. Approximately 20 acres of active sand dune deposits, which are relatively barren expanses of moving sand and do not support extensive stabilizing vegetation, are located approximately one mile east of the Solar Farm alternatives. These dunes are located at the base of the southwest-facing bajada below the Coxcomb Mountains.

SCE Components

The SCE components consist primarily of Creosote Bush Scrub with active alluvial fans and prominent washes supporting Desert Dry Wash Woodland (Table 4 and Figure 10). Desert dry wash woodland is located within the broad alluvial system in the eastern third of the Red Bluff Substation A Study Area. Several deeply incised large washes with dry wash woodland occur in the western third of the Red Bluff Substation A Study Area. Vegetation communities along the access road alternatives and Distribution line were relatively disturbed and sparse as a result of historical land disturbance. The presence of existing dirt roads, utility lines, and flood control dykes has had a substantial impact on the vegetation density and diversity. Ironwood trees within this region displayed signs of poor health where surface flow had been diverted as a result of these disturbances.

Table 4. Vegetation Communities – SCE Study Area

Project Component Study Area*	Vegetation Community (acres) Sonoran Desert Scrub	Desert Dry Wash Woodland	Developed / Disturbed / Agriculture	Aeolian Sand Dunes	Total
Red Bluff Substation A	564	138	0	0	702
Red Bluff Substation B	172	23	4	0	199
Access Road A (west)	56	7	5	0	68
Access Road B (east)	61	9	0	0	70
SCE Telecom Site	41	0	0	0	41
SCE Distribution Line	200	27	3	0	230

Project Alternatives*

* Disturbance areas for SCEcomponents are less than area depicted in map.

Desert Dry Wash Woodland (Blue Palo Verde-Ironwood-Smoke Tree Series)

Sonoran Desert Scrub (Creosote Bush-White Bursage Series)

Developed/Disturbed/Agricultural

DESERT SUNLIGHT SOLAR FARM PROJECT
DESERT SUNLIGHT HOLDINGS, LLC

Figure 10
Vegetation Communities
SCE Components

Prepared by Ironwood Consulting, Inc. - July 2010

3.3 Special Status Plant Species

The spring 2010 botanical study followed above-average winter rainfall for the region (Figure 5). Over 190 plant species were detected during the botanical study (Appendix A). No federal- or state-listed (threatened or endangered) plant species were found within the Study Area. A total of six special status (CNPS listing status and NECO-covered) plant species were found within the Study Area (Figure 11). Five of these special status plant species were found occupying an area of approximately 3,700 acres within and adjacent to the Sunlight Study Area. Three were found occupying an area of approximately 150 acres within and adjacent to the SCE Study Area (Tables 5 and 6, respectively). A description of each species follows the tables and figure.

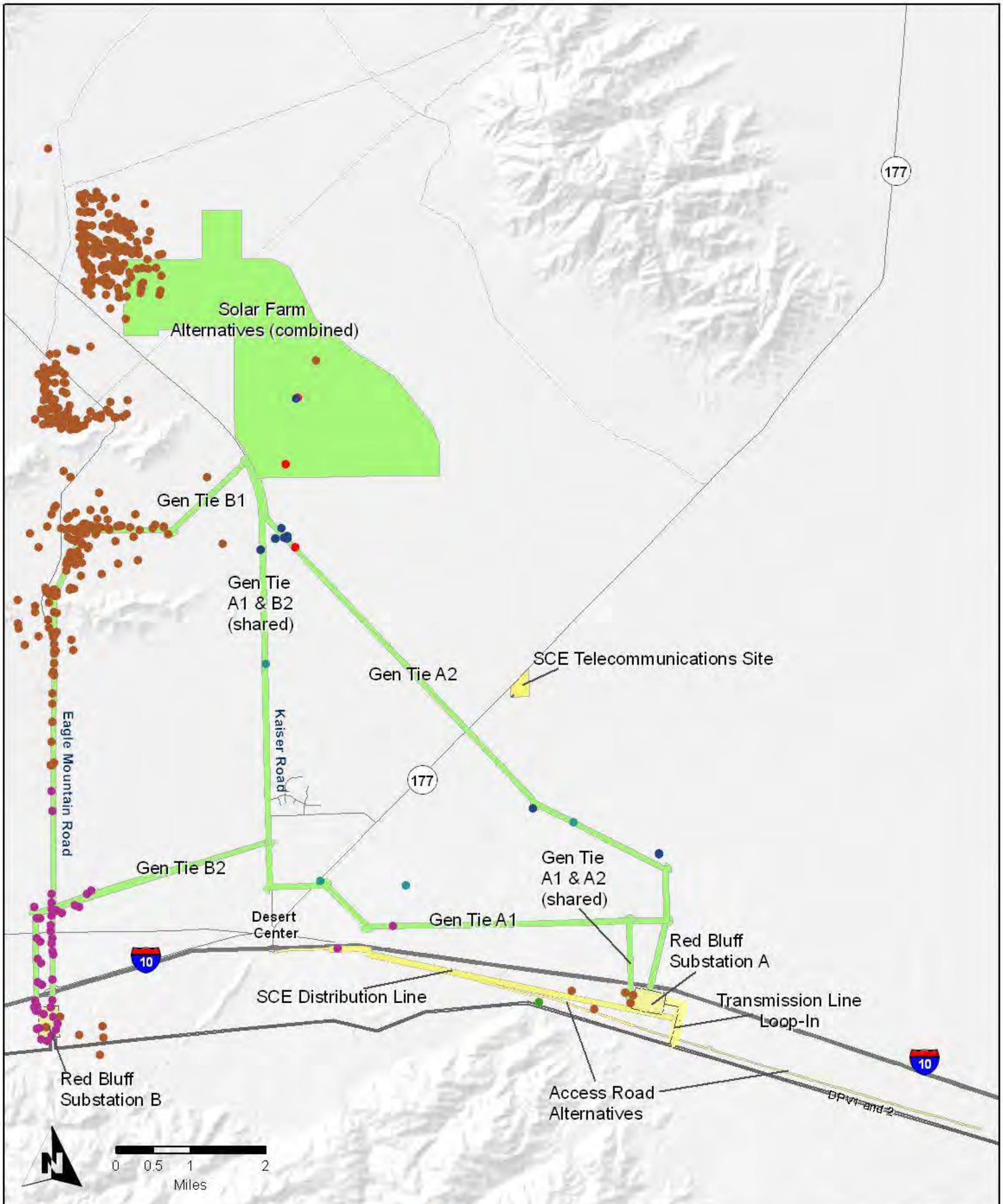
Table 5. Special Status Plant Species Occurrence – Sunlight Study Area

Scientific Name **Common Name**	**Status[1]**		**Sunlight Components (approximate number of plants)**						
			Solar Farm A	**Solar Farm B**	**Solar Farm C**	**Gen-Tie Line A1**	**Gen-Tie Line A2**	**Gen-Tie Line B1**	**Gen-Tie Line B2**
Castela emoryi **Crucifixion thorn**	Federal: State: CNPS: BLM:	none none 2.3 NECO	**1**	**1**	**1**	**2**	**32**	-	**2**
Coryptantha alversonii **Foxtail cactus**	Federal: State: CNPS: BLM:	none none 4.3 NECO	**18**	**3**	**1**	-	-	**250**	-
Ditaxis serrata var. *californica* **California ditaxis**	Federal: State: CNPS: BLM:	none none 3.2 NECO	-	-	-	**1**	-	**575**	**1,475**
Koeberlinia spinosa ssp. tenuispina **Slender-spined allthorn (Crown-of-thorns)**	Federal: State: CNPS: BLM:	none none 2.2 NECO	**5**	**5**	**5**	-	-	-	-
Proboscidea althaeifolia **Desert unicorn plant**	Federal: State: CNPS: BLM:	none none 4.3 NECO	-	-	-	**4**	**1**	-	**1**

[1] California Native Plant Society (CNPS) designations:
1A: Plants presumed extinct in California
1B: Plants rare and endangered in California and throughout their range.
2: Plants rare, threatened or endangered in California but more common elsewhere in their range.
3: Plants about which more information is needed; a review list.
4: Plants of limited distribution; a watch list.

Threat Code Extensions:
.1: Seriously endangered in California.
.2: Fairly endangered in California.
.3: Not very endangered in California.

BLM designation:
NECO: Species is addressed in the Northern and Eastern Colorado Desert Plan (NECO).



Sunlight Components*	Crucifixion Thorn (Castela emoryi)	California Ditaxis (Ditaxis serrata var. californica)
SCE Components*	Las Animas Colubrine (Colubrina californica)	Slender-spined allthorn (Koeberlinia spinosa ssp. tenuispina)
	Foxtail Cactus (Coryphantha alversonii)	Desert Unicorn Plant (Proboscidea althaefolia)

* Disturbance area of linear components and telecommunications site are less han area depicted in map.

DESERT SUNLIGHT
SOLAR FARM PROJECT
DESERT SUNLIGH HOLDINGS, LLC

Figure 11
Project Alternatives
Special Status Plants

Prepared by Ironwood Consulting, Inc. - July 2010

Table 6. Special Status Plant Species Occurrence – SCE Study Area

Scientific Name **Common Name**	Status[1]		SCE Components (approximate number of plants) Red Bluff Sub A	Red Bluff Sub B	Dist Line	Access Roads	Telecom site
Coryptantha alversonii **Foxtail cactus**	Federal: State: CNPS: BLM:	none none 4.3 NECO	4	2	1	1	-
Ditaxis serrata var. *californica* **California ditaxis**	Federal: State: CNPS: BLM:	none none 3.2 NECO	-	522	2	2	-
Colubrina californica **Las Animas colubrine, snakebush**	Federal: State: CNPS: BLM:	none none 2.3 NECO	1	-	1	-	-

[1] California Native Plant Society (CNPS) designations:
1A: Plants presumed extinct in California
1B: Plants rare and endangered in California and throughout their range.
2: Plants rare, threatened or endangered in California but more common elsewhere in their range.
3: Plants about which more information is needed; a review list.
4: Plants of limited distribution; a watch list.
[2] Within 400 feet of access road and 600 feet of Distribution Line

Threat Code Extensions:
.1: Seriously endangered in California.
.2: Fairly endangered in California.
.3: Not very endangered in California.
BLM designation:
NECO: Species is addressed in the Northern and Eastern Colorado Desert Plan (NECO).

Crucifixion thorn *(Castela emoryi*) is a CNPS List 2.3 perennial deciduous shrub belonging to the Simaroubaceae (Quassia) family. It is historically known to occur in Mojavean desert scrub, playas, and gravelly Sonoran desert scrubs at elevations ranging from 300 to 2,200 feet (90 to 670 meters) amsl. It typically prefers fine, slightly alkaline or gravelly soils along playa margins. This species blooms in June and July, but may flower as early as April. The majority of crucifixion thorn shrubs were observed in the northern reaches of the Gen-Tie Line A1/B2 (two plants) and Gen-Tie Line A2 (approximately thirty-two plants), which cross the broad active alluvial fan associated with Big Wash. One crucifixion thorn shrub was found within the Study Area of the Solar Farm site. This species was not found within the Study Area of the SCE components.

Foxtail cactus *(Coryphantha alversonii*, formerly *Escobaria vivipera* var. *alversonii*) is a CNPS List 4.3 species belonging to the Cactaceae (Cactus) family. This low-lying cactus is typically found in rocky soils on hills, mountains, margins of washes, and bajadas dominated by Sonoran desert scrub. Three distinct concentrations of foxtail cactus were located along the rocky margins of older alluvial systems within the Study Area. One concentration was located northwest of the Solar Farm site on the east site of Kaiser Road. A portion of this concentration was located within the Solar Farm site alternatives. Another concentration was located west of Kaiser Road and north of the Eagle Mountain Pumping Station, which is not currently associated with any Sunlight components. The third concentration was located within and adjacent to Gen-Tie Line B1, associated with Big Wash north of Victory Pass and the rocky alluvial system south of Victory

Pass. Approximately 250 foxtail cactus plants were found within the Gen-Tie Line B1 Study Area. In total, over 830 individual plants were recorded by GPS and/or tallied during all surveys within and adjacent to the Study Area for the Sunlight components. Outside of these populations, foxtail cactus occurred individually or in small groups. Four foxtail cactus were detected within the Red Bluff Substation A Study Area and two were found within the Red Bluff Substation B Study Area. One cactus was found within the shared alignment of the access road (west) and the Distribution line.

California ditaxis (*Ditaxis serrata* var. *californica,* formerly *Ditaxis californica*) is a CNPS List 3.2 perennial herb belonging to the Euphorbiaceae (Spurge) family. It is typically known to occur in rocky, gravelly soils of washes, mountains, hills, and canyons that support Sonoran desert scrub and Desert Dry Wash Woodland vegetation communities at elevations ranging from 100 to 3,300 feet (30 to 1,000 meters) amsl. This species' distribution is not well understood and most records within the NECO plan area are within, and immediately south of, Joshua Tree National Park (BLM 2002). The majority of California ditaxis were observed in the southern reaches of the Gen-Tie Line B1 (approximately 575 plants) and Gen-Tie Line B2 (approximately 1,475 plants). Five-hundred and twenty-two California ditaxis were found within the Red Bluff Substation B Study Area and two were found within the shared alignment of the access road (west) and the Distribution line.

Slender-spined allthorn (*Koeberlinia spinosa* ssp. *tenuispina*), also known as crown-of-thorns, is a CNPS List 2.2 deciduous shrub belonging to the Koeberliniaceae family. This species typically blooms from May to July. It is historically known to occur in rocky or gravelly soils in washes and ravines in Desert Dry Wash Woodlands and Sonoran desert scrub at elevations ranging from 500 to 1,700 feet (150 to 510 meters) amsl. Slender-spined allthorn may form small colonies by root-sprouting. Records of this species range from the Sonoran Desert of California to Texas and Central Mexico. Previously, known occurrences of this species within have been located in the vicinity of the Chocolate Mountains, primarily in the Chocolate Mountains Aerial Gunnery Range in Imperial County (BLM 2002). Two records (five plants) of crown-of-thorns were found within the Solar Farm site and another record (two plants) was recorded approximately 600 feet outside the Gen-Tie Line A2 Study Area. This species was not found within the Study Area of the SCE components.

Desert unicorn plant *(Proboscidea althaeifolia)* is a CNPS List 4.3 perennial herb belonging to the Martyniaceae family. This species typically blooms from May to August. It is historically known to occur in sandy soils along washes in Sonoran desert scrub at elevations ranging from 500 to 3,300 feet (150 to 1,000 meters) amsl. Records of this species range from Sonoran Desert of California to Texas, with most records occurring outside of California. In the NECO planning area, records occur in Milpitas Wash, and the Chuckwalla and Chemehuevi Valleys (BLM 2002). Five records of this species were found within the Sunlight Study Area. One desert unicorn plant was found along the shared alignment of Gent-Tie A1 and B2, on the west side of Kaiser Road approximately 3.5 miles north of the community of Lake Tamarisk. Also associated with the Gen-

Tie Line A1 Study Area, another individual plant was found just east of where it crosses Highway 177 and two other plants were found approximately 1.2 miles east of the aforementioned individual plant. One individual plant was found within the Gen-Tie Line A2 Study Area approximately 2 miles southeast of where it crosses Highway 177. This species was not found within the Study Area of the SCE components.

Las Animas colubrine (*Colubrina californica*) is a CNPS List 2.3 perennial deciduous shrub belonging to the Rhamnaceae (Buckthorn) family. It is historically known to occur in both Mojavean and Sonoran desert scrub communities at elevations ranging from 30 to 3,200 feet (10 to 1,000 meters) amsl. This species typically occurs in dry canyons with sandy, gravelly soils (BLM 2002). Most records of Las Animas colubrine within the NECO planning area are located in the vicinity of the Chocolate Mountains (BLM 2010). One individual plant was found approximately 400 feet south of the access road (west) alignment and 600 south of the Distribution line within the SCE Study Area. This species was not found within the Study Area of the Sunlight components.

Coachella Valley milk-vetch (*Astragalus lentiginosus* var. *coachellae*) is a federally listed endangered, CNPS List 1B.2, annual or perennial herb belonging to the Fabaceae (Pea) family. It is historically known to occur in sandy Sonoran desert scrub and windblown sand dunes at elevations ranging from 100 to 2,200 feet (40 to 655 meters) amsl. A record of this species was located approximately 2.5 miles southeast of the Solar Farm Site (CDFG 2009). No suitable sandy habitats for this species are found within the Sunlight or SCE components; however, the eastern portion of the preliminary assessment area (east of Pinto Wash), supports pockets of Sonoran desert scrub on aeolian sand deposits, which are mostly stabilized by shrub and herbaceous vegetation but include approximately 20 acres of active sand dune deposits located approximately one mile east of the Solar Farm alternatives. The stabilized and active sand dunes east of Pinto Wash are suitable habitat for Coachella Valley milk-vetch. Based on the presence of suitable habitat, surveys were conducted within this area in the spring of 2008, ancillary to the desert tortoise surveys conducted during the same period. Several specimens suspected to be the more common freckled milk-vetch (*A. l.* var. *variabilis*) were found. These two varieties are very similar and are typically characterized by slight morphological differences. Recent taxonomical investigations of herbarium specimens have suggested that records previously annotated as *A. l.* var. *coachellae* were more likely to be *A. l.* var. *variabilis.* Based on the recent findings in *Astragalus lentiginosus* varieties within the Chuckwalla Valley, the potential for Coachella Valley milk-vetch to occur with the Study Area is lower than originally considered. Furthermore, the Study Area for the Sunlight and SCE components do not support aeolian sand deposits and therefore are not expected to support this species.

3.4 Cactus

For the purpose of estimating the level of effort that might be required for salvaging cactus prior to ground disturbance, general distribution data was collected during the botanical study (Table 7). A count of each species occurrence within the Sunlight components would be performed during pre-activity surveys to quantify the number of individual cactus requiring salvage.

Table 7. Cactus Distribution – All Project Alternatives

Scientific Name	Solar Farm Alts	Gen-Tie Line A1	Gen-Tie Line A2	Gen-Tie Line B1	Gen-Tie Line B2	Red Bluff Sub A	Red Bluff Sub B	Access Road	Dist Line	Telecom site
Coryphantha vivipara **foxtail cactus**	P	-	-	P	-	P	P	P	P	-
Echinocactus polycephalus **cottontop cactus**	P	P	-	P	-	-	-	-	-	-
Echinocereus engelmannii **hedgehog cactus**	-	P	-	P	P	-	P	P	P	-
Ferocactus cylandraceus **barrel cactus**	P	-	-	P	P	-	-	P	P	-
Mammalaria spp. **fish-hook cactus**	P	P	P	P	P	P	P	P	P	-
Opuntia basilaris basilaris **beavertail cactus**	P	P	P	P	-	-	-	P	P	-
Opuntia echinocarpa **golden cholla**	P	P	P	P	P	P	P	P	P	-
Opuntia ramosissima **pencil cholla**	P	P	P	P	P	P	P	P	P	-

P – Present within Project component.

3.5 Non-Special Status Wildlife Species

A list of all wildlife species detected within the surveys can be found in Appendix B. At the request of BLM District Office, all wildlife incidentally observed during full-coverage tortoise surveys were recorded and tallied (LaPre 2008). No native fish species are expected to inhabit the Study Area due to the absence of adequate surface water. The Study Area is not expected to support any amphibian species due to its distance and isolation from hydrological units within the Sonoran Desert that support extant amphibian populations [i.e., Couch's spadefoot toad (*Scaphiopus couchii*)]. Thirty-four bird species were observed in the Solar Farm Study Area. The bird species most commonly observed included black-throated sparrow (*Amphispiza bilineata*), Gambel's quail (*Callipepla gambelii*), turkey vulture (*Cathartes aura*), common raven (*Corvus corax*), horned lark (*Eremophila alpestris*), and mourning dove (*Zenaida macroura*). The cumulative number of observations for each bird species is shown in Figure 12.

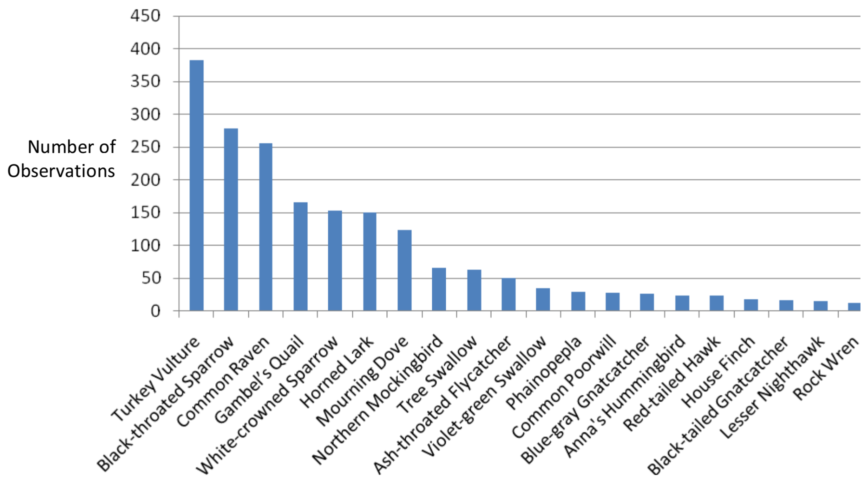


Figure 12. Incidental Observations of Bird Species
(Bird species with ten or more observations shown)

Four mammal species were regularly detected as incidental sightings including black-tailed jackrabbit (*Lepus californicus*), white-tailed antelope ground squirrel (*Ammospermophilus leucurus*), coyote (*Canis latrans*), desert cottontail (*Sylvilagus audubonii*). Other small mammals detected during baseline small mammal trapping included long-tailed pocket mouse (*Chaetodipus formosus*), Merriam's kangaroo rat (*Dipodomys merriami*), spiny pocket mouse (*Perognathus spinatus*), little pocket mouse (*Perognathus longimembris*), and desert woodrat (*Neotoma lepida*). The cumulative number of observations for each mammal species is shown in Figure 13.

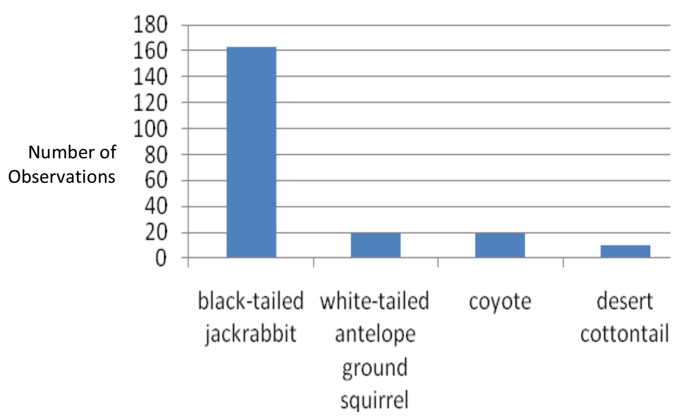


Figure 13. Incidental Observations of Mammal Species

Fourteen species of non-special status reptiles were observed in the Study Area. The most common reptiles observed included zebra-tailed lizard (*Callisaurus draconoides*), western whiptail (*Cnemidophorus tigris*), side-blotched lizard (*Uta stansburiana*), and desert iguana (*Dipsosaurus dorsalis*). The cumulative number of observations for each reptile species is shown in Figure 14.

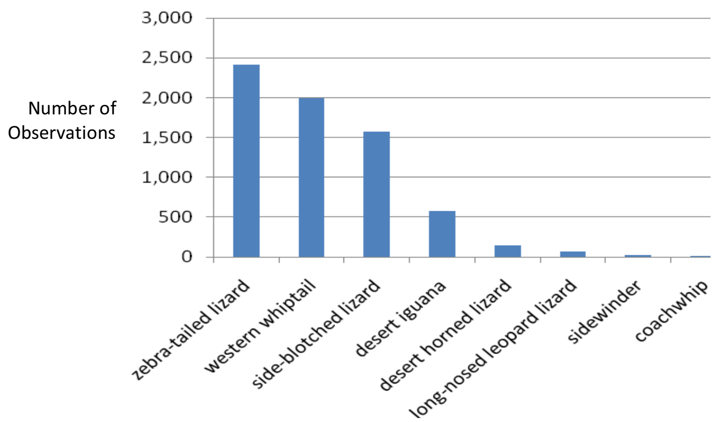


Figure 14. Incidental Observations of Reptile Species

3.6 Special Status Wildlife Species

3.6.1 Desert Tortoise

Desert tortoise *(Gopherus agassizii*) is federal- and state-listed threatened species. This species occurs in desert scrub, desert wash and Joshua tree habitats with appropriate soils for burrowing, and prefers areas of creosote scrub with abundant annual wildflowers. The entire Sunlight Study Area is located in Category III desert tortoise habitat as classified by BLM, which generally includes lands in the Chuckwalla Valley north of I-10 (NECO Plan/EIS, Appendix A, Map 2-3). This area is also classified as BLM Moderate Use Class in the (NECO Plan/EIS, Appendix A, Map 2-2). Category III habitat is defined as areas that are not essential to maintenance of viable populations, that contain low to medium densities, and that are not contiguous with medium- or high-density areas and in which the population is stable or decreasing (BLM 1992).

The Chuckwalla Desert Wildlife Management Area (DWMA) and Chuckwalla Critical Habitat Unit (CHU), both protected management areas for desert tortoise, are located immediately west of Kaiser Road. Portions of Gen-Tie Lines A1, B1, and B2 intersect the Chuckwalla DWMA. Portions of all four Gen-Tie Lines intersect the CHU (Figure 2).

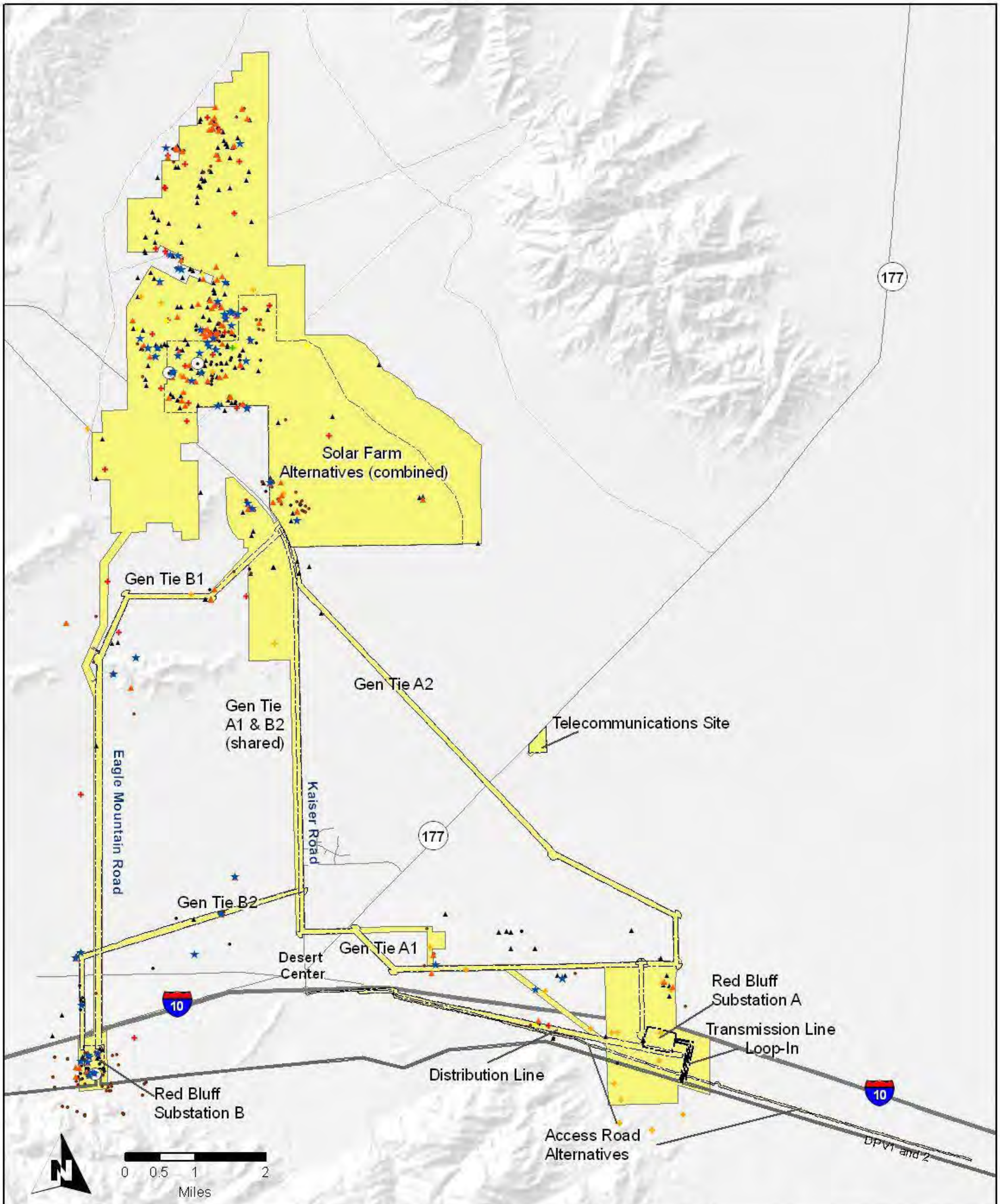
The entire SCE Study Area is located in BLM Category II desert tortoise habitat, which includes lands in the Chuckwalla Valley south of I-10 (NECO Plan/EIS, Appendix A, Map 2-3). This area is also classified as BLM Limited Use Class in the (NECO Plan/EIS, Appendix A, Map 2-2). Category II habitat is defined as areas that may be essential to the maintenance of viable tortoise populations, that contain medium to high density habitat or low density habitat contiguous with medium or high density habitat and in which the population is stable or decreasing (BLM 1992). The Red Bluff Substation B is the only SCE component not located within the Chuckwalla CHU because it is located on private land. The entire SCE Study Area is located within the Chuckwalla DWMA (Figure 2).

Desert tortoise sign (i.e., live tortoises, burrows, pallets, scat, courtship rings, and carcasses) were found throughout the full Study Area, but were not uniformly distributed (Figure 15). Total active sign included sixty-two tortoises, 103 burrows, and seven pallets. Additional sign attributable to desert tortoise but not indicating recent activity included 202 burrows (poor to good quality), 16 pallets, and seventy-four carcasses.

The US Geological Survey (USGS) published a desert tortoise model for portions of the Sonoran Desert of California (Nussear et al. 2009). The model involved merging historical desert tortoise presence data with sixteen environmental data variables relating to soils, landscape, biota and climate. These data were converted into a grid and inputted into the Maxent habitat-modeling algorithm. The resulting dataset is a statistical probability of desert tortoise habitat potential. The USGS model within the Sunlight Study Area was consistent with the distribution of tortoise sign observed during the focused surveys conducted by Ironwood (Figure 16).

Tortoise sign was more abundant in older, inactive alluvial fan systems where drainages were well defined and vegetation was relatively more diverse than younger alluvial fan systems. These occupied areas typically contained well-developed desert pavement within the upland mounds between slopes leading to ephemeral washes. Areas of younger, active alluvial deposits contained minimal tortoise sign, which was a characteristic of most of the land within the Solar Farm alternatives. These areas are not expected to be within core territories of resident tortoises.

Three concentrations of tortoise activity were evident within the Sunlight Study Area . The northernmost concentration was located within the Study Area, but approximately 1.5 miles north of the Solar Farm alternatives. This concentration consisted of two observed tortoises and approximately eighteen burrows with indication of recent use. The second and largest tortoise concentration was located immediately north of the MWD transmission line and east of Kaiser Road. This concentration consisted of thirty-five observed tortoises and approximately sixty burrows with indication of recent use. Sign of mating was observed in this area. This concentration overlaps with the northeastern reaches of the Solar Farm A and B sites (Figure 17). The third concentration was located immediately east of Kaiser Road, near the bend in the road as it transitions to a north-south alignment. This concentration consisted of two observed tortoises and approximately six burrows with indication of recent use. This concentration was located in the southwestern extent of the Solar Farm alternatives.



Project Alternatives*

Full Coverage Survey Area

* Disturbance areas for linear components and telecommunications site are less than area depicted in map.

Tortoise
Mating Ring
Active Burrow/Pallet
Inactive Burrow/Pallet
Scat - Fresh
Scat - Old

Carcasses
(estimated time since death)
<1 yrs
1-2 yrs
2-4 yrs
>4 yrs

DESERT SUNLIGHT
SOLAR FARM PROJECT
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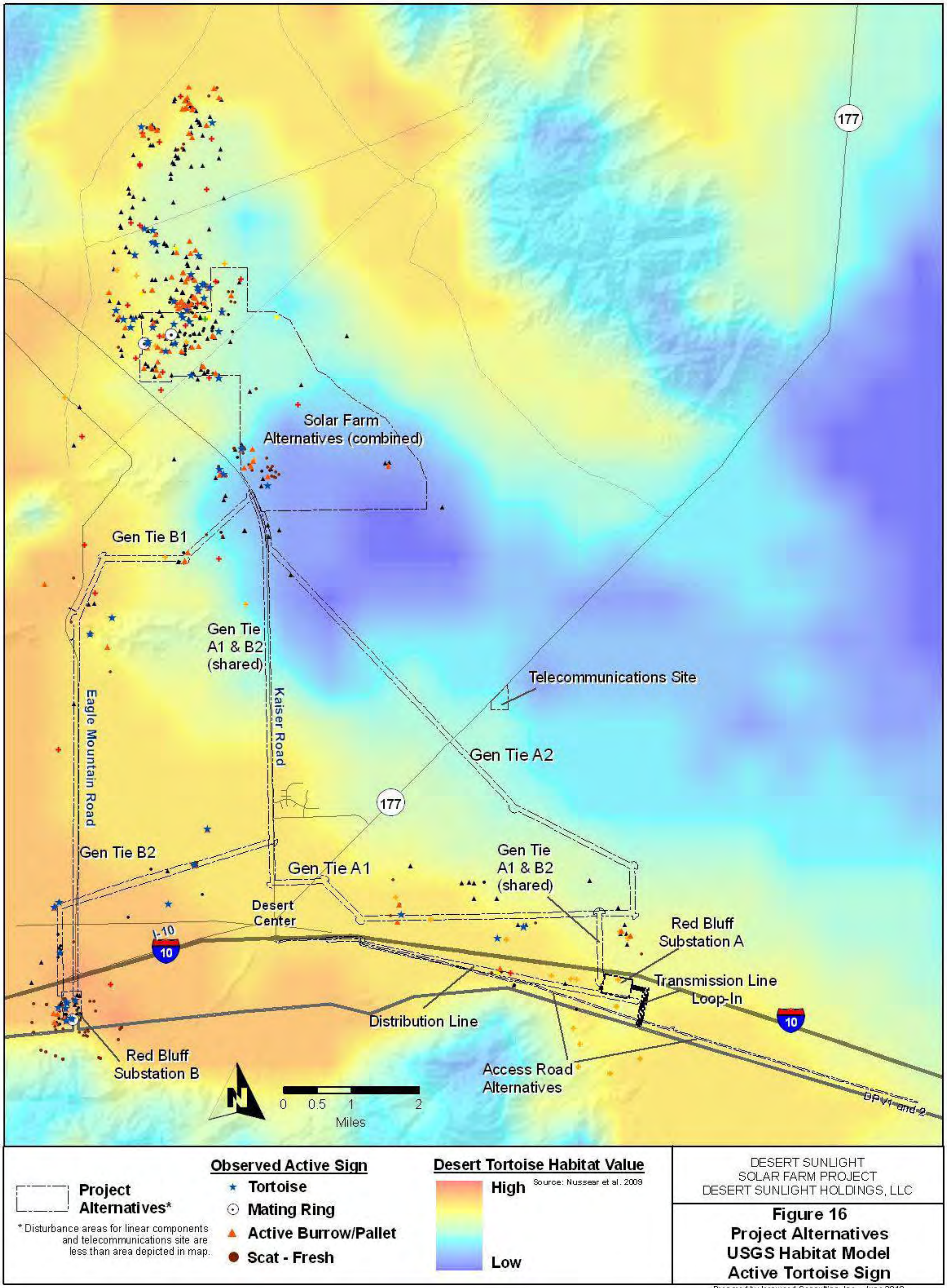
Figure 15
Project Components
All Alternatives
Desert Tortoise Sign

Prepared by Ironwood Consulting, Inc. - July 2010



DESERT SUNLIGHT
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Figure 16
Project Alternatives
USGS Habitat Model
Active Tortoise Sign

Prepared by Ironwood Consulting, Inc. - June 2010

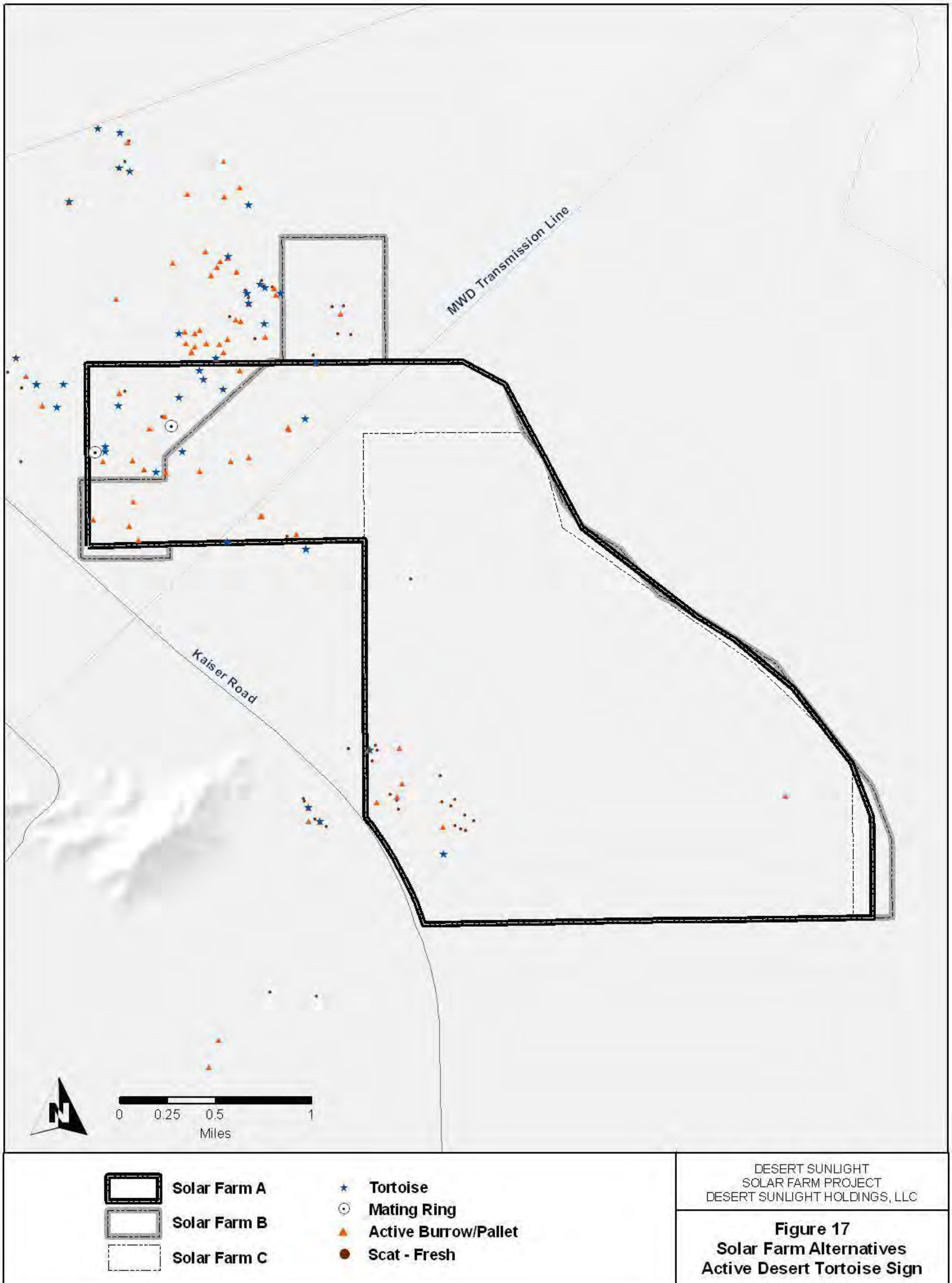

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Figure 17
Solar Farm Alternatives
Active Desert Tortoise Sign

Prepared by Ironwood Consulting, Inc. - July 2010

The number of active burrows and live tortoises observed during surveys were totaled for each Sunlight component (Table 8). The estimated number of tortoises was subsequently calculated using the formula described in the revised protocol (USFWS 2010):

$$\left(\begin{array}{c}\text{Estimated number of tortoises}\\ \text{within action area}\end{array}\right)=\frac{\left(\begin{array}{c}\text{Number of tortoises}\\ \text{observed above ground}\end{array}\right)}{\left(\begin{array}{c}\text{Probability that}\\ \text{a tortoise is}\\ \text{above ground } (P_a)\end{array}\right)\left(\begin{array}{c}\text{Probability of}\\ \text{detecting a tortoise,}\\ \text{if above ground } (P_d)\end{array}\right)}\left(\frac{\text{Size of action area}}{\text{Size of area surveyed}}\right)$$

A value of 0.80 was used for the P_a (probability that a tortoise is above ground) because annual winter rainfall averages were above 1.5 inches from 2008 to 2010 (Figure 5). P_d (probability of detecting a tortoise, if above ground) is a constant value of 0.63 based on regional sampling data (USFWS 2010). The size of the action area is equivalent to the size of the area surveyed. The resulting equation is the number of observed tortoise multiplied by a factor of two. The predicted range was based on a fifteen percent possible margin of error.

Table 8. Active Tortoise Sign and Estimated Number of Tortoises

Project Component	Active Burrows	Live Tortoises Observed	Estimated Live Tortoises[1]	Predicted Range of Live Tortoises[2]
Solar Farm A	29	14	28	24-32
Solar Farm B	22	6	12	10-14
Solar Farm C	7	2	4	3-5
Gen-Tie Line A1	2	1	2	0-4[3]
Gen-Tie Line A2	1	0	0	0
Gen-Tie Line B1	2	0	0	0
Gen-Tie Line B2	0	2	4	3-5
Red Bluff Sub A	0	0	0	0
Red Bluff Sub B	6[4]	8[5]	16	14-18
Access Road	0	0	0	0
Distribution Line	1[6]	0	0	0
Telecom Site	0	0	0	0

[1] Calculated from formula from revised protocol (USFWS 2010).
[2] Predicted Range based on 15% error.
[3] Represents minimum range.
[4] Two active burrows immediately west of Study Area.
[5] May include recounts of same tortoise.
[6] Located 200 feet north of Study Area.

3.6.2 Western Burrowing Owl

***Athene cunicularia* (western burrowing owl)** is a State Species of Special Concern and addressed in the NECO Plan/EIS. Burrowing owls inhabit open dry grasslands and desert scrubs, and typically nests in mammal burrows although they may use man-made structures including culverts and debris piles. They exhibit strong nest site fidelity. Burrowing owls eat insects, small mammals and reptiles. Burrowing owls can be found from California to Texas and into Mexico. In some case, owls migrate into southern deserts during the winter.

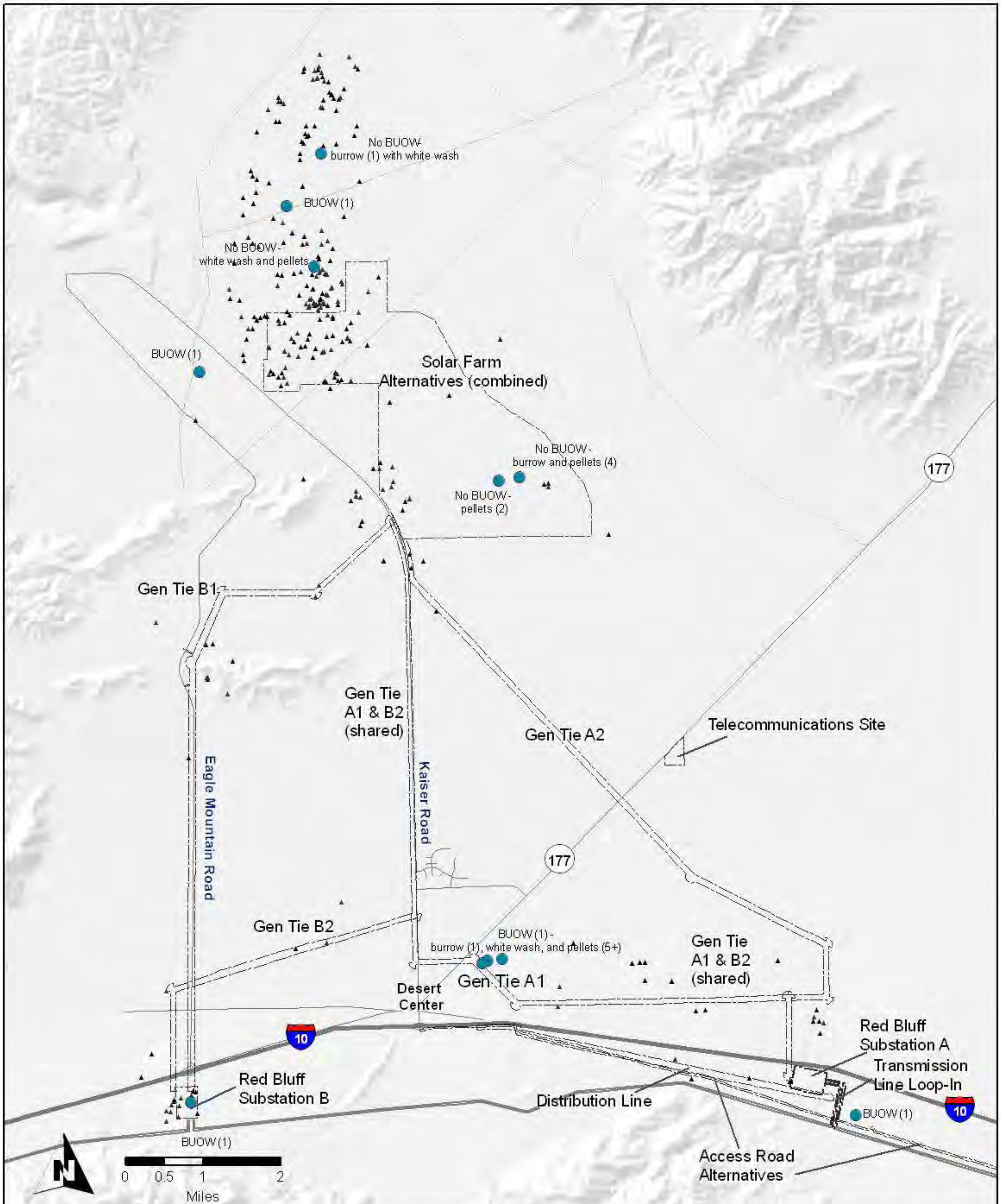
The Phase 1 assessment concluded that suitable habitat for burrowing owls existed throughout the Study Area. During the Phase 2 burrow surveys, nine records of burrowing owl sign, including three individual owl sightings were observed within the Study Area of the Sunlight components (Figure 18). The Solar Farm alternatives support numerous suitable burrows, mainly old tortoise burrows; however, only two records of burrowing owl sign (i.e., burrow, white wash and pellets) were observed. One group of observations, which included one individual owl and two burrows with white wash and pellets, occurred approximately 1,500 feet east of the intersection of Gen-Tie Line A1 and highway 177, neither of which was within any Project component area. The two other individual owl sightings occurred approximately one mile north and 0.8 mile west of the Solar Farm alternatives. Owls observed were all individual adults and observations occurred during both spring and fall seasons. It is expected that the owls reside within the Study Area year-round and there is a high potential for pairs to occur within the Study Area. Phase 3 surveys would be performed prior to ground disturbing activities to determine the number of resident owls potentially affected by construction.

3.6.3 Other Special Status Wildlife Species

BIRDS

Loggerhead shrike (*Lanius ludovicianus*) is a State Species of Special Concern and a year-round resident in parts of the Southern California desert. As a predatory bird its diet consists of insects, amphibians, small reptiles, small mammals, and other birds. Loggerhead shrikes occur across much of California excluding the far northern limits. In Southern California, they are more numerous in the desert regions than along the coast. Shrikes typically build nests one to three meters above the ground depending on the height of the vegetation.

Within the Study Area, 47 observations of loggerhead shrikes were recorded (Figure 19). Two pairs were observed during the surveys outside the Project components. One pair was located 1,200 feet northwest of the Solar Farm alternatives and the other was over 1.5 miles west of Gen-Tie Line B1. Observations of adults were made in both spring and fall, and one first-year plumage was recorded in the fall. Loggerhead shrikes were often observed perching on palo verde and ironwood trees as well as larger creosote bush shrubs and other structures including utility poles.



Project Alternatives*

* Disturbance areas for linear components and telecommunications site are less than area depicted in map.

Burrowing Owl Sign

Suitable Burrow (no sign)

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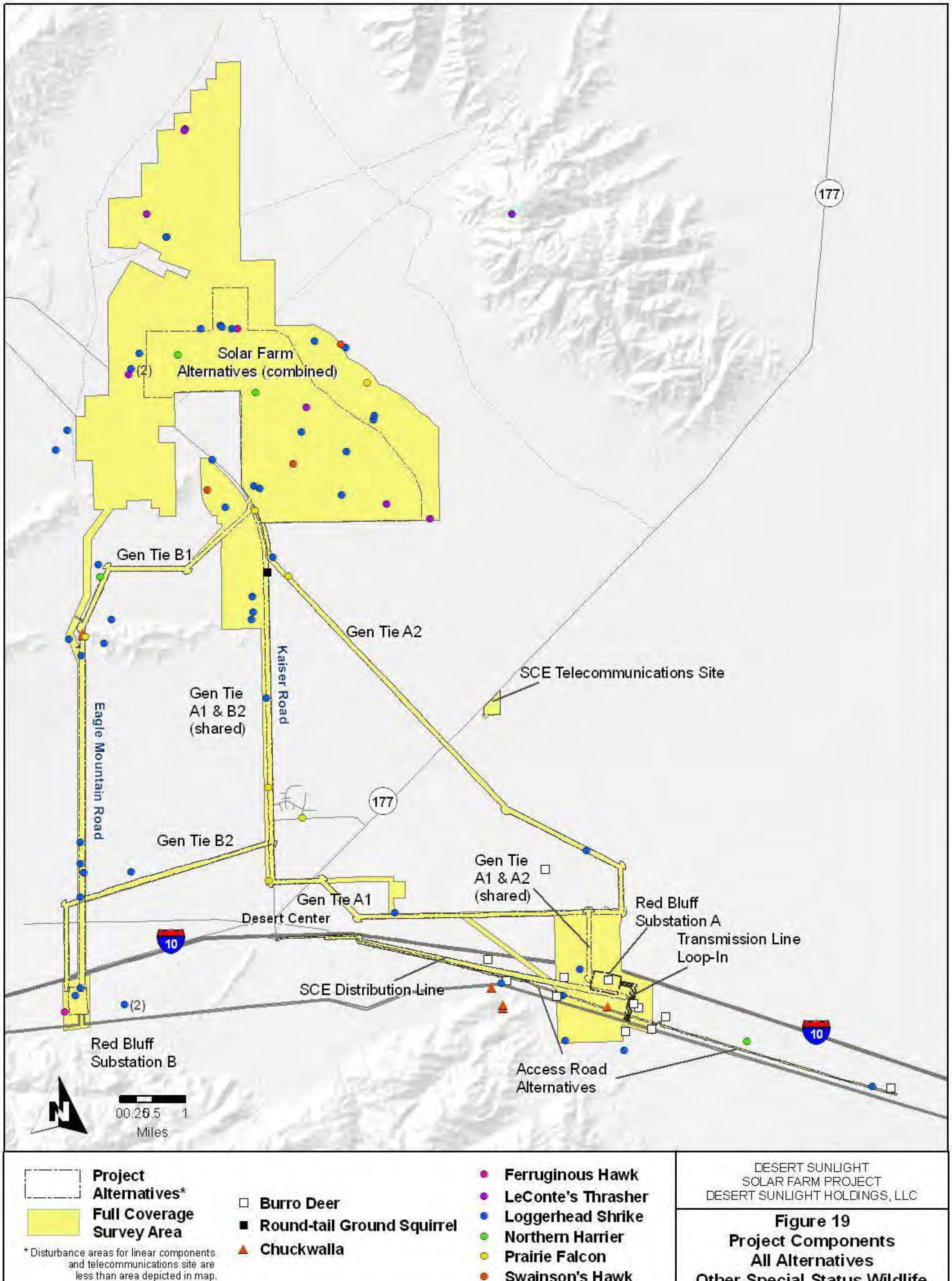
Figure 18
Project Components
All Alternatives
Burrowing Owl Sign

Prepared by Ironwood Consulting, Inc. - July 2010



DESERT SUNLIGHT
SOLAR FARM PROJECT
DESERT SUNLIGHT HOLDINGS, LLC

Figure 19
Project Components
All Alternatives
Other Special Status Wildlife

Prepared by Ironwood Consulting, Inc. - July 2010

The number of individual loggerhead shrikes recorded within and adjacent to each Project components are shown in Figure 20. Suitable habitat for this species is found throughout the entire Sunlight and SCE Study Area. Based on the amount and type of observations made during the surveys, loggerhead shrikes are year-round residents within the Study Area.

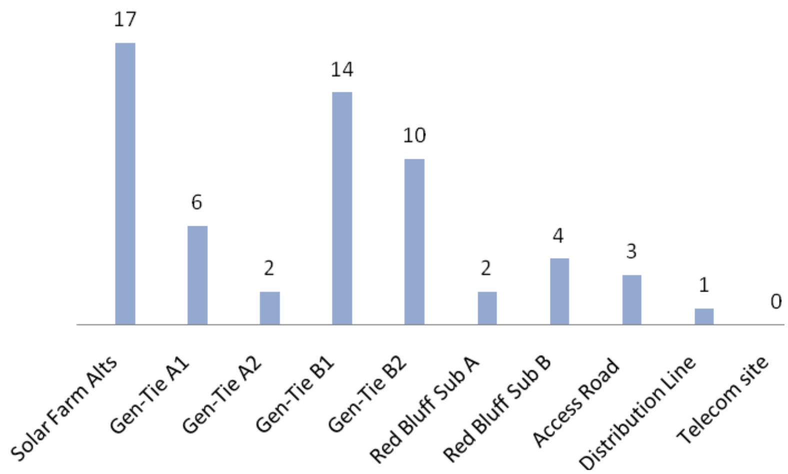


Figure 20. Loggerhead Shrike Observations

Le Conte's thrasher (*Toxostoma lecontei*) is a State Species of Special Concern and year-round desert resident. These species inhabit various desert scrub and wash habitats and typically breeds in desert areas that support cactus, Mojave yucca (*Yucca schidigera*), Joshua trees (*Yucca brevifolia*), and large thorny shrubs such as *Lycium* spp. This species is distributed from the Mojave Desert east into southern Utah and northern Arizona, and south into northern Mexico (BLM 2002). Nine individual observations of this species were recorded during the surveys (Figure 17). Four were located more than one mile north of the Solar Farm alternatives. Two were located just outside the northwest and southeast corners of the Solar Farm alternatives. Two observations were located within the Solar Farm alternatives. No records of Le Conte's thrasher were located within the Gen-Tie Line alternatives. Suitable habitat for this species is found throughout the entire Sunlight and SCE Study Area.

Ferruginous hawk (*Buteo regalis*) is a State Species of Special Concern and addressed in the NECO Plan/EIS. This species typically nests in northern latitudes of North America and overwinter in southern regions of the U.S. from Texas to California. Migrant ferruginous hawks are a regular but uncommon during spring and fall in the California southern desert region. Within the NECO planning area, hawks have been observed overwintering in low numbers in the lower Colorado River Valley, Yuma Basin, West Mesa, and the agricultural areas of Imperial Valley (BLM 2002). Overwintering hawks are often associated with grassland and agricultural areas within Southern California (CDFG 2010). Two sightings of migrating ferruginous hawks were recorded within the Study Area, one within the Solar Farm alternative near the MWD Transmission line and another within the Red Bluff Substation Study Area. Both observations occurred in March 2010 and consisted of birds in flight overhead. The golden eagle surveys performed by helicopter in spring 2010 did not reveal observation of this species. Based on data reviewed and observations, it is not expected that ferruginous hawks utilize the Study Area for nesting or overwintering. This species may forage within the Study Area during migration.

Swainson's hawk (*Buteo swainsonii*) is state-listed (threatened) raptor species that breeds in much of western North America. Within California, nesting occurs primarily in the Central Valley and northern territories; however, regular nesting occurs in the high desert between the Tehachapi Mountains and Lancaster. This species winters in southern South America with a migration route of over 20,000 miles (Woodbridge 2008). Arrival on breading areas generally occurs from late February to early May depending on geographical characteristics of the breeding area (Woodbridge 2008). Nest sites have not been documented in the Sonoran Desert of California. This species was observed within the Study Area during migration. Three incidental records were documented on April 9, 2010 during botanical and baseline surveys. Two observations were of individual Swainson's hawks and the third observation consisted of a group of over ten birds. All individuals were seen in flight overhead within or near the Solar Farm boundaries. Additionally, Swainson's hawks were observed during golden eagle surveys near Chuckwalla Mountains [two individuals (March 26 and April 3, 2010)], Coxcomb Mountains [fourteen individuals (April 2, 2010)], and Palen Mountains [four individuals (March25, 2010)] (WRI 2010). This species is not expected to nest or overwinter within the Study Area.

Prairie falcon (Falco mexicanus) is State Species of Special Concern that breeds throughout the arid West from southern Canada to central Mexico. The overall distribution appears to be stable. Prairie falcons are found in areas of the dry interior where cliffs provide secure nesting sites. In the desert they are found in all vegetation types, although sparse vegetation provides the best foraging habitat. Prairie falcons were observed in the southwest corner of the Solar Farm Site and approximately one mile east of the eastern boundary as flyovers. They were also observed at all Gen-Tie Line alternatives, but not south of I-10 near the Red Bluff Substation alternatives or related components. During aerial surveys for golden eagles, two prairie falcons were recorded within ten miles of the Solar Farm alternatives near the boundary of Eagle Mountain Mine and Joshua Tree National Park (WRI 2010). One location was an active, reproductive nest in 2010 with unknown nest success (Figure 20). The entire Study Area supports suitable foraging habitat for this species; however, nesting habitat is absent.

Northern harrier *(Circus cyaneus*), a State Species of Special Concern, is a raptor species that occurs in a wide range of habitats throughout North America. It can be found in grassland and shrub communities near the coast up to lodgepole pine and alpine meadow habitats. In Southern California, harriers typically nest and forage in open habitats that provide adequate vegetative cover, suitable prey base, and scattered perches such as shrubs or fence posts (Shuford 2008). This species is often found near bodies of water and wetlands (CDFG 2010).

Harriers are ground-nesting birds. Suitable habitat is limited in the southern California desert (Shuford 2008). Some individuals seasonally migrate into California (CDFG 2010). This species was recorded in recent years in the vicinity of Palen Lake (Solar Millennium 2009; Genesis Solar 2009). Four observations of harriers were recorded within the Study Area: two within the Solar Farm alternatives (recorded March 26, 2008 and April 1, 2010), one along Gen-Tie Line B1 approximately 0.8 miles north of Victory Pass (recorded October 28, 2009), and one along the east access road alternative for the Red Bluff Substation A (recorded March 26, 2010). All sightings were of birds in flight except for the observation along the access road in which the harrier was flushed from a wash dominated by Desert Dry Wash Woodland vegetation.

Mountain plover (*Charadrius montanus*) is a federally proposed (threatened) species and addressed in the NECO Plan/EIS. This species breeds in the high plains east of the Rocky Mountains from Montana to New Mexico and in western Texas and western Oklahoma south to central Mexico (Shuford 2008). Mountain plover winter in central and southern California, with primary wintering grounds located in the Central, Antelope, San Jacinto, Imperial, and Palo Verde Valleys. Wintering grounds are typically associated with agricultural areas (Shuford 2008). They begin to arrive on their wintering grounds in southern California in October (BLM 2002). Appendix A (Map 3-6d) of the NECO Plan identifies an area of suitable wintering habitat northeast of Desert Center along Highway 177. This distribution is likely associated with historical, large-scale active agriculture (i.e., jojoba farms) in this area. These farms have not been in operation since the 1980's. The golf course located at Lake Tamarisk, which is approximately four mile south of the Solar Farm Site and between Gen-Tie Line A1 and A1, may be suitable wintering grounds, although this site would be extralimital and its potential to support plover is not founded on existing occurrence records. Based on current conditions and documented wintering ranges for mountain plover, this species is not expected to occur within the Study Area.

Golden eagle (*Aquila chrysaetos*) is a State Species of Special Concern and addressed in the NECO Plan/EIS. Golden eagles and their primary prey species, jackrabbits, have declined in the California desert regions due to prolonged drought conditions that have persisted since 1998 (WRI 2010). Breeding in Southern California starts in January, nest building and egg laying in February to March, and hatching and raising the young eagles occur from April through June. Once the young eagles are flying on their own, the adult eagles will continue to feed them and teach them to hunt until late November.

No golden eagle nests were found on or adjacent to the Solar Farm Site or other Project components. Phase I occupancy surveys conducted in April 2010 detected 13 potentially-active nests within a ten mile radius of the Solar Farm Site and red Bluff substation, as shown on Figure 3. Of these, nests were within Joshua Tree National Park (JTNP), with an additional three in steep hills west and above Eagle Mountain mine, nearly within the JTNP boundaries. These are located either on BLM lands or lands owned by Eagle Mountain Mine and the Kaiser Corporation. The remaining three potential nests were located south of Interstate 10 in the

Chuckwalla Mountains, approximately 3 miles west and southwest from the proposed Red Bluff Substation. One observation of a golden eagle flyover of the Chuckwalla Valley was recorded during these surveys (WRI 2010).

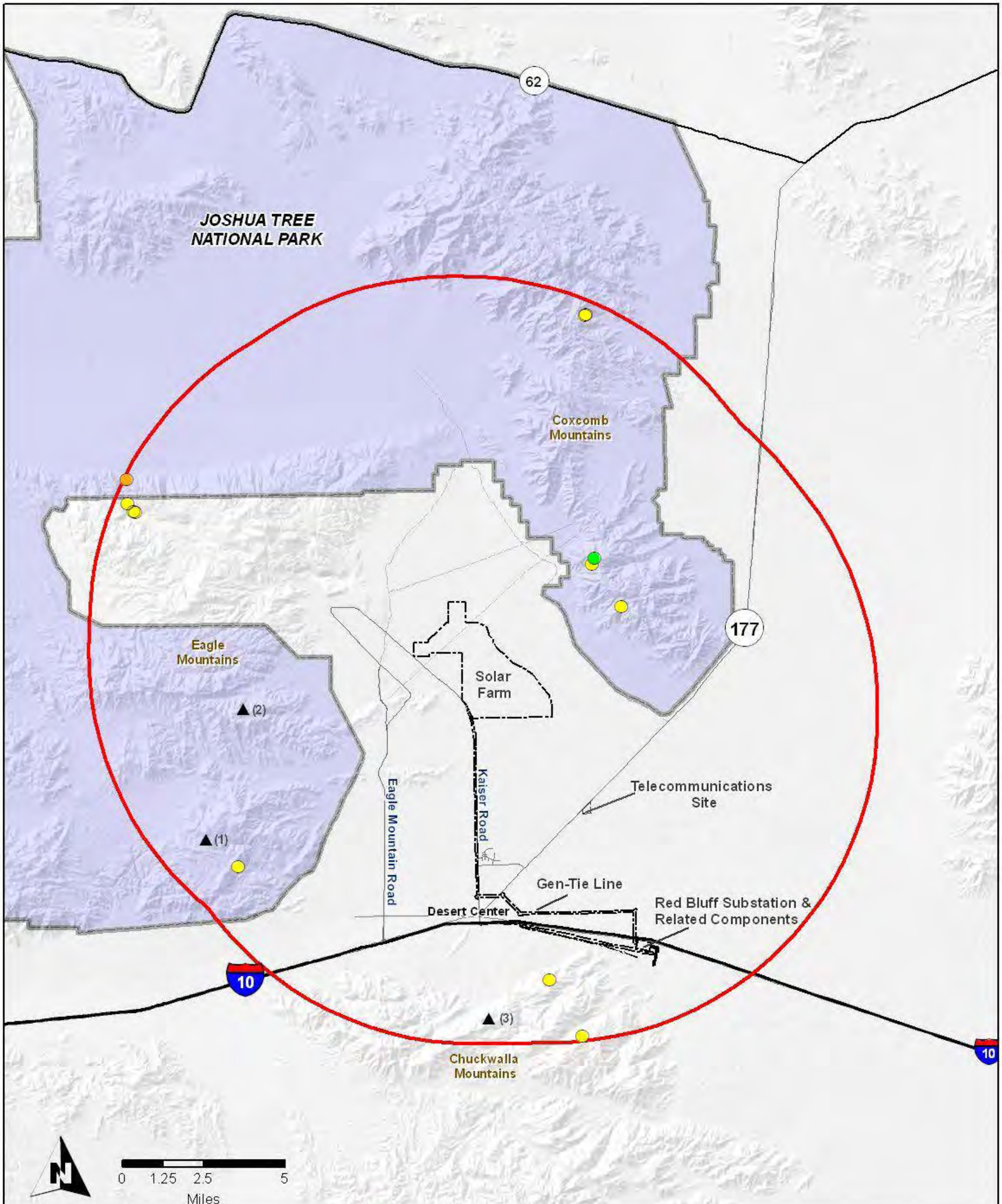
Phase II productivity surveys determined that 12 of these 13 nests were inactive, with one active but non-reproductive nest located in the Joshua Tree Wilderness Area approximately 5 miles from the Solar Farm Site boundary (Figure 21). No reproductive nests were located within the 10-mile radius of the Solar Farm Site and Red Bluff Substation (WRI 2010).

AMPHIBIANS

Couch's spadefoot toad *(Scaphiopus couchii)* is a State Species of Special Concern and addressed in the NECO Plan/EIS. It is very adapted to extremely dry conditions and spends most of its life in subterranean burrows, emerging for short periods only during spring and summer rains. It is typically associated with ephemeral ponds/puddles that persist for a minimum of seven days and contain water temperatures greater than fifteen degrees Celsius. It breeds explosively during scarce rainfall from May through September. Most breeding occurs during the first night after puddles form. Eggs typically hatch in less than one day and tadpoles transform in about one week. Couch's spadefoot toad's diet consists of invertebrates, specifically termites that also emerge during rains. This species is known to occur from the Sonora Desert in California across to Texas and south into Mexico. In California, it occurs in the southeast region of California along the Colorado River western plains, particularly associated with agricultural areas within the Imperial Reservoir Hydrological Unit and Sub-basin. The western range limit is located west of Ford Dry Lake and east of Palen Dry Lake approximately eight miles from the eastern extent of the access road alternative and eighteen miles from the Solar Farm alternatives (CDFG 2010 and BLM 2002). The Study Area, which is located within the Southern Mojave Hydrological Unit and Sub-basin, is disjunct from known populations of Couch's spadefoot toad and therefore not expected to support this species.

REPTILES

Chuckwalla *(Sauromalus obesus)* is addressed in the NECO Plan/EIS. Habitat for this species includes areas that have large rocks and boulders, similar to that of rosy boa. Chuckwallas occur throughout the Mojave and Sonoran Deserts in California, Nevada, Utah, Arizona, and Mexico. They are found in appropriate habitat throughout the NECO planning area (BLM 2002). Chuckwalla scat was observed along Gen-Tie Line B1 near Victory Pass. Approximately 250 acres of suitable habitat occurs within the Gen-Tie Line B1 Study Area. Three live chuckwallas were observed basking in the rocky slopes south of the western access road to Red Bluff Substation A. One observation was approximately 1,000 feet south of the access road and the other two were approximately 2,200 feet south of the access road. Another chuckwalla scat was observed in the rocky outcrop in the southeastern portion of the Red Bluff Substation A Study Area. Approximately 350 acres of suitable habitat occurs within the Red Bluff Substation A Study Area.



Project Area

10-Mile Project Buffer

Golden Eagle Nest, Active

Golden Eagle Nest, Inactive

Prarie Falcon Nest,
Active and Reproductive

Nelson's Big Horn Sheep

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Figure 21
Results of Golden Eagle
Phase 1 and 2 Surveys

Prepared by Ironwood Consulting, Inc. - July 2010

Mojave fringe-toed lizard *(Uma scoparia*) is a State Species of Special Concern and addressed in the NECO Plan/EIS. This species typically occurs in fine, loose, aeolian sand deposits associated with in dunes, dry lakebeds, washes, and sparse shrublands within California and Arizona deserts. Within the NECO planning area, this species is known to occur near Bristol Dry Lake, Cadiz Dry Lake, Dale Dry Lake, Rice Valley, Pinto Basin, Palen Dry Lake, and Ford Dry Lake (BLM 2002). Several individual Mojave fringe-toed lizards were observed during ancillary jurisdictional water surveys approximately 5 miles east of the Project along the western edge of Palen Dry Lake. Additional recent records of this species were found at the Palen and Genesis solar project sites southeast of the Sunlight Study Area (Solar Millennium 2009; Genesis Solar 2009). The eastern portion of the preliminary assessment area (east of Pinto Wash), supports pockets of Sonoran desert scrub on aeolian sand deposits that have been stabilized by shrub and herbaceous vegetation. Approximately 20 acres of active sand dune deposits, which are relatively barren expanses of moving sand and do not support extensive stabilizing vegetation, are located approximately one mile east of the Solar Farm alternatives. These dunes are located at the base of the southwest-facing bajada below the Coxcomb Mountains. The 20 acres of stabilized and active sand dunes east of Pinto Wash are suitable habitat for Mojave fringe-toed lizard. The Study Area for the Sunlight and SCE components, all located west of Pinto Wash, do not support aeolian sand deposits and therefore are not expected to support this species.

Rosy boa *(Lichanura trivirgata*) is a species protected in the NECO Plan/EIS and has no other special state of federal status. The rosy boa is widely but sparsely distributed in desert and chaparral habitats throughout southern California (CDFG 2010). In the desert it is typically found in areas with moderate to dense vegetation and rock cover (CDFG 2010). Suitable habitat for this species occurs in the rocky washes (e.g., Big Wash) east of the Solar Farm alternatives and in the rocky foothills of the surrounding mountains. Rosy boas were not observed during the surveys; however, this species may occur along Gen-Tie Line B1 within Big Wash (approximately 250 acres of suitable habitat), near Victory Pass, and within the rock outcroppings (approximately 350 acres of suitable habitat) within the Red Bluff Substation A Study Area.

MAMMALS

Palm Springs round-tailed ground squirrel *(Spermophilus teriticaudus chlorus*) is listed by USFWS as a candidate species and is covered under the NECO Plan/EIS. Primary habitat for the Palm Springs round- tailed ground squirrel includes dunes and sand hummocks associated with honey mesquite (*Prosopis glandulosa* var. *torreyana*) and to a lesser extent those dunes and hummocks associated with creosote bush or other plant species. Recent research has determined that this subspecies of the round-tailed ground squirrel is much more widely distributed than previously thought (Federal Register 2009). The *chlorus* subspecies was originally thought to be restricted to the Coachella Valley and nearby areas, but has been found as far south as Imperial County and as far north as Death Valley National Park (Douglas 2009). Although this subspecies is currently listed as a candidate species, reviews of its status are ongoing within USFWS due to this new information about its range. This species has been observed within the Solar Farm alternative and Gen-Tie Line A1 Study Areas.

Nelson's bighorn sheep *(Ovis Canadensis nelsoni*) is addressed in the NECO Plan/EIS and holds no additional special status. Bighorn sheep habitat requirements include steep, rugged terrain used for escape from predators and lambing areas, boulder-strewn slopes used for protection against the sun or wind; alluvial fans and/or washes that may provide higher quantities and qualities of forage than that found in the rocky terrain; and water availability. In some areas, the valley floor could serve as important linkages between neighboring mountainous regions and allow gene flow to occur between subpopulations (USFWS 2000). This species is known to live in the mountainous rocky areas of Joshua Tree National Park west and northwest of the Solar Farm alternatives and in the Chuckwalla Mountains south of I-10. The bighorn sheep population in the Chuckwalla area is estimated at between 25 and 50 individuals (Epps 2004) and the populations in JTNP is estimated at 200 individuals throughout the park (NPS 2010). This population is known to cross the very northern extreme of the Chuckwalla Valley between Joshua Tree National Park and the Coxcomb Mountains. Although this population crosses the northernmost part of the Chuckwalla Valley, there is no evidence that the valley floor is used for movement or foraging (Cipra 2009). The area most likely to be used would be Pinto Wash, which provides nearly continuous tree canopy cover between the northern and south portions of the valley. No sighting or tracks of this species were observed over several years of pedestrian surveys conducted in the wash area. During golden eagle aerial surveys the crew also noted sightings of bighorn sheep, particularly lambing areas. Six individual bighorn sheep were observed at three locations within the ten mile radius of the Solar Farm Alternatives (Figure 21). These sightings were not identified by the surveyors as lambing areas where bighorn sheep give birth and protect their young. Two locations were within JTNP within the Eagle Mountains, and one in the Chuckwalla Mountains.

American badger *(Taxidea taxus*) is a State Species of Special Concern that inhabits open shrub areas throughout the California desert. They require friable soils for building burrows and sufficient rodent population. Badgers eat small and medium-sized mammals, terrestrial insects, invertebrates, reptiles, small and medium-sized birds, and eggs (CDFG 2010). This species was observed during recent surveys about ten miles southeast of the Sunlight Project (Solar Millennium 2009). One badger dig was noted during the surveys within the Sunlight Study Area. Suitable habitat for badger is found throughout the entire Study Area, therefore this species has a high potential to occur in association with both Sunlight and SCE components.

***Odocoileus hemionus eremicus* (burro deer)** is addressed in the NECO Plan/EIS and holds no additional special status. Burro deer is a subspecies of mule deer found in the Colorado Desert of Southern California. This species is most often associated with Desert Dry Wash Woodland habitat where water and cover are available. Within the NECO planning area, they are primarily found along the Colorado River with some individuals migrating into other portions of the desert in search of water and food (BLM 2002). Two individuals and numerous tracks of this species were observed in and around the Red Bluff Substation A Study Area, near the base of the Chuckwalla Mountains. Several large washes with relatively dense overstory of ironwood and palo verde trees occur in this area. Approximately 138 acres of Desert Dry Wash Woodland, which may provide suitable cover for burro deer, are located within the Red Bluff Substation A Study Area.

Yuma mountain lion (*Felis concolor browni)* is a NECO Plan/EIS species that is known to inhabit the low mountains and use the Desert Dry Wash Woodlands in the Project vicinity following the trails of burro deer. Burro deer typically make up the majority of their diet throughout year (CDFG 2010). Mountain lions in the Colorado Desert of California are generally associated low mountains and washes supporting Desert Dry Wash Woodland near Chuckwalla Bench, Chuckwalla Mountains, Chocolate Mountains, Picacho Mountains, Milpitas Wash, and Vinagre Wash, primarily in Imperial County (BLM 2002). They are more common along the riparian zone of the Colorado River and in densely vegetated woodlands near the Coachella Canal. Sign of mountain lion were not observed during the surveys of the Study Area. Burro deer were detected in and around the Red Bluff Substation A Study Area, near the base of the Chuckwalla Mountains. Several large washes with relatively dense overstory of ironwood and palo verde trees occur in this area. Mountain lions may be attracted to this area due to the presence of prey and suitable refuge within the washes. Additionally, Pinto Wash may serve as a suitable movement corridor for mountain lions (Figures 7 and 8). Pinto Wash averages approximately 1,000 feet wide and occupies approximately 900 acres within the preliminary assessment Study Area. Although this species was not detected during the Project surveys, it has a moderate potential to occur within the previously described portions of the Study Area.

Colorado Valley woodrat *(Neotoma albigula venusta*) is addressed in the NECO Plan/EIS species and holds no additional special status. This species is a California subspecies of white-throated woodrat (*Neotoma albigula*) that occurs in Arizona. This species is found in low-lying desert areas (washes and rock outcroppings) with beavertail cactus (*Opuntia basilaris*) and mesquite (*Prosopis* sp.) (BLM 2002). A different species of woodrat, desert woodrat (*Neotoma lepida*) was incidentally detected during baseline small mammal trapping surveys within the Solar Farm Study Area, suggesting that the Colorado Valley woodrat is not present within this area. Habitat more suitable for the Colorado Valley woodrat occurs along the northern bajada of the Chuckwalla Mountains. This species has a moderate potential to occur within the SCE Study Area.

Eleven bat species potentially occur within the Study Area (Table 9; Brown 2010). Five of these species are State Species of Special Concern including **California leaf-nosed bat (*Macrotus californicus*), western mastiff (*Eumops perotis californicus*), pocketed free-tailed bat (*Nyctinomops femorosaccus*), pallid bat (*Antrozous pallidus*), and Townsend's big-eared bat (*Plecotus townsendii*).** Southern yellow bat (*Lasiurus xanthinus*) is a proposed State Species of Special Concern and potentially occurs within the Study Area. Mexican free-tailed bat (*Tadarida brasiliensis*), big brown bat (southern California population, *Eptesicus fuscus pallidus*), hoary bat (*Lasiurus cinereus*), California myotis (*Myotis californicus*), and western pipistrelle (*Parastrellus hesperus*) are non-special status species with the potential to occur within the Study Area.

Table 9. Bat Species Potentially Occurring within the Study Area

Species		Status State	Status Federal
FAMILY PHYLLOSTOMIDAE (LEAF-NOSED BATS)			
Macrotus californicus	California leaf-nosed bat	SSC	FSOC
FAMILY MOLOSSIDAE (FREE-TAILED BATS)			
Eumops perotis	Western mastiff bat	SSC	FSOC
Nyctinomops femorosaccus	Pocketed free-tailed bat	SSC	-
Tadarida brasiliensis	Mexican free-tailed bat	-	-
FAMILY VESPERTILIONIDAE (MOUSE-EARED BATS)			
Antrozous pallidus	Pallid bat	SSC	-
Corynorhinus townsendii	Townsend's big-eared bat	SSC	FSOC
Eptesicus fuscus pallidus	Big brown bat (So. CA)	-	-
Lasiurus cinereus	Hoary bat	-	-
Lasiurus xanthinus	Southern yellow bat	P	-
Myotis californicus	California myotis	-	-
Parastrellus hesperus	Western pipistrelle	-	-

SSC - California Department of Fish and Game, Mammal of Special Concern or Sensitive Species (MSSC)
FSOC - Former Candidate (Category 2) for listing under U.S. Endangered Species Act; Species of Concern
P - Proposed for addition to CDFG, MSSC list
E - Listed under FESA as Endangered

Pallid bats and western pipistrelles roost in small rocks on the ground. Suitable habitat for these species occurs within approximately 250 acres of the Gen-Tie Line B1 Study Area (Big Wash and in the vicinity of Victory Pass) and 350 acres of the Red Bluff Substation A (rocky outcrops situated along the base of the Chuckwalla Mountains). Desert dry wash (microphyll) woodland areas have been documented as important habitat to several bat species (Brown 2010). Hoary bats will roost in palo verde trees and ironwoods. During the warmer months, California leaf-nosed bats night roost in ironwood trees between foraging bouts. Desert dry wash woodland vegetation attracts foraging bats due to increased insect concentration. This is especially true for California leaf-nosed bats and pallid bats (both State Species of Special Concern) that feed on large arthropods which they glean off of the foliage. The acreage of Desert Dry Wash Woodland associated with the Study Area is found in Tables 3 and 4. Roosts for California leaf-nosed bats and pallid bats have been identified in existing mines in the Eagle and Coxcomb Mountains. The entire Study Area could be used for foraging by bats.

3.7 Sensitive Habitats

Sensitive habitats discussed in this report include:

- Plant communities listed as sensitive by BLM, CDFG and other resources agencies, or listed in the NECO plan are described in Section 3.2,
- USFWS-designated critical habitat (CHU) for a listed species,
- Areas of Critical Environmental Concern (ACECs), Desert Wildlife Management Areas (DWMAs), or other special designations by the BLM, and
- Wildlife movement corridors.

The NECO Plan/EIS designates Desert Dry Wash Woodland habitats as a sensitive habitat subject to 3:1 mitigation for any disturbance within that habitat. The Sunlight Study Area supports Desert Dry Wash Woodland in the large central drainage (Pinto Wash), in one narrow drainage along the edges of the Solar Farm alternatives, and within the Gen-Tie Line alternatives (Figures 8 and 9). The SCE Study Area supports Desert Dry Wash Woodland located in washes that flow north from the Chuckwalla Mountains (Figure 10). Acreages of these sensitive vegetation communities are found in Tables 3 and 4.

The Solar Farm alternatives are not located within a DWMA or CHU. However, three of the four Gen-Tie Line alternatives are partially located within the Chuckwalla DWMA and all four are partially located within the Chuckwalla CHU (Figure 2). The Red Bluff substation, distribution line and access road are not located within the boundaries of a Wilderness Area; however, they are located within the Chuckwalla DWMA and CHU (Figure 2). The telecommunications site is not within an ACEC, Wilderness Area, DWMA, or CHU.

Pinto Wash, which is located east of the Solar Farm Alternatives in the central part of the preliminary assessment Study Area, may provide a movement corridor for numerous large mammal species including several special status species including mountain lion, bighorn sheep, and burro deer (Figures 7 and 8). Pinto Wash averages approximately 1,000 feet wide and occupies approximately 900 acres within the preliminary assessment Study Area.

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Appendix A

Plant List from Desert Sunlight Surveys

Scientific Name	Common Name	Family	Solar Farm (northern region)	Solar Farm (southern region)	Gen-Tie A1	Gen-Tie A2	Gen-Tie B1	Gen-Tie B2	Telecom site	Red Bluff Substation A (east)	Red Bluff Substation B (west)	Red Bluff Substation Access Road (both alternatives)
Abronia villosa	sand verbena	Nyctaginaceae	x	x	x	x	x		x			
Acacia greggii	catclaw acacia	Fabaceae	x		x	x	x	x			x	x
Achyronychia cooperi	frost mat	Caryophyllaceae	x	x	x	x	x	x	x			x
Allionia incarnata	windmills	Nyctaginaceae			x		x	x		x		x
Ambrosia dumosa	burro bush	Asteraceae	x	x	x	x	x	x	x	x	x	x
Ambrosia ilicifolia		Asteraceae			x							x
Amsinckia tessellatta	fiddleneck	Boraginaceae	x	x	x	x	x	x		x	x	x
Antirrhinum filipes	twining snapdragon	Scrophulariaceae	x	x	x	x	x	x		x	x	x
Argemone munita	prickly poppy	Papaveraceae					x					
Aristida adscensionis	six-weeks three awn	Poaceae					x					
Aristida purpurea	three awn	Poaceae	x				x	x			x	
Asclepias erosa	desert milkweed	Asclepiadaceae	x	x			x	x	x			
Asclepias subulata	rush milkweed	Asclepiadaceae	x	x			x	x			x	x
Atrichoseris platyphylla	gravel ghost	Asteraceae				x	x	x				x
Atriplex polycarpa		Chenopodiaceae				x						
Bebbia juncea	sweetbush	Asteraceae	x	x	x	x	x	x		x	x	x
Brandegea bigelovii	brandegea	Cucurbitaceae	x	x	x	x	x	x		x		x
*Brassica tournefortii**	Asian mustard	Brassicaceae	x	x	x	x	x	x	x	x	x	x
*Bromus madritensis rubens**	red brome	Poaceae					x					x
Calycoseris wrightii	white-tack stem	Asteraceae	x	x	x	x	x	x	x	x	x	x
Calyptridium monandrum		Portulacaceae		x								
Camissonia boothii	Booth's primrose, woody bottlewasher	Onagraceae	x	x	x	x	x	x	x		x	x
Camissonia boothii		Onagraceae	x									

Scientific Name	Common Name	Family	Solar Farm (northern region)	Solar Farm (southern region)	Gen-Tie A1	Gen-Tie A2	Gen-Tie B1	Gen-Tie B2	Telecom site	Red Bluff Substation A (east)	Red Bluff Substation B (west)	Red Bluff Substation Access Road (both alternatives)
desertorum												
Camissonia brevipes	golden evening primrose	Onagraceae	x	x	x	x	x	x	x	x	x	x
Camissonia californica		Onagraceae		x	x		x	x				x
Camissonia chamaenerioides		Onagraceae	x									
Camissonia claviformis	brown-eyed evening primrose	Onagraceae	x	x	x	x	x	x	x		x	x
Camissonia pallida		Onagraceae	x	x								
Camissonia refracta	narrow-leafed suncup	Onagraceae			x	x	x	x			x	x
CASTELA EMORYI	**CRUCIFIXION THORN**	Simaroubaceae		x	x	x		x				
Cercidium floridium	palo verde	Fabaceae	x	x	x	x	x	x	x	x	x	x
Chaenactis carphoclinia	pebble pincushion	Asteraceae	x	x	x	x	x	x		x	x	x
Chaenactis fremontii	desert pincushion	Asteraceae	x	x	x	x	x	x		x	x	x
Chaenactis stevioides	stevia pincushion	Asteraceae	x	x	x	x	x	x	x			x
Chamaesyce setiloba		Euphorbiaceae	x				x	x				x
Chamaesyce polycarpa		Euphorbiaceae	x	x	x	x	x	x		x	x	x
Chenopodium murale	pigweed	Chenopodiaceae		x	x	x	x	x				x
Chenopodium sp.		Chenopodiaceae				x						
Chorizanthe brevicornu	brittle spineflower	Polygonaceae	x	x	x	x	x	x		x	x	x
Chorizanthe corrugata		Polygonaceae	x	x	x	x						x
Chorizanthe rigida	spiny-herb	Polygonaceae	x	x	x	x	x	x		x	x	x
COLUBRINA CALIFRONICA	**LAS ANIMAS COLUBRINE**	Rhamnaceae										x
CORYPHANTHA VIVIPARA	**FOXTAIL CACTUS**	Cactaceae	x				x					

Scientific Name	Common Name	Family	Solar Farm (northern region)	Solar Farm (southern region)	Gen-Tie A1	Gen-Tie A2	Gen-Tie B1	Gen-Tie B2	Telecom site	Red Bluff Substation A (east)	Red Bluff Substation B (west)	Red Bluff Substation Access Road (both alternatives)
Crassula cornata		Crassulaceae	x									
Croton californicus	california croton	Euphorbiaceae		x		x						
Cryptantha angustifolia	narrow leaved forget me not	Boraginaceae	x	x	x	x	x	x	x		x	x
Cryptantha barbigera	bearded forget me not	Boraginaceae	x	x	x	x	x	x			x	x
Cryptantha dumetorum	flexuous forget me not	Boraginaceae	x	x	x	x	x	x	x		x	x
Cryptantha maritima	white haired forget me not	Boraginaceae	x	x	x	x	x	x	x	x	x	x
Cryptantha nevadensis	Nevada forget me not	Boraginaceae	x	x	x	x	x	x			x	x
Cryptantha pterocarya	wing nut forget me not	Boraginaceae	x	x	x	x	x	x			x	x
Cryptantha sp.		Boraginaceae		x	x	x	x	x				x
Cucurbita palmata	coyote melon	Cucurbitaceae	x									
Cuscuta denticulata	dodder	Cuscutaceae		x	x	x		x			x	x
Cynanchum utahense	Utah cynanchum	Asclepiadaceae	x	x								
*Cynodon dactylon**	burmuda grass	Poaceae					x	x				
*Dactylis glomerata**	orchard grass	Poaceae										
Dalea mollissima	silky dalea	Fabaceae	x	x	x	x	x	x		x	x	x
Datura discolor		Solanaceae		x	x	x	x					
Datura wrightii	Jimson weed	Solanaceae				x	x	x				x
Descurainia pinnata	tansy mustard	Brassicaceae				x	x	x			x	x
Dimorphotheca sinuata		Asteraceae	x									
DITAXIS CALIFORNICA	**CALIFORNIA DITAXIS**	Euphorbiaceae			x		x	x			x	x
Ditaxis lanceolata		Euphorbiaceae	x	x	x	x	x	x		x		x
Ditaxis neomexicana		Euphorbiaceae	x	x	x	x	x	x		x	x	x

Scientific Name	Common Name	Family	Solar Farm (northern region)	Solar Farm (southern region)	Gen-Tie A1	Gen-Tie A2	Gen-Tie B1	Gen-Tie B2	Telecom site	Red Bluff Substation A (east)	Red Bluff Substation B (west)	Red Bluff Substation Access Road (both alternatives)
Dithyrea californica	spectacle pod	Brassicaceae	x	x	x	x	x	x				x
Echinocactus polycephalus	cottontop	Cactaceae	x	x	x		x					
Echinocereus engelmannii	hedgehog cactus	Cactaceae			x		x	x			x	x
Emmenanthe penduliflora	whispering bells	Hydrophyllaceae					x	x				
Encelia farinosa	brittlebush	Asteraceae	x	x	x	x	x	x	x	x	x	x
Encelia frutescens	rayless encelia	Asteraceae	x	x		x	x	x				x
Ephedra nevadensis	mormon tea	Ephedraceae									x	
Eremalche exilis		Malvaceae		x					x			
Eremalche rotundifolia	desert five-spot	Malvaceae	x	x	x	x	x	x	x		x	x
Eriogonum deflexum		Polygonaceae										x
Eriogonum inflatum	desert trumpet	Polygonaceae	x	x	x		x	x			x	x
Eriogonum sp.		Polygonaceae		x	x	x	x	x			x	x
Eriogonum thomasii		Polygonaceae	x	x	x	x				x		x
Eriogonum reniforme		Polygonaceae	x	x	x	x	x	x				x
Erioneuron pulchellum	fluff grass	Poaceae			x		x	x			x	
Eriophyllum wallacei	Wallace's woolly daisy	Asteraceae		x		x	x	x				
Erodium cicutarium	cranes bill	Geraniceae	x	x		x	x	x	x		x	x
Erodium texanum	Texas filaree	Geraniceae	x	x	x	x	x	x	x	x	x	x
Eschscholzia minutiflora	small-flowered desert poppy	Papaveraceae	x	x	x	x	x	x		x	x	x
Eschscholzia sp.		Papaveraceae			x	x	x	x		x		x
Eucrypta chrysanthemifolia		Hydrophyllaceae						x				x
Eucrypta micrantha		Hydrophyllaceae	x	x	x	x		x			x	x
Fagonia laevis	fagonia	Zygophyllaceae	x	x	x	x	x	x		x	x	x
Fagonia pachyacantha	fagonia	Zygophyllaceae		x			x	x				x
Ferocactus cylandraceus	barrel cactus	Cactaceae	x	x			x	x				x

Scientific Name	Common Name	Family	Solar Farm (northern region)	Solar Farm (southern region)	Gen-Tie A1	Gen-Tie A2	Gen-Tie B1	Gen-Tie B2	Telecom site	Red Bluff Substation A (east)	Red Bluff Substation B (west)	Red Bluff Substation Access Road (both alternatives)
Filago depressa		Asteraceae	x	x		x					x	
Fouquieria splendens	ocotillo	Fouguieriaceae	x	x	x	x	x	x			x	x
Geraea canescens	desert sunflower	Asteraceae	x	x	x	x	x	x	x	x	x	x
Gilia brecciarum		Polemoniaceae					x	x				
Gilia sp.	gilia	Polemoniaceae					x			x		x
Gilia latifolia	broad leaved gilia	Polemoniaceae	x	x	x	x	x	x		x		x
Gilia stellata	star gilia	Polemoniaceae	x	x	x	x	x	x		x	x	x
Guillenia lasiophylla	mustard	Brassicaceae	x	x	x	x	x	x			x	x
Hesperocallis undulata	desert lily	Liliaceae	x	x	x	x	x	x	x			x
Hibuscus denudatus	desert hibiscus	Malvaceae	x	x	x	x	x	x		x		x
*Hordeum murinum**		Poaceae							x			
Hymenoclea salsola	cheesebush	Asteraceae	x	x	x	x	x	x	x	x	x	x
Hyptis emoryii	desert lavender	Lamiaceae	x	x	x	x	x	x		x	x	x
Isomeris arborea	bladderpod	Capparaceae					x				x	
Justicia californica	chuparosa	Scrophulariaceae			x	x	x	x		x		x
Koeberlinia spinosa spp. Tenuispina	crown-of-thorns	Koeberliniaceae		x								
Krameria erecta		Krameriaceae		x			x	x		x		x
Krameria grayi	white rhatany	Krameriaceae	x	x	x	x	x	x		x	x	x
*Lactura serriola**		Asteraceae		x			x					
Larrea tridentata	creosote bush	Zygophyllaceae	x	x	x	x	x	x	x	x	x	x
Lepidium fremontii	desert alyssum	Brassicaceae			x		x	x				
Lepidium lasicocarpum	peppergrass	Brassicaceae	x	x	x	x	x	x	x	x	x	x
Linanthus jonesii	linanthus	Polemoniaceae	x	x		x	x					x
Loeseliastrum matthewsii	desert calico	Polemoniaceae	x	x		x	x	x				x
Lotus strigosus	stiff hair lotus	Fabaceae	x	x	x	x	x	x	x	x	x	x
Lupinus arizonicus	lupine	Fabaceae	x	x	x	x	x	x	x	x	x	x

Scientific Name	Common Name	Family	Solar Farm (northern region)	Solar Farm (southern region)	Gen-Tie A1	Gen-Tie A2	Gen-Tie B1	Gen-Tie B2	Telecom site	Red Bluff Substation A (east)	Red Bluff Substation B (west)	Red Bluff Substation Access Road (both alternatives)
Lycium andersonii	wolfberry	Solanaceae	x	x	x	x	x	x		x	x	x
Lycium pallidum	pallid box thorn	Solanaceae					x	x				
Malacothrix glabrata	desert dandelion	Asteraceae	x	x	x	x	x	x	x	x	x	x
Mammalaria sp.	fishhook cactus	Cactaceae	x		x		x	x		x		x
Mammalaria tetrancistra	fishhook cactus	Cactaceae	x	x		x					x	
Marina parryi	Parry's false prairie clover	Fabaceae	x	x		x	x	x		x		x
Mentzelia albicaulis or obscura	white-stemmed stickleaf	Loasaceae	x	x	x	x	x	x				x
Mentzelia involucrata	sand blazing star	Loasaceae	x	x	x	x	x	x		x	x	x
Mimulis bigelovii	Bigelow's monkeyflower	Scrophulariaceae			x	x		x			x	x
Mirabilis bigelovii	wishbone plant	Nyctaginaceae	x	x	x	x	x	x		x	x	x
Mohavea confertiflora	ghost flower	Scrophulariaceae	x			x	x	x				x
Monoptilon bellioides	desert star	Asteraceae	x	x	x	x	x	x		x	x	x
Nama demissum	purple mat	Hydrophyllaceae	x	x	x	x	x	x			x	x
Nama pusillum		Hydrophyllaceae	x		x	x	x	x		x		x
Nemacladus rubescens		Campanulaceae	x	x		x	x					x
Nerium oleander	oleander	Apocynaceae						x				x
Nicotiana obtusifolla	coyote tobacco	Solanaceae					x	x				x
Oenothera deltoides	dune evening primrose	Onagraceae							x			
Oligomeris linifolia		Resedaceae	x	x	x	x	x				x	x
Olneya tesota	Ironwood	Fabaceae	x	x	x	x	x	x	x	x	x	x
Opuntia sp.		Cactaceae										x
Opuntia basilaris basilaris	beavertail cactus	Cactaceae	x	x	x	x	x					x
Opuntia echinocarpa	golden cholla	Cactaceae	x	x	x	x	x	x		x	x	x
Opuntia ramosissima	pencil cholla	Cactaceae	x	x	x	x	x	x		x	x	x

Scientific Name	Common Name	Family	Solar Farm (northern region)	Solar Farm (southern region)	Gen-Tie A1	Gen-Tie A2	Gen-Tie B1	Gen-Tie B2	Telecom site	Red Bluff Substation A (east)	Red Bluff Substation B (west)	Red Bluff Substation Access Road (both alternatives)
Orobanche cooperi	broomrape	Orobanchaceae					x					
Palafoxia arida	Spanish needles	Asteraceae	x	x	x	x	x	x	x		x	x
Parietaria hespera		Urticaceae										x
Pectocarya heterocarpa		Boraginaceae	x	x	x	x						x
Pectocarya penicillata		Boraginaceae	x		x			x			x	
Pectocarya peninsularis		Boraginaceae	x		x			x				
Pectocarya platycarpa	broad-nutted combbur	Boraginaceae	x	x	x	x	x	x	x			x
Pectocarya recurvata	broad-nut combseed	Boraginaceae	x	x	x	x	x	x	x	x	x	x
Pectocarya sp.		Boraginaceae					x					x
Perityle emoryi	Emory's rocket daisy	Asteraceae	x	x	x	x	x	x		x	x	x
Petalonyx thurberi	sandpaper plant	Loasaceae	x				x					
Peucephyllum schottii	pygmy-cedar	Asteraceae	x				x				x	
Phacelia crenulata	notch-leaf phacelia	Hydrophyllaceae	x	x	x	x	x	x	x	x	x	x
Phacelia distans	lace leaf phacelia	Hydrophyllaceae	x	x	x	x	x	x		x	x	x
Phacelia neglecta		Hydrophyllaceae	x	x	x	x	x	x		x		x
Phoradendron californicum	desert mistletoe	Visaceae		x	x	x	x	x				x
Physalis crassifolia	thick leaved ground cherry	Solanaceae					x	x			x	x
Plagiobothrys sp.		Boraginaceae					x	x				x
Plantago ovata	woolly plantain	Plantaginaceae	x	x	x	x	x	x	x	x	x	x
Pleuraphis rigida	big galleta grass	Plantaginaceae	x	x	x	x	x	x	x	x	x	x
Porophyllum gracile	odora	Asteraceae			x	x		x				x
PROBOSCIDEA ALTHEAEFOLIA	**UNICORN PLANT**	Martyniaceae			x	x		x				

Scientific Name	Common Name	Family	Solar Farm (northern region)	Solar Farm (southern region)	Gen-Tie A1	Gen-Tie A2	Gen-Tie B1	Gen-Tie B2	Telecom site	Red Bluff Substation A (east)	Red Bluff Substation B (west)	Red Bluff Substation Access Road (both alternatives)
Prosopis glandulosa	honey mesquite	Fabaceae										x
Psathyrotes ramosissima	velvet turtleback	Asteraceae	x	x	x	x	x	x			x	x
Psorothamnus emoryi	dye plant	Fabaceae	x	x	x	x	x	x	x			x
Psorothamnus schotti	Schott's indigobush	Fabaceae	x	x	x	x	x	x			x	x
Psorothamnus spinosus	smoke tree	Fabaceae	x	x	x	x	x	x				x
Pulchea sericea	arrow plant	Asteraceae						x				
Rafinesquia neomexicana	desert chicory	Asteraceae	x	x	x	x	x	x		x	x	x
Salazaria mexicana	paper-bag bush	Lamiaceae		x			x				x	
Salsola tragus	Russian thistle, tumbleweed	Chenopodiaceae				x						
Salvia columbariae	chia	Lamiaceae	x	x	x	x	x	x		x	x	x
Sarcostemma cynanchoides	climbing milkweed	Asclepiadaceae	x	x	x		x	x			x	x
Sarcostemma hirtellum	trailing townula	Asclepiadaceae		x								
*Schismus arabicus**		Poaceae	x	x	x							
*Schismus barbatus**	mediterranean grass	Poaceae	x	x	x	x	x	x	x	x	x	x
Senecio mohavensis		Asteraceae	x	x		x	x	x		x	x	x
Senna armata	spiny senna	Fabaceae					x	x			x	
Simmondsia chinensis	jojoba	Simmondsiaceae			x	x	x	x			x	x
Sisymbrium irio	London rocket	Brassicaceae			x							x
Sphaeralcea angustifolia		Malvaceae					x					x
Sphaeralcea ambigua	globe mallow	Malvaceae			x	x	x	x		x	x	x
Stephanomeria pauciflora		Asteraceae	x	x	x	x	x	x			x	x
Streptanthella longirostris	mustard	Brassicaceae		x	x	x	x	x				x
Stillingia linearifolia	linear leaved stillingia	Euphorbiaceae		x								

Scientific Name	Common Name	Family	Solar Farm (northern region)	Solar Farm (southern region)	Gen-Tie A1	Gen-Tie A2	Gen-Tie B1	Gen-Tie B2	Telecom site	Red Bluff Substation A (east)	Red Bluff Substation B (west)	Red Bluff Substation Access Road (both alternatives)
Stillingia spinulosa		Euphorbiaceae	**x**	**x**		**x**			**x**			
*Tamarix aphyll**	tamarisk	Tamaricaceae				**x**						
Thysanocarpus curvipes	fringepod	Brassicaceae		**x**	**x**							**x**
Tiquilia plicata	tequilia	Boraginaceae			**x**	**x**			**x**			**x**
Tidestromia oblongifolia		Amaranthaceae		**x**			**x**	**x**				
Trichoptilium incisum	yellowhead	Asteraceae	**x**		**x**	**x**	**x**			**x**		**x**
Trixis californica		Asteraceae	**x**	**x**			**x**				**x**	
Vulpia bromoides		Poaceae	**x**		**x**	**x**	**x**				**x**	**x**
Vulpia octoflora var. octoflora		Poaceae	**x**									

Appendix B

Wildlife List from Desert Sunlight Surveys

Common Name	*Scientific Name*	Sign
BIRDS		
American avocet	*Recurvirostra americana*	O, V
American Kestrel	*Falco sparverius*	O
American Robin	*Turdus migratorius*	O
American White Pelican	*Pelecanus erythrorhynchos*	O
Anna's Hummingbird	*Calypte anna*	O
Ash-throated Flycatcher	*Myiarchus cinerascens*	O, V
Barn Swallow	*Hirundo rustica*	O
Black-crowned Night Heron	*Nycticorax nycticorax*	O
Black-tailed Gnatcatcher	*Polioptila melanura*	O, V
Black-throated Sparrow	*Amphispiza bilineata*	O, V
Black-throated Gray warbler	*Dendroica nigrescens*	O, V
Blue-gray Gnatcatcher	*Polioptila caerulea*	O, V
Brewer's Blackbird	*Euphagus cyanocephalus*	O, V
Brewer's Sparrow	*Spizella breweri*	O
Bullock's Oriole	*Icterus bullockii*	O, V
burrowing owl	*Athene cunicularia*	O
Common Poorwill	*Phalaenoptilus nuttallii*	O
Common Raven	*Corvus corax*	O, V
Costa's Hummingbird	*Calypte costae*	O
Egret	*Egretta sp.*	O
ferruginous hawk	*Buteo regalis*	O
Gambel’s Quail	*Callipepla gambelii*	O, V
Greater Roadrunner	*Geococcyx californianus*	O
Great-tailed Grackle	*Quiscalus mexicanus*	O, V
Horned Lark	*Eremophila alpestris*	O, V
House Finch	*Carpodacus mexicanus*	O, V
House Wren	*Troglodytes aedon*	O, V
Killdeer	*Charadrius vociferous*	O
Lark Sparrow	*Chondestes grammacus*	O
LeConte’s thrasher	*Toxostoma lecontei*	O, V
Lesser Goldfinch	*Spinus psaltria*	O
Lesser Nighthawk	*Chordeiles minor*	O
Loggerhead Shrike	*Lanius ludovicianus*	O
Merlin	*Falco columbarius*	O
Mourning Dove	*Zenaida macroura*	O, V
Northern Flicker	*Claptes auratus*	O
northern harrier	*Circus cyaneus*	O
Northern Mockingbird	*Mimus polyglottos*	O, V
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	O
Osprey	*Pandion haliaetus*	O
Phainopepla	*Phainopepla nitens*	O
prairie falcon	*Falco mexicanus*	O
Red-tailed Hawk	*Buteo jamaicensis*	O, V
Rock Wren	*Salpinctes obsoletus*	O, V
sage thrasher	*Oreoscoptes montanus*	O
Say’s Phoebe	*Sayonaris nigricans*	O
Sharp-shinned Hawk	*Accipiter striatus*	O
Swainson’s hawk	*Buteo swainsonii*	O
Tree Swallow	*Tachycineta bicolor*	O
Turkey Vulture	*Cathartes aura*	O
Verdin	*Auriparus flaviceps*	O

Common Name	*Scientific Name*	Sign
Violet-green Swallow	*Tachycineta thalassina*	O
Western Kingbird	*Tyraannus verticalis*	O, V
Western Meadowlark	*Sturnella neglecta*	O, V
White-crowned Sparrow	*Zonotrichia leucophrys*	O, V
white-throated sparrow	*Zonotrichia albicollis*	O, V
White-throated Swift	*Aeronautes saxatalis*	O
Wilson's Warbler	*Wilsonia pusilla*	O
Yellow-rumped Warbler	*Dendroica coronata*	O, V
REPTILES		
desert tortoise	*Gopherus agassizii*	O,B, T, S, C
chuckwalla	*Sauromalus obesus*	O, S
Mojave fringe-toed lizard	*Uma scoparia*	O
zebra-tailed lizard	*Callisaurus draconoides*	O
western whiptail	*Cnemidophorus tigris*	O
side-blotched lizard	*Uta stansburiana*	O
desert iguana	*Dipsosaurus dorsalis*	O, S
desert horned lizard	*Phrynosoma platyrhinos*	O, S
long-nosed leopard lizard	*Gambelia wislizenii*	O
sidewinder	*Crotlus cerastes*	O
coachwhip	*Masticophis flagellum*	O
southern sagebrush lizard	*Sceloporus graciosus vandenburgianus*	O
speckled rattlesnake	*Crotalus mitchelli*	O
gopher snake	*Pituophis melanoleucus*	O
western patch-nosed snake	*Salvadora hexalepis*	O
Long-tailed Brush Lizard	*Urosaurus graciosus*	O
western shovel-nosed snake	*Chionactis occipitalis*	O
California kingsnake	*Lampropeltis getula californiae*	O
MAMMALS		
black-tailed jackrabbit	*Lepus californicus*	O, T, S
white-tailed antelope ground squirrel	*Ammospermophilus leucurus*	O
coyote	*Canis latrans*	T, S
desert cottontail	*Sylvilagus audubonii*	O, T, S
burro deer	*Odocoileus hemionus eremicus*	O, T, S
Palm Spring round-tailed ground squirrel	*Spermophilus teriticaudus chlorus*	O
American badger	*Taxidea taxus*	B
Desert kit fox	*Vulpes macrotis arsipus*	B
Long-tailed Pocket Mouse	*Chaetodipus formosus*	O
Merriam's Kangaroo Rat	*Dipodomys merriami*	O, B
Desert Woodrat	*Neotoma lepida*	O, B
Spiny Pocket mouse	*Perognathus spinatus*	O
Little Pocket Mouse	*Perognathus longimembris*	O

O – Observed Directly T – Tracks S – Scat
B – Burrow V – Vocalization C – Carcass

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Desert Tortoise Translocation Plan

DESERT TORTOISE TRANSLOCATION PLAN
DESERT SUNLIGHT SOLAR FARM PROJECT
CASE FILE NUMBER CACA-48649
RIVERSIDE COUNTY, CALIFORNIA

Prepared for
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December 17, 2010

Table of Contents

List of Tables

List of Figures

List of Acronyms

AC	Alternating Current
ACEC	Area of Critical Environmental Concern
BLM	U.S. Bureau of Land Management
BMP	Best Management Practice
BO	Biological Opinion
CDFG	California Department of Fish and Game
CHU	Critical Habitat Unit
DB	Designated Biologist
DOI	U.S. Department of the Interior
DPV 1	SCE's Devers to Palo Verde 1 transmission line
DTCC	Desert Tortoise Conservation Center
DWMA	Desert Wildlife Management Area
ECM	Environmental Compliance Manager
ELISA	Enzyme-linked immunosorbent assay
GIS	Geographic Information System
I-10	Interstate 10
ITS	Incidental Take Statement
kV	Kilovolt
LTB	Lead Translocation Biologist
MCL	Mean Carapace Length
MW	Megawatt
MWD	Metropolitan Water District
O&M	Operations and Maintenance
PV	Photovoltaic
PSA	Project Study Area
ROW	Right of Way
SBBM	San Bernardino Base and Meridian
SCE	Southern California Edison
URTD	Upper Respiratory Tract Disease
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

1.0 Introduction

This discussion provides a brief summary of the project description for the Applicant and SCE project components of the Proposed Action. Complete details of project locations and description are found in the *Desert Sunlight Solar Farm Final Environmental Impact Statement* (BLM 2010) and in the Biological Assessment, *Desert Sunlight Solar Farm Project* (Ironwood 2010).

Desert Sunlight has applied to the BLM for an issuance of a right-of-way (ROW) grant that would authorize construction, operation, maintenance, and decommission of a commercial solar power-generating facility and new substation facility on over 7,600 hectares (19,000 acres) of BLM-managed lands. The proposed project is located in Riverside County, California, approximately 6 miles north of the rural community of Desert Center and approximately (10.5 kilometers or 6.5 miles north of the Interstate 10 corridor (Figure 1). Project components generally include construction, operation, and maintenance of the solar farm site, a gen-tie transmission line, and construction, operation and maintenance of the Southern California Edison (SCE) Red Bluff substation and related components (Figure 2). While the Red Bluff substation is included as part of this project description for planning and environmental considerations, it would be constructed, owned, and operated by SCE, not by the Applicant.

The purposes of this Desert Tortoise Translocation Plan are to provide:

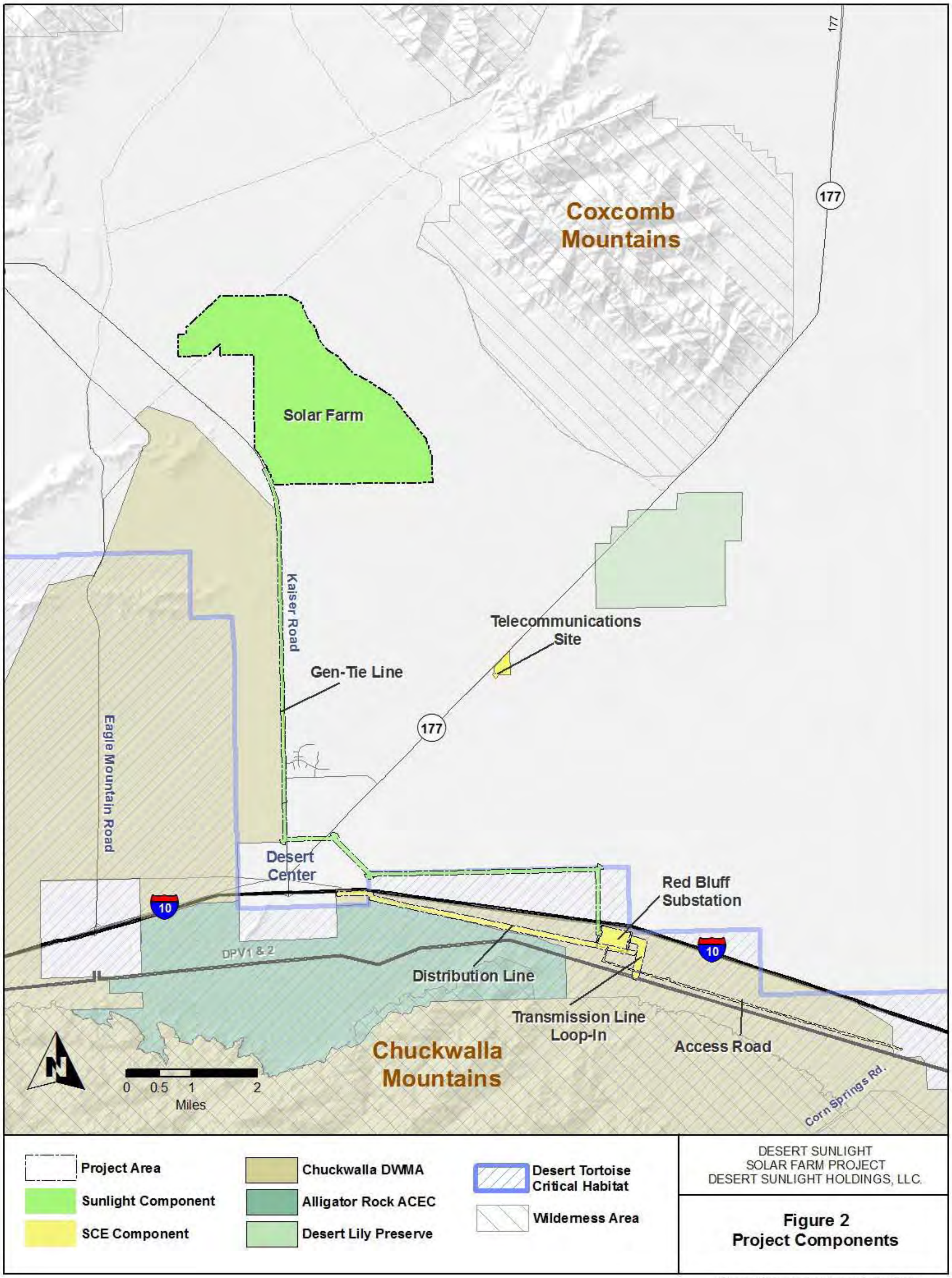
1. Estimates of the number of desert tortoise currently present on the Project components and Recipient and Control Sites, with appropriate methodology.
2. Detailed descriptions of the methods to be used to translocate tortoises present on the Solar Farm Site and Red Bluff Substation at the time of Project construction in order to avoid and minimize potential "take" of desert tortoises during project construction and operations.
3. The details of the long-term monitoring and reporting program to track the effectiveness of the translocation effort.

This Translocation Plan is needed to support permitting for the translocation of any desert tortoises found on the Solar Farm Site (Applicant) and Red Bluff Substation (SCE). The desert tortoise is a federal and state-listed threatened species known to inhabit the Project components and the immediately surrounding areas.

DESERT SUNLIGHT
SOLAR FARM PROJECT
DESERT SUNLIGHT HOLDINGS, LLC

Figure 1
Regional Location

Prepared by Ironwood Consulting, Inc. - Dec. 16, 2010



Prepared by Ironwood Consulting, Inc. - Dec 16, 2010

2.0 Estimated Numbers of Desert Tortoise

The Biological Resources Technical Report for the Desert Sunlight Solar Farm (Ironwood Consulting, 2010) provides detailed information on the surveys and methods used to determine the estimated number of desert tortoises that could be translocated before and during construction of the Project. All surveys and analysis were conducted between 2008 and 2010 using current protocols and statistical methods (USFWS 1992, 2009a).

Reliable estimates of desert tortoise densities for the region surrounding the Project were not available prior to conducting Project surveys. Results of range-wide sampling provided limited information on densities recorded for the Eastern Colorado Recovery Unit, which can vary widely throughout the recovery unit. The U.S. Fish and Wildlife Service (USFWS) has concluded that too few study plots and transects have been utilized in this region for confident analysis, but that the ratio of carcasses to live animals found in recent range-wide sampling was low, which may indicate a relatively stable population. Density estimates from range-wide sampling between 2001 and 2005 resulted in general estimates of desert tortoise density for the entire Eastern Colorado Recovery Unit of between 3 and 15 animals per square kilometer, with estimates varying greatly by year (USFWS 2008).

2.1 Solar Farm Site and Gen-Tie Line

Solar Farm Site

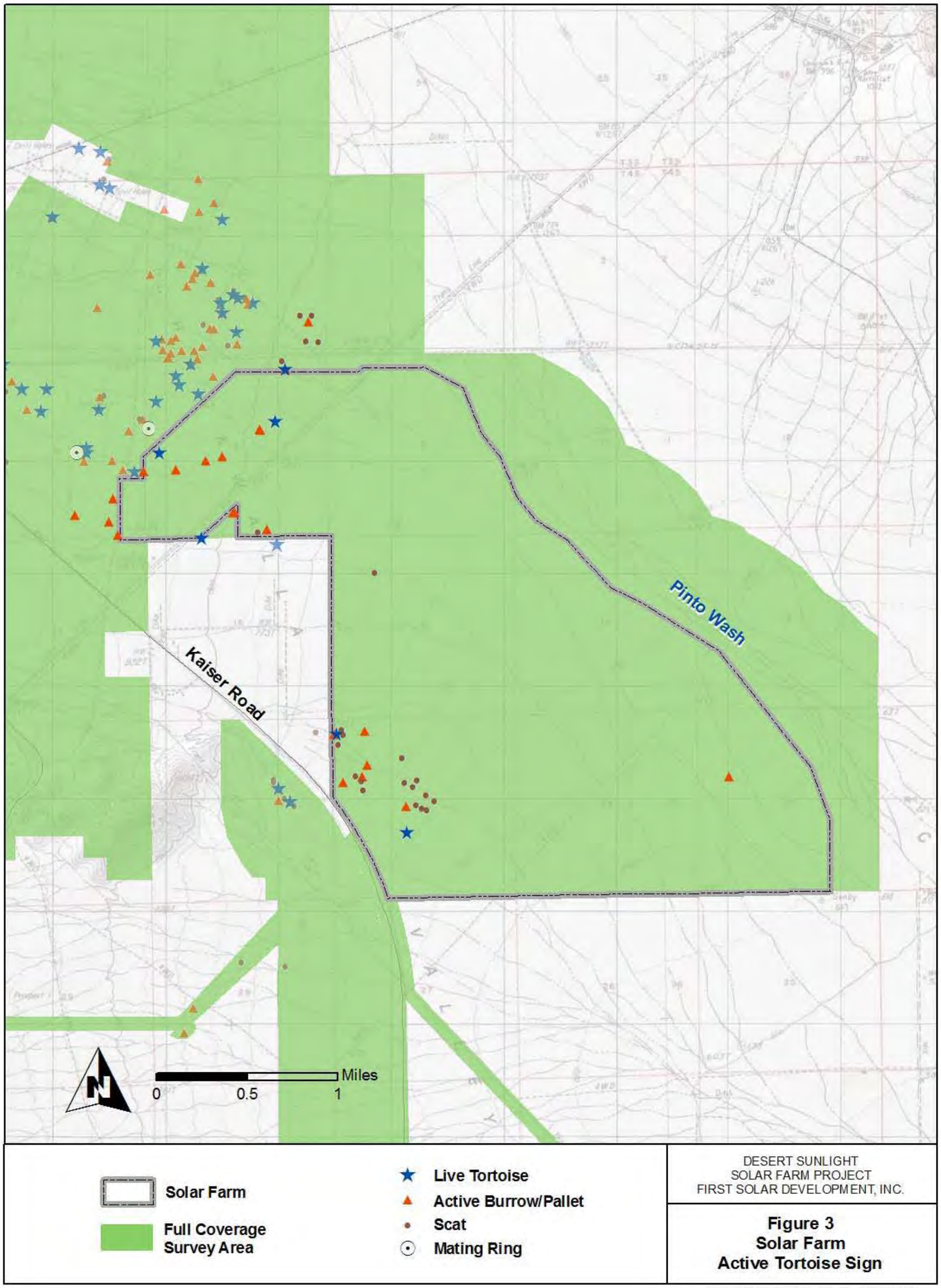
Desert tortoise sign was found within the Solar Farm Site, but was not distributed evenly (Figure 3). Four live desert tortoises and fourteen active burrows were observed within the boundaries of the Solar Farm Site in two concentrations. One concentration in the northwest area of the site contained two observations of live tortoise and the second concentration in the southwest portion of the site contained two observations of live tortoises. Except for these concentrations, relatively few sign (including active, inactive, or historic sign such as older carcasses) were found.

Gen-Tie Line

Active desert tortoise sign was present along the Gen-Tie Line (Figure 4), but abundance and distribution are not described in detail in this document because translocation of desert tortoises is not proposed for this Project component. The northern portion of the Gen-Tie Line along Kaiser Road lacked evidence of recent tortoise activity. Active sign was found along the Gen-Tie Line east of Highway 177 and north of I-10, including one live tortoise observed within 30 meters of the center of the Gen-Tie Line.

2.2 SCE Project Components

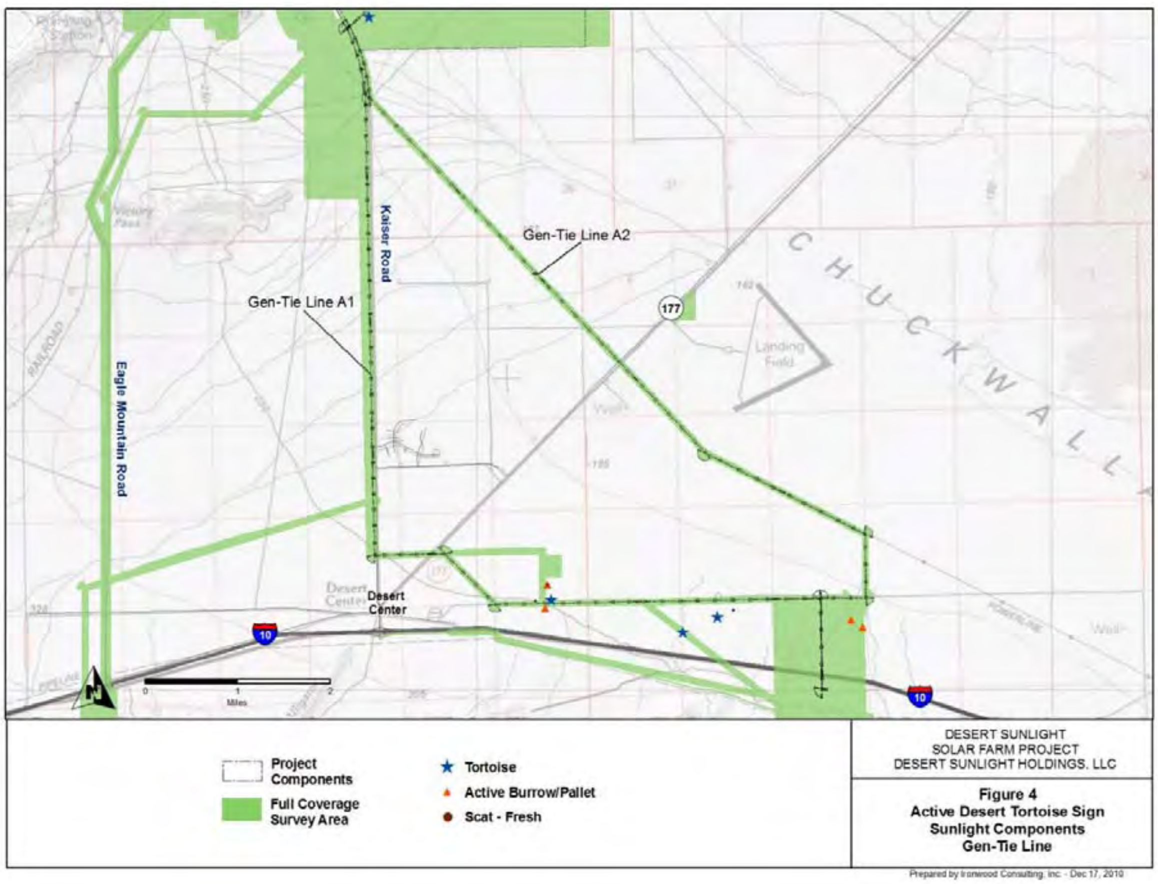
No active desert tortoise sign was found on or immediately adjacent to the Red Bluff Substation site (Figure 5). One active desert tortoise burrow and fresh scat were observed just north of the distribution line, approximately 2.0 kilometers (1.6 miles) west of the Red Bluff Substation. No desert tortoise sign was found on or near the telecommunications site.

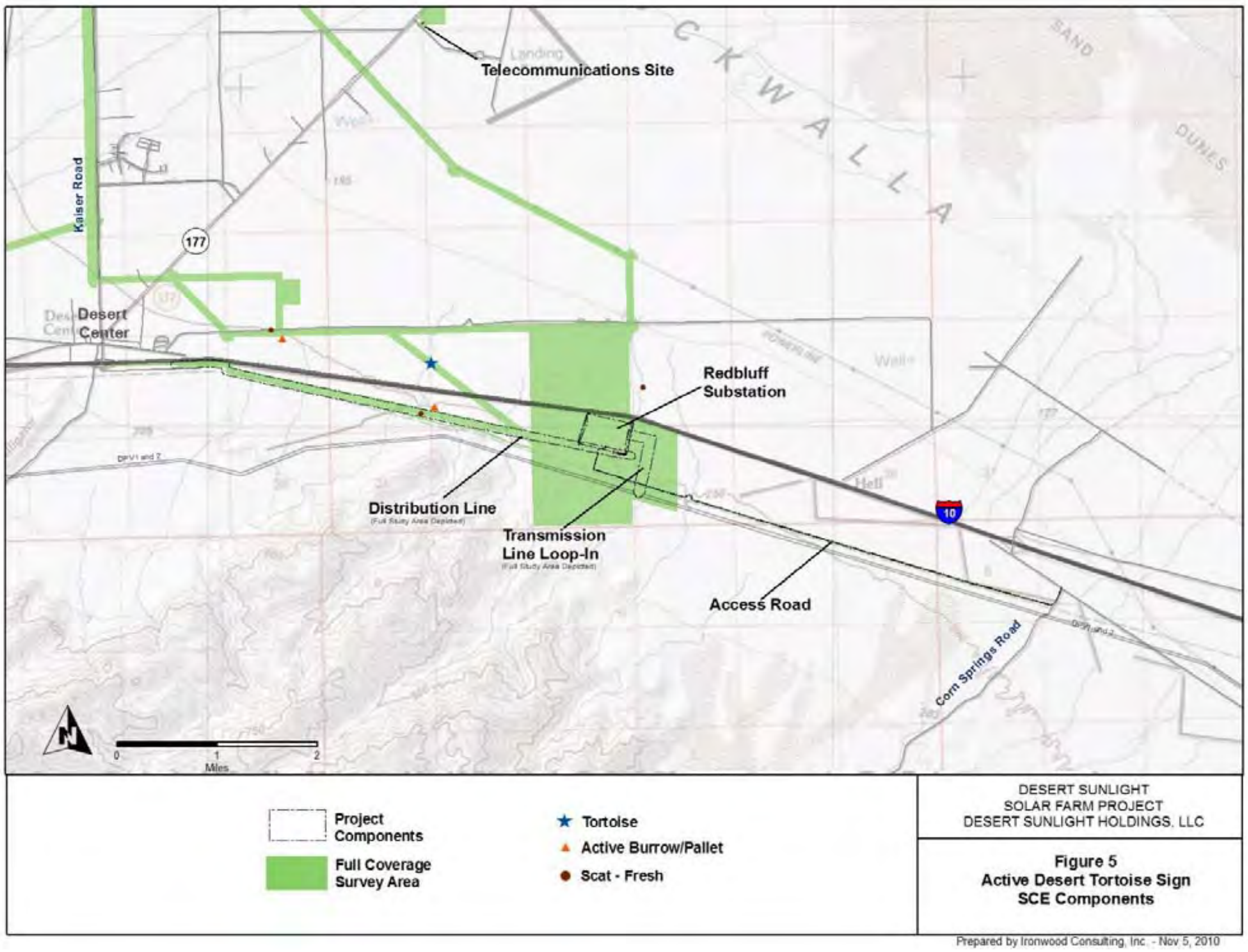


DESERT SUNLIGHT
SOLAR FARM PROJECT
FIRST SOLAR DEVELOPMENT, INC.

Figure 3
Solar Farm
Active Tortoise Sign

Prepared by Ironwood Consulting, Inc. - Dec. 16, 2010


Kaiser Road
Gen-Tie Line A2
Gen-Tie Line A1
Eagle Mountain Road
CHUCKWALLA
177
Desert Center
10
Miles
Project Components
Full Coverage Survey Area
Tortoise
Active Burrow/Pallet
Scat - Fresh
DESERT SUNLIGHT
SOLAR FARM PROJECT
DESERT SUNLIGHT HOLDINGS, LLC
Figure 4
Active Desert Tortoise Sign
Sunlight Components
Gen-Tie Line
Prepared by Ironwood Consulting, Inc. - Dec 17, 2010


Telecommunications Site
Kaiser Road
177
Desert Center
Redbluff Substation
Distribution Line
Transmission Line Loop-In
Access Road
Corn Springs Road
10
Miles
Project Components
Full Coverage Survey Area
Tortoise
Active Burrow/Pallet
Scat - Fresh
DESERT SUNLIGHT SOLAR FARM PROJECT
DESERT SUNLIGHT HOLDINGS, LLC
Figure 5
Active Desert Tortoise Sign
SCE Components
Prepared by Ironwood Consulting, Inc. - Nov 5, 2010

3.0 Recipient and Control Sites

This section discusses how selected Recipient and Control Sites conform to USFWS guidance documents and protocols for the preparation of Translocation Plans (USFWS 2010; Fraser personal communications 2010). The selection criteria for the Recipient Sites and Control Sites were based on current direction from BLM, the California Department of Fish and Game (CDFG), and USFWS (2009b, 2010; Fraser personal communications 2010); and current research in the field of desert tortoise home range and movement (Bertolero 2007, Desert Tortoise Science Advisory Committee 2009, Dodd 1991, Esque et al, 2010; Harless 2009; Letty 2007, Reinert 1991, Seddon 2007).

3.1 Recipient Sites

Using Geographic Information Systems (GIS) methodology, land located within 40 kilometers (22 miles) of the Solar Farm Site boundaries was assessed for locating potential Recipient Sites. Selection criteria used to further aid in site selection included the following from the *Translocation of Desert Tortoises (Mojave Population) from Project Sites, Plan Development Guidance* (USFWS 2010):

- ♦ Areas of contiguous public lands equal to or greater than the area of the Project
- ♦ Lack of significant barriers to movement
- ♦ Habitat similarity and suitability for all life stages of the desert tortoise
- ♦ Lands containing no existing Rights-of-Way (ROWs), ROW proposals or other encumbrances
- ♦ Lands managed for conservation [in the Project region this includes the Chuckwalla Desert Wildlife Management Area (DWMA), Chuckwalla Critical Habitat Unit (CHU), Areas of Critical Environmental Concern (ACECs), National Park Service land, and both National Park Service and BLM Wilderness Areas]
- ♦ Lands where tortoise populations have been depleted yet still support suitable habitats
- ♦ Lands 15 km (9 miles) from major unfenced roads or highways with distance reduced if fencing is a proposed minimization measure (in the Project region this includes I-10)

In addition to the above criteria, additional criteria were considered in the selection of potential Recipient Sites:

- ♦ Proximity to existing home ranges of individuals on the Solar Farm Site and Red Bluff Substation
- ♦ Potential for increased predation (e.g., raven subsidies)
- ♦ Potential for Upper Respiratory Tract Disease (URTD) to the extent known
- ♦ Existing tortoise densities and distribution within the proposed Recipient Sites
- ♦ Site access

Recipient Sites were chosen as those areas that met the largest number of the selection criteria, which included areas located to the west of the Solar Farm Site, and the area south of the Red Bluff Substation. The Recipient Sites described in Table 1 and shown in Figure 6 are proposed for the Project, with detailed discussion of the selection criteria addressed in the following sections. As shown in Figure 6, these Recipient Sites are also some of the areas of greatest habitat potential in the region (Nussear et al, 2009).

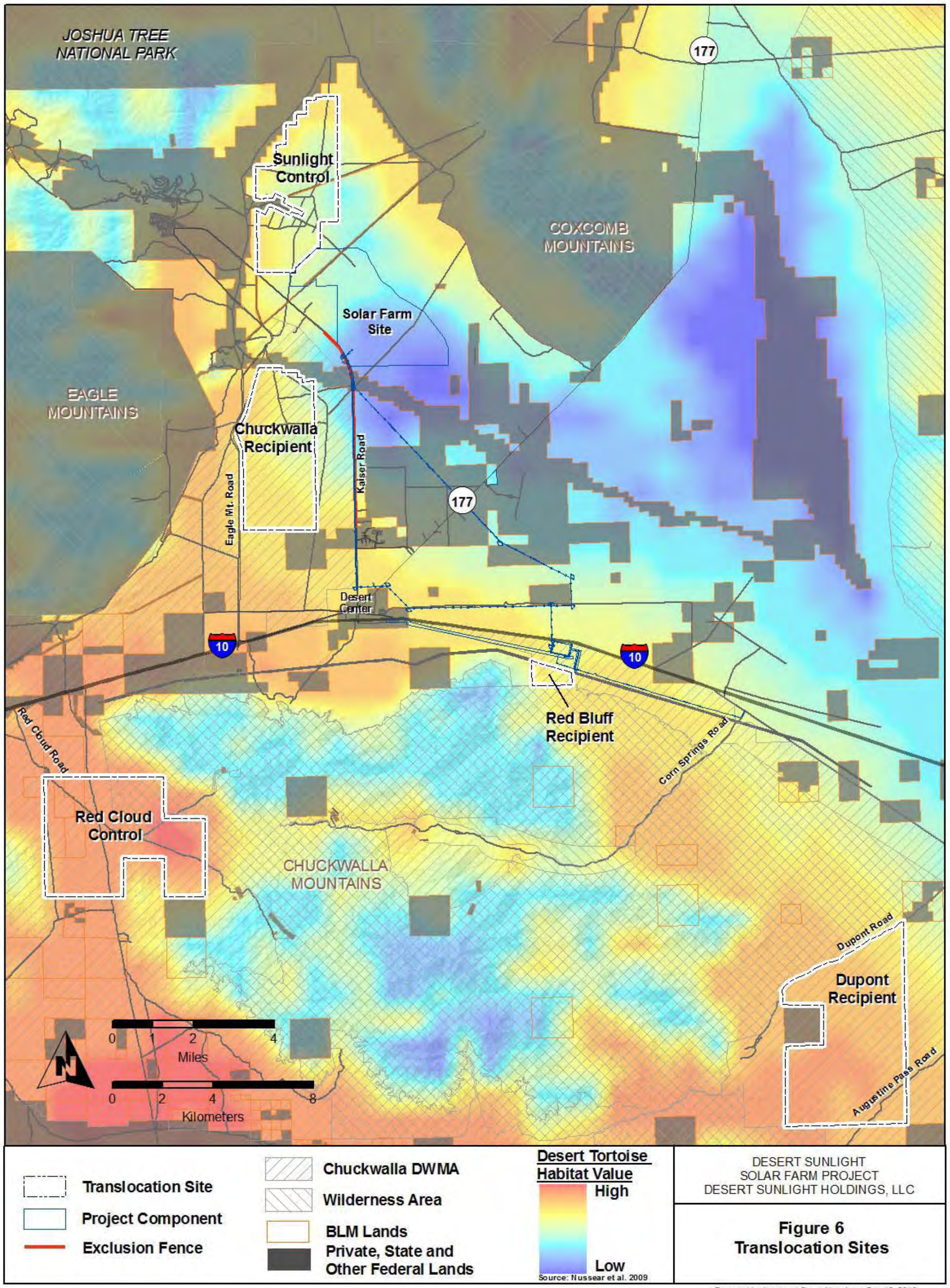

JOSHUA TREE NATIONAL PARK
177
Sunlight Control
COXCOMB MOUNTAINS
Solar Farm Site
EAGLE MOUNTAINS
Chuckwalla Recipient
Kaiser Road
Eagle Mt. Road
Desert Center
10
Red Bluff Recipient
Corn Springs Road
Red Cloud Road
Red Cloud Control
CHUCKWALLA MOUNTAINS
Dupont Road
Dupont Recipient
Augustine Pass Road
0 1 2 4
Miles
0 2 4 8
Kilometers
Translocation Site
Project Component
Exclusion Fence
Chuckwalla DWMA
Wilderness Area
BLM Lands
Private, State and Other Federal Lands
Desert Tortoise Habitat Value
High
Low
Source: Nussear et al. 2009
DESERT SUNLIGHT SOLAR FARM PROJECT
DESERT SUNLIGHT HOLDINGS, LLC
Figure 6
Translocation Sites
Prepared by Ironwood Consulting, Inc. - Dec 16, 2010

Table 1. Recipient Sites

Project Component (acres)	Responsibility	Recipient Site (acres)	Location (also shown in Figure 6)
Solar Farm Site (3,912)	Applicant	Chuckwalla Recipient Site (4,317)	North of I-10, approximately 1.8 km (1.1 miles) west and southwest of the Solar Farm Site
Red Bluff Substation (75)	SCE	Red Bluff Recipient Site (295)	South of I-10, south of the proposed Red Bluff Substation and DPV1 and DPV2 lines

In addition, the DuPont Recipient Site, covering approximately 7,460 acres south of I-10 and DuPont Road east of the Chuckwalla Mountains is evaluated as an alternative potential Recipient Site for the Solar Farm Site.

3.1.1 Chuckwalla Recipient Site

The location of the Chuckwalla Recipient Site is shown in Figure 7. This section addresses each selection criteria described above in detail, including the current densities of desert tortoise on the Chuckwalla Recipient Site.

Within the Chuckwalla Recipient Site, the site has been divided into a north and southern portion, divided by the hills in the center of the site (Figure 7). The northern Chuckwalla Recipient Site covers approximately 1,490 acres (6.0 km^2), an area slightly larger than the area of the Solar Farm Site that supports moderate densities of desert tortoise (1,454 acres or 5.9 km^2 – Ironwood Consulting 2010b). This northern portion is the preferred location for translocation because it meets more of the selection criteria described below. However, the entire Chuckwalla Recipient Site will be retained as a potential site to ensure that if a larger number of tortoises are found that need to be translocated than can be moved into the northern portion of the site, the southern portion will be used. A preliminary disposition plan that described this further is present in Section 4.0 of this document.

The use of the Chuckwalla Recipient Site is also conditional upon the following conditions being met as stated by the USFWS Desert Tortoise Recovery Office (Fraser 2010):

1. A reasonable certainty is required that the transmission line for the Eagle Mountain Pumped Storage Project will not occur through the DWMA along Eagle Mountain Road and will instead be co-located with transmission for Desert Sunlight along Kaiser Road.

   The reason for this condition is that if the transmission lines for both projects, with lattice towers for the 500kV line for Eagle Mountain Pumped Storage Project and monopoles for Desert Sunlight, are constructed where currently proposed; and tortoise fencing is constructed as recommended below for the Desert Sunlight project with similar fencing is constructed for the Eagle Mountain Pumped Storage Project with Eagle Mountain Road improved for the purposes of that project, this portion of the Chuckwalla DWMA could be isolated and potentially no longer contribute to recovery of the species.

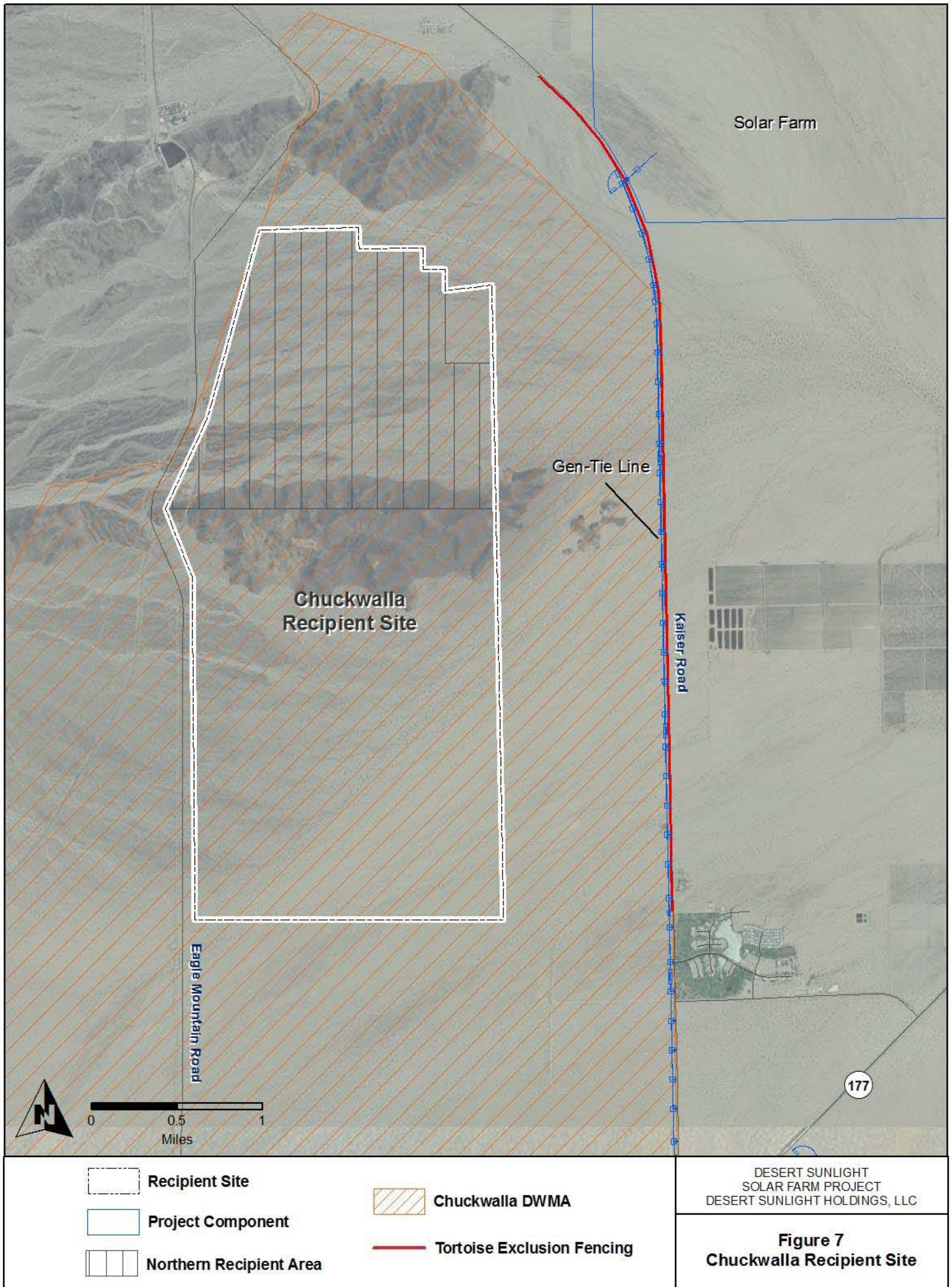


Figure 7
Chuckwalla Recipient Site

Prepared by Ironwood Consulting, Inc. - Nov 17, 2010

2. Permanent tortoise fencing is constructed along Kaiser Road to I-10 (or to a mutually agreed upon point based on land ownership or habitat suitability). Permanent tortoise fencing is constructed along I-10. A discussion of proposed fencing is presented below.

3. Raven and raptor deterrents are built into the project design for the transmission, and appropriate monitoring and adaptive management are implemented subsequent to project construction for the life of the transmission line component (details in the Project's Raven Management Plan, Ironwood 2010c).

3.1.1.1 Selection Criteria

Areas of contiguous public lands equal to or greater than the area of the Project. The Solar Farm Site covers approximately 3,912 acres. The Chuckwalla Recipient Site is located on contiguous public lands covering approximately 4,317 acres.

Lack of significant barriers to movement. In the Project region significant barriers to movement include I-10, Hwy 177, portions of the MWD aqueduct that are above ground, and steep rocky terrain along the boundaries of Joshua Tree National Park (JTNP). None of these are found on or adjacent to the Chuckwalla Recipient Site (Figure 6). In addition, regional modeling of habitat potential for desert tortoise shows an area of higher potential habitat that extends from I-10 to the south and continues north into the Pinto Basin and JTNP. The Chuckwalla Recipient Site is within this potential corridor area.

Habitat similarity and suitability for all life stages of the desert tortoise. The Chuckwalla Recipient Site supports Creosote Bush-White Bursage vegetation and several areas of Blue Palo Verde-Ironwood-Smoke Tree Series vegetation (Desert Dry Wash Woodland), similar to habitats found on the Solar Farm Site, particularly those areas that support the highest densities of desert tortoise on the Solar Farm Site. These habitats are known to support all life stages of the desert tortoise (USFWS 2008).

Containing no existing ROWs, ROW proposals or other encumbrances. There are no existing designated ROWs, no currently proposed ROWs, and no other encumbrances located within the Chuckwalla Recipient Site. BLM's LR2000 database does not show any over-filings or pending applications for use of the Chuckwalla Recipient Site property. A buffer of 100 meters (325 feet) on the north side of this corridor is excluded from the translocation area to avoid the MWD emergency spillway to the north (Figure 7).

Be managed for conservation. In the Project region DWMA, CHU, ACEC, National Park Service, and Wilderness Areas are managed for conservation. The Chuckwalla Recipient Site is located on BLM-managed lands within the Eastern Colorado Desert Recovery Unit for the desert tortoise. The Chuckwalla Recipient Site is within the Chuckwalla DWMA and CHU for desert tortoise.

Lands where tortoise populations have been depleted yet still support suitable habitats. The Chuckwalla Recipient Site is within a portion of the Chuckwalla DWMA and CHU that extends north of I-10 with the majority of the DWMA and CHU located south of I-10. The recipient site is in an area where densities are lower than the average for the recovery unit, although the lack of large numbers of carcasses found in the area do not support that these are lands that have been recently depleted. The Chuckwalla recipient Site does support suitable habitat as evidenced by the survey data for the site (Section 3.1.1.2) and supported by the USGS modeling (Nussear 2009).

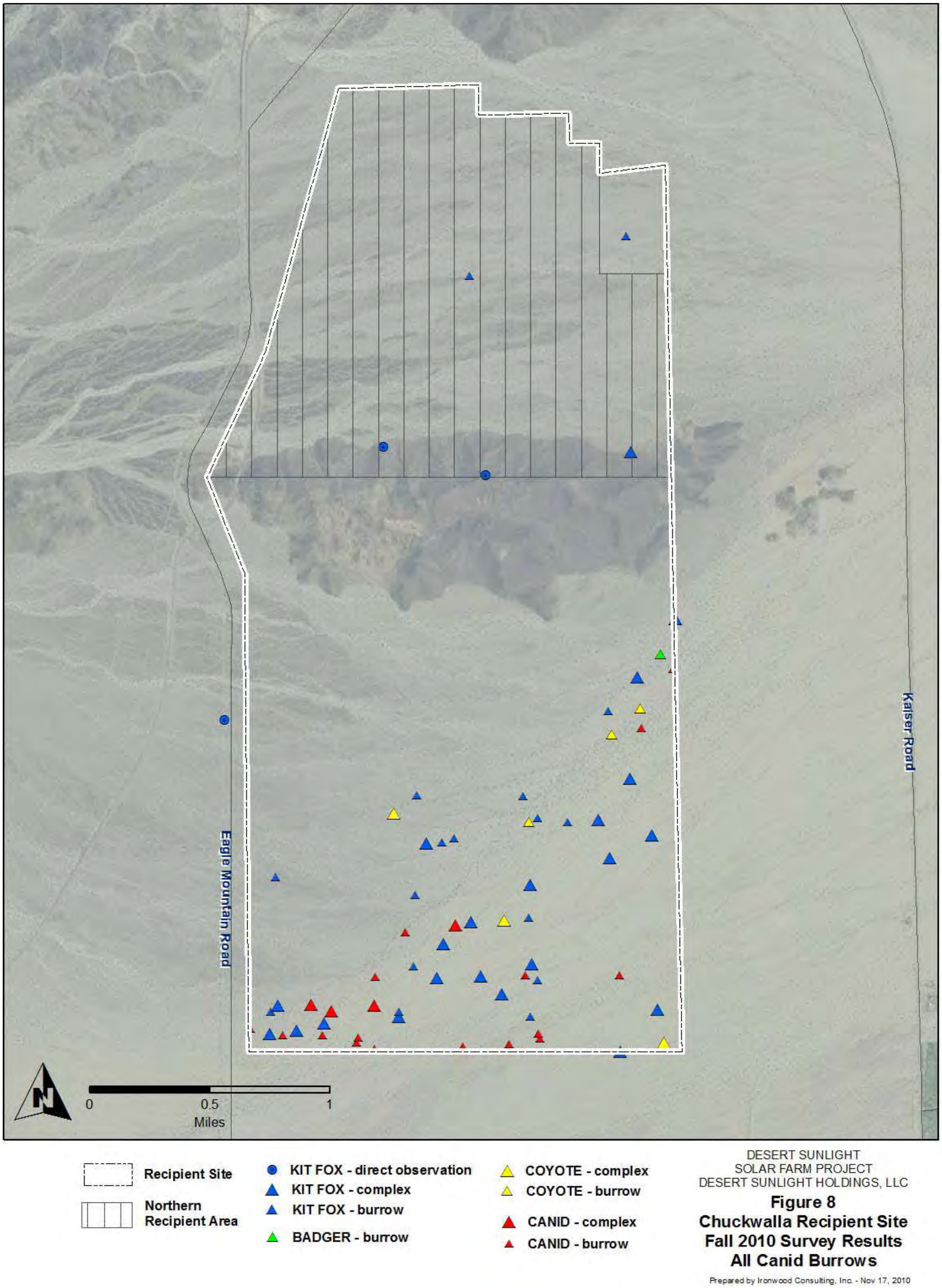
<u>Lands 15 km (9 miles) from major unfenced roads or highways</u>. Two phases of the Chuckwalla Recipient Site are proposed for translocation. The area north of the hills in the center of the Recipient Site will be used first for several reasons, partly because it is furthest from I-10. At the closest point, the area north of the hills is approximately 6 km (5 miles) north of I-10. Fencing will be installed along I-10 under an agreement with BLM and the easement holder of the land for the installation and long-term maintenance of this fence.

If additional area is required for translocation due to the number of desert tortoises found during clearance surveys, the area of the Chuckwalla Recipient Site south of the hills will be used and fencing along I-10 extended to include all areas within 15 km of the Chuckwalla Recipient Site's southern boundary.

In addition, desert tortoise fencing will be placed along the west side of Kaiser Road, as shown in Figure 7, under an agreement with BLM and the easement holder of the land for the installation and long-term maintenance of this fence.

<u>Proximity to existing home ranges of individuals on the Solar Farm Site and Red Bluff Substation.</u> The Chuckwalla Recipient Site is close enough to the Solar Farm Site (within 2.0 km or 1.6 miles) to be within the male home range of some of the individual tortoises on the southwestern part of the Solar Farm Site.

<u>Potential for increased predation</u>. Local known predators of desert tortoise include coyotes that can prey on tortoises of all age classes, and desert kit fox and ravens that can prey on young tortoises and eggs. The densities of coyote and kit fox on the Chuckwalla Recipient Site were mapped during full coverage surveys conducted in 2010 and are shown in Figure 8. To avoid the potential for increased predation from coyotes and kit fox, the southwestern portion of the Chuckwalla Recipient Site will not be used for translocation due to high densities of coyote and kit fox dens.


Eagle Mountain Road
Kaiser Road
0
0.5
1
Miles
Recipient Site
Northern Recipient Area
KIT FOX - direct observation
KIT FOX - complex
KIT FOX - burrow
BADGER - burrow
COYOTE - complex
COYOTE - burrow
CANID - complex
CANID - burrow
DESERT SUNLIGHT SOLAR FARM PROJECT
DESERT SUNLIGHT HOLDINGS, LLC
Figure 8
Chuckwalla Recipient Site
Fall 2010 Survey Results
All Canid Burrows
Prepared by Ironwood Consulting, Inc. - Nov 17, 2010

To avoid and minimize the potential for increased raven predation, the following Project features are included:

- Raven deterrents will be installed on the Project Gen-Tie Line (as per the Common Raven Management Plan, Ironwood 2010c).
- Buffering the Chuckwalla Recipient Site a minimum of 500 meters away from Kaiser Road, and from a closed Riverside County landfill located west of Kaiser Road.

Site access. Kaiser and Eagle Mountain Roads provide paved access for translocation in the Chuckwalla Recipient Site within 3.2 km (2.0 miles) of all areas of the Recipient Site, which allows efficiency for monitoring of both the resident animals and the translocated animals and ensures rapid access even in situations of natural disaster. Although these roads are paved, they support extremely low traffic volumes and are not anticipated to significantly change with the implementation of the Project (with the exception of the estimated 26-month construction phase of the Project). During this phase of the Project, there will be an increased volume of truck traffic on Kaiser Road.

3.1.1.2 Desert Tortoise Densities

Surveys were conducted between September 20 and October 6, 2010 following current USFWS protocols (USFWS 2009a) to determine the current density of desert tortoise within the Chuckwalla Recipient Site. All active sign of desert tortoise (live animals, active and good burrows, scat, tracks, and mating rings) are mapped on Figure 9. All live desert tortoises found were observed for signs of upper respiratory tract disease (URTD). No individuals exhibited obvious clinical signs of these diseases.

The Chuckwalla CHU is estimated to support an average of 8.3 tortoises/km^2, with a range of 3 to 15 per km^2. No tortoises will be relocated to areas within the Chuckwalla Recipient Site that are estimated to contain more than 130% of the average estimate or 10.8 tortoises/km^2.

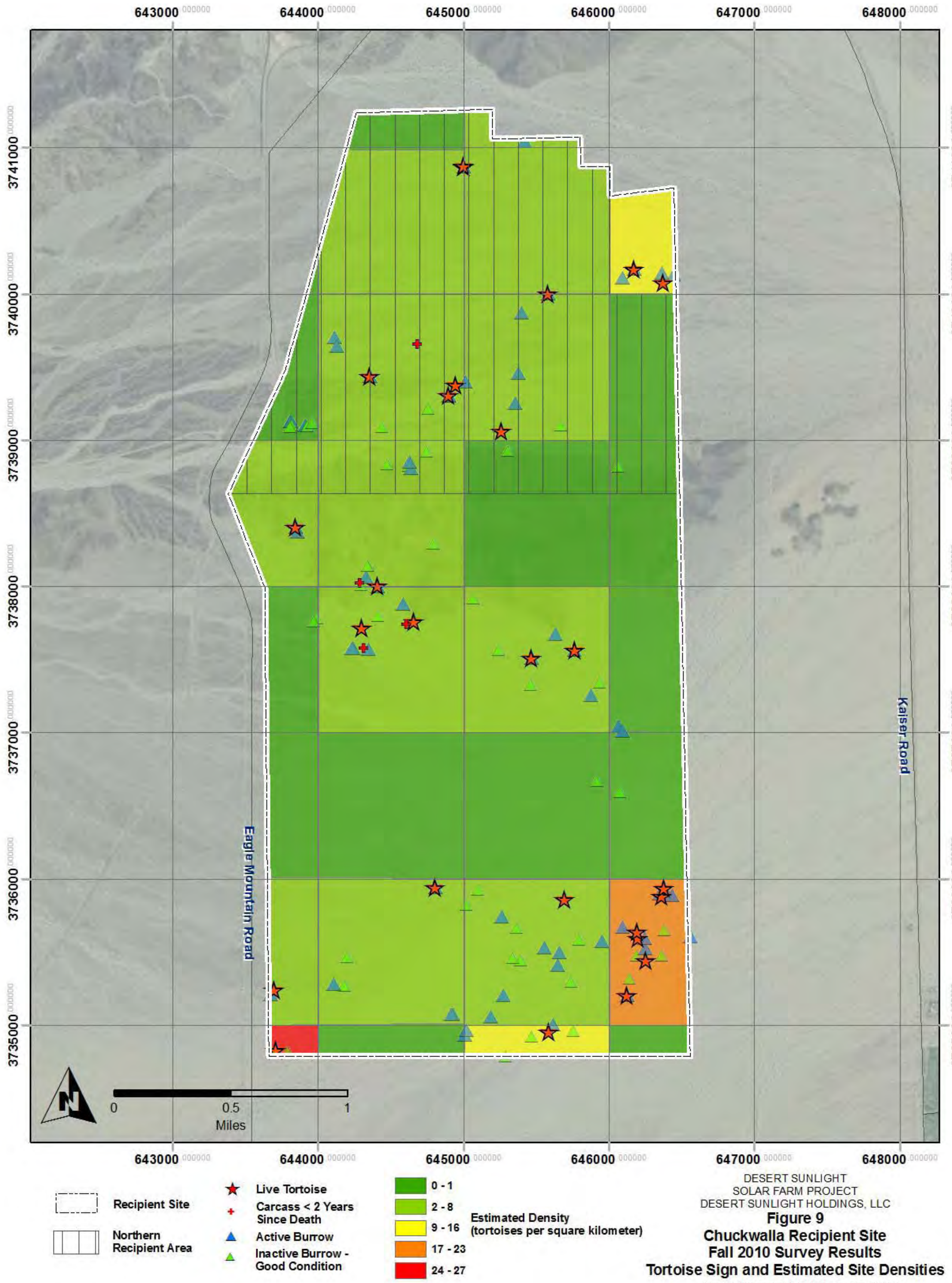
Figure 9 shows the estimated density of each square kilometer of the Chuckwalla Recipient Site. Because surveys of the recipient site showed that densities there are in most cases less than the estimated 8.3 tortoises/km^{2,} all translocated tortoises will be placed in the Project's Disposition Plan to retain density estimates under an estimated 6.0 km^2 (see proposed Translocation and Disposition in Section 4.2.3)

3.1.2 Red Bluff Recipient Site

The Red Bluff Recipient Site is shown in Figure 10. This section addresses each selection criteria described above in detail, and the current densities of desert tortoise on the Red Bluff Recipient Site.

3.1.2.1 Selection Criteria

Areas of contiguous public lands equal to or greater than the area of the Project. The Red Bluff Substation covers approximately 75 acres. The Red Bluff Recipient Site is located on contiguous public lands covering approximately 295 acres.


643000
644000
645000
646000
647000
648000
3741000
3740000
3739000
3738000
3737000
3736000
3735000
Eagle Mountain Road
Kaiser Road
N
0
0.5
1
Miles
Recipient Site
Northern Recipient Area
Live Tortoise
Carcass < 2 Years Since Death
Active Burrow
Inactive Burrow - Good Condition
0 - 1
2 - 8
9 - 16
17 - 23
24 - 27
Estimated Density (tortoises per square kilometer)
DESERT SUNLIGHT
SOLAR FARM PROJECT
DESERT SUNLIGHT HOLDINGS, LLC
Figure 9
Chuckwalla Recipient Site
Fall 2010 Survey Results
Tortoise Sign and Estimated Site Densities
Prepared by Ironwood Consulting, Inc. - Nov 17, 2010

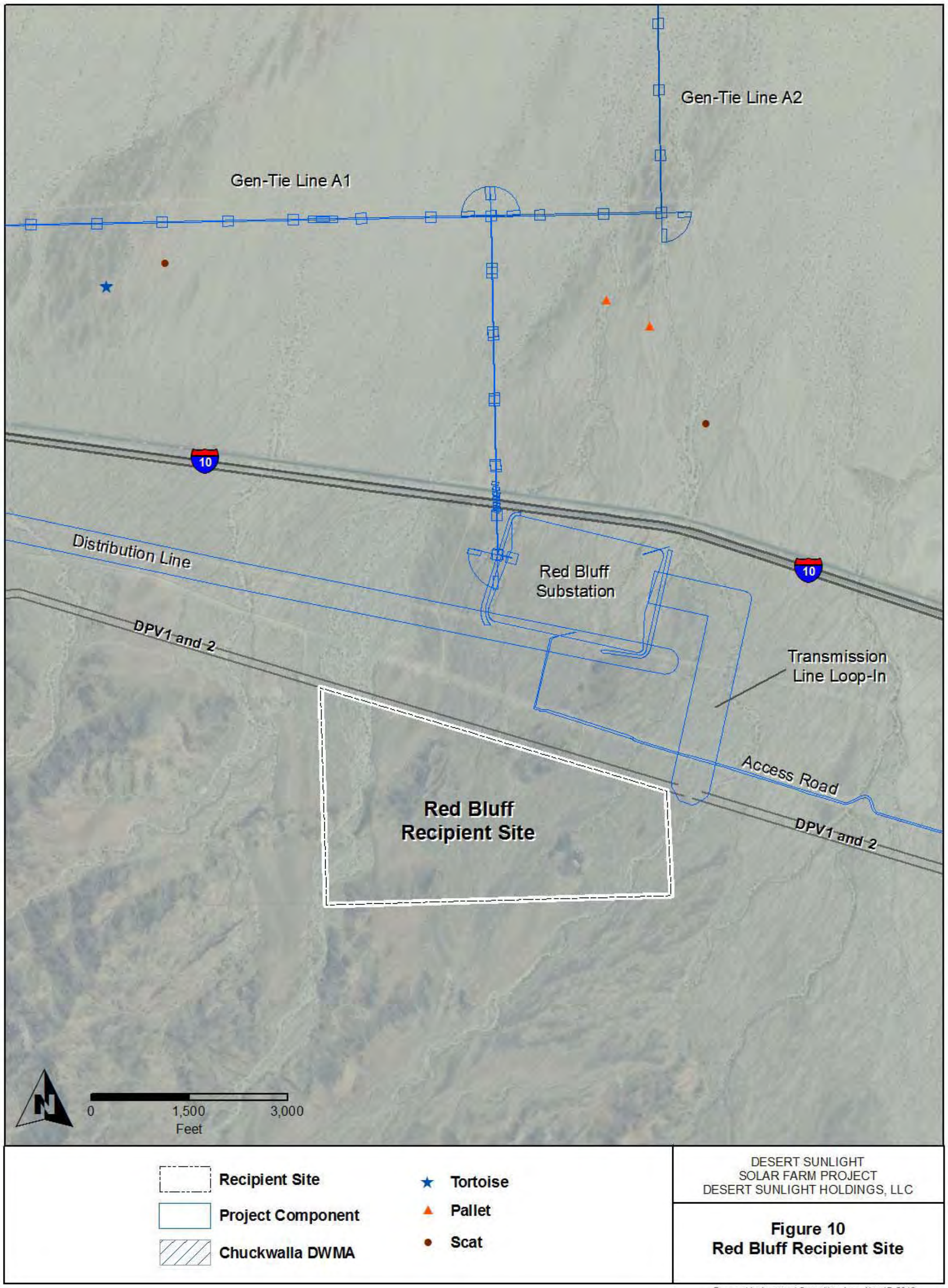


Figure 10
Red Bluff Recipient Site

Lack of significant barriers to movement. In the region of the Red Bluff Substation, significant barriers to movement include I-10 and steep rocky terrain along the boundaries of the Chuckwalla Mountains, just south of the Red Bluff Recipient Site (Figure 10). Using the Red Bluff Recipient Site will retain any translocated tortoises within their existing corridor between the base of the Chuckwalla Mountains and I-10.

Habitat similarity and suitability for all life stages of the desert tortoise. The Red Bluff Recipient Site supports rocky substrates with sparse Creosote Bush-White Bursage vegetation and several areas of Blue Palo Verde-Ironwood-Smoke Tree Series vegetation (Desert Dry Wash Woodland), similar to habitats found on the Red Bluff Substation. These habitats are known to support all life stages of the desert tortoise (USFWS 2008).

Containing no existing ROWs, ROW proposals or other encumbrances. Several existing telephone, electrical transmission, and high-power gas lines and associated access roads are located within the Red Bluff Recipient Site. A buffer of 100 meters (325 feet) on both sides of each existing line or road was excluded from the translocation area. Beyond existing ROWs or encumbrances, and the soon-to-be constructed DPV 2 line, BLM's LR2000 database does not show any over-filings or pending applications. The northern portion of the Red Bluff Recipient Site will be avoided to the extent possible for translocation due to the proximity to DPV 1 and 2 lines

Be managed for conservation. In the Project region DWMA, CHU, ACEC, National Park Service, and Wilderness Areas are managed for conservation. The Red Bluff Recipient Site is located on BLM-managed lands within the Eastern Colorado Desert Recovery Unit for the desert tortoise. The Red Bluff Recipient Site is within the Chuckwalla DWMA and CHU for desert tortoise and is adjacent to the Chuckwalla Wilderness.

Lands where tortoise populations have been depleted yet still support suitable habitats. The Red Bluff Recipient Site is within a portion of the Chuckwalla DWMA and CHU that extends between the north side of the Chuckwalla Mountains and the south side of I-10. The lack of recent carcasses in this area suggests it is an area of relatively stable population densities.

Lands 15 km (9 miles) from major unfenced roads or highways. The closest point of the Red Bluff Recipient Site will be approximately 1.3 km (0.8 miles) south of I-10. Fencing will be installed along I-10 under an agreement with BLM and the easement holder of the land for the installation and long-term maintenance of this fence.

Proximity to existing home ranges of individuals on the Red Bluff Substation and Red Bluff Substation. The Red Bluff Recipient Site is close enough to the Red Bluff Substation (within 2.0 km or 1.6 miles) to be within the male home range of individual tortoises on the southwestern part of the Red Bluff Substation.

Potential for increased predation. Local known predators of desert tortoise include coyotes that can prey on tortoises of all age classes, and desert kit fox and ravens that can prey on young tortoises and eggs. To avoid the potential for increased predation from raven and other raptors that may be attracted to SCE facilities, the northern portion of the Red Bluff Recipient Site will be avoided to the extent possible for translocation due to the proximity to DPV 1 and 2 lines.

Site access. Existing dirt roads provide good access for translocation within 2.0 km (1.2 miles) of all areas of the Red Bluff Recipient Site, which allows efficiency for monitoring of both the resident animals and translocated animals.

3.1.2.2 Desert Tortoise Densities

The Red Bluff Recipient Site is shown in Figure 10 and includes all data collected for desert tortoise presence and distribution in this recipient site. The Red Bluff Recipient Site was surveyed for resident desert tortoises in 2009 and 2010 using current protocols (USFWS 2009a). No areas of the Red Bluff Recipient Site appear to contain densities of desert tortoise higher than eight individuals per square kilometer.

3.1.3 DuPont Recipient Site

The DuPont Recipient Site is the alternative recipient site for desert tortoise and is located south of I-10 on BLM-managed lands immediately east of the Chuckwalla Wilderness Area (Figure 11). This section addresses each selection criteria in detail, and the current knowledge about densities of desert tortoise on the DuPont Recipient Site.

3.1.3.1 Selection Criteria

Areas of contiguous public lands equal to or greater than the area of the Project. The Solar Farm Site covers approximately 3,912 acres. The DuPont Recipient Site is located on contiguous public lands covering approximately 7,460 acres.

Lack of significant barriers to movement. The DuPont Recipient Site is situated approximately 24 kilometers (15 miles) southeast of the Solar Farm Site. Barriers that might pose a significant restriction to movement in the DuPont area include I-10 to the north and the Chuckwalla Mountains to the west.

Habitat similarity and suitability for all life stages of the desert tortoise. The DuPont Recipient Site supports sandy substrates with small gravel and a sparse Creosote Bush-White Bursage vegetation community with several areas of Blue Palo Verde-Ironwood-Smoke Tree Series vegetation (Desert Dry Wash Woodland). Although the vegetation communities are the same as those found on the Solar Farm Site, the substrates are more friable and vegetation appears to be both more dense and diverse that that found on the Solar Farm Site. The vegetation communities found on the DuPont Recipient Site are known to support all life stages of the desert tortoise (USFWS 2008).

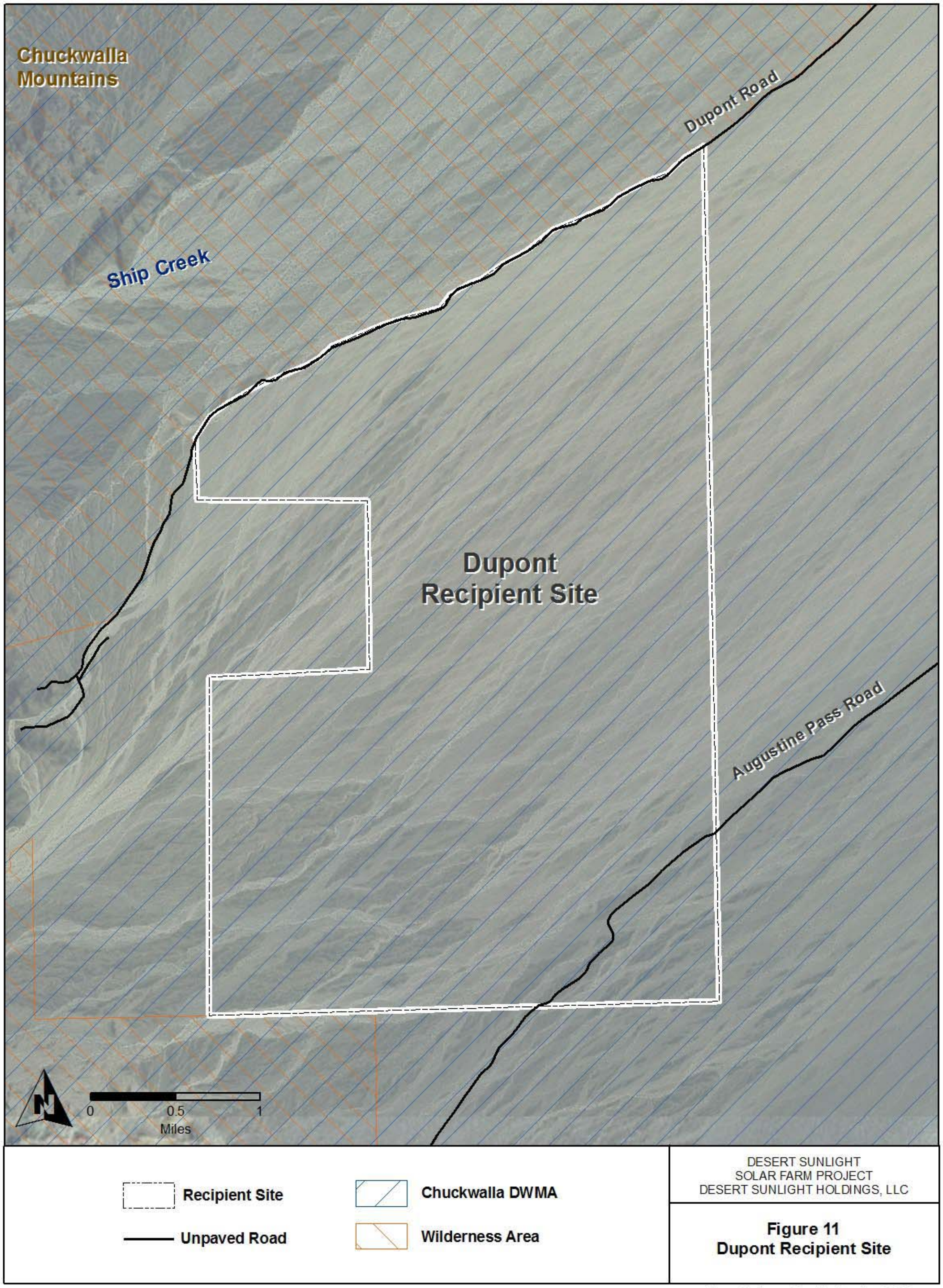


Figure 11
Dupont Recipient Site

Prepared by Ironwood Consulting, Inc. - Nov 17, 2010

Containing no existing ROWs, ROW proposals or other encumbrances. There are no existing designated ROWs or other encumbrances that will conflict with translocation of tortoises within the DuPont Recipient Site. BLM's LR2000 database indicated withdraw of lands into the Wilderness Area, withdrawal of a Solar Energy Study Area, and a private land transfer to the BLM within portions of the site.

Be managed for conservation. In the region of the DuPont Recipient Site, DWMA, CHU, ACEC, and Wilderness Areas are managed for conservation. The DuPont Recipient Site is located on BLM-managed lands within the Eastern Colorado Desert Recovery Unit for the desert tortoise. The DuPont Recipient Site is within the Chuckwalla DWMA and CHU for desert tortoise and is adjacent to the Chuckwalla Wilderness. One section (640- acres) within the DuPont Recipient Site is owned and managed by the State of California. No individuals will be translocated in this section, although it will remain part of the recipient site.

Lands where tortoise populations have been depleted yet still support suitable habitats. Little is known about desert tortoise densities at the DuPont Recipient Site. U.S. Geological Survey (USGS) modeling (Figure 6) suggests a moderate to high potential for presence based on habitat suitability. Existing density information is discussed further in Section 3.1.3.2 below. The DuPont Recipient Site is within a large area of the Chuckwalla DWMA and CHU south side of I-10.

Lands 15 km (9 miles) from major unfenced roads or highways. The closest major unfenced road or highway to the DuPont Recipient Site is approximately 5.0 km (3.1 miles) north, where I-10 is located.

Proximity to existing home ranges of individuals on the Solar Farm Site and Solar Farm Site. The DuPont Recipient Site is too far away with too many barriers (e.g., I-10) to be within the male home range of individual tortoises on the Solar Farm Site.

Potential for increased predation. Local known predators of desert tortoise include coyotes that can prey on tortoises of all age classes, and desert kit fox and ravens that can prey on young tortoises and eggs. No known subsidies for these predators (e.g., human activity, trash dumping, etc.) are anticipated to increase within the DuPont Recipient Site. Therefore, the risk of predation from these predators is not likely to increase substantially in the near future.

Site access. The existing dirt roads that provide access for translocation within 4.0 km (3.2 miles) of all areas of the DuPont Recipient Site are in moderate to poor condition. The conditions of the roads suggest possible concern for access to translocated and resident animals in the event of impassable road conditions or natural disaster.

3.1.3.2 Desert Tortoise Densities

The DuPont Recipient Site is located in the Chuckwalla Valley and supports desert tortoise, although densities are unknown. Range-wide sampling conducted between 2001 and 2005 within the region of the DuPont Recipient Site indicated the historical presence of tortoise (i.e., carcasses) and recorded one live tortoise in 2003 (USFWS 2006).

Protocol-level surveys have not been conducted within the DuPont Recipient Site. In September 2010, random transects were walked throughout the site to assess general habitat characteristics and habitat suitability for desert tortoise. These surveys covered approximately 20 linear miles and recorded no active sign of desert tortoise, nor any older sign (currently unused burrows, old scats, carcasses, etc).

If the Chuckwalla Recipient Site is determined to be unusable prior to translocation, protocol-level surveys (USFWS 2009a) will be completed at the DuPont Recipient Site. These surveys will identify and exclude areas of tortoise densities higher than approximately 8 tortoise/km^2 or concentrations of predator sign.

3.1.4 Linear Components of the Proposed Action

There is no need to designate a recipient site for tortoises located along the linear components of the Project (USFWS 2010b). Linear components are often separated from the other Project component discussions in this document because desert tortoises are not required to be translocated from linear components of the Project. Linear components of the Project include:

- Applicant: Gen-Tie Line
- SCE: Access road, distribution line, transmission loop-in, and telecommunication site

Any desert tortoises found on these linear components of the Proposed Action will be moved out of harm's way but not translocated pursuant to USFWS guidance (2010) as described in further detail in Section 4.

3.2 Control Sites

The purpose of a Control Site is to observe and record the movements and behaviors of animals within an area with no impact from the Project, so that these data can be compared to data recorded for desert tortoise movement and behavior among the translocated population and the recipient population.

Selection criteria for the control site include:

- Similar habitat to the recipient site
- Not previously used as a recipient site
- Minimum distance of 10km (6 miles) from the recipient site or have fencing or other movement barrier between sites

These selection criteria are discussed in detail below for each potential control site:

- **Sunlight Control Site**, located within the original study area north of the Solar Farm Site
- **Red Cloud Control Site**, located approximately seven miles southwest of Desert Center, south of I-10.

One Control Site will be selected and used by the Applicant in conjunction with all translocated desert tortoises from the Solar Farm Site. No control site is required for the SCE components because based on surveys conducted at the site fewer than five tortoises are estimated to be translocated from the Red Bluff Substation.

3.2.1 Sunlight Control Site

The Sunlight Control Site is shown in Figure 6. Because the Sunlight Control Site is not within an area that is protected as a conservation area, this control site will only be used if BLM takes formal regulatory action to ensure protection of the control population from ROW or other encumbrances for the duration of the long-term monitoring period (Section 5).

Similar habitat to the recipient site. The Sunlight Control Site is located near the northern boundary of the Solar Farm Site and support habitats very similar to those on the portion of the site that supports higher densities of desert tortoise, such as upland areas of stabilized desert pavement and channelized drainages with soft banks and higher vegetation density and diversity than the low-density desert tortoise portions of the Solar Farm Site.

Not previously used as a recipient site. The Sunlight Control Site has not been previously used as a recipient site for other projects.

Minimum distance of 10 km (6 miles) from the recipient site or have fencing or other movement barrier between sites. Although portions of the Sunlight Control Site are within 10 km (6 miles) of the Chuckwalla Recipient Site, several barriers to movement between the sites will exist, including Kaiser Road and desert tortoise fencing placed along the west side of Kaiser Road to prevent translocated animals from crossing the road towards the Solar Farm Site.

3.2.2 Red Cloud Control Site

The Sunlight Control Site is the Applicant's preferred alternative. However, if the Sunlight Control Site is not used, the Project will use the Red Cloud Control Site (Figure 6). Although project-specific surveys of this site have not been conducted, available data suggests that this site has the potential to support at least moderate to densities of desert tortoise (Nussear 2009; USFWS 2006)

Similar habitat to the recipient site. The Red Cloud Control Site is located southwest from the Solar farm Site and supports habitats most similar to the DuPont Recipient Site, also located south of I-10 with substrates that are more friable than those on the Solar Farm Site and vegetation that appears to be more dense and diverse.

Not previously used as a recipient site. The Red Cloud Control Site has not been previously used as a recipient site for other projects.

Minimum distance of 10 km (6 miles) from the recipient site or have fencing or other movement barrier between sites. No portion of the Red Cloud Control Site is within 10 km (6 miles) of the Chuckwalla or DuPont Recipient Sites. In addition, several barriers to movement between the sites will exist including I-10 and the Chuckwalla Mountains.

4.0 Proposed Methods for Desert Tortoise Translocation

4.1 Definitions

4.1.1 Health Assessments

Detailed health assessments of desert tortoises will be conducted following current USFWS guidance by individuals approved and permitted by the USFWS and CDFG to conduct such assessments. Detailed health assessments will be performed prior to translocation and repeated periodically during long-term monitoring as discussed in Section 5.

Any individual tortoise that exhibits severe clinical signs of URTD will be transported to the DTCC near Las Vegas, Nevada for further evaluation. Tortoises will only be prepared for transport to the DTCC by individuals authorized for these activities under the Project Biological Opinion (BO). Preparation for transport will include hydrating the animal according to current USFWS guidelines and placing the tortoise in a new clean, ventilated protective container and placing it in the interior of the vehicle. Once the animal is ready for transport, the Lead Translocation Biologist will communicate with the DTCC that the animal is being transported to their facility and will remain in communication with the transport vehicle and DTCC until the animal has arrived at the DTCC and is removed from the vehicle by DTCC personnel. The tortoise will be transported to the DTCC within 48 hours of it being discovered with clinical signs of disease. The vehicle transporting the tortoise will be in good working order with working air conditioning and the driver will keep the container with the animal inside the vehicle at all times with temperatures remaining under 27 degrees Celsius (°C) or 80 degrees Fahrenheit (°F) until it is removed at the DTCC by their personnel. The driver will not stop the vehicle for longer than 10 minutes on the way to the DTCC. Personnel at the DTCC will coordinate with the Project's key personnel (Section 5) to update them on the status of the animal and any potential of moving it back out of captivity.

4.1.2 Transmittering

All tortoises found over 120 mm mean carapace length (MCL) without obvious clinical signs of URTD will be given a unique identifier provided by the USFWS and fitted with a transmitter following methods in *Review of Radio Transmitter Attachment Techniques for Chelonian Research and Recommendations for Improvement* (Boarman et all 1998). These activities will conform to restrictions of time of day, temperature, and total time handled (*Desert Tortoise Field Manual*; USFWS 2009). Transmitters will remain on all individuals throughout the 5-year monitoring period and be replaced as necessary (Section 5).

4.1.3 Disease Testing

All tortoises to be translocated to Project recipient sites will be tested for URTD using an enzyme-linked immunoabsorbent assay (ELISA) test and monitored in situ or penned on site pending test results. Blood will be drawn for disease testing between March 1 and October 15 to the extent possible. Blood drawing will only occur on the same day as transmittering if these activities combined will not exceed restrictions of time of day, temperature, and total time handled (*Desert Tortoise Field Manual*; USFWS 2009). If these restrictions could be exceeded, the blood drawing will occur on the following day.

Tortoises will remain in place until test results are received. All animals with positive test results will be transported to the DTCC as described above in Section 4.1.1. Animals with negative test results will be translocated during the active season only according to the translocation and disposition plan below. Suspect test results will indicate the animal should be held in a quarantine pen until a repeat test is run.

4.2 Steps in Translocation Process – Solar Farm Site

It is anticipated that more than five individual desert tortoises are likely to be translocated from the Solar Farm Site. Any individuals translocated will likely be translocated greater than 500 meters to the Chuckwalla Recipient Site.

4.2.1 Surveys and Disease Testing at Chuckwalla Recipient Site

Initially, only the northern portion of the Chuckwalla Recipient Site will be used for translocation (as shown in Figure 7), unless it becomes clear that the number of tortoises needed to be translocated could exceed the desired density of animals in that area. Although the northern portion of the Chuckwalla Recipient Site (1,490 acres) is smaller than the acreage of the entire Solar Farm Site, it is larger than that portion of the Solar Farm that supports desert tortoises (approximately 1,454 acres). If more tortoises are found on the Solar Farm Site than anticipated by the Preliminary Disposition Plan (Section 4.0), the southern portion of the Chuckwalla Recipient Site will also be used and activities described in this report will be extended to cover this area (fencing along I-10, disease testing, etc).

After receiving project permits allowing handling, health assessment and disease testing of tortoises for the Project, surveys will begin to: (1) confirm desert tortoise densities at the recipient site, (2) conduct health assessments and ELISA tests for all tortoises found and (3) attach transmitters to all tortoises found within the northern portion of the recipient site.

1. Surveys will be conducted using current protocols issued by the USFWS and/or CDFG to confirm densities of desert tortoises within the northern portion of the Chuckwalla Recipient Site targeted for translocation. All live tortoises found will receive detailed health assessments and blood draws for the ELISA tests.

2. No animals will be translocated to the Chuckwalla Recipient Site until test results for the ELISA test showed that none of the individuals within the northern part of the recipient site had positive or suspect test results. Suspect results will be re-tested to confirm positive or negative results.

3. Determination of Tortoise Densities and Determination of Disease Sampling Area. The northern portion of the Chuckwalla Recipient Site is approximately 1,490 acres (6.0 km^2). In GIS, a 6.5 km buffer was established around this 1,490 acre area with a resulting polygon of approximately 51,000 acres (205 km^2). In order to estimate the density of tortoises within this 6.5-km buffer area, the full-coverage desert tortoise survey area and observations of live tortoises from project-specific surveys were overlaid and clipped to the 6.5-km buffer. Approximately 32% of the 6.5-km buffer area has been surveyed by project-specific full coverage desert tortoise surveys. Sixty-three tortoises were located within the 16,111 acres (64 km^2) of full coverage survey area. Using the USFWS formula for population estimation, 125 tortoises were estimated to occur within the full coverage survey area. The resulting density was 125 tortoises/64 km^2, or 2.0 tortoises/km^2.

   Of the total 205 km^2 of land within the 6.5 km buffer area, 125 km^2 is managed by the BLM, which represents the area where authorized disease testing of tortoise will occur (Figure 12). The remaining land is owned and managed by the National Park Service (38 km^2), State Lands Commission (3 km^2), and other entities (including MWD and private land holdings) (39 km^2). BLM land located east of Kaiser Road was excluded because the Project's installation of tortoise exclusion fence along Kaiser Road will eliminate the transfer of disease across Kaiser Road. In GIS, 1 km concentric bands were generated around the proposed northern Chuckwalla Recipient Site and restricted to the BLM land located within the 6.5 km closer to the recipient site have a higher likelihood to come into contact with translocated tortoises, therefore a greater proportion of these tortoises will be subject to disease testing. Figure 13 shows numbers of individual desert tortoises will be located and tested for each concentric ring.

4. If any tested animals have positive results, the Chuckwalla Recipient Site will not be used and effort will begin at Step 1 above at the DuPont Recipient Site.

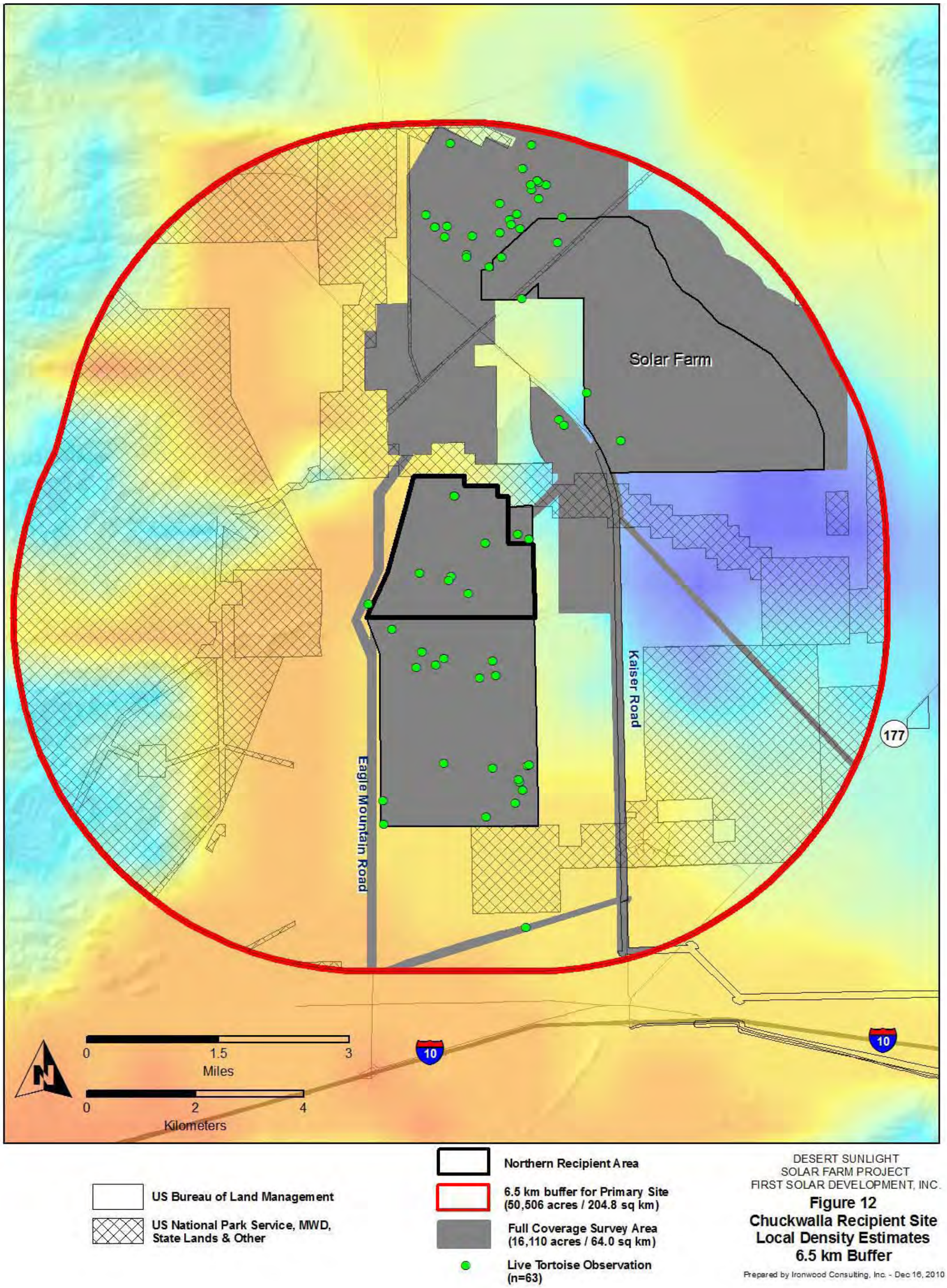
4.2.2 Fencing and Clearance Surveys

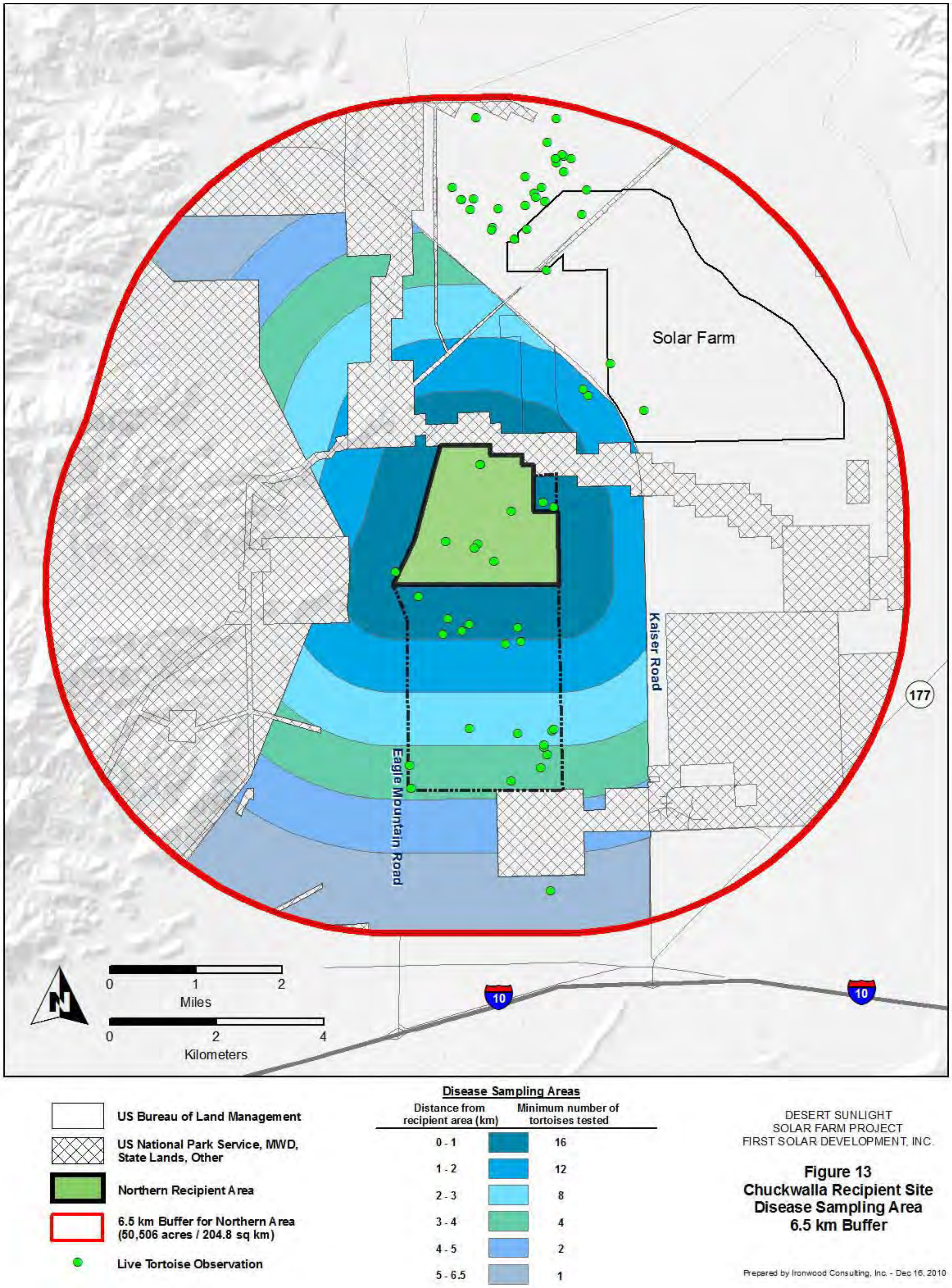
Figure 14 shows a flow chart summarizing the procedures described below and decision points in the proposed translocation process. The translocation activities will comply with the specific required terms and conditions contained in the USFWS BO and Incidental Take Statement (ITS), and the Consistency Determination issued by the CDFG.

4.2.2.1 Clearance Surveys during Non-Active Desert Tortoise Season (approximately June 1 to September 1 and November 1 to April 1) – No Translocation

If construction commences in a non-active season for desert tortoise, the following procedures will be followed. Prior to any other construction activities, the Solar Farm Site will be fenced into subsections with temporary desert tortoise exclusion fencing (example shown in Figure 15).

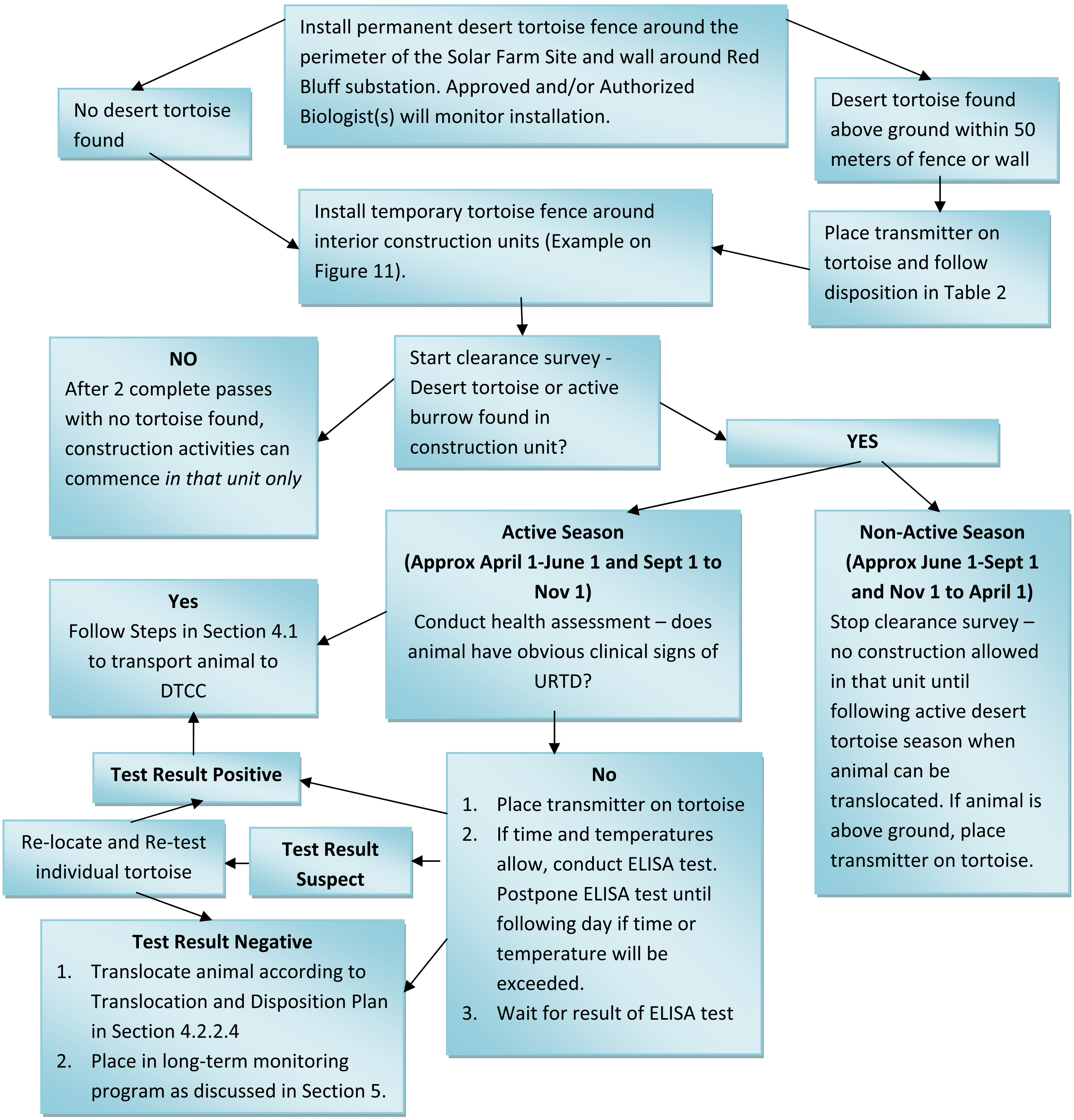
1. Clearance surveys will be conducted for one unit near the southwestern boundary of the site that will allow the siting of an access and staging area from Kaiser Road, which will be fenced separately with permanent desert tortoise exclusion fencing (example in Figure 15).
2. Clearance surveys will be conducted for each construction unit using belt transects at a minimum of 5 meter (16 foot) spacing, using tighter spacing if vegetation becomes denser. If a desert tortoise or active burrow is found within a unit, surveys will stop at that time and the unit will not be developed until the tortoise is translocated in the following active season. If two complete passes are completed in a unit (north-south and east-west) without a desert tortoise being found, construction may commence within that unit prior to the following active season.
3. Construction will only be conducted in units without desert tortoise presence until the next active desert tortoise season when the tortoises from all remaining units will be translocated.
4. If a desert tortoise is found above ground in the non-active season, it will be fitted with a transmitter and left where it was found so that it can more easily be re-located in the following active season.

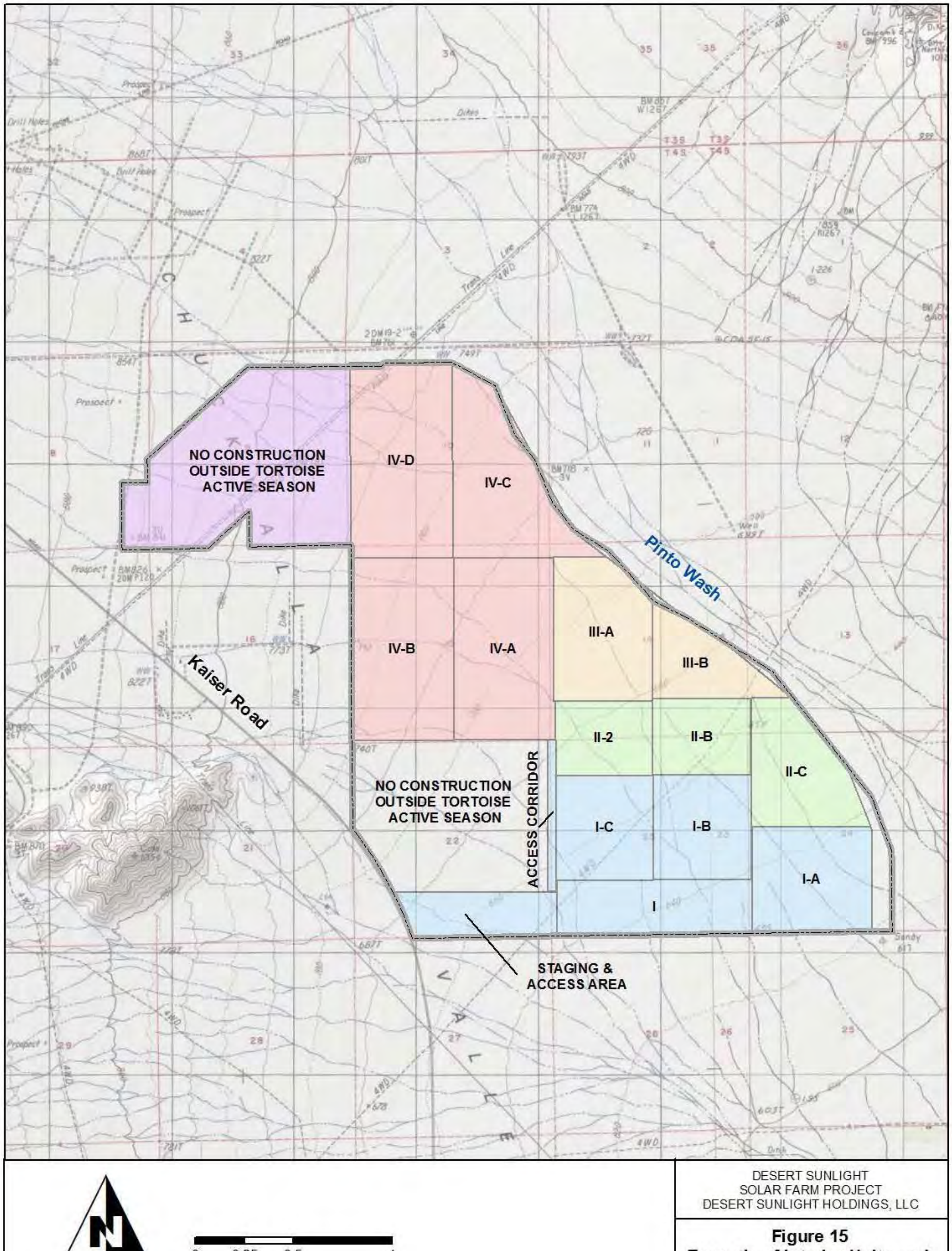

Solar Farm
Kaiser Road
Eagle Mountain Road
177
10
0 1.5 3
Miles
0 2 4
Kilometers
N
US Bureau of Land Management
US National Park Service, MWD, State Lands & Other
Northern Recipient Area
6.5 km buffer for Primary Site (50,506 acres / 204.8 sq km)
Full Coverage Survey Area (16,110 acres / 64.0 sq km)
Live Tortoise Observation (n=63)
DESERT SUNLIGHT
SOLAR FARM PROJECT
FIRST SOLAR DEVELOPMENT, INC.
Figure 12
Chuckwalla Recipient Site
Local Density Estimates
6.5 km Buffer
Prepared by Ironwood Consulting, Inc. - Dec 16, 2010



Solar Farm
Kaiser Road
Eagle Mountain Road
177
10
10
0 1 2
Miles
0 2 4
Kilometers
N
US Bureau of Land Management
US National Park Service, MWD, State Lands, Other
Northern Recipient Area
6.5 km Buffer for Northern Area (50,506 acres / 204.8 sq km)
Live Tortoise Observation
Disease Sampling Areas
Distance from recipient area (km)
Minimum number of tortoises tested
0 - 1 16
1 - 2 12
2 - 3 8
3 - 4 4
4 - 5 2
5 - 6.5 1
DESERT SUNLIGHT
SOLAR FARM PROJECT
FIRST SOLAR DEVELOPMENT, INC.
Figure 13
Chuckwalla Recipient Site
Disease Sampling Area
6.5 km Buffer
Prepared by Ironwood Consulting, Inc. - Dec 16, 2010

Figure 14. Decision Making Chart for Project Desert Tortoise Translocation





DESERT SUNLIGHT
SOLAR FARM PROJECT
DESERT SUNLIGHT HOLDINGS, LLC

Figure 15
Example of Interior Units and Temporary Fencing

Prepared by Ironwood Consulting, Inc. - Dec 16, 2010

4.2.2.2 Clearance Surveys and Translocation during Active Desert Tortoise Season (approximately April 1 to June 1 and September 1 to November 1)

If construction commences in the active season for desert tortoise (approximately April 1 to June 1 and September 1 to November 1), the following procedures will be followed.

Step 1- Complete perimeter and interior fencing at Solar Farm Site

This step can be completed concurrent with the surveys and disease testing at the Chuckwalla Recipient Site.

a) The perimeter fence and associated desert tortoise exclusion fencing will be established around the entire Solar Farm Site. These fencing activities will be treated as a linear activity of the Proposed Action. All fencing activities will be monitored by a qualified biological monitor. All fencing will be checked and repaired (if necessary) on a daily basis to ensure its integrity.

b) All individual desert tortoises found above ground during construction of the perimeter fence and near the fence will be given a unique identifier and fitted with a transmitter as discussed in section 4.1. Depending on location of the animal and its activity level, it will either be placed outside the perimeter fence and used as part of the Sunlight Control Site, or be placed inside the Solar Farm Site to be translocated during clearance surveys (Table 2). The individuals not placed outside the fence will eventually be part of the group of translocated animals and will be included in all other activities of the translocation program discussed in this section.

Table 2. Disposition of Tortoises found during Perimeter Fence Installation

Where Tortoise was Found	Activity Level	Disposition
Near NW area of Solar Farm Site	Active	Place outside perimeter fence to be monitored as part of the Sunlight Control Site
Near NW area of Solar Farm Site	Dormant	Place inside perimeter fence for translocation during clearance surveys
Near SW area of Solar Farm Site	Active or Dormant	Place inside perimeter fence for translocation during clearance surveys
In other areas of the Solar Farm Site	Active or Dormant	Place inside perimeter fence for translocation during clearance surveys

c) When the entire Solar Farm Site has been cleared of desert tortoise, daily checks of the perimeter fence will continue throughout construction and the life of the project to ensure the integrity of the fence, and any remaining interior fencing can be removed.

Step 2 – Clearance Surveys
These surveys will be conducted once fencing is completed in any unit.

a) Clearance surveys will be conducted using belt transects at a minimum of 5 meter (15 foot) spacing, using tighter spacing if vegetation becomes denser. Clearance surveys will continue in each unit until two consecutive passes are completed in a unit (north-south and east-west) without a desert tortoise being found, at which time construction may commence in that unit.

b) When a tortoise is found during clearance surveys, an Authorized Biologist (surveyors authorized to conduct these activities under project specific permits) will:

- Complete a detailed health assessment of the animal;
- Place a transmitter on the individual; and
- Test the individual animal for URTD.

c) Tortoises found during the clearance of the Solar Farm Site will be either: (1) left in situ where they were found (preferred), or (2) held in temporary pens on the project site until the results of their ELISA tests are received.

d) Any tortoise showing clinical signs of disease, or any tortoise that tests: (1) positive in the first ELISA test, or (2) positive in a second test after an initial suspect result, will be transported to the Desert Tortoise Conservation Center (DTCC) as described in Section 4.1.1.

Step 3 - Surveys at Sunlight Control Site
After receiving project permits allowing handling, surveys will begin to (1) find a number of control tortoises equal to the number that will be translocated from the Solar Farm Site, and (2) attach transmitters to these individuals in order to monitor movement and behavior and compare this data with that recorded for both the translocated tortoises and resident tortoises at the recipient site.

If the Sunlight Control site is deemed inappropriate due to lack of protective land status or other factors, the Red Cloud Control Site will be used.

4.2.3 Translocation and Disposition Plan

After desert tortoises have been tested for disease, a Final Disposition Plan for each of the identified tortoises will be prepared by the Applicant and submitted to USFWS and CDFG. This plan will identify the proposed fate of each individual desert tortoise to be translocated in conformance with the performance standards and alternatives contained in this Translocation Plan, and will include the complete health assessment and ELISA results for each individual. Desert tortoises will not be translocated prior to concurrence by the USFWS and CDFG with the Final Disposition Plan.

Table 3 shows the different translocation strategies for juveniles, nests, adults and sub-adults.

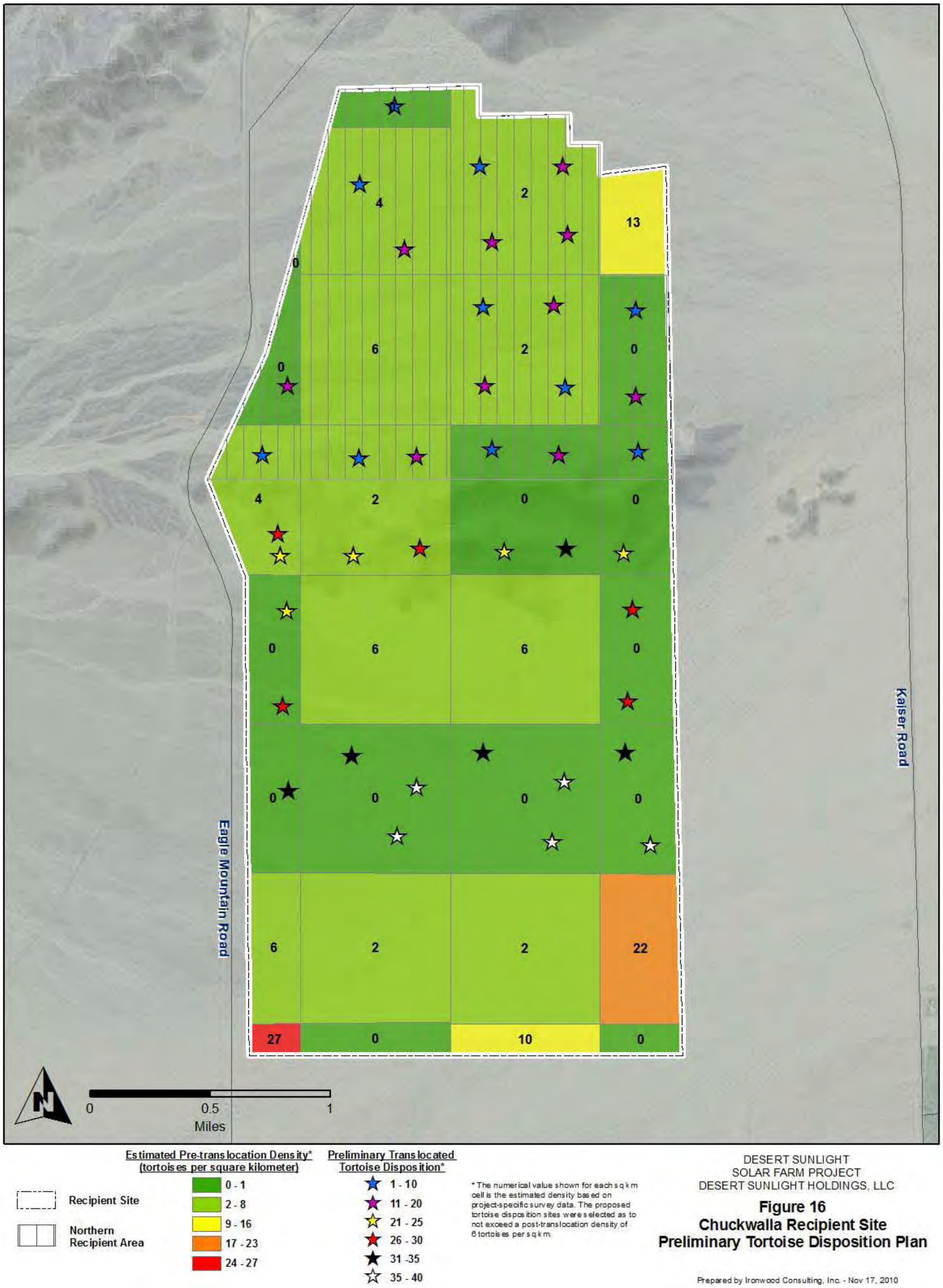
Table 3. Translocation of Desert Tortoises and Eggs

Size of tortoise	Translocation Strategy
Juveniles (<120 mm MCL)	Health assessment as described, unique identifier, no transmitter, translocated as described.
Sub-adults (120-180 mm MCL) and Adults (>180 mm MCL)	Health assessment, unique identifier, transmittered, and translocated as described above. If individual is in burrow, every effort will be made to remove it using “tapping” or repeated visits to the burrow prior to using the less preferred method of carefully excavating the burrow.
Nests with potentially viable eggs	If a nest is suspected or found, the eggs will be carefully moved together and placed in a replacement nest created by an Authorized Biologist for the project at the appropriate recipient site. The replacement nest location(s) will be added to the long-term monitoring program.

All translocations will take place on the day of collection between 0700 and 1600 hours. Translocation will occur only when temperatures range from 18-30°C (65-85°F) and are not forecasted to exceed 32°C (90°F) within 3 hours of release. Forecasted daily low temperatures should not be cooler than 10°C (50°F) for one week post-release.

After the individual desert tortoise is given a unique identifier and transmitter it will be hydrated according to existing protocols. Individual desert tortoises will then be transported to their release sites (within the appropriate recipient site as described in Section 3) in clean, ventilated protective containers. If these containers are re-used, they will be disinfected according to existing protocols. All individuals will be released at unoccupied shelter sites such as unoccupied soil burrows, spaces within rock outcrops, caliche caves, or the shade of shrubs or trees.

Translocated tortoises will first be placed within the northern portion of the Chuckwalla Recipient Site, where estimated densities of less than 8 animals per square kilometer (20 per square mile) have been determined. Release locations will be identified and spatial patterns between tortoises will be maintained as consistently as possible. Figure 16 represents a proposal of where these individual tortoises will be placed, assuming densities and distribution at the Chuckwalla Recipient Site are similar to those during the 2010 survey, and that no disease is found at or near the recipient site. Tortoises found in close proximity to each other (i.e. within 50 meters) will be released in the same area in the same proximity.


Eagle Mountain Road
Kaiser Road
0
0.5
1
Miles
Recipient Site
Northern Recipient Area
Estimated Pre-translocation Density*
(tortoises per square kilometer)
0 - 1
2 - 8
9 - 16
17 - 23
24 - 27
Preliminary Translocated Tortoise Disposition*
1 - 10
11 - 20
21 - 25
26 - 30
31 -35
35 - 40
* The numerical value shown for each sq km cell is the estimated density based on project-specific survey data. The proposed tortoise disposition sites were selected as to not exceed a post-translocation density of 6 tortoises per sq km.
DESERT SUNLIGHT
SOLAR FARM PROJECT
DESERT SUNLIGHT HOLDINGS, LLC
Figure 16
Chuckwalla Recipient Site
Preliminary Tortoise Disposition Plan
Prepared by Ironwood Consulting, Inc. - Nov 17, 2010

4.3 Steps in Translocation Process – Red Bluff Substation

Less than five individual desert tortoises are likely to be translocated from the Red Bluff Substation. Any individuals translocated will likely be translocated greater than 500 meters to the Red Bluff Recipient Site. No control site is associated with the Red Bluff Substation because none is required when less than five individuals will be translocated.

4.3.1 Fencing and Clearance Surveys

Clearance surveys will be conducted for the Red Bluff Substation immediately following the construction of the perimeter wall or fence using belt transects at a minimum of 5 meter (16 foot) spacing:

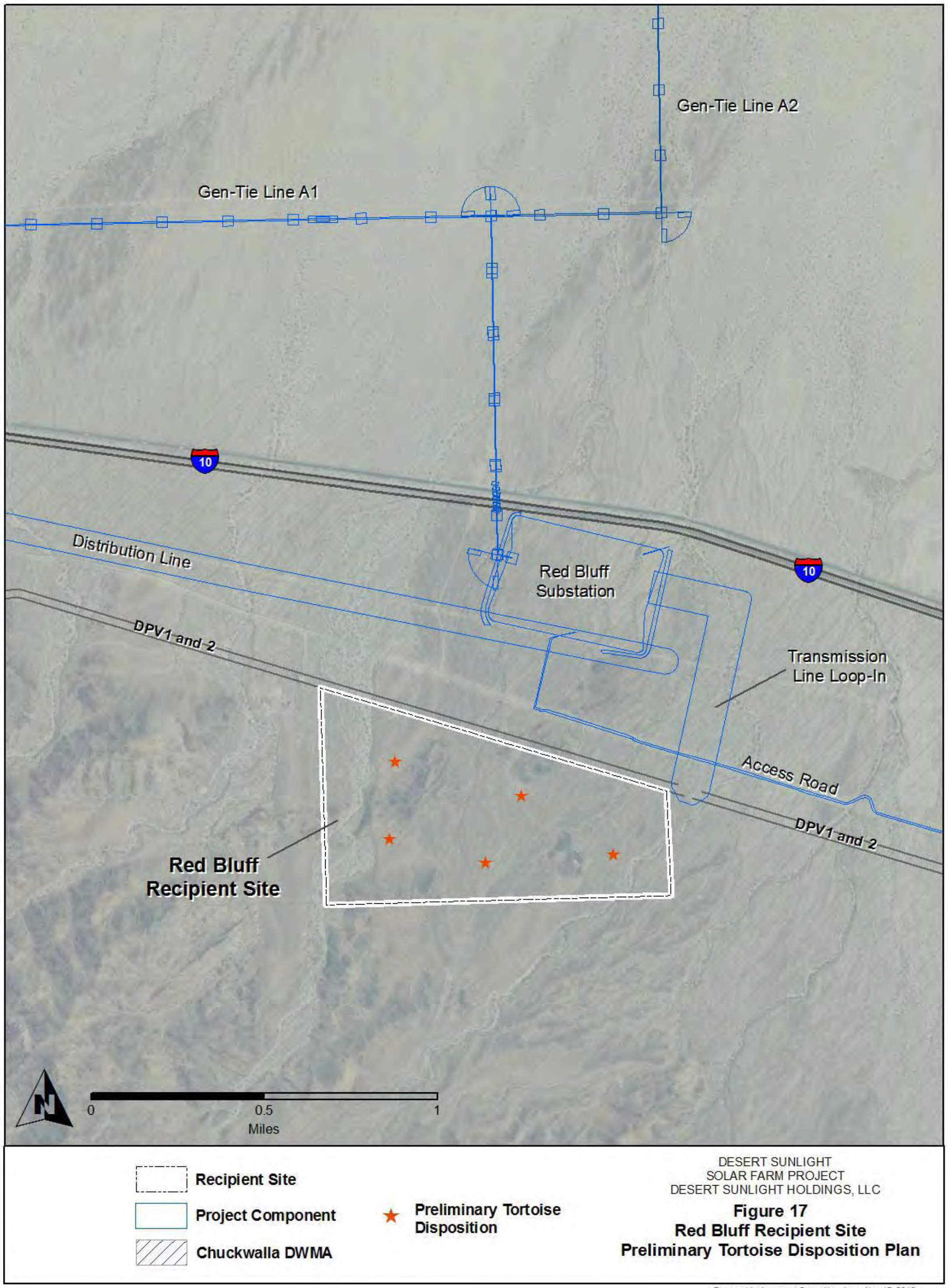
- If these surveys are conducted within any season and *no* desert tortoise or active burrows are found, construction can commence within the fence.
- If these surveys are conducted outside the active desert tortoise season and live desert tortoise or active burrow is found, construction will be halted until the next active desert tortoise season.
- If these surveys are conducted within the active desert tortoise season and a live desert tortoise or active burrow is found, the procedures listed in Sections 4.1 for health assessment, disease testing, and transmittering will be followed.
- The tortoise will be held in situ until test results are received. If the individual tests positive for disease, procedures provided in Section 4.1.1 will be followed and SCE will be responsible for the associated costs.

4.3.2 Surveys and Disease Testing at Red Bluff Recipient Site

Surveys of the Red Bluff Recipient Site will be conducted only if any desert tortoises were found within the Red Bluff Substation perimeter. If not tortoises are found within the Red Bluff Substation perimeter on the substation site, these surveys, disease testing, and associated activities will not be required.

After receiving project permits allowing handling, health assessment and disease testing of tortoises for the Project, surveys will begin to: (1) confirm desert tortoise densities at the recipient site, (2) conduct health assessments and ELISA tests for all tortoises found, and (3) attach transmitters to all tortoises found within the recipient site. Although monitoring is not required for these resident tortoises, transmitters will allow any animals with positive or suspect ELISA test results to be re-located.

1. Surveys will be conducted using current protocols issues by the USFWS and/or CDFG to confirm densities of desert tortoises within the Red Bluff Recipient Site. All live tortoises found will receive detailed health assessments and blood draws for ELISA tests.
2. No animals will be translocated to the Red Bluff Recipient Site until test results for the ELISA tests showed that none of the individuals within the northern part of the recipient site had positive or suspect test results. Suspect results will be re-tested to confirm positive or negative results.
3. Any desert tortoise translocated from the Red Bluff Substation site will be placed in the Red Bluff Recipient Site as far as possible from known future activities of to be conducted for this project or other regional projects such as the Devers-Palos Verde 2 Transmission Line. The preliminary disposition plan for these animals is shown in Figure 17 with the assumption that less than five individuals will be translocated from the Red Bluff Substation.


Gen-Tie Line A2
Gen-Tie Line A1
10
10
Distribution Line
Red Bluff
Substation
DPV1 and 2
Transmission
Line Loop-In
Access Road
DPV1 and 2
Red Bluff
Recipient Site
0
0.5
1
Miles
Recipient Site
Project Component
Chuckwalla DWMA
Preliminary Tortoise
Disposition
DESERT SUNLIGHT
SOLAR FARM PROJECT
DESERT SUNLIGHT HOLDINGS, LLC
Figure 17
Red Bluff Recipient Site
Preliminary Tortoise Disposition Plan
Prepared by Ironwood Consulting, Inc. - Nov 17, 2010

4.4 Linear Project Components

4.4.1 Gen-Tie Line

As a linear Project component, construction of the Gen-Tie Line can occur at any time of the year (USFWS 2010). Any desert tortoises found during clearance of linear facilities should be moved out of harm's way following clearance and handling procedures outlined in the current *Desert Tortoise Field Manual* (USFWS 2009).

1. Within 30 days prior to construction, a clearance survey will be conducted along each portion of the line and all active desert tortoise sign mapped and communicated to the Lead Biological Monitor and site-specific biological monitor(s).

2. Biological monitors will be on-site during all construction activities to ensure that active burrows along the Gen-Tie Line will be avoided by project construction and facilities.

3. If a desert tortoise is found on along the Gen-Tie Line, adverse effects will be avoided by allowing the tortoise to passively traverse the site while construction in the immediate area is halted. If the tortoise does not move out of harm's way after approximately 20 minutes, an Authorized Biologist for the Project can actively move the animal out of harm's way. The Authorized Biologist will be responsible for taking appropriate measures to ensure that any desert tortoise moved in this manner is not exposed to temperature extremes which could be harmful to the animal.

4. Vehicles parked in desert tortoise habitat shall be inspected immediately prior to being moved. If a tortoise is found beneath a vehicle, the Authorized Biologist shall be contacted to move the animal from harm's way, or the vehicle shall not be moved until the desert tortoise leaves of its own accord.

4.4.2 SCE Project Components

Construction of the Access Road, Distribution Line, and Telecommunications Site can occur at any time of the year (USFWS 2010) using the same desert tortoise methodologies described above in Section 4.4.1 for the Gen-Tie Line.

5.0 Monitoring and Reporting

All activities related to monitoring will be conducted by Approved and/or Authorized Biologists identified in the project BO. Standardized data sheets will be used to record individual tortoise locations, interactions, burrow locations, etc. during all monitoring activities.

5.1 Solar Farm Site and Gen-Tie Line

5.1.1 Monitoring During Construction

During project construction, all desert tortoise fencing at the Solar Farm Site will be monitored daily and, if necessary, repaired or replaced. All site entrances and equipment moving outside the desert tortoise exclusion fence will be monitored by Approved and/or Authorized biological monitors. If any additional desert tortoises are located within the fenced area, the translocation process described in Section 4.2 will be followed and Project activities will temporarily cease in that area with desert tortoise clearance surveys recommencing until no tortoises are found during additional clearance surveys.

All tortoises being held in situ will be monitored at least

- ♦ Once a day during first week
- ♦ Once a week for the following three weeks
- ♦ Twice per month until the Final Disposition Plan is approved and the individual is translocated

5.1.2 Long-Term Monitoring

All translocated desert tortoises and an equal number of resident individuals at the Recipient Site and Control Site (equal gender ratios) will be monitored on a long-term basis for a period of at least 5 years after the initial translocation date.

Transmitters will be changed as necessary throughout the monitoring period as necessary to maintain battery life. At the end of the 5-year monitoring period, coordination with USFWS and CDFG will determine whether transmitters should be removed and decommissioned.

Translocated desert tortoises will be monitored as follows:

- ♦ Once within 24 hours of release
- ♦ A minimum of twice weekly for the first two weeks after release
- ♦ A minimum of once a week during the active season for the 5-year monitoring period
- ♦ Once every other week during the non-active season for the duration of the 5-year monitoring period

Resident and control desert tortoises should be monitored for the 5-year monitoring period as follows:

- ♦ A minimum of once a week during the active season for the 5-year monitoring period
- ♦ Once every other week during the non-active season for the duration of the 5-year monitoring period

Health Monitoring

Condition assessment will be conducted for all translocated individuals annually prior to over-wintering (and subsequent to over-wintering; and a health assessment for each translocated individual will be conducted at the end of the 5-year monitoring period. Any health problems or mortalities observed will be reported to USFWS and CDFG verbally within 48 hours of discovery or via email within 5 business days thereafter and will include unique identifier, location, suspected health issue and/or cause of death (if known). Fresh carcasses will be brought for necropsy as directed by USFWS and CDFG. Animals showing clinical signs of disease at any time will be transported to the DTCC following the guidelines provided in Section 4.1.

Vegetation Monitoring

Vegetation transects established in 2010 within the recipient sites will be surveyed annually between March 15 and April 30 to measure potential changes in habitat characteristics.

5.1.3 Reporting

Reporting During Translocation

All activities will be recorded on standardized data sheets and/or on digital data recorders. The Authorized Biologist for the translocation effort will send e-mails prior to the 5th day of the month summarizing the translocation activities performed the previous month. These e-mails will be sent to the project biologists at BLM, USFWS, CDFG, and SCE (see Key Resources below). Annual project reports submitted to USFWS and CDFG by BLM will contain detailed information on these translocations including all information recorded.

Reporting During Long-Term Monitoring

All activities will be recorded on standardized data sheets and/or on digital data recorders. Reporting to the respective federal and state agencies will be performed on a quarterly basis. The lead biologist for the project will send a brief report via e-mail to the appropriate contact at BLM, USFWS, and CDFG. This report will include monitoring data for all desert tortoises in the monitoring program, including those from recipient and control populations.

Annual Reports

During the period of long-term monitoring annual reports will be completed each year by the Lead Translocation Biologist and submitted to the appropriate contact at the BLM on or before January 15 for the preceding calendar year so that the February 1 deadline for annual reports to USFWS can be met. Annual reports will summarize all long-term monitoring activities conducted during the previous calendar year including health assessments, vegetation monitoring and any adaptive management employed.

Final Report

Following the completion of the fifth year of monitoring, a final report will be completed that will assess the overall success of the monitoring program. The final report will summarize all long-term monitoring activities for five years of post-construction monitoring and will discuss any observed differences in individual or group behaviors in the translocated, recipient, and/or control populations; overall tracking of health assessments for each individual; an overview of the 5-years of vegetation monitoring; and any adaptive management employed throughout the long-term monitoring period and an assessment of the success of each adaptive management strategy (see section 5.3 below).

5.1.4 Key Resources

<u>Project Proponent</u>
Desert Sunlight Holdings, LLC (c/o First Solar, Inc.)
1111 Broadway St, 4th Floor
Oakland, CA 94607
(510) 625-7400
Contact: Kim Oster
koster@firstsolar.com

<u>Lead Translocation Biologist</u>
PMB 613
1539 N. China Lake Boulevard
Ridgecrest, CA 93555
(760) 954-0645
Contact: Rachel Woodard
rachwoodard@earthlink.net

<u>Biological Monitoring</u>
Ironwood Consulting
20 Nevada St., Suite 300
Redlands, CA 92373
(909) 798-0330
Contact: Kathy Simon
Kathy@ironwoodconsultinginc.com

<u>Bureau of Land Management</u>
California Desert District Office
22835 Calle San Juan De Los Lagos
Moreno Valley, CA 92553-9046
(951) 697-5223
Contact: Kim Marsden
Kim_Marsden@BLM.gov

<u>U.S. Fish and Wildlife Service</u>
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Rd., 101
Carlsbad, CA 92011
760.431.9440 x 354 ph
Contact: Jody Fraser
jody_fraser@fws.gov

California Department of Fish and Game
Inland Deserts Region
3602 Inland Empire Blvd Suite C220
Ontario, CA 91764
(909) 484-0167
Contact: Magdalena Rodriguez
mcrodriguez@dfg.ca.gov

5.2 SCE Project Components

5.2.1 Monitoring During Construction

All activities will be the same as the construction monitoring and translocation monitoring discussed above in Section 5.1.1 for the Solar Farm Site and Gen-Tie Line.

During project construction, all desert tortoise fencing at the substation be monitored daily and, if necessary, repaired or replaced until a perimeter wall for the substation is built, at which time no further monitoring will be conducted for this component.

All site entrances and equipment moving outside the substation will be monitored by Approved and/or Authorized biological monitors.

Any tortoise being held in situ will be monitored at leas:t

- Once a day during first week
- Once a week for the following three weeks
- Twice per month until the Final Disposition Plan is approved and the individual is translocated

5.2.2 Long-Term Monitoring

All tortoises actively translocated from the Red Bluff Substation will be placed into a long-term monitoring program. Transmitters will be changed as necessary throughout the monitoring period as necessary to maintain battery life. At the end of the 5-year monitoring period, coordination with USFWS and CDFG will determine whether transmitters should be removed and decommissioned.

Translocated desert tortoises will be monitored as follows:

- Once within 24 hours of release
- A minimum of twice weekly for the first two weeks after release
- A minimum of once a week during the active season for the 5-year monitoring period
- Once every other week during the non-active season the duration of the 5-year monitoring period

Resident and control desert tortoises will not be monitored for the Red Bluff Substation and related components because, since less than 5 desert tortoises will be translocated, no such monitoring is required by the regulatory agencies.

5.2.3 Reporting

Reporting during translocation activities, long-term monitoring, annual reporting and final report will be the same as set forth above in Section 5.1.3 for the Solar Farm Site and Gen-Tie Line.

5.2.4 Key Resources

Project Proponent
Southern California Edison
2244 Walnut Grove Avenue
Rosemead, CA 91770
(626) 302-1117
Contact: Paul Yamasaki
Paul.Yamasaki@sce.com

Bureau of Land Management
California Desert District Office
22835 Calle San Juan De Los Lagos
Moreno Valley, CA 92553-9046
(951) 697-5223
Contact: Kim Marsden
Kim_Marsden@BLM.gov

U.S. Fish and Wildlife Service
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Rd., 101
Carlsbad, CA 92011
760.431.9440 x 354 ph
Contact: Jody Fraser
jody_fraser@fws.gov

California Department of Fish and Game
Inland Deserts Region
3602 Inland Empire Blvd Suite C220
Ontario, CA 91764
(909) 484-0167
Contact: Magdalena Rodriguez
mcrodriguez@dfg.ca.gov

5.3 Roles and Responsibilities

The Applicant and SCE will each appoint an Environmental Compliance Manager (ECM), Lead Translocation Biologist (LTB), and Designated Biologist (DB) who will be responsible for the implementation of all desert tortoise translocation activities. The LTB and DB can be the same person if they meet the qualifications for both positions. If at any time a change is proposed to the ECM, LTB and/or DB, the Applicant and SCE will obtain concurrence with the experience of new personnel from BLM, USFWS, and CDFG.

5.3.1 Environmental Compliance Manager

The Environmental Compliance Manager (ECM) will be independently or jointly assigned by the Applicant and SCE for their components of the Project. The ECM will be responsible for facilitating the implementation of all environmental management components of the project, including avoidance, minimization and mitigation measures for air quality, water quality and streambed permits, and other biological permits. The name, contact info, and qualifications of the ECM(s) will be listed in the Project's *Final Biological Resources Mitigation, Implementation, and Monitoring Plan*.

The ECM will have specific experience in the implementation of similar environmental compliance programs. The ECM will complete an extensive training program with the Project's Designated Biologist(s) and work closely together to ensure compliance with all environmental avoidance, minimization, and mitigation measures for the Project.

5.3.2 Lead Translocation Biologist

The Lead Translocation Biologist (LTB) will be independently or jointly assigned by the Applicant and SCE for their components of the Project. The LTB will be responsible for facilitating the implementation of avoidance, minimization and mitigation measures for the desert tortoise translocation effort under this plan and the Final Disposition Plan.

The name, contact info, and qualifications of the DB(s) will be listed in the Project's *Final Biological Resources Mitigation, Implementation, and Monitoring Plan* and their resume(s) will have been previously confirmed by BLM, USFWS, and CDFG as appropriate individuals for this position.

The LTB will have specific experience in the implementation of similar desert tortoise translocation programs. The LTB will complete an extensive training program with the Project's ECM(s) and work closely together to ensure compliance with all desert tortoise avoidance, minimization, and mitigation measures for the Project. In addition, the LTB will hold a Bachelor's or higher degree in Biological Sciences, Zoological Sciences, or a related field and will have at least five years of field experience in California desert habitats and desert tortoise handling.

5.3.3 Designated Biologist

The Designated Biologist (DB) will be independently or jointly assigned by the Applicant and SCE for their components of the Project. The DB will be responsible for facilitating the implementation of avoidance, minimization and mitigation measures for streambed permits and other biological permits.

The name, contact info, and qualifications of the DB(s) will be listed in the Project's *Final Biological Resources Mitigation, Implementation, and Monitoring Plan* and their resume(s) will have been previously confirmed by BLM, USFWS, and CDFG as appropriate individuals for this position.

The DB will have specific experience in the implementation of similar environmental compliance programs. The DB will complete an extensive training program with the Project's ECM(s), LTB(s) and work closely together to ensure compliance with all biological avoidance, minimization, and mitigation measures for the Project. In addition, the DB will hold a Bachelor's or higher degree in Biological Sciences, Zoological Sciences, or a related field and will have at least five years of field experience in California desert habitats.

5.4 Adaptive Management

The applicant made key decisions to ensure that each phase of Project development was evaluated to attempt to reduce potential adverse effects to desert tortoise. These included the siting, design, construction, operation, and post-operation phases of the Proposed Action.

In addition to the specific Project measures described below, Sunlight and SCE are committed to an adaptive management approach that supports flexible decision making and can be adjusted as the effects of the Proposed Action are better understood, including achievement of the purpose and goals of this plan (Section 1.0). Any adaptive management actions will be proposed by the Project's ECM, LTB, and DB in response to specific management issues that arise that pose a threat to translocated or recipient tortoises. Adaptive management strategies will be coordinated with BLM, USFWS and CDFG.

5.4.1 Solar Farm Site and Gen-Tie Line

Desert Sunlight Holdings evaluated a larger Project Study Area (PSA) when determining the siting of the Solar Farm Site. Areas of DWMA, CHU, and known or modeled higher desert tortoise density were avoided when siting the current Solar Farm Site.

Project design has incorporated features to reduce adverse effects to desert tortoise, including:

- ♦ Limiting vegetation disturbance and grading to the smallest area possible
- ♦ Working closely with Project biologists to improve desert tortoise exclusion features such as fencing and gates

During the construction and the operations and maintenance (O&M) phases of the project, the following best management practices (BMPs) will be incorporated to reduce adverse effects to desert tortoise:

1. Speed limits on all unpaved areas of the Project will be a maximum of 15 miles per hour.
2. No dogs or firearms will be allowed on the project site during construction or O&M.
3. Construction and O&M activities will be limited to daylight hours to the extent possible.
4. Trash will always be contained within raptor and raven-proof receptacles and removed from the site frequently, including trash collected in vehicles in the field.
5. Water required for construction purposes will be transported throughout the site in enclosed water trucks.
6. Water sources for the project (such as wells) will be checked periodically by biological monitors to ensure they are not creating open water sources through by leaking or consistently overfilling trucks.
7. All vehicles leaking fuel or other liquids will be immediately removed to the staging area and repaired – all vehicles will carry spill materials and all spills will be cleaned up promptly and disposed of correctly.
8. A formal Worker Environmental Awareness Program will be completed for every individual on all Project components. This Program will include formal classroom training. All individual completing training will sign a sign-in sheet and receive wallet cards and stickers to show they have completed this training. The training will include the following information and include photos of all resources:

    a. Discussion of the desert ecosystem, vegetation and wildlife communities on the project site
    b. Discussion of desert tortoise ecology and known tortoise activity found on the Project components being constructed
    c. Legal drivers, permitting, and penalties related to avian and bat protection
    d. Project-specific desert tortoise protection measures
    e. Worker responsibilities and biological monitor responsibilities, including the authority for biological monitors to halt project activities

Post-construction activities will avoid disturbing areas of native vegetation adjacent to the project site. In addition, any restoration and reclamation activities that take place during the decommissioning phase of the Project will take into account vegetation appropriate to support desert tortoise.

Results of long-term monitoring will be used to aid in making management decisions for the Project. Should adaptive management become necessary for any reason, the Lead Translocation Biologist for the Project will immediately inform the key personnel of the conditions causing management concern and possible avenues to correct these conditions. All key personnel for the Project will agree on the scope and direction of adaptive management actions prior to them being implemented except in the case of immediate threat to one or more desert tortoise. In cases of immediate threat, the Lead Translocation Biologist will direct activities to avoid or minimize the immediate threat and contact the key personnel within 3 days afterwards with information on the threat and actions taken to avoid or minimize the impacts, as well as actions recommended to avoid similar threats in the future.

5.4.2 SCE Project Components

SCE evaluated two alternative sites for the proposed Red Bluff Substation and related components, and investigated larger areas for these facilities than they will cover in order to avoid sensitive resources such as active desert tortoise burrows. SCE's Project design, construction, and operations and maintenance (O&M) phases of the project, include the same project design features and BMPs discussed above to reduce adverse effects to desert tortoises.

Post-construction activities will avoid disturbing areas of native vegetation adjacent to the project site. In addition, any restoration and reclamation activities that take place during the decommissioning phase of the Project will take into account vegetation appropriate to support desert tortoise. Adaptive management actions will follow those discussed above in Section 5.3.1 for the Solar Farm Site and Gen-Tie Line.

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Habitat Compensation Plan

HABITAT COMPENSATION PLAN

DESERT SUNLIGHT SOLAR FARM PROJECT

BLM CASE FILE NUMBER CACA-48649

RIVERSIDE COUNTY, CALIFORNIA

Prepared for:
BUREAU OF LAND MANAGEMENT
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December 17, 2010

Table of Contents

List of Tables

List of Figures

List of Acronyms

AC	Alternating Current
ARRA	American Recovery and Reinvestment Act
BLM	U.S. Bureau of Land Management
CDFG	California Department of Fish and Game
CHU	Critical Habitat Unit
DOI	U.S. Department of the Interior
DPV 1	SCE's Devers to Palo Verde 1 transmission line
DRECP	Desert Renewable Energy Conservation Plan
DWMA	Desert Wildlife Management Area
IMS	Interim Mitigation Strategy
kV	Kilovolt
MW	Megawatt
MWD	Metropolitan Water District
NECO	North and Eastern Colorado Plan and Final Environmental Impact Statement
NFWF	National Fish and Wildlife Federation
PEP	Potassium Excretion Potential
PV	Photovoltaic
SB	Senate Bill
SCE	Southern California Edison
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

1.0 Introduction

This discussion provides a brief summary of the project description for the Applicant and SCE project components of the Proposed Action. Complete details of project locations and description are found in the *Desert Sunlight Solar Farm Final Environmental Impact Statement* (BLM 2010) and in the Biological Assessment, *Desert Sunlight Solar Farm Project* (Ironwood 2010).

Desert Sunlight has applied to the BLM for an issuance of a right-of-way (ROW) grant that would authorize construction, operation, maintenance, and decommission of a commercial solar power-generating facility and new substation facility on over 7,600 hectares (19,000 acres) of BLM-managed lands. The proposed project is located in Riverside County, California, approximately 6 miles north of the rural community of Desert Center and approximately (10.5 kilometers or 6.5 miles north of the Interstate 10 corridor (Figure 1). Project components generally include construction, operation, and maintenance of the solar farm site, a gen-tie transmission line, and construction, operation and maintenance of the Southern California Edison (SCE) Red Bluff substation and related components (Figure 2). While the Red Bluff substation is included as part of this project description for planning and environmental considerations, it would be constructed, owned, and operated by SCE, not by the Applicant.

The Applicant and SCE have prepared this Mitigation Plan in accordance with regulatory agency guidance to provide further details regarding the proposed mitigation for impacts to biological, vegetation and other resources that potentially or actually will be affected by the Proposed Action.

The purposes of this document are to provide:

1. Ratios for mitigation of biological resources for the Solar Farm Site, Gen-Tie Line, and SCE Components of the Proposed Project;
2. A calculation of the number of acres that will be required of in-kind mitigation for the implementation of the Proposed Project and associated additional costs for burrowing owl burrow mitigation and raven management;
3. Applicant and SCE avoidance and minimization measures that will be implemented for the protection of biological resources or minimizing of impacts to these resources; and
4. Information on how obligations for providing mitigation and compensation will be met.

2.0 Calculation of Mitigation Requirements

The Applicant contemplates that the mitigation set forth in this document would compensate for all mitigation required by the BLM, U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDFG), and any other applicable agencies, in connection with potential or actual impacts to biological and vegetation resources that may or will be affected by the Proposed Action. This section provides calculations of ratios and mitigation requirements for such mitigation. Supporting data and maps for these calculations are presented in Appendix A.

2.1 Ratios

The ratios in Table 1 below were used to calculate mitigation acreage for the Solar Farm Site, Gen-Tie Line and SCE Project Components. The basis of the calculations is set forth in Appendix A. If more than one of these resources was present in the same location, the higher ratio was used for mitigation calculations.

Table 1. Mitigation Ratios for Desert Sunlight Solar Farm Project

Ratios	Type of Impact Areas
5:1	Desert Wildlife Management Area (DWMA) Designated Critical Habitat (CHU)
3:1	Desert wash woodland CDFG jurisdictional drainage areas
2:1	Areas of moderate desert tortoise density
2:1 for 6.5 acres each	Per occupied burrow of burrowing owls
1:1	Areas of low desert tortoise density

In additional to the above ratios, a fee of $105 per acre is required for regional raven mitigation under the October 2010 Draft Summary *Renewable Energy Development in the California Desert: Common Raven Predation on the Desert Tortoise.*

2.2 Mitigation Requirements

2.2.1 Solar Farm Site and Gen-Tie Line

The total acreage for mitigation is calculated as 6,423 acres, based on the ratios above, as shown on Table 2 for the Solar Farm Site and Gen-Tie Line, assuming the Proposed Action will be represent the reduced Solar Farm footprint of 3,912 acres and Gen-Tie alternative A-1. At the completion of the Final EIS and selection of the final Proposed Action, final compensation will be calculated based on the footprint and acreage of the components of the final Proposed Action. If Gen-Tie alternative A-2 is chosen, impacts to the DWMA, CHU, drainages and desert tortoise habitat will be slightly less (totaling approximately 6,124 acres) because (1) Gen-Tie alternative A-2 is slightly shorter than A-1, and (2) portions of Gen-Tie A-2 cross areas that do not support habitat for desert tortoise or many other native species (abandoned agriculture).

Table 2. Proposed Mitigation for Desert Sunlight Solar Farm Site and Gen-Tie Line

Resource	Acres of Impact	Ratio	Acres of Mitigation
DWMA CHU	50 37	5:1	250 185
Desert dry wash woodland CDFG jurisdictional drainage areas	73 200	3:1	219 600
Occupied burrows of burrowing owls	2 occupied burrows	2:1 for 6.5 acres each	26
Areas of moderate desert tortoise density	1,214	2:1	2,428
Areas of low desert tortoise density – within the Solar Farm	2,698	1:1	2,698
Areas of low desert tortoise density – within the Other Project Components	17	1:1	17
TOTAL PROPOSED MITIGATION REQUIREMENT			**6,423 acres**

In addition to these requirements, the calculation for raven management fees is presented below in Table 3. These calculations are based on the October 2010 Draft Summary *Renewable Energy Development in the California Desert: Common Raven Predation on the Desert Tortoise*.

Table 3. Raven Management Acreages for Desert Sunlight Solar Farm and Gen-Tie Line

Resource	Acres of Impact
Solar Farm Site	3,912
Gen-Tie Line	104
TOTAL ACREAGE FOR RAVEN MITIGATION	**4,016 acres**

2.2.2 SCE Project Components

The total acreage for mitigation is calculated as shown on Table 4 for the SCE Project Components.

Table 4. Proposed Mitigation for SCE Project Components

Resource	Acres of Impact	Ratio	Acres of Mitigation
DWMA and CHU	149	5:1	745
Telecommunications Site (disturbed creosote bush scrub)	0.5	1:1	0.5
TOTAL PROPOSED MITIGATION REQUIREMENT			**746 acres**

In addition to these requirements, the calculation for raven management fees is presented below in Table 5. These calculations are based on the October 2010 Draft Summary *Renewable Energy Development in the California Desert: Common Raven Predation on the Desert Tortoise*.

Table 5. Raven Management Acreage for SCE Project Components

Resource	Acres of Impact
Red Bluff Substation	149

3.0 Mitigation

The Applicant and SCE will ensure that all impacts discussed in the *Biological Assessment for the Desert Sunlight Solar Farm Project* (Ironwood 2010a) are minimized and fully mitigated. Avoidance and minimization measures for the project are discussed in this section, as well as mitigation alternatives and funding to compensate for the identified impacts to biological resources.

3.1 Avoidance and Minimization Measures

The following measures are included in the Project's Biological Assessment (Ironwood 2010a) and Draft Environmental Impact Statement (DEIS; BLM 2010) and will be adopted by the project to ensure that all potential avoidance and minimization measures will be followed for biological resources. They also qualify as Mitigation Measures under the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA). This section summarizes both desert tortoise specific measures (as the only federally-and state-listed species at the project site), and general avoidance and minimization measures that will assist in the protection of many biological resources. A more detailed discussion of these measures is found in the Biological Assessment.

3.1.1 Desert Tortoise-Specific Protection Measures

- Desert Tortoise Translocation Plan
- Desert tortoise exclusion fencing
- Desert tortoise avoidance during construction of linear features
- Pre-construction clearance surveys
- Avoidance during operations and maintenance
- Common Raven Management Plan

3.1.2 General Protection Measures

- Environmental Inspection and Compliance Monitoring Program
- Worker Environmental Awareness Program
- Best Management Practices
- Integrated Weed Management Plan
- Dust Control Plan
- Storm Water Pollution Prevention Plan
- Spill Prevention Control and Countermeasure Plan
- Waste Management

3.2 Mitigation and Compensation

The Applicant and SCE are prepared to implement necessary mitigation and compensation for impacts to protected wildlife species as required by BLM, the CDFG and USFWS. The Applicant and SCE understand that at present CDFG and the other cooperating Renewable Energy Action Team (REAT) agencies are still in the process of developing and implementing the mitigation options available under SB X8 34 (SB 34). The Applicant and SCE also understands that the CDFG and REAT agencies want to provide flexibility to make decisions as to the appropriate pathway for providing mitigation, whether through the SB 34 options or through other means (e.g. land acquisition with enhancement and endowment fees). The Applicant and SCE expect that, simultaneous with the Section 7 consultation with USFWS, the SB 34 options will become more developed by CDFG and a final decision can be made by the Applicant and SCE. At present, Applicant and SCE evaluating and will be prepared to implement the following potential mitigation options.

3.2.1 Solar Farm and Gen-Tie Line

Mitigation and/or compensation will be accomplished either by (1) payment of an in lieu fee or use of the "advance mitigation" option, which are the two closely related, but distinct, mitigation pathways contained in SB 34, (2) acquiring mitigation land or conservation easements, or (3) a combination of the two. Adequate funding will be provided by the Applicant to accomplish both the avoidance and minimization measures listed above, and to provide the mitigation and compensation discussed in this section. The Applicant will provide a letter of credit, or other appropriate security to ensure the availability of funds for the required mitigation measures.

SB 34

SB 34 authorizes CDFG, in consultation with the BLM and USFWS, to develop mitigation actions, including advance mitigation and interim mitigation strategies, to fully mitigate the impacts of the potential or actual take of state- listed threatened, endangered, or candidate species associated with the development of solar energy projects that are eligible for federal American Recovery and Reinvestment Act (ARRA) funding, and are proposed for siting in the California Desert in the Desert Renewable Energy Conservation Plan (DRECP) planning area. The Applicant understands that BLM and USFWS are cooperating in establishing mitigation under SB 34 that will cover the mitigation requirements of all the REAT agencies.

An "in-lieu" fee or mitigation account option, whereby CDFG, BLM and USFWS would use mitigation fees to implement the individual permit specific project mitigations to assist the project in completing land acquisition obligations. The Project has paid the $75,000 required to use this in-lieu fee option. The amount of in-lieu fee will be determined in cooperation with CDFG in accordance with the Interim Mitigation Strategy. The in-lieu fee may be used for some or all of the Project's mitigation requirements and will follow Appendix E of the IMS, the *Biological Resource Compensation/Mitigation Costs for In-Lieu Fee Implementation* (presented as Appendix B to this document).

The second SB 34 mitigation option is known as "advance mitigation" and involves CDFG's direct purchase of mitigation lands that will be used as a land bank in which qualified projects can purchase credits to meet all or a portion of their mitigation obligations. Applicant understands that CDFG is still in the process of setting up this land bank process and the precise details of this program are not yet fully known. Examples of these details include the amount of credits available, the schedule for their availability, and their price have not yet been set to the Applicant's knowledge. Applicant is potentially interested in this approach and is actively monitoring its development and discussing this mitigation alternative with CDFG.

Land Acquisition

One other alternative for the Applicant to mitigate or compensate (alone or in combination with SB 34 mitigation) for the potential project impacts is traditional mitigation through direct land acquisition or establishment of conservation easements. Under this alternative, the Applicant would acquire mitigation land or conservation easements within the Eastern Colorado Recovery Unit for desert tortoise (USFWS 2008) and within the Chuckwalla Valley and BLM's Northern and Eastern Colorado Desert (NECO) Plan area (BLM 2002), and enable the transfer of the land or easements to the National Fish and Wildlife Federation (NFWF) or to another third party land manager approved by the BLM, USFWS and CDFG.

The Applicant has researched many of the private land parcels in the region to determine their habitat comparability with habitats present at the Solar Farm Site and Gen-Tie Line and to evaluate other factors important to USFWS and CDFG for suitable mitigation land. Once the SB 34 options are better developed and Applicant's mitigation ratios and key land requirements are discussed with USFWS and

CDFG, Applicant is prepared to proceed quickly with a land acquisition schedule and endowment funding strategy utilizing this option, if chosen.

Raven Mitigation

Table 6 calculates the amount of raven mitigation required by October 2010 Draft Summary *Renewable Energy Development in the California Desert: Common Raven Predation on the Desert Tortoise.*

Table 6. Raven Mitigation for Solar Farm and Gen-Tie Line

Total Acres	Cost Per Acre (based on 30-year lease)	Total Cost
4,016	$105	**$421,680**

3.2.2 SCE Project Components

SCE's Mitigation and/or compensation will be accomplished either by (1) payment of an in lieu fee or use of the "advance mitigation" option, (2) acquiring mitigation land or conservation easements, or (3) a combination of the two. Adequate funding will be provided by SCE to accomplish both the avoidance and minimization measures listed above, and to provide the mitigation and compensation discussed in this section. SCE will provide a letter of credit, or other appropriate security to ensure the availability of funds for the required mitigation measures.

Raven Mitigation

Table 7 calculates the amount of raven mitigation required by October 2010 Draft Summary *Renewable Energy Development in the California Desert: Common Raven Predation on the Desert Tortoise.*

Table 7. Raven Mitigation for SCE Project Components

Total Acres	Cost Per Acre (based on 30-year lease)	Total Cost
149	$105	**$15,645**

4.0 References

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Appendix D-1
Detailed Explanation of Acreage Calculations

Detailed Explanation of Acreage Calculations

Methods

Information in the following determination was calculated in GIS and include the following reports, also listed in the reference section of this document:

- Calculations of plant community acreage (Ironwood Consulting 2010b);
- Calculations of desert washes and CDFG jurisdictional areas from the *Identification and Delineation of Areas Potentially Subject to Jurisdiction under the California Department of Fish and Game Lake and Streambed Alteration Agreement Program, Desert Sunlight Solar Farm Project* (Ironwood Consulting and Huffman-Broadway Group 2010);
- Calculations conducted for the acreage of DWMA and CHU within the footprint of the project components (BLM 2010);
- Focused survey data for desert tortoise surveys conducted in 2008 through 2010 following protocols created and approved by the USFWS and CDFG (Ironwood Consulting 2010b);
- Incidental data of desert tortoise sightings and sign found by other surveys including full coverage plant surveys, jurisdictional waters surveys, archaeological surveys of the Solar Farm site (Ironwood Consulting 2010b);
- Baseline data for general vegetation and wildlife resources at random fixed points within the Solar farm Site, proposed desert tortoise recipient sites, and additional control sites on BLM managed lands near the Project boundaries (Ironwood 2010b);
- Percent cover of high Potassium Excretion Potential (PEP) plants from baseline vegetation data (Oftedal 2002);
- Calculations of soil mapping (AECOM 2010);
- Modeling of desert tortoise habitat conducted by the U.S. Geological Survey (USGS) in 2009 (Nussear et al 2009); and
- The *Northern and Eastern Colorado Desert Coordinated Management Plan and EIS* (NECO; BLM 2002).

Definitions

<u>DWMA and CHU</u>

Areas previously designated by the BLM and/or USFWS as Chuckwalla DWMA and CHU which overlap with the Applicant Gen-Tie Line and the SCE project components.

<u>Desert Wash Woodland</u>

This community is described in *Preliminary Descriptions of the Terrestrial Natural Communities of California* (1986) and the NECO Plan (BLM 2002) as drought-deciduous, small-leaved (microphyllous) trees, often leguminous, in association with sandy or gravelly washes with braided channels in active alluvial fans. Dominant plants species associated with this community include ironwood (*Olneya tesota*), blue palo verde (*Cercidium floridum*), and smoke tree (*Psorothamnus spinosa*).

CDFG Jurisdiction
These areas are defined by CDFG as features with:

- identifiable surface or subsurface flow;
- identifiable biological components associated with surface or subsurface flow;
- a recognizable lateral extent of surface or subsurface flow.

Burrowing Owl Burrows
For each occupied burrowing owl burrow found on the Project components, burrow enhancement or creation at a ratio of 2:1 is required. During all surveys of the site, two burrowing owls were observed on the Solar Farm Site. Assuming all owls observed could represent an occupied burrow at the time of pre-construction passive relocation, this would represent the maximum number required to offset impacts to occupied burrows.

Areas of Moderate and Low Desert Tortoise Density
It is appropriate to distinguish between moderate and low density desert tortoise habitat on the Solar Farm site. As described below, two areas of the Solar Farm provide significantly higher densities for desert tortoise than the majority of the site, which provides low densities. For this document, low densities were considered less than 1 tortoise per square kilometer and moderate densities between 1 and 10 tortoises per square kilometer, with the average for the larger Chuckwalla DWMA area estimated at 8.3 per square kilometer (USFWS 2008).

This distinction did not need to be made for the other Project components for the following reasons:

1. The majority of the Gen-Tie Line is located within DWMA and/or CHU and thus has a mitigation ratio of 5:1. Areas outside DWMA and CHU (and those other criteria above such as desert wash woodland and CDFG jurisdiction) were calculated at 1:1.
2. All SCE project components (except the telecommunication site discussed below) are within DWMA and CHU and are calculated at a 5:1 mitigation ratio.
3. The SCE telecommunications site is in a moderately disturbed area, near extensively used roads (including State Route 177), and supported no tortoise sign on or within the action area for the site. Mitigation for this area was calculated at 1:1 given the low habitat quality.

Background Information
Focused surveys of each project component were conducted between 2008 and 2010 according to then-current protocols (USFWS 1992, 2009, and 2010). Each area was only surveyed once with most areas surveyed in 2008 and additional areas surveyed in 2009 and 2010 as project components were added or altered. These surveys recorded two distinct concentrations of active tortoise sign (Figure 1) within the Solar Farm, with two live tortoises found in northern concentration and two in the southern concentration. A total of eight individual tortoises (four in the northern concentration and four in the southern concentration) were estimated to occur within the Solar Farm Site based on calculations using the formula described in the 2010 USFWS protocol.

Although the USGS habitat model for desert tortoise is useful in predicting desert tortoise density on a range-wide basis, it is not effective in closely assessing habitat suitability on a particular site. In conducting a site-specific assessment of habitat characteristics, we started with the habitat preferences

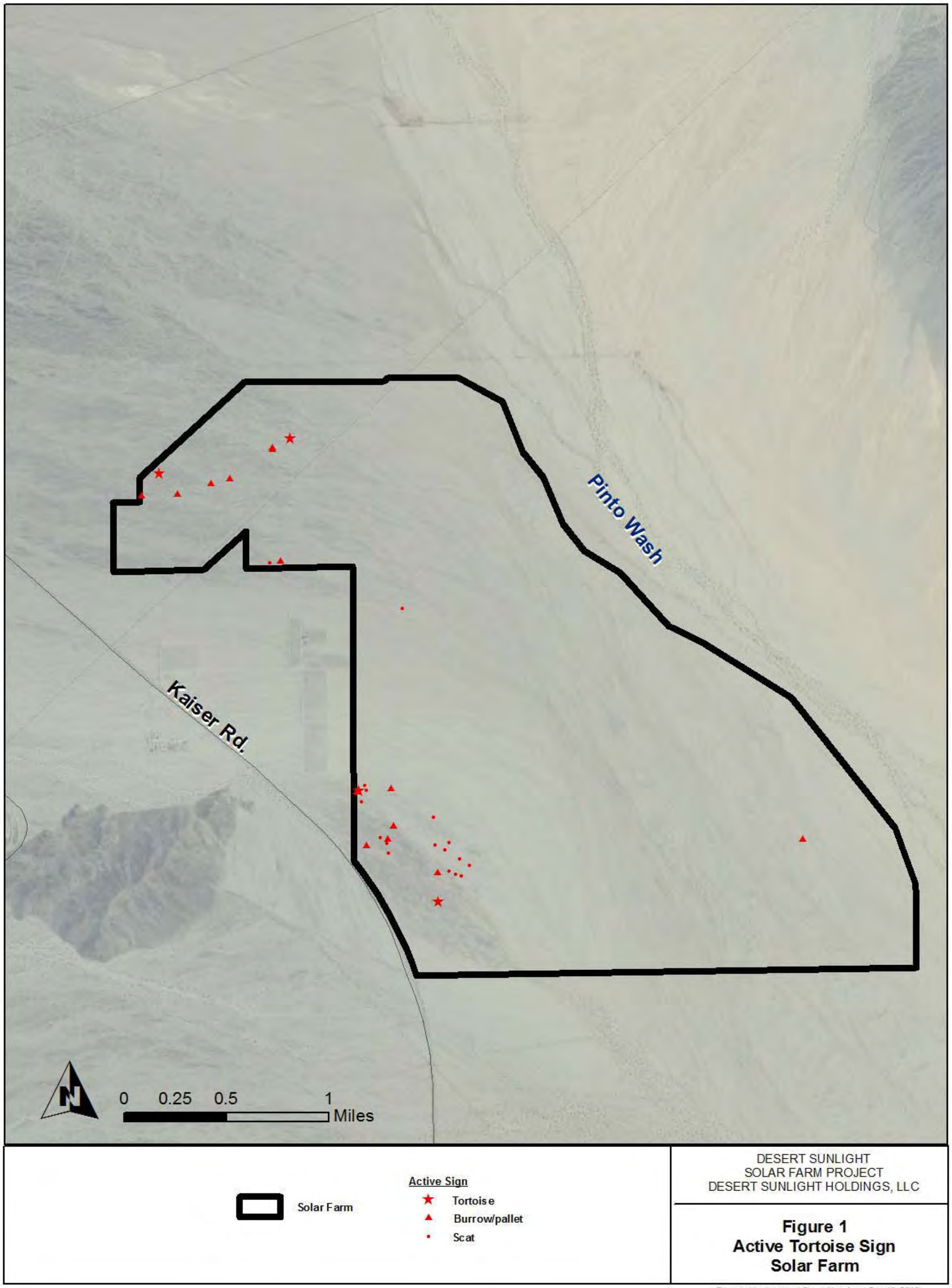


Figure 1
Active Tortoise Sign
Solar Farm

Prepared by Ironwood Consulting, Inc. - Dec 16, 2010

of the desert tortoise as they are briefly summarized in the following excerpt from the 2008 Draft Recovery Plan (USFWS 2008):

> "Tortoises occur most commonly on gently sloping terrain with sandy-gravel soils and where there is sparse cover of low-growing shrubs, which allows establishment of herbaceous plants. Soils must be friable enough for digging of burrows, but firm enough so that burrows do not collapse. Typical habitat for the desert tortoise in the Mojave Desert has been characterized as *Larrea tridentata* scrub where precipitation ranges from 5 to 20 centimeters (2 to 8 inches), the diversity of perennial plants is relatively high, and production of ephemerals is high."

Accordingly, consistent with this summary and studies that have examined the habitat requirements and limiting factors for this species (such as the numerous studies used to develop the USGS habitat model), we examined the site-specific geology and soils data, vegetation data (including data for plant species with high PEP values), drainage mapping, recent USGS modeling of desert tortoise habitat, and relevant data from site studies relating to other wildlife species.

Moderate Desert Tortoise Density

The locations where concentrations of desert tortoise appear to correlate with numerous other resources:

- Desert pavement areas (Figure 2) of older stabilized alluvial fan systems and well developed desert pavement where drainages were well defined and vegetation was more diverse.
- Incidental tortoise data (Figure 3) collected during additional full coverage and other surveys mimic those areas where desert tortoise sign was found during the focused tortoise surveys (two independent full-coverage survey efforts at 10-meter transect intervals resulted in the same distribution and pattern of active tortoise sign).
- Carcass data (Figure 4) from all biological surveys suggest that desert tortoises also inhabited the same areas in the past.
- Baseline sampling data from sampling stations (Figure 5) provided additional information on the value of habitat. The number of species observed during avian point counts were generally higher in habitats that correlated with active tortoise sign concentrations. Baseline vegetation sampling, which measured percent cover by species, was analyzed in terms of high PEP plant species. High PEP plants have been theorized as being critical to desert tortoise diet and nutrition. Plants with traditionally high PEP values that were recorded during baseline sampling and analyzed include *Camissonia brevipes*, *Camissonia claviformis*, *Chaenactis carpoclinia*, *Chaenactis fremontii*, *Chaenactis stevioides*, *Malacothrix glabrata*, and *Phacelia distans*. Percent cover of high PEP plants were found to be generally higher in habitats that correlated with active tortoise sign concentrations.

Once the moderate density areas were identified using the factors above, calculations of the size of active tortoise areas and subsequent estimated densities were based on the median desert tortoise home range sizes as described in the 2010 USFWS protocol (USFWS 2010): "The annual home range of a female desert tortoise averages around 0.15 to 0.16 km2 (35 to 40 acres), about one third the size of male home ranges, which are variable."

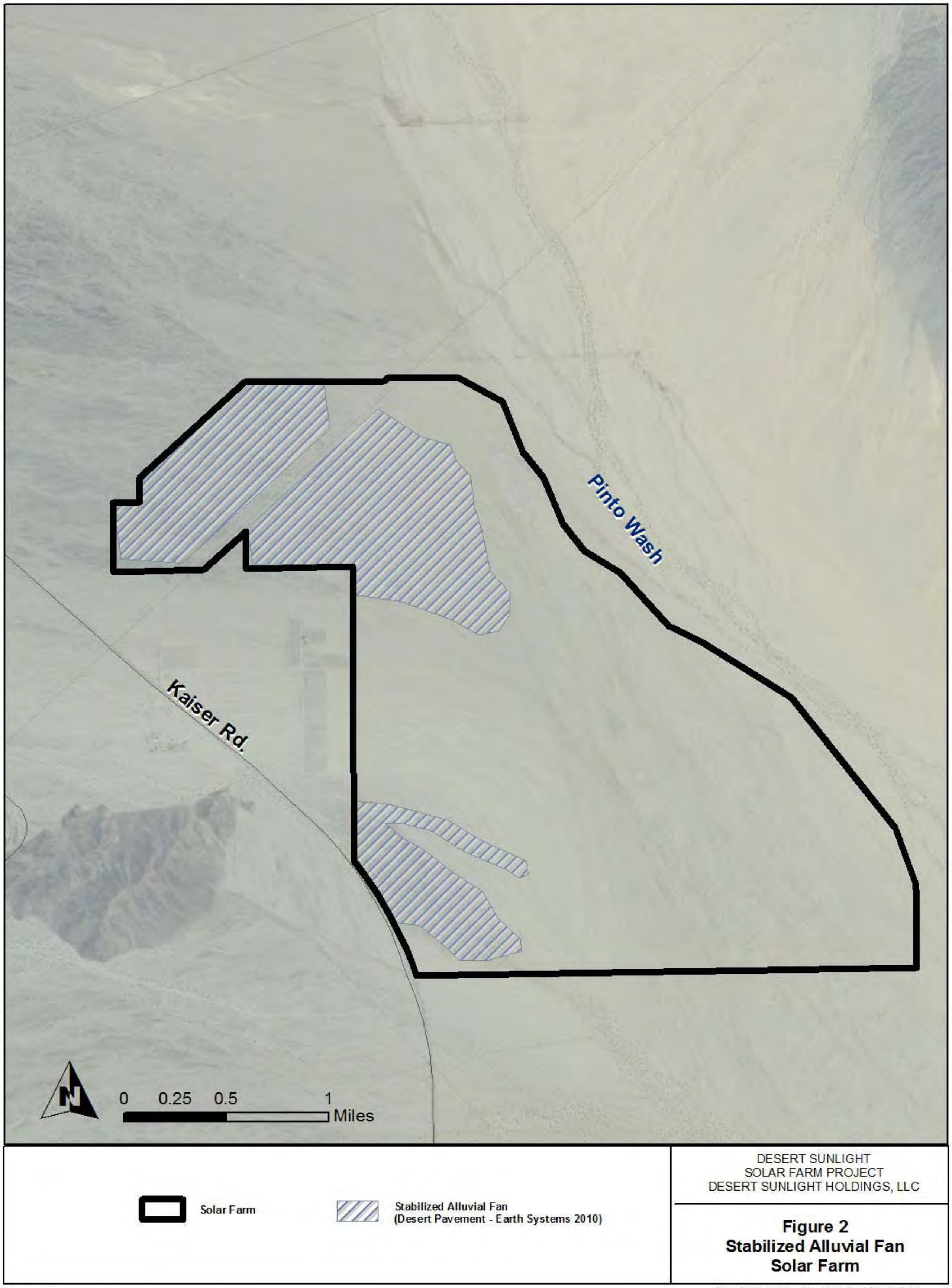


Figure 2
Stabilized Alluvial Fan
Solar Farm

Prepared by Ironwood Consulting, Inc. - Dec 16, 2010

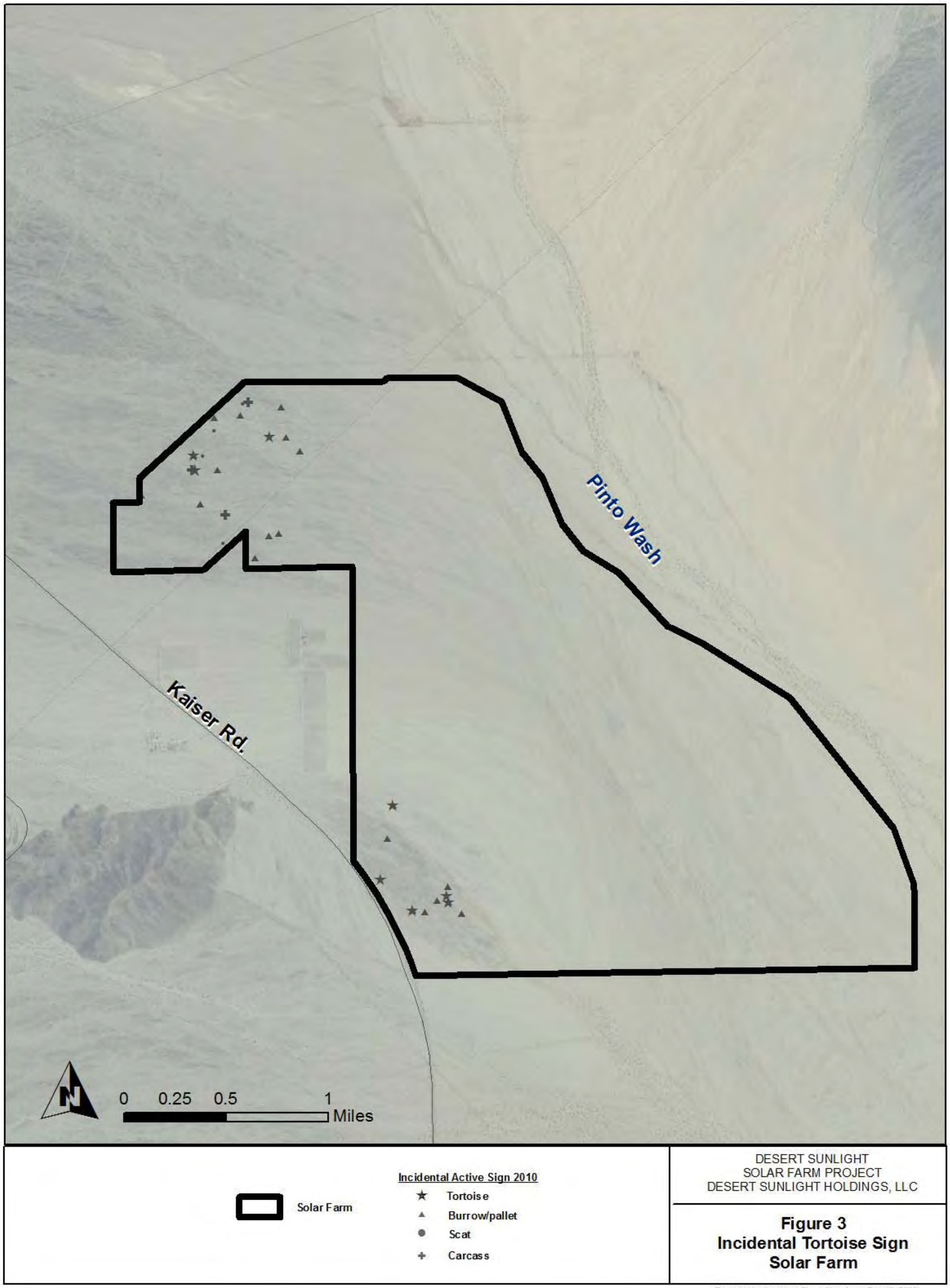
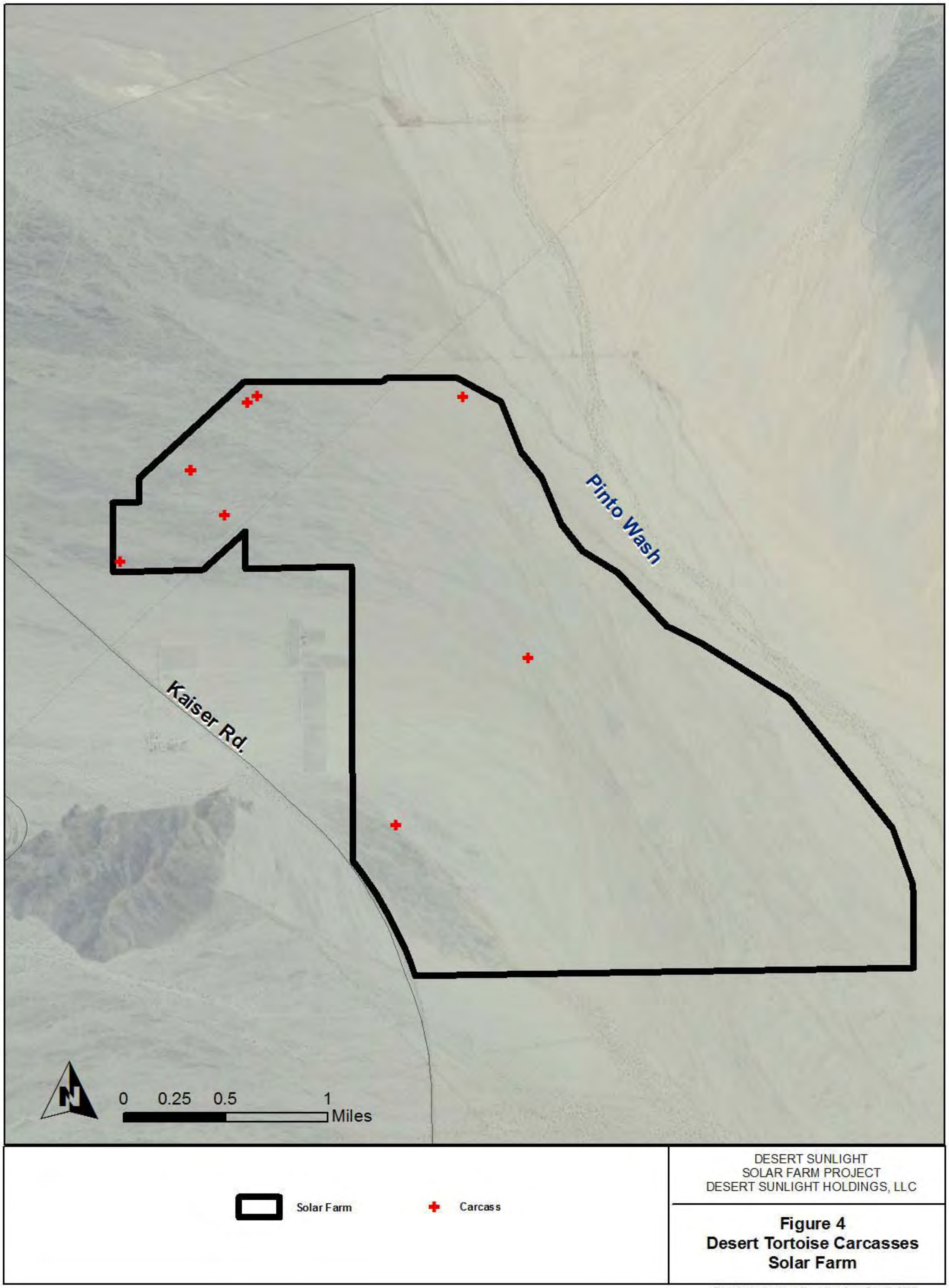


Figure 3
Incidental Tortoise Sign
Solar Farm

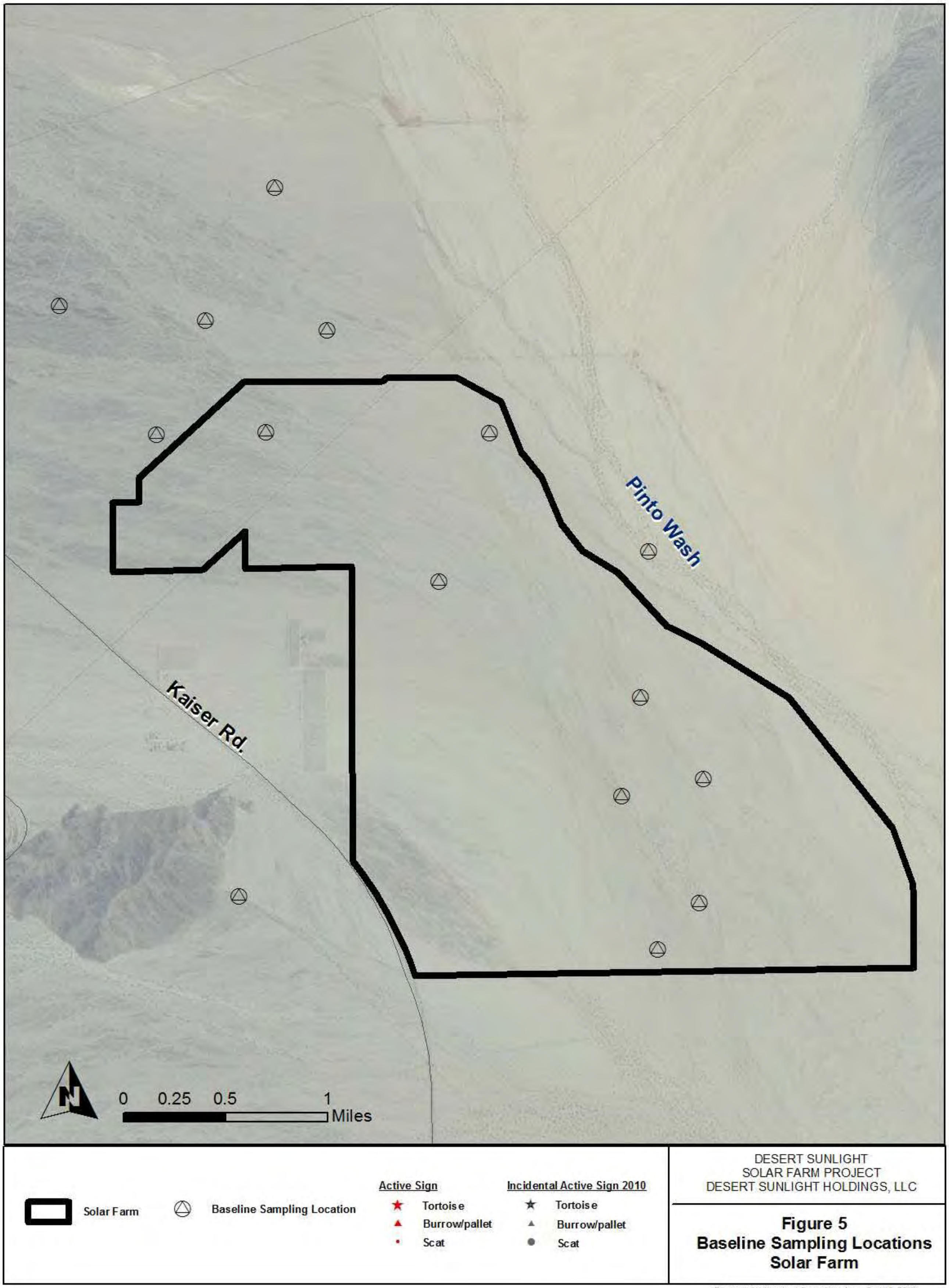
Prepared by Ironwood Consulting, Inc. - Dec 16, 2010



DESERT SUNLIGHT
SOLAR FARM PROJECT
DESERT SUNLIGHT HOLDINGS, LLC

Figure 4
Desert Tortoise Carcasses
Solar Farm

Prepared by Ironwood Consulting, Inc. - Dec 16, 2010



DESERT SUNLIGHT
SOLAR FARM PROJECT
DESERT SUNLIGHT HOLDINGS, LLC

Figure 5
Baseline Sampling Locations
Solar Farm

Prepared by Ironwood Consulting, Inc. - Dec 16, 2010

To calculate acreages to be mitigated at a ratio other than 1:1, the following criteria was used: median diameter of the female and male desert tortoise home range from any active desert tortoise burrow. These areas were modified to the final areas calculated for mitigation by the inclusion of:

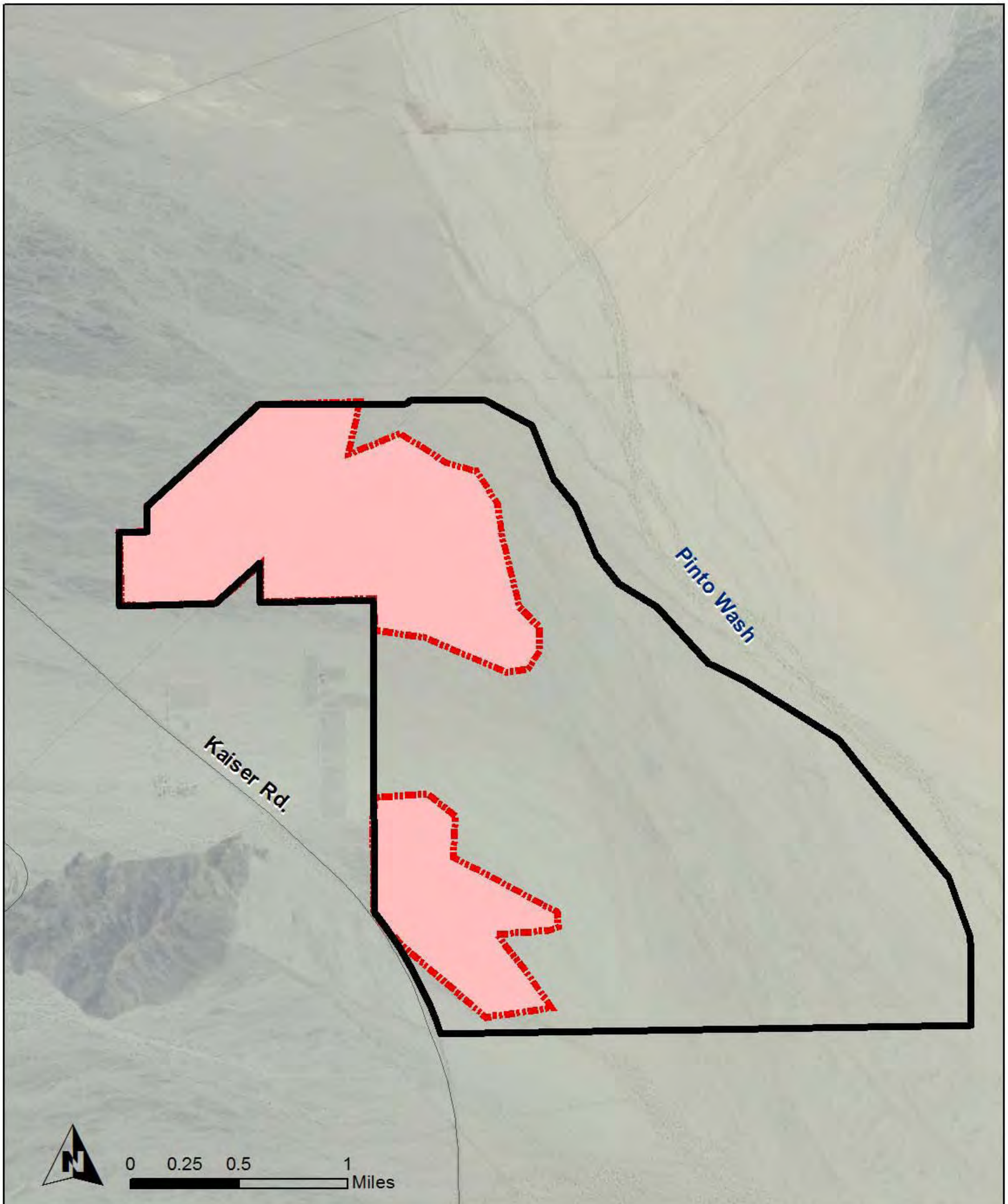
- all factors listed above that appear to correlate with moderate density areas of the Solar Farm Site
- any small inclusions within these areas of the project site
- edge smoothing to create comprehensive polygons

The resulting total area of moderate desert tortoise habitat in the two locations within the Solar Farm is 1,214 acres, with density of approximately 0.55 individuals per square kilometer (Figure 6).

Low Desert Tortoise Density
The locations where concentrations of desert tortoise were not found to correlate with:

1. Areas of younger, active alluvial deposits with less defined channels that support vegetation similar to that found in upland areas.
2. Areas are described by the USGS habitat model as potentially low predicted desert tortoise presence based on climate, topography, soils and biological characteristics of the site. As noted above, incidental active tortoise sign and carcass sign also correlated with these data and focused survey data (Figure 7).

The area of low desert tortoise habitat within the Solar Farm is 2,698 acres (Figure 6).



DESERT SUNLIGHT
SOLAR FARM PROJECT
DESERT SUNLIGHT HOLDINGS, LLC

Figure 6
Moderate Quality Habitat
Solar Farm

Prepared by Ironwood Consulting, Inc. - Dec 16, 2010

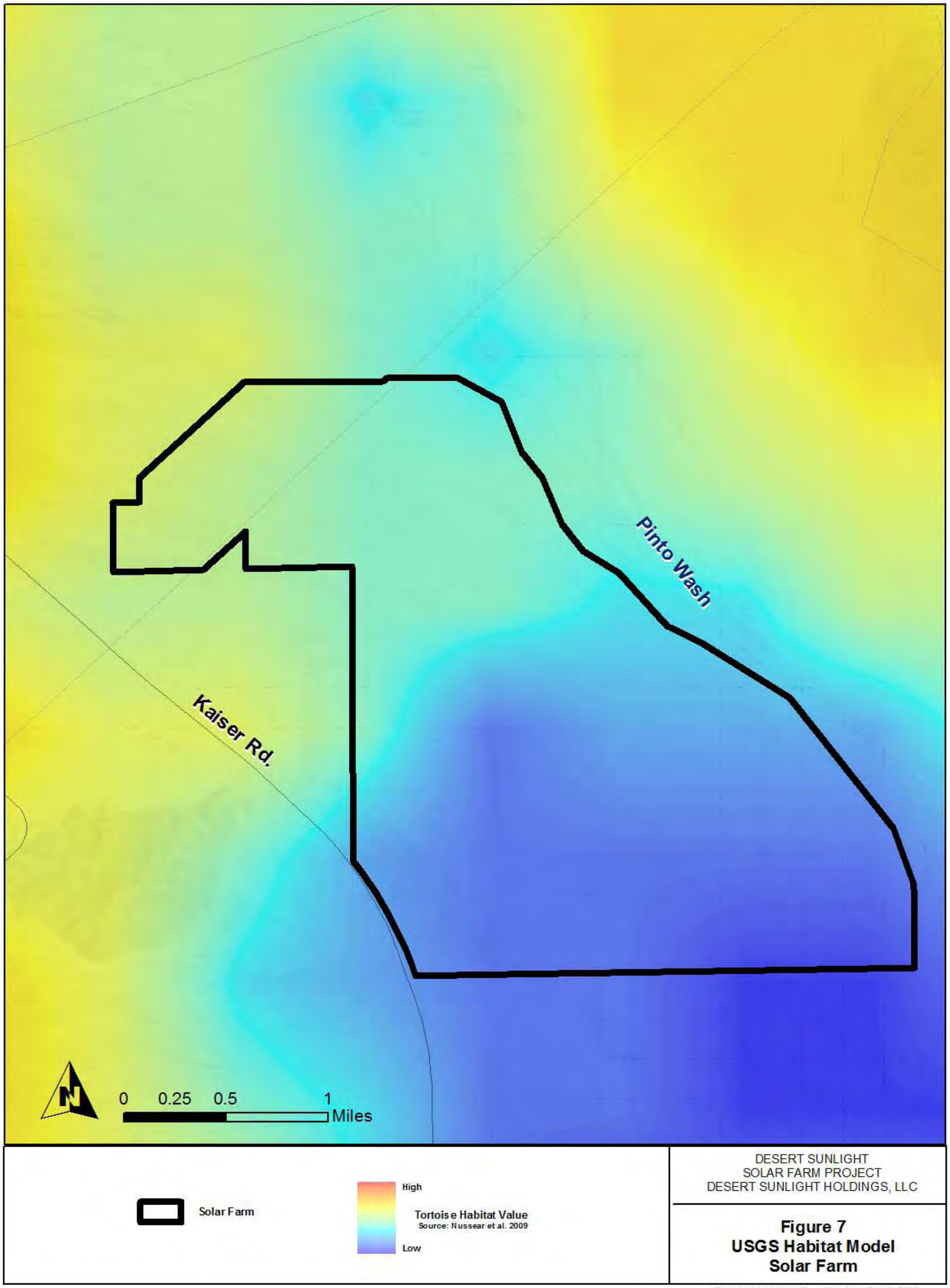


Figure 7
USGS Habitat Model
Solar Farm

Appendix D-2

Biological Resource Compensation/ Mitigation Costs for In-Lieu Fee Implementation

Senate Bill 34
Interim Mitigation Strategy
Biological Resource Compensation/Mitigation Costs for In-Lieu Fee Implementation

	Task	Cost		
		Imperial, Riverside (excluding Coachella Valley), San Bernardino Counties	Kern County	LA County
1.	Land Acquisition[1]	$1,000	$3,000	$10,000
2.	Level 1 Environmental Site Assessment (per acre)	$75/acre		
3.	Appraisal	$5,000/parcel[2]		
4.	Initial site work – clean-up, enhancement, restoration (per acre)	$290/acre		
5.	Closing and Escrow Costs – 2 transactions at $2,500 each; landowner to 3rd party and 3rd party to agency	$5,000 for 2 transactions $2,500 for single transaction if lands come to DFG		
6.	Endowment for long-term Management and Maintenance (LTMM) – includes land management; enforcement and defense of easement or title (short and long term); region-wide raven management; monitoring, etc. (per acre)	$1,450/acre[3]		
7.	Fund management costs[4]	$1.5% of LTMM No fee if Special Deposit Fund is used.		
TOTAL land acquisition mitigation cost		**$**		

1 The per acre costs estimates represent the average for all Wildlife Conservation Board land transactions where acquisitions consisted of parcels greater than 40 acres in size within the respective counties.

2 Parcel sizes may range from 1 acre to 640 acres and above. The general location of the land acquisition(s) will determine the generalized parcel size for determining project specific estimates.

3 The endowment for long-term management and maintenance is based on PAR like analysis calculating management costs estimates with a 3% annual capitalization rate.

4 NFWF-related fees ("REAT-NFWF Mitigation Account Additions" identified in the attached table) will apply if the NFWF accounts are used for fund management.

Note: If compensation lands are accepted by BLM (rather than the state), applicable fees in the REAT Biological Mitigation Cost Table (attached) may apply.

Avian & Bat Protection Plan

AVIAN AND BAT PROTECTION PLAN
DESERT SUNLIGHT SOLAR FARM PROJECT
BLM CASE FILE NUMBER CACA-48649
RIVERSIDE COUNTY, CALIFORNIA

Prepared for:
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August 3, 2010

Table of Contents

List of Tables **Page #**

List of Figures **Page #**

List of Acronyms

ABPP	Avian and Bat Protection Plan
AC	Alternating Current
ACEC	Area of Critical Environmental Concern
BGEPA	Bald and Golden Eagle Protection Act
BLM	U.S. Bureau of Land Management
CDCA	California Desert Conservation Area Plan
CDFG	California Department of Fish and Game
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CHU	Critical Habitat Unit
CPUC	California Public Utility Commission
DWMA	Desert Wildlife Management Area
I-10	Interstate 10
kV	Kilovolt
MBTA	Migratory Bird Treaty Act
MW	Megawatt
NECO	Northern and Eastern Colorado Coordinated Management Plan
NEPA	National Environmental Policy Act
O&M	Operations and Maintenance
PV	Photovoltaic
ROW	Right of Way
SCE	Southern California Edison
USFWS	U.S. Fish and Wildlife Service

A. Introduction

Desert Sunlight Holdings, LLC (Sunlight or Applicant), a wholly owned subsidiary of First Solar Development, Inc. (First Solar), proposes to develop a 550-megawatt (MW) alternating current (AC) solar photovoltaic (PV) energy-generating project known as the Desert Sunlight Solar Farm Project (Project). The Project consists of three main components: a PV- generating facility (Solar Farm), a 220-kilovolt (kV) generation interconnection (Gen-Tie Line) transmission line, and a 500- to 220- (500/220) kilovolt (kV) substation (referred to herein as the Red Bluff Substation). The Solar Farm and most of the route for the Project's Gen-Tie Line would be located on lands administered by the U.S. Department of Interior, Bureau of Land Management, Palm Springs-South Coast Field Office (BLM). The Red Bluff Substation, where the project would interconnect with the Southern California Edison (SCE) regional transmission system, is included as part of the Project for planning and environmental considerations, but it would be constructed and operated by SCE.

A.1 Purpose of the Avian and Bat Protection Plan

The Avian and Bat Protection Plan (ABPP) is intended to reduce the potential risks for avian and bat mortality due to actions performed by Sunlight in the construction and operation of the Solar Farm and Gen-Tie Line; and by SCE in the construction and operation of their project components (Red Bluff Substation and associated access road, distribution line and telecommunications site). The objectives of this plan are as follows:

- Identify baseline conditions for raptor and bat species currently present at the Project components.
- Identify construction and operational activities that may increase the potential of adverse effects to these species on and adjacent to the Project components.
- Specify steps that will be taken to avoid, minimize and mitigate any potential adverse effects on these species.
- Detail long-term monitoring and reporting goals for the Project.

This plan is modeled on the recommendations of the U.S. Fish and Wildlife Service (USFWS or Service) in its *Interim Guidelines for the Development of a Project Specific Avian and Bat Protection Plan for Wind Energy Facilities*. Although this document is applicable to wind energy, rather than solar energy, projects, USFWS recommends that this template be utilized, to the extent appropriate, for solar projects. This plan also follows the Avian and Bat Protection Plan Guidelines developed jointly by Edison Electric Institute's Avian Power Line Interaction Committee (1994, 2006) and the USFWS (2000, 2003, 2010). Additionally, the ABPP is consistent with applicable federal and state regulations established by the BLM and other regulatory agencies such as the *Northern and Eastern Colorado Desert Coordinated Management Plan* (NECO Plan, BLM and CDFG 2002).

A.2 Legal Drivers

The Migratory Bird Treaty Act (MBTA), Bald and Golden Eagle Protection Act (BGEPA), National Environmental Policy Act (NEPA), and the California Environmental Quality Act (CEQA) provide the primary legal bases for this ABPP. The Migratory Bird Treaty Act (16 U.S.C. §§ 703, *et seq*.) prohibits the taking, killing, possession, transportation and importation of migratory birds, their eggs, parts, and nests, except when authorized by the USFWS. Because MBTA does not provide a specific mechanism to authorize "incidental" take, proponents often work proactively with the Service to avoid and minimize the potential take of species.

The Bald and Golden Eagle Protection Act (16 U.S.C. §§ 668-668d) protects bald and golden eagles. Through a new regulation (50 CFR § 22.26), the Service can authorize take of bald and golden eagles when the take is associated with, but not the purpose of, an otherwise lawful activity, and cannot practicably be avoided. Thus, these new regulations provide a mechanism where take of eagles can be legally authorized.

Under the National Environmental Policy Act (42 USC §§ 4321-4370h), federal agencies such as BLM are required to prepare a detailed environmental impact statement (EIS) for any major federal action significantly affecting the quality of the human environment. An EIS must include an examination of the environmental impacts of a proposed project, a reasonable range of alternatives for a project and other related matters. BLM authorization of a right-of-way (ROW) grant for the Project would require a land use plan amendment (PA) to the California Desert Conservation Area (CDCA) Plan (BLM 1980), as amended. In addition, DOE will consider Sunlight's application for a loan guarantee under Title XVII of the Energy Policy Act of 2005 (EPAct 05), as amended by Section 406 of the American Recovery and Reinvestment Act of 2009, Public Law (PL) 111-5 (the "Recovery Act").

The California Public Utilities Commission (CPUC) has discretionary authority to issue the Permit to Construct (PTC) for SCE's proposed Red Bluff Substation, a portion of the Proposed Project. As allowed by the California Environmental Quality Act (CEQA) Guidelines Section 15221, the CPUC intends to use this EIS to provide the environmental review required for its approval process. The CPUC and BLM have signed a Memorandum of Understanding (MOU) that defines the relationship of the two agencies, and identifies CPUC as a cooperating agency with the BLM.

The Applicant anticipates that construction and/or operation of the Project will not cause unauthorized "take" or prohibited "disturbance" of any species protected by the Migratory Bird Treaty Act or the Bald and Golden Eagle Protection Act. However, it is voluntarily proposing this Avian and Bat Protection Plan to proactively implement measures to avoid, minimize and mitigate for any potential adverse effects of the Project on such species. In addition, by utilizing the adaptive management approach in this plan, it is committing to evaluate data during the operation phase of the Project and make further adjustments to the plan, if necessary and appropriate.

B. Corporate Policy

Sunlight and SCE have a commitment to work cooperatively towards the protection of migratory birds and bats. These entities are committed to consistent coordination with agency personnel at BLM, USFWS, and the California Department of Fish and Game (CDFG) so that all parties and agencies understand the scope of the Project and can discuss project facilities and features that may require additional attention for avian species. To that end, Sunlight, SCE, BLM, USFWS, and CDFG have been conducting weekly telephone meetings since March 2010 to discuss ongoing Project components and any new information or changes that arise throughout the week.

C. Adaptive Management and Habitat Compensation

C.1 Adaptive Management Process

The Applicant has incorporated siting criteria, design features and best management practices into the Project that will provide significant avoidance and minimization measures into the Project to reduce the potential for adverse effects on protected avian and bat species. Specifically, decisions were made to ensure that each phase of project development was evaluated with an eye to reducing potential adverse effects to migratory birds and bats during the siting, design, construction, operation, and post-operation phases of the Proposed Project.

Moreover, in additional to the specific Project measures described below, Sunlight and SCE are committed to utilizing an adaptive management approach in the future during operation that supports flexible decision making and can be adjusted as the actual monitoring results are received. In so doing, the protections in this plan are expected to have continued effectiveness throughout the life of the Project.

Solar Farm and Gen-Tie Line

Sunlight evaluated a larger Project Study Area (PSA) when determining the siting of the Project. Areas of desert wash woodland were avoided in this siting to the extent possible, in part to avoid the potential roosting, nesting, and foraging areas for birds and bats within areas of greater vegetation structure.

The Applicant also has incorporated design features into the Project to reduce potential adverse effects to migratory birds and bats, including:

- Limiting vegetation disturbance and grading to the smallest area practicable; and
- Placing electrical lines underground or transmission lines on existing structures to the extent practical to avoid collisions with lines.

The Applicant further intends to utilize the following best management practices (BMPs) during the construction phase and operations and maintenance (O&M) phase of the project to reduce potential adverse effects to migratory birds and bats:

1. The Gen-Tie Line and all electrical components will be installed in accordance with the APLIC *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (Avian Power Line Interaction Committee 2006) and maintained in accordance with APLIC *Mitigating Bird Collisions with power lines: The State of the Art in 1994* (Avian Power Line Interaction Committee 2004) to reduce the likelihood of electrocutions of raptors and other large birds.
2. Low and medium voltage connecting power lines will be placed underground to the extent practical to avoid collisions with lines.
3. Communication towers and permanent meteorological towers should not be guyed. If guy wires are necessary, bird flight diverters or high visibility marking devices would be used.

4. Facility lighting will be installed and maintained to prevent upward and side casting of light towards wildlife habitat and the use of motion sensors and switches to keep lights off when not required will be used. The use of high intensity lighting, steady-burning, or bright lights such as sodium vapor or spotlights will be avoided or minimized.
5. Speed limits on all unpaved areas of the Project will be a maximum of 15 miles per hour.
6. No dogs or firearms will be allowed on the project site during construction or O&M.
7. Construction and O&M activities will be limited to daylight hours to the extent possible.
8. Trash will always be contained within raptor and raven-proof receptacles and removed from the site frequently, including trash collected in vehicles in the field.
9. Water required for construction purposes will not be stored in open containers or structures and will be transported throughout the site in enclosed water trucks.
10. Water sources for the project (such as wells) will be checked periodically by biological monitors to ensure they are not creating open water sources through by leaking or consistently overfilling trucks.
11. All vehicles leaking fuel or other liquids will be immediately removed to the staging area and repaired – all vehicles will carry spill materials and all spills will be cleaned up promptly and disposed of correctly.
12. A formal Worker Environmental Awareness Program will be completed for every individual on all Project components. This Program will include formal classroom training. All individual completing training will sign a sign-in sheet and receive wallet cards and stickers to show they have completed this training. The training will include the following information and include photographs of all resources:
    a. Discussion of the fragile desert ecosystem, vegetation and wildlife communities on the Project site,
    b. Discussion of sensitive avian and bat species found on the Project components being constructed,
    c. Regulations and , permitting compliance, for avian and bat protection,
    d. Project-specific avian and bat protection measures such as nest avoidance, and
    e. Worker responsibilities and biological monitoring responsibilities, including the authority for biological monitors to halt project activities.

Post-operation activities will avoid disturbing areas of desert wash woodland adjacent to the Project site. In addition, restoration and reclamation activities will take into account vegetation appropriate to support bird species that were identified on the Project prior to construction.

Red Bluff Substation and Related Components

SCE evaluated two alternative sites for the proposed Red Bluff Substation and related components, and surveyed areas beyond the footprint of these facilities in order to avoid sensitive resources such as important avian and bat roosting, nesting, and foraging areas.

SCE's Project design, construction, and operations and maintenance (O&M) phases of the Project include the same project design features and BMPs discussed above to reduce potential adverse effects to migratory birds and bats.

Post-operation activities will avoid disturbing areas of desert wash woodland adjacent to the substation and related components. In addition, restoration and reclamation activities will take into account vegetation appropriate to support bird species that were identified on these facilities prior to construction.

Project Goals

Sunlight's fundamental objectives for the Project are to construct, operate and eventually decommission a 550-MW solar photovoltaic (PV) energy facility and associated interconnection transmission infrastructure, to facilitate the construction and operation by SCE of a necessary substation, to provide renewable electric power for California's existing transmission grid to help meet Federal and State renewable energy supply and GHG reduction requirements, to provide an environmentally responsible commercial solar energy project, and with its related renewable energy supply a significant portion of the needs of the State's investor-owned utilities.

Future Management Actions

The Applicant is committed to utilizing an adaptive management approach for future measures to protect covered avian and bat species. This adaptive management approach will include the following six key concepts described by Williams (2009) that are endorsed by the Service in its Interim Guidance for wind energy facilities:

1. Problem Assessment
2. Design
3. Implementation
4. Monitoring
5. Evaluation
6. Adjustment

The Problem Assessment, Design, and Implementation portions of the adaptive management plan for the Project are discussed above, with Monitoring, Evaluation, and Adjustment discussed later in this document in Sections F and G.

The Applicant will implement appropriate and reasonable future management actions if studies show that bird populations in the area surrounding the Project site are reduced or reducing for reason that are demonstrated to be attributable to the Project. The potential actions will be based on monitoring data, including baseline bird point count surveys that have been conducted at random locations on the site (stratified by vegetation community), and at control sites on surrounding BLM lands that are not likely to be disturbed during the lifespan of the Proposed Project.

C.2 Habitat Compensation

Compensation for Western burrowing owl impacts will be determined by reference to the DFG Staff Report on Burrowing Owl Mitigation (DFG, 1995). It is anticipated that due to the presence of eight burrowing owls and active burrows across the DSSF and SCE Red Bluff Substation and Components, mitigation for impacts will be required.

D. Site Suitability Assessment

D.1 Pre-Site Survey Assessment

Solar Farm and Gen-Tie Line

The Solar Farm Site alternatives and Gen-Tie Line route alternatives are not within an Important Bird Area, a Western Hemisphere Shorebird Reserve Network (WHSRN), or an area designated by the Convention on Wetlands of International Importance (Ramsar Convention). The Solar Farm Site alternatives are not within an area designated as a critical habitat unit (CHU), a Desert Wildlife Management Area (DWMA) or other Area of Critical Environmental Concern (ACEC). However, three of the four Gen-Tie Line alternatives are partially located within the Chuckwalla DWMA and all four are partially located within the Chuckwalla CHU. These DWMA and CHU areas are designated Desert Tortoise management areas.

Red Bluff Substation and Related Components

The Red Bluff Substation alternatives and related components are not within an Important Bird Area, WHSRN area, or Ramsar Convention area. The Red Bluff Substation alternatives and related components are within an area designated as Chuckwalla CHU and DWMA.

For the Solar Farm Site, Gen-Tie Line route, Red Bluff Substation and its related components, initial document assessments identified the potential presence of 10 sensitive avian species (Table 1) and 11 sensitive bat species (Table 2) within the Project areas. These pre-survey assessments were then followed up on by the surveys described in the succeeding sections of this plan.

The Solar Farm Site and Gen-Tie Line route would be constructed and operated in a manner consistent with the protection of migratory avian and bat species including avoidance of impacts, minimization of impacts, and mitigation for those impacts that are not able to be avoided.

This plan does not cover the common raven (*Corvus corax*) since this species is discussed separately and specially covered in the *Common Raven Management Plan for Desert Sunlight Solar Farm* (Ironwood Consulting 2010).

Table 1. Sensitive Avian Species with the Potential to Inhabit the Proposed Project Area

Scientific Name **Common Name**	**Status**
Passerine Species	
Chaetura vauxi Vaux's swift (breeding)	Federal: none State: SSC NECO: covered
Progne subis purple martin	Federal: none State: SSC NECO: covered
Toxostoma lecontei LeConte's thrasher	Federal: none State: SSC NECO: covered
Raptors	
Aquila chrysaetos golden eagle	Federal: not listed; protected by BGEPA State: SSC; fully protected NECO: covered
Athene cunicularia burrowing owl	Federal: none State: SSC NECO: covered
Buteo regalis ferruginous hawk (nesting)	Federal: none State: none NECO: covered
Buteo swainsonii Swainson's hawk (nesting)	Federal: none State: threatened NECO: covered
Circus cyaneus northern harrier	Federal: none State: SSC NECO: covered
Falco mexicanus prairie falcon (nesting)	Federal: none State: SSC NECO: covered
Lanius ludovicianus loggerhead shrike	Federal: none State: SSC NECO: covered

Table 2. Sensitive Bat Species with the Potential to Inhabit the Proposed Project Area

Scientific Name **Common Name**	**Status**
Antrozous pallidus pallid bat	Federal: none State: SSC NECO: covered
Eptesicus fuscus pallidus Big brown bat	Federal: none State: SSC NECO: covered
Eumops perotis californicus western mastiff bat	Federal: none State: SSC NECO: covered
Eumops perotis Pocketed free-tailed bat	Federal: none State: SSC NECO: covered
Lasiurus cinereus Hoary bat	Federal: none State: SSC NECO: covered
Lasiurus xanthinus Southern yellow bat	Federal: none State: SSC NECO: covered
Macrotus californicus California leaf-nosed bat	Federal: none State: SSC NECO: covered
Myotis californicus California myotis	Federal: none State: SSC NECO: covered
Parastrellus hesperus Western pipistrelle	Federal: none State: SSC NECO: covered
Plecotus townsendii Townsend's big-eared bat	Federal: none State: SSC NECO: covered
Tadarida brasiliensis Mexican free-tailed bat	Federal: none State: SSC NECO: covered

D.2 Bird Use Studies and Risk Assessment

D.2.1 Methods

Four separate types of surveys were conducted that contribute to the knowledge of avian species at the Solar Farm Site and Gen-Tie Line: point counts, golden eagle and raptor surveys, nest surveys, and incidental sightings. At the Red Bluff Substation and its related components, golden eagle and raptor surveys, nest surveys, and incidental sightings were conducted.

Point Counts

Point count surveys for all birds were conducted in April and May 2010 by an experienced desert avian biologist at a total of twelve locations, nine on the Solar Farm Site and three at control sites, using point count methodology as described in *Monitoring Bird Populations by Point Counts* (Ralph et al. 1995). The surveys identify bird species and their relative numbers at each fixed study point location (point counts). Point count methodology is well accepted and widely used in bird studies. Each point is visited for a fixed amount of time and all birds detected within an often fixed radius are recorded. Research suggests that the amount of time spent at a sampling location increases standard error, especially at times greater than 10 minutes (Smith et al. 1997). Each count was limited to 10 minutes to minimize standard error introduced by double counting, flyovers, etc. Additionally, incidental flyovers were recorded separately from typical observations and each count was divided into three survey periods consisting of the first three minutes, minutes 3 to 5, and minutes 5 to 10. This time division was done to facilitate data analysis used to differentiate birds most likely to be permanent or temporary occupants of the study point from transients in the area surveyed.

Golden Eagle Surveys

The Applicant participated in a joint program to conduct aerial surveys for golden eagles in and around Blythe and Desert Center, California. These surveys were conducted in two phases, with Phase 1 occurring on April 2-3, 2010 and Phase 2 occurring on May 14, 2010. These surveys were conducted in accordance with applicable USFWS guidance and were designed to record and report occupancy (Phase I) and productivity (Phase II) of golden eagle nests within a ten-mile radius of four solar projects, including Sunlight's Solar Farm Site.

Although the primary purpose of the surveys was to conduct the first of two aerial surveys for golden eagles [*Interim Golden Eagle Inventory and Monitoring Protocols; and Other Recommendations* (USFWS 2010)], the surveys also recorded data for other raptor species. The data and results from these surveys are found in the *Final Report, Golden Eagle Surveys Surrounding Four Proposed Energy Developments in the Mojave Desert Region, California* (Wildlife Research Institute 2010).

Nest Surveys

Surveys of the alternatives for all three main components of the Project site were conducted on April 23-24 and May 20, 2010 in accordance with draft State agency protocols for identifying raptor nests [California Energy Commission (CEC) and CDFG 2010]. The results from these nest surveys are incorporated in this document.

Incidental Sightings

During all Project biological surveys, all bird species were identified and/or tallied on standardized data forms (Ironwood Consulting 2010).

D.2.2 Results

Results are compiled into passerines and raptors with a special discussion for sensitive species as listed on Table 1. Sensitive species detections for all Project components are also shown on Figure 1.

Passerines

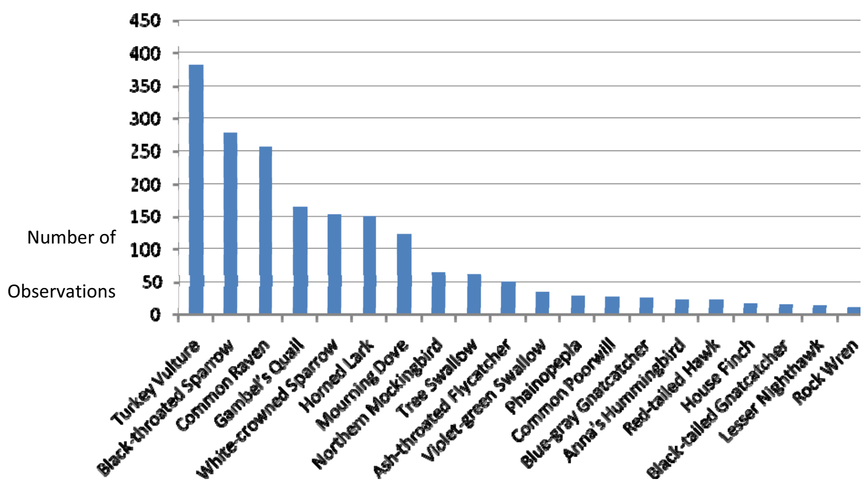
All of these passerine (songbird) species were found in habitats that are present both on the Solar Farm Site and Gen-Tie Line, and on the Red Bluff Substation and related components, and therefore any of these species may inhabit each of these Project components.

Thirty-eight passerine species are known to occur at the Project components (Table 3). The species indicated in bold type are sensitive species discussed separately below. The chart below Table 3 shows those species most commonly found on the Project components.

Table 3. Passerine Species Recorded at the Solar Farm and Gen-Tie Line

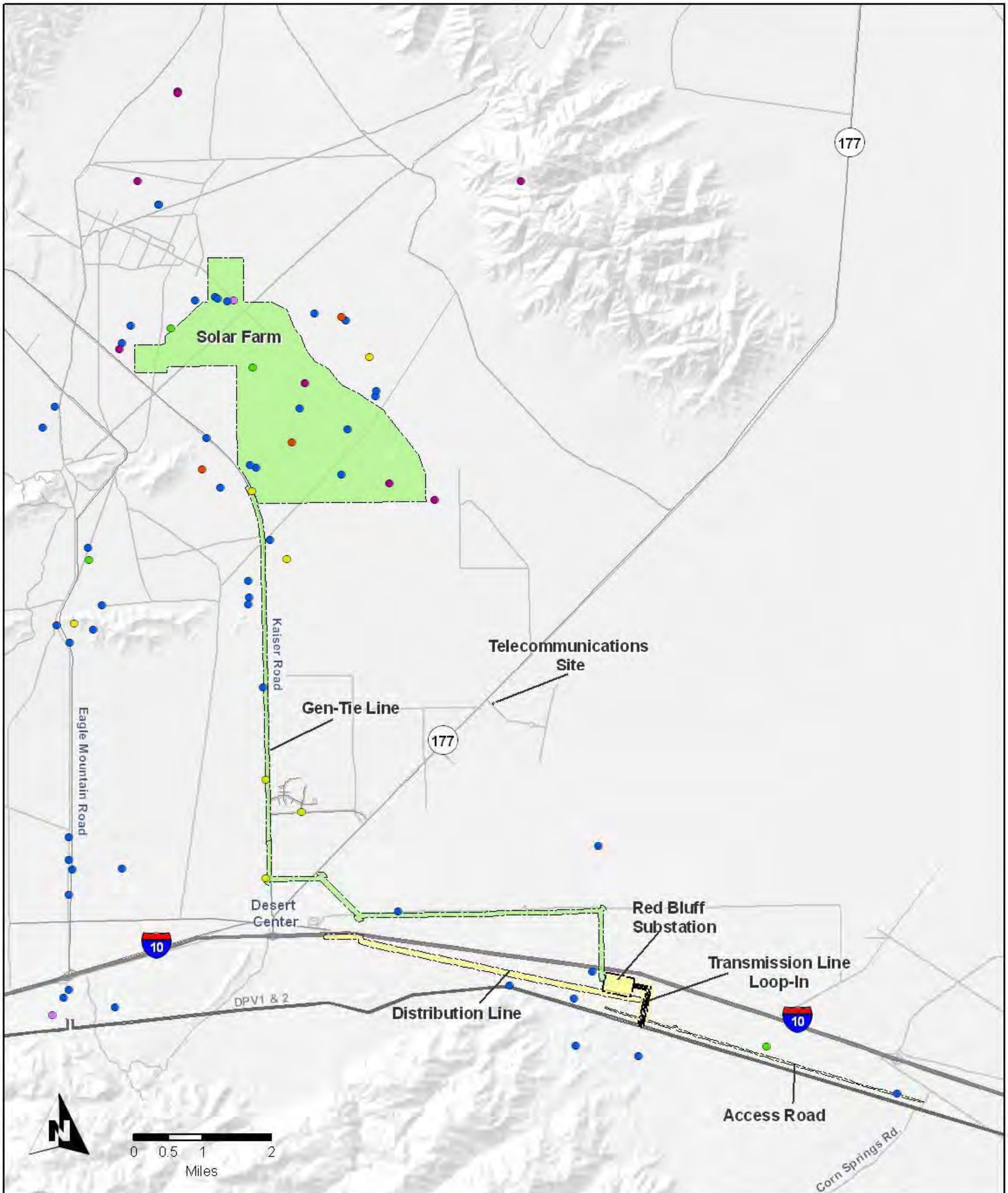
Common Name	*Scientific name*
American robin	*Turdus migratorius*
Anna's hummingbird	*Calypte anna*
ash-throated flycatcher	*Myiarchus cinerascens*
barn swallow	*Hirundo rustica*
black-crowned night heron	*Nycticorax nycticorax*
black-tailed gnatcatcher	*Polioptila melanura*
black-throated sparrow	*Amphispiza bilineata*
blue-gray gnatcatcher	*Polioptila caerulea*
Brewer's blackbird	*Euphagus cyanocephalus*
Brewer's sparrow	*Spizella breweri*
Bullock's oriole	*Icterus bullockii*
common poorwill	*Phalaenoptilus nuttallii*
Costa's hummingbird	*Calypte costae*
Gambel’s quail	*Callipepla gambelii*
greater roadrunner	*Geococcyx californianus*
great-tailed grackle	*Quiscalus mexicanus*
horned lark	*Eremophila alpestris*
house finch	*Carpodacus mexicanus*
house wren	*Troglodytes aedon*
killdeer	*Charadrius vociferous*
LeConte’s thrasher	***Toxostoma Lecontei***
lesser goldfinch	*Carduelis psaltria*

Common Name	*Scientific name*
lesser nighthawk	*Chordeiles minor*
mourning dove	*Zenaida macroura*
northern flicker	*Colaptes auratus*
northern mockingbird	*Mimus polyglottos*
phainopepla	*Phainopepla nitens*
rock wren	*Salpinctes obsoletus*
northern rough-winged swallow	*Stelgidopteryx serripennis*
Say's phoebe	*Sayonaris nigricans*
tree swallow	*Tachycineta bicolor*
verdin	*Auriparus flaviceps*
violet-green swallow	*Tachycineta bicolor*
western kingbird	*Tyraannus verticalis*
western meadowlark	*Sturnella neglecta*
white-crowned sparrow	*Zonotrichia leucophrys*
white-throated swift	*Aeronautes saxatalis*
yellow-rumped warbler	*Dendroica coronata*



Most Common Incidental Observations of Bird Species

(Bird species with ten or more observations shown)



Project Area	Ferruginous Hawk
Sunlight Component	LeConte's Thrasher
SCE Component	Loggerhead Shrike
	Northern Harrier
	Prairie Falcon
	Swainson's Hawk

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Figure 1
Sensitive Avian Species

Prepared by Ironwood Consulting, Inc. - August 3, 2010

Le Conte's thrasher (*Toxostoma lecontei*) is a State Species of Special Concern and year-round desert resident. These species inhabit various desert scrub and wash habitats and typically breeds in desert areas that support cactus and large thorny shrubs such as *Lycium* spp. This species is distributed from the Mojave Desert east into southern Utah and northern Arizona, and south into northern Mexico (BLM 2002). Nine individual observations of this species were recorded during the surveys (Figure 1). Two were located on the Solar Farm Site with no records of Le Conte's thrasher located along the Gen-Tie Line, Red Bluff Substation or its related components.

Raptors

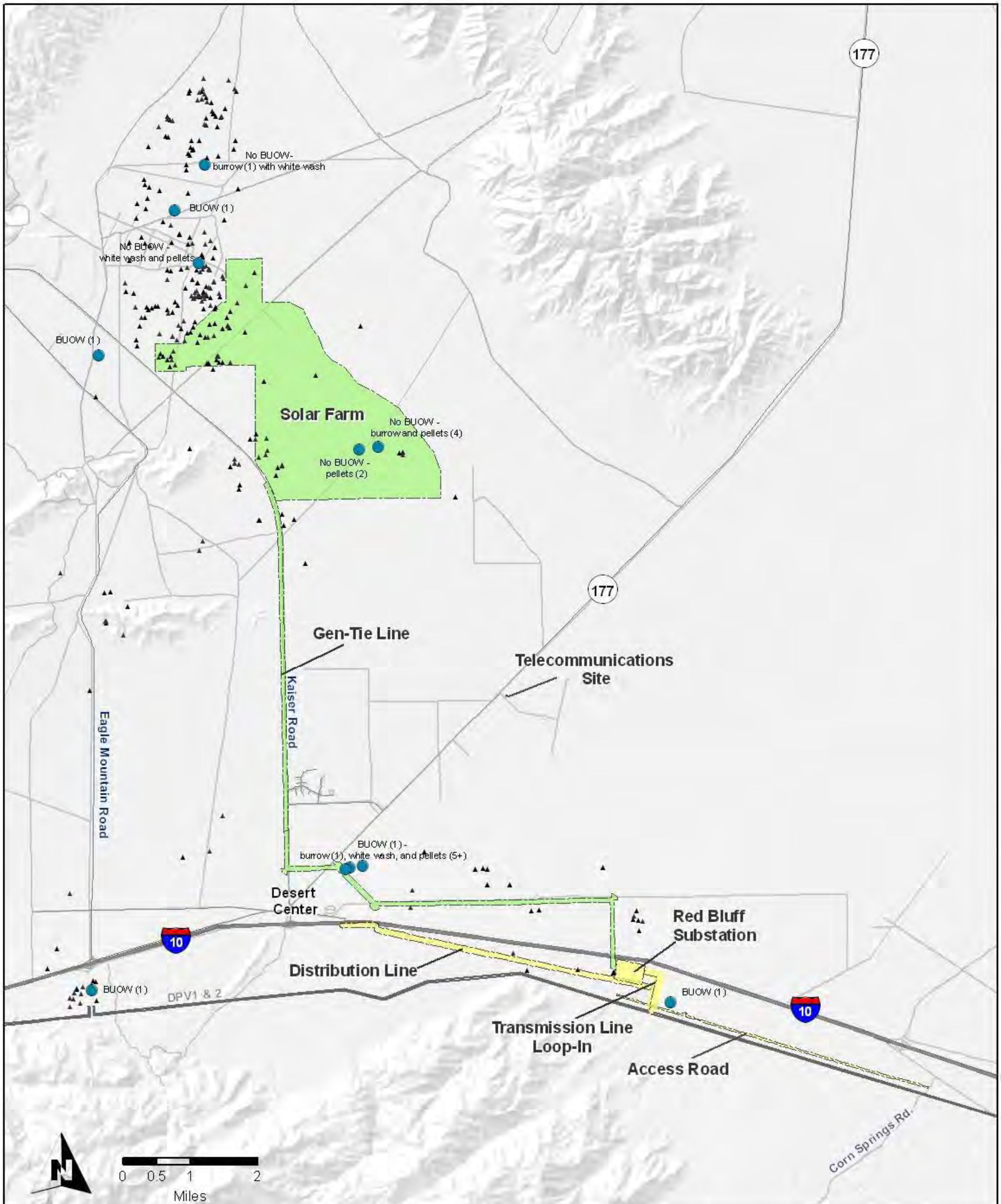
Thirteen raptor species (excluding common raven) are known to occur at the Solar Farm Site and along the Gen-Tie Line (Table 4). The species in bold type are sensitive species as shown on Table 1 with locations shown on Figure 1 for all species except burrowing owl, shown on Figure 2. Because the Solar Farm Site and Gen-Tie Line are located in the valley floor of the Chuckwalla Valley, most raptor species were observed as flyovers of the components as indicated on Table 4.

Table 4. Raptor Species Recorded at the Solar Farm and Gen-Tie Line

Common Name	*Scientific Name*	Approximate Number of Individuals	
		Solar Farm and Gen-Tie Line	Red Bluff Substation and Related Components
American kestrel	*Falco sparverius*	P	P
burrowing owl	***Athene cunicularia***	**1***	**0***
ferruginous hawk	***Buteo regalis***	**1 flyover**	**0**
golden eagle	***Aquila chrysaetos***	**0**	**0**
loggerhead shrike	***Lanius ludovicianus***	**23**	**6**
merlin	*Falco columbarius*	P	P
northern harrier	***Circus cyaneus***	**2 flyovers**	**0**
prairie falcon	***Falco mexicanus***	**4 flyovers**	**0**
red-tailed hawk	*Buteo jamaicensis*	P	P
sharp-shinned hawk	*Accipiter striatus*	P	P
Swainson's hawk	***Buteo swainsonii***	**18 flyovers**	**0**
turkey vulture	*Cathartes aura*	P	P

P = present at Project component (non-sensitive species were not recorded by location)
*see burrowing owl discussion for more information

Burrowing owl (*Athene cunicularia*) is a State Species of Special Concern and addressed in the NECO Plan/EIS. Burrowing owls inhabits open dry grasslands and desert scrubs, and typically nest in mammal burrows although they may use man-made structures including culverts and debris piles. In the Project region, they are resident species and exhibit strong nest site fidelity. Burrowing owls eat insects, small mammals and reptiles.



Project Area	Burrowing Owl Sign
Sunlight Component	Suitable Burrow (no sign)
SCE Component	

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Figure 2
Project Components
Burrowing Owl Sign

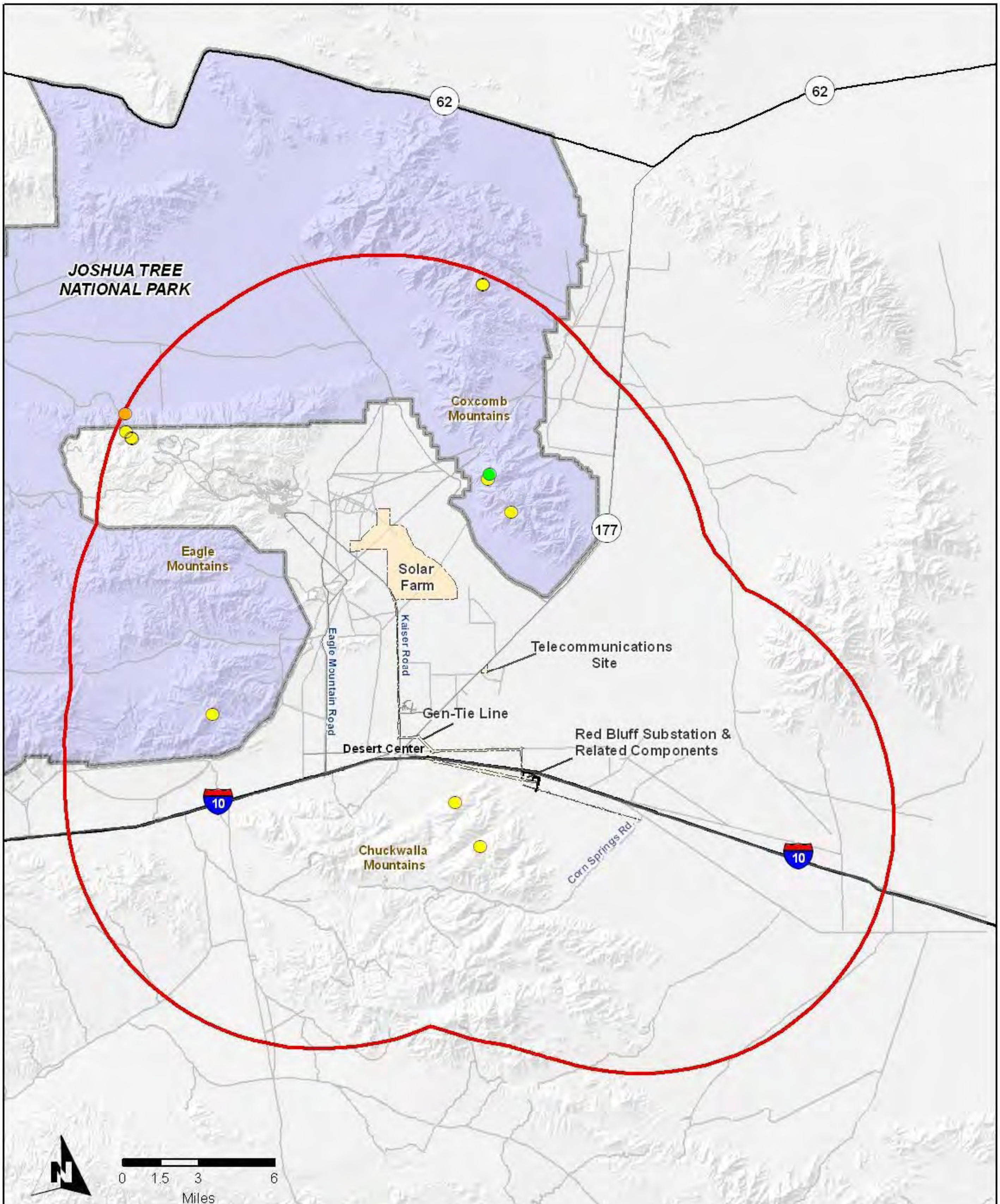
Prepared by Ironwood Consulting, Inc. - August 3, 2010

The Phase 1 assessment for burrowing owls concluded that suitable habitat for burrowing owls existed throughout the study area. During the Phase 2 burrow surveys, numerous suitable burrows were recorded on the Solar Farm Site; however, only two records of burrowing owl sign (i.e., burrow, white wash and pellets) were observed with no individuals present. One group of observations, which included one individual owl and two burrows with white wash and pellets, occurred approximately 1,500 feet east of the intersection of Gen-Tie A1 and highway 177. The two other individual owl sightings occurred approximately one mile north and 0.8 mile west of the Solar Farm alternatives. Owls observed were all individual adults and observations occurred during both spring and fall seasons. It is expected that the owls reside within the area and there is a high potential for pairs to occur. Phase 3 surveys will be performed prior to ground disturbing activities to determine the exact number of resident owls potentially affected by construction immediately prior to these activities.

Ferruginous hawk (*Buteo regalis*) is a State Species of Special Concern and addressed in the NECO Plan/EIS. This species typically nests in northern latitudes of North America and overwinters in southern regions. Migrant ferruginous hawks are a regular but uncommon during spring and fall in the California desert regions. Within the NECO planning area, ferruginous hawks have been observed overwintering in low numbers in the lower Colorado River Valley, Yuma Basin, West Mesa, and the agricultural areas of Imperial Valley (BLM 2002). Two sightings of migrating ferruginous hawks were recorded, one within the Solar Farm Site and one east of the Red Bluff Substation. Both observations occurred in March 2010 and consisted of flyovers. The golden eagle surveys performed by helicopter in spring 2010 did not observe presence of this species. Based on data reviewed and observations, it is not expected that ferruginous hawks utilize the study area for nesting or overwintering. This species may forage within the study area during migration.

Golden eagle (*Aquila chrysaetos*) is a State Species of Special Concern and Fully Protected Species, and it is addressed in the NECO Plan/EIS. Golden eagles and their primary prey species, jackrabbits, have declined in the California desert regions due to prolonged drought conditions that have persisted since 1998 (WRI 2010). Breeding in Southern California starts in January, nest building and egg laying in February to March, and hatching and raising the young eagles occur from April through June. Once the young eagles are flying on their own, the adult eagles will continue to feed them and teach them to hunt until late November.

No golden eagle nests were found on or adjacent to the Solar Farm Site or other Project components. Phase I occupancy surveys conducted in April 2010 detected 13 potentially-active nests within a ten mile radius of the Solar Farm Site and Red Bluff Substation, as shown on Figure 3. Of these, nests were within Joshua Tree National Park (JTNP), with an additional three in steep hills west and above Eagle Mountain mine, nearly within the JTNP boundaries. These are located either on BLM lands or lands owned by Eagle Mountain Mine and the Kaiser Corporation. The remaining three potential nests were located south of Interstate 10 in the Chuckwalla Mountains, approximately 3 miles west and southwest from the proposed Red Bluff Substation. One observation of a golden eagle flyover of the Chuckwalla Valley was recorded during these surveys (WRI 2010).



Project

10-Mile Project Buffer

Golden Eagle Nest, Active

Golden Eagle Nest, Inactive

Prarie Falcon Nest,
Active and Reproductive

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Figure 3
Results of Golden Eagle
Phase 1 and 2 Surveys

Prepared by Ironwood Consulting, Inc. - August 3, 2010

Phase II productivity surveys determined that 12 of these 13 nests were inactive, with one active but non-reproductive nest located in the Joshua Tree Wilderness Area approximately 5 miles from the Solar Farm Site boundary (Figure 3). No reproductive nests were located within the 10-mile radius of the Solar Farm Site and Red Bluff Substation (WRI 2010).

During these surveys, there were additional raptor species observed within 10 miles of the Solar Farm Site: turkey vultures, common ravens, prairie falcons, and Swainson's hawks (WRI 2010).

Loggerhead shrike (*Lanius ludovicianus*) is State Species of Special Concern and a year-round resident in parts of the Southern California desert. As a predatory bird its diet consists of insects, amphibians, small reptiles, small mammals, and other birds. One pair was observed approximately 0.2 miles northwest of the Solar Farm Site. Observations of adults were made in both spring and fall, and one individual with first-year plumage was recorded in the fall. Based on the amount and nature of observations made during the surveys, loggerhead shrikes are year-round residents within the study area. Loggerhead shrikes were often observed perching on palo verde and ironwood trees as well as larger creosote bush shrubs and other structures including utility poles.

Northern harrier *(Circus cyaneus*), a State Species of Special Concern, is a raptor species that occurs in a wide range of habitats throughout North America. In Southern California, harriers typically nest and forage in open habitats that provide adequate vegetative cover, suitable prey base, and scattered perches such as shrubs or fence posts (Shuford 2008). This species is often found near bodies of water and wetlands (CDFG 2010). Harriers are ground-nesting birds with suitable nesting habitat limited in the southern California desert (Shuford 2008). Three harriers were recorded: two within the Solar Farm Site, and one east of the Red Bluff Substation.

Prairie falcon (*Falco mexicanus*) is State Species of Special Concern that breeds throughout the arid West from southern Canada to central Mexico. The overall distribution appears to be stable. Prairie falcons are found in areas of the dry interior where cliffs provide secure nesting sites. In the desert they are found in all vegetation types, although sparse vegetation provides the best foraging habitat. Prairie falcons were observed in the southwest corner of the Solar Farm Site and approximately 1 mile east of the eastern boundary as flyovers. Two additional observations were recorded along the Gen-Tie Line, but not south of Interstate 10 (I-10) near the Red Bluff Substation alternatives or related components. During aerial surveys for golden eagles, two prairie falcons were recorded within 10 miles of the Solar Farm Site near the boundary of Eagle Mountain Mine and Joshua Tree National Park (WRI 2010). One location was an active, reproductive nest in 2010 with unknown nest success (Figure 3). No prairie falcon nests were observed within any Project areas.

Swainson's hawk (*Buteo swainsonii*) is state-listed (threatened) raptor species that breeds in much of western North America. Within California, nesting occurs primarily in the Central Valley and northern territories; however, regular nesting occurs in the high desert between the Tehachapi Mountains and Lancaster. This species winters in southern South America with a migration route of over 20,000 miles (Woodbridge 2008). Arrival on breading areas generally occurs from late February to early May depending on geographical characteristics of the breeding area (Woodbridge 2008). Nest sites have not been documented in the Sonoran Desert of California. This species was observed within the study area during migration. Three incidental records were documented on April 9, 2010 during botanical and baseline surveys. Two observations were of individual Swainson's hawks and the third observation consisted of a group of over ten birds. All individuals were seen in flight overhead within or near the Solar Farm boundaries. Additionally, Swainson's hawks were observed during golden eagle surveys near Chuckwalla Mountains [two individuals (March 26 and April 3, 2010)], Coxcomb Mountains [fourteen individuals (April 2, 2010)], and Palen Mountains [four individuals (March 25, 2010)] (WRI 2010). This species is not expected to nest or overwinter within the study area.

D.2.3 Risk Assessment

Solar Farm and Gen-Tie Line Route

Potential direct impacts to passerine species which may occur at the Solar Farm Site alternatives and Gen-Tie Line route alternatives include the potential removal of individuals or occupied nests by Project machinery or through electrocution related to project electrical structures such as the Project substation. Potential indirect long-term impacts include the removal of approximately 4,400 acres of potential nesting and foraging habitat. Potential indirect short-term impacts include effects from increased nighttime lighting, and increased noise and dust that potentially could adversely affect nesting and roosting sites in areas adjacent to active construction. The Project is not expected to cause any prohibited "take" or "disturbance" of any species protected by the BGEPA or MBTA.

Avoidance and Minimization Measures

During pre-construction clearance surveys, all active raptor and owl nest locations would be identified and clearly marked with an avoidance buffer of approximately 50 meters. Regardless of seasonal timing of construction, active nests will be flagged and nests avoided whenever possible, with special attention paid to the nesting season of most avian species (February 15 – May 15). Avoidance areas will remain in place until it is determined by a biological monitor that the young have fledged.

Nest avoidance discussions will be part of mandatory site training for all construction personnel and will be included in Worker Environmental Awareness training briefings. Training will include identification of avoidance areas and requirements for these areas.

Red Bluff Substation and Related Components

Most potential impacts at the Red Bluff Substation alternatives are similar to those listed above for the Solar Farm Site and Gen-Tie line route, although potential indirect long-term impacts from the removal of habitat are restricted to approximately 152 acres of potential nesting and foraging habitat.

Cumulative Impacts

The Draft Environmental Impact Statement (EIS) for the Proposed Project (BLM 2010) lists those projects considered as part of the cumulative impact analysis.

For passerine and raptor species (with the exception of golden eagles), potential cumulative impacts identified in the EIS include the combined effects of all new and existing renewable energy projects, utility structures, and other human disturbances within 16 kilometers (10 miles) of the Proposed Project. Although each project may potentially remove a small number of individuals and nests, these effects are not likely to be cumulatively significant and project BMPs and avoidance measures discussed in Section C will be implemented at the project to attempt to avoid or minimize these potential impacts.

Golden eagles forage in an area extending up to 225 kilometers (140 miles) from the Project boundaries. Although there will be a potential direct cumulative loss of foraging habitat from the development of alternative energy projects and other regional projects discussed in the EIS, this loss is not expected to be significant, or cause prohibited “disturbance” or “taking,” because it is only a small percentage of the total foraging area.

Potential long-term cumulative indirect effects include the potential removal of nesting and foraging habitat.

D.3 Bat Use Studies and Risk Assessment

D.3.1 Methods

On February 17, 2010, Dr. Patricia Brown, desert bat expert who has conducted numerous bat surveys in the Project region, conducted a reconnaissance-level survey of the Solar Farm Site alternatives, Gen-Tie route alternatives, Red Bluff Substation alternatives and related components. The purpose of this survey was to determine those bats species that might inhabit these project areas and to formulate avoidance and minimization measures for bat species to be used during the construction, O&M, and post-construction phases.

D.3.2 Results

Dr. Brown’s results indicate that pallid bats and western pipistrelles could roost in small rocks on the ground on the Solar Farm Site alternatives. Radio-telemetry surveys have shown that hoary bats will roost in palo verde trees and ironwoods and that California leaf-nosed bats might roost in the limited areas of ironwood trees between foraging bouts. These tree species are found within the small area of desert dry wash woodland on the Solar Farm Site alternatives and along the Gen-Tie Line route alternatives, Red Bluff Substation and related components.

Desert dry wash woodland attracts foraging bats due to increased insect concentration. This is especially true for California leaf-nosed bats and pallid bats that feed on large insects they glean off the foliage. Roosts for these species have been identified in mines in the Eagle and Coxcomb Mountains, both within 16 kilometers (10 miles) of the Solar Farm Site.

D.3.3 Risk Assessment

Solar Farm and Gen-Tie Line

Impacts to bats include potential direct impacts to ground nesting species (pallid bats and western pipistrelles) and removal of trees with active bat colonies. Indirect impacts could potentially occur from removal of foraging habitat. Indirect impacts could also potentially occur from increased human activity, noise, nighttime lighting, and dust.

Avoidance and Minimization Measures

During pre-construction clearance surveys, all active bat colonies would be identified and clearly marked with an avoidance buffer of approximately 50 meters. Whenever possible, these areas will be avoided by construction activities.

Bat colony avoidance discussions will be part of mandatory site training for all construction personnel and will be included in initial Environmental Awareness training briefings. Training will include identification of avoidance areas and requirements for these areas.

Red Bluff Substation and Related Components

Most potential impacts at the Red Bluff Substation alternatives are similar to those listed above for the Solar Farm Site alternatives and Gen-Tie Line route alternatives, although indirect long-term impacts from the removal of habitat are restricted to approximately 152 acres.

Cumulative Impacts

For bat species, potential cumulative impacts are discussed for an area 16 kilometers (10 miles) from the boundaries of the Proposed Project. These include the potential for combined direct effects of the removal of individuals and occupied nests of ground nesting species such as pallid bats and western pipistrelles from project construction. Although each project may remove a small number of individuals, roosts, and nests, these effects are not likely to be cumulatively significant and project BMPs and avoidance measures discussed in Section C will be implemented to attempt to avoid or minimize these impacts.

Potential long-term cumulative indirect effects include the removal of nesting and roosting habitat.

E. Project Design and Impact-Reducing Conservation Measures

Sunlight has sited and designed the Project to avoid where possible fragmenting large contiguous blocks of high quality bird/bat habitat in desert wash woodland areas as discussed in Section A. Best management practices (BMPs) and avoidance/minimization measures that will be used during the construction, O&M, and post-construction phases of the Proposed Project are discussed in Sections C and D. All discussions below of macro- and micro-siting considerations, nest site buffers and conservation measures during the construction and O&M phases of the Project will apply to both Desert Sunlight Holdings project components (Solar Farm Site and Gen-Tie Line) and SCE project components (Red Bluff Substation and related components).

E.1 Macro- and Micro-Siting Considerations

Sections C and D also discuss macro- and micro-siting details including the avoidance of:

- *Locations with federally or state listed, or otherwise designated sensitive species, and areas managed for the conservation of listed species*
  Project components avoid DWMAs, CHU, and ACECs to the extent possible and were sited in the area of lowest known concentration for sensitive species available.

- *Areas frequently used for daily bird and bat movements (i.e., areas between roosting and feeding sites)*
  Areas of desert wash woodland were identified and avoided by Project components, particularly the larger expanses of this habitat found in the Pinto and Big Wash areas.

- *Breeding and wintering eagle use areas*
  These areas were identified and avoided for all Project components. Valley floor areas such as the proposed Solar Farm site do not provide wintering or breeding habitat for eagles.

- *Known migration flyways for birds and bats*
  Pinto Wash is a known bat migration corridor with impacts to this area avoided by the siting of the Solar Farm Site.

- *Areas near known bat hibernacula, breeding, and maternity/nursery colonies*
  No known areas are found with the footprint of the Project components.

- *Areas with high incidence of fog, mist, low cloud ceilings, and low visibility, or where other risk factors may come into play*
  No areas with these constraints are found in the Project region, except in times of extremely high winds and blowing sand and dust.

- *Fragmentation of large, contiguous tracts of wildlife habitat*
  Areas of potential movement corridors were avoided in siting the Solar Farm Site.

In addition, all Project facilities at all Project components are not adjacent to landscape features that attract migrant birds such as water sources, and are not within 1 mile of cliff tops (potential raptor nesting areas). Project construction and O&M phases will minimize the potential for creating habitats suitable for rodents such as rock piles that will attract raptors.

E.2 Nest Site Buffers

During pre-construction clearance surveys for all Project components, a biologically meaningful buffer will be placed around any active avian nests or bat roosts located.

For passerines, an exclusion area will be established at approximately 100 (330 feet) meters from any active nest. The nest will be checked within a week prior to planned construction to determine nest success and whether young have fledged. The exclusion area boundary will not be removed until the biological monitor has determined that the nest has failed or the young have fledged.

For raptors, an exclusion area will be established at approximately 1.6 kilometers (1 mile) from any active nest (excluding nests of common raven). The nest will be checked within a week prior to planned construction to determine nest success and whether young have fledged. The exclusion area boundary will not be removed until the biological monitor has determined that the nest has failed or the young have fledged.

For burrowing owls, Phase III burrow surveys will be completed within 30 days prior to planned construction in each construction unit and within a 150-meter (500 foot) buffer area. All active burrowing owl nests will be avoided with a buffer of 100 meters (330 feet) during the nesting season (February 1 – August 31st). The nest will be checked within a week prior to planned construction to determine nest success and whether young have fledged. The exclusion area boundary will not be removed until the biological monitor has determined that the nest has failed or the young have fledged. Outside nesting season or after determining a nest has failed or young have fledged, owls will be passively relocated after concurrence of specific methods by CDFG. Passive relocation will include:

- Identifying suitable relocation sites within 1 mile of the Project area;
- Creating or enhancing at least two natural or artificial burrows per relocated owl;
- Passively relocating burrowing owls; and
- Monitoring and reporting the results of the passive relocation.

E.3 Construction Phase Conservation Measures

Conservation measures that that will be implemented by the Project that relate to bird conservation include those discussed in Sections C and D. In addition, the Project will:

1. Minimize permanent disturbance area such as creating unneeded access roads. Construction of the Gen-Tie Line and other linear Project features will avoid vegetation clearing, and grading whenever possible.
2. Vegetation clearing will be conducted outside of the bird breeding season to the maximum extent practicable (approximately February 1 – August 31), taking into account necessary timing of conservation measures for other species, including the federally- and state-

threatened desert tortoise (*Gopherus agassizii*) present at the Project site as well as the timing constraints in other Project permits.

3. Biological monitors will be present on-site during all phases of construction and will be tasked with monitoring avian and bat nesting and roosting sites in adjacent habitats and will employ the same buffers described above in E.2 if nests are found adjacent to an active construction area.
4. Construction activities will be conducted in a manner consistent with reducing fire danger.
5. During construction, all trash will be removed promptly and disposed of properly to avoid creating attractive nuisances for birds and bats.
6. Appropriate control measures will be implemented to prevent the introduction and spread of invasive plant species with and surrounding the project area (see the Project's Integrated Weed Management Plan – Ironwood Consulting, 2010).
7. Only plants native to the area for will be used seeding or planting during habitat revegetation and/or restoration efforts.

E.4 Operations and Maintenance Conservation Measures

During the O&M phase of the Project, conservation measures will be used to reduce the attractiveness of the facility to breeding, migrating, and wintering birds and bats to ensure mortality is minimized. Many of these measures are listed in Sections C and D, and the O&M phase will include these additional measures:

1. The Project will not create or maintain attraction features for birds and /or bats by removing and disposing of road kills near the Project of carrion that attracts raptors and other scavengers to the site, regularly removing vegetation around larger facilities such as substations and meteorological towers to reduce raptor foraging, and minimizing water availability.
2. The Project will minimize the use of lighting that could attract migrating birds and bats (feeding on concentrations of insects at lights). All nighttime lighting will be within 800 meters (0.5 mile) of the Project facilities. Lighting will be kept to the minimum level necessary for safety and security. High intensity, steady burning, bright lights such as sodium vapor or spotlights will not be used on Project facilities.

F. Post-Construction Monitoring and Risk Assessment Validation

The objective of post-construction monitoring is to validate the pre-construction risk assessment and to provide a factual basis for the Applicant to implement adjustments based on the monitoring results. All of the measures in this section apply to the Solar Farm, Gen-Tie and Red Bluff Substation and related components.

F.1 Post-Construction Monitoring

The long-term monitoring program for measuring raptor and bat incidence at the Project site will consist of three activities: incidental sightings, bi-annual point counts, and annual nest surveys. This program will be conducted during construction and for 5 years post-construction during the operations and maintenance phase of the Proposed Project.

F.1.1 Incidental Sightings

Throughout the construction and operation phases of the Proposed Project, all incidental sightings of raptors and bats will be logged. During construction, all sightings will be recorded by biological monitors. The Lead Biological Monitor will be tasked with keeping records and reporting these results (as described in Section F.2). During the first 5 years of the operation phase of the Project (the long-term monitoring period), a person designated by Sunlight will be responsible for completing this task, including reporting.

F.1.2 Nest Surveys

Nest surveys will be conducted at least twice each spring between March 15 and June 1, separated by at least 30 days. All Project-related infrastructure (e.g.; fence posts, transmission towers, and buildings) would be inspected for active and inactive raptor nests. Nest locations may also be detected via incidental sightings or during point count surveys.

F.2 Reporting and Risk Assessment Validation

Quarterly e-mail summaries of all biological monitoring activities will be submitted to BLM, USFWS, and CDFG by the Lead Biological Monitor. One section of these reports will focus on reporting for the long-term monitoring program for raptors (including owls) and bats. This section will include species and number of raptors observed incidentally, results of any point counts or nest surveys conducted during that monitoring quarter, and a discussion of whether these observation represent an increase or decrease in raptor activity and associated theories of cause. These reports may also include recommendations for future adaptive management actions.

On or before January 15th of each calendar year, an annual report will be submitted to the BLM that summarizes all monitoring activities sufficient for the BLM to provide necessary reporting to the USFWS and CDFG in their annual permitting report, due on or before February 1 of each year. This annual report will summarize all quarterly reports and be submitted via e-mail by the Lead Biological Monitor.

All biological monitors and project personnel will be given information on the provisions for reporting bird and bat fatalities to the USFWS office of law enforcement's confidential voluntary mortality reporting system website found at: http://www.aplic.org/USFWS_BirdFatality_FilerInstructions.pdf.

G. Implementation

G.1 Permit Compliance

BLM intends to complete the EIS and the associated Record of Decision (ROD). The ROD is expected to include terms, conditions and an incidental take statement for species protected by the federal Endangered Species Act pursuant to the Section 7 consultation process. The Applicant will also comply with other applicable federal and state legal requirements relating to protected species.

In addition to required legal permitting, the Applicant's consultants have prepared biological plans that outline Project commitments, including the following documents:

- Biological Resources Technical Report
- Integrated Weed Management Plan
- Draft Biological Assessment
- Desert Tortoise Translocation Plan
- Common Raven Management Plan

G.2 Employee Training

Employee training is a critical component of protecting biological resources during the construction and O&M phases of the Project. This training is discussed in detail in Section A.

G.3 Quality Control

During the quarterly and annual reporting discussed in Section F, the Lead Biological Monitor, and personnel from the BLM, USFWS, and CDFG will review existing practices and conduct project audits as necessary.

G.4 Key Resources

Key resources include the team of proponent personnel, biological monitors and agency personnel who will work together to ensure the success of the protection, avoidance, and minimization of impacts to bird and bat species during the construction and operations and maintenance phases of the Project. The names and contact information for key personnel are provided on the following page.

Project Proponents
Desert Sunlight Holdings, LLC
1111 Broadway St, 4th Floor
Oakland, CA 94607
(510) 625-7400
Contact: Wayne Hoffman
WHoffman@firstsolar.com

Southern California Edison
2244 Walnut Grove Avenue
Rosemead, CA 91770
(626) 302-1117
Contact: Paul Yamasaki
Paul.Yamasaki@sce.com

Biological Monitoring
Ironwood Consulting
20 Nevada St., Suite 300
Redlands, CA 92373
(909) 798-0330
Contact: Kathy Simon
Kathy@ironwoodconsultinginc.com

Bureau of Land Management
California Desert District Office
22835 Calle San Juan De Los Lagos
Moreno Valley, CA 92553-9046
(951) 697-5223
Contact: Kim Marsden
Kim_Marsden@BLM.gov

U.S. Fish and Wildlife Service
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Rd., 101
Carlsbad, CA 92011
760.431.9440 x 354 ph
Contact: Jody Fraser
jody_fraser@fws.gov

California Department of Fish and Game
Inland Deserts Region
3602 Inland Empire Blvd Suite C220
Ontario, CA 91764
(909) 484-0167
Contact: Magdalena Rodriguez
mcrodriguez@dfg.ca.gov

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Ironwood Consulting, Inc.

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Common Raven Management Plan

COMMON RAVEN MANAGEMENT PLAN
DESERT SUNLIGHT SOLAR FARM PROJECT
BLM CASE FILE NUMBER CACA-48649
RIVERSIDE COUNTY, CALIFORNIA

Prepared for:
BUREAU OF LAND MANAGEMENT
Palm Springs South Coast Field Office
1201 Bird Center Drive
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and

DESERT SUNLIGHT HOLDINGS, LLC
1111 Broadway St, 4th Floor
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Prepared by:
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20 Nevada Street, Suite 300
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December 17, 2010

Table of Contents

List of Tables

List of Figures

List of Acronyms

AC	Alternating Current
ACEC	Area of Critical Environmental Concern
BLM	U.S. Bureau of Land Management
CDCA	California Desert Conservation Area Plan
CDFG	California Department of Fish and Game
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CHU	Critical Habitat Unit
CPUC	California Public Utility Commission
CRMP	Common Raven Management Plan
DB	Designated Biologist
DOI	U.S. Department of the Interior
DPV I	SCE's Devers to Palo Verde I transmission line
DWMA	Desert Wildlife Management Area
ECM	Environmental Compliance Manager
ESA	Endangered Species Act
I-10	Interstate 10
km	Kilometer
kV	Kilovolt
MBTA	Migratory Bird Treaty Act
MVA	Mega-volt ampere
MW	Megawatt
MWD	Metropolitan Water District
O&M	Operations and Maintenance
PV	Photovoltaic
ROW	Right of Way
SBBM	San Bernardino Base and Meridian
SCE	Southern California Edison
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WEAP	Worker Education and Awareness Program
WRI	Wildlife Research Institute

1.0 Introduction

This discussion provides a brief summary of the project description for the Applicant and SCE project components of the Proposed Action. Complete details of project locations and description are found in the *Desert Sunlight Solar Farm Final Environmental Impact Statement* (BLM 2010) and in the Biological Assessment, *Desert Sunlight Solar Farm Project* (Ironwood 2010).

Desert Sunlight has applied to the BLM for an issuance of a right-of-way (ROW) grant that would authorize construction, operation, maintenance, and decommission of a commercial solar power-generating facility and new substation facility on over 7,600 hectares (19,000 acres) of BLM-managed lands. The proposed project is located in Riverside County, California, approximately 6 miles north of the rural community of Desert Center and approximately (10.5 km or 6.5 miles north of the Interstate 10 corridor (Figure 1). Project components generally include construction, operation, and maintenance of the solar farm site, a gen-tie transmission line, and construction, operation and maintenance of the Southern California Edison (SCE) Red Bluff substation and related components (Figure 2). While the Red Bluff substation is included as part of this project description for planning and environmental considerations, it would be constructed, owned, and operated by SCE, not by the Applicant.

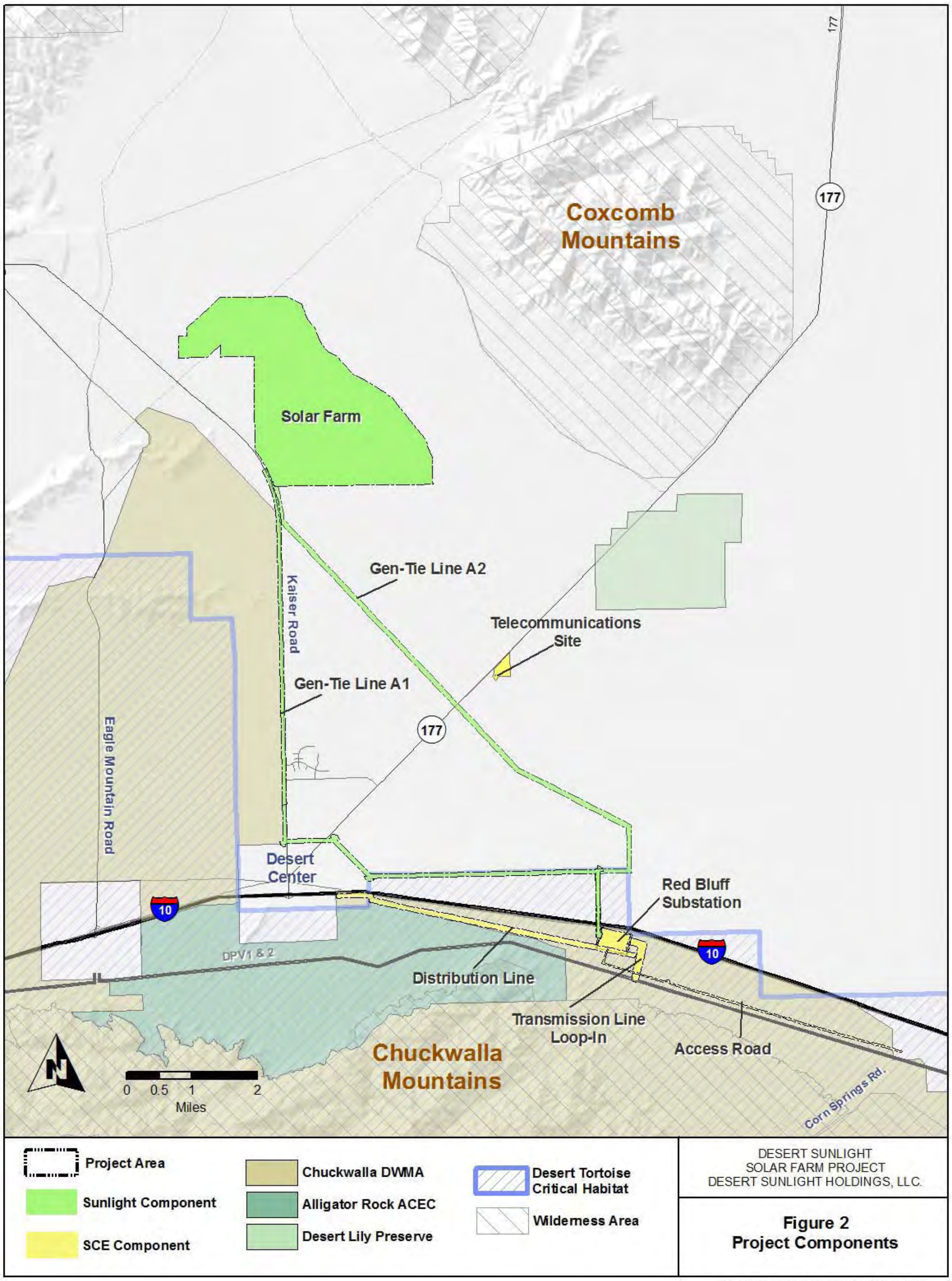
The Project area and surrounding vicinity support desert tortoise (*Gopherus agassizii*) and common raven (*Corvus corax*). Ravens are efficient predators of desert tortoise and thrive in areas of human activity. In order to avoid unwanted indirect impacts to the resident desert tortoise population in the Project vicinity, specific measures to control ravens are required with construction of the Project. This Common Raven Management Plan (CRMP) summarizes the raven control measures that will occur at the pre-construction, construction, operations and maintenance (O&M), and decommissioning phases of the Proposed Action.

The purpose of the CRMP is to address direct impacts to desert tortoise by eliminating and minimizing subsidies to the maximum extent practicable. This Project-specific plan will protect juvenile and hatchling desert tortoises in the Project vicinity (within the immediate area of the Chuckwalla Valley) from increased predation by common ravens by eliminating or minimizing raven attractants and subsidies (e.g., surface water, trash and animal and plant waste materials; perching, nesting, and roosting sites) during construction, O&M, and decommissioning of the Project.

The objectives of this CRMP include:

1. Identifying the Project-specific conditions of concern that may attract ravens to the Project site and vicinity.
2. Providing specific management and control measures intended to avoid, minimize, and/or mitigate impacts.
3. Monitoring raven activity to measure the effectiveness of these measures. The monitoring effort is intended to provide qualitative data that can be interpreted by the Project's Environmental Compliance Manager or Designated Biologist to determine if existing Project design features to reduce raven subsidies are effective or if adaptive management is needed to meet these CRMP objectives.


San Bernardino County
40
Fresno
CALIFORNIA
Las Vegas
15
Los Angeles
5
15
10
San Diego
Mexicali
Twentynine Palms
62
Joshua Tree NP
Riverside County
Desert Sunlight Solar Farm Project
177
Midland
Arizona
111
Palm Springs
Coachella
Joshua Tree NP
10
Riverside County
Blythe
La Paz County
86
Salton Sea
Imperial County
78
California
78
Anza-Borrego Desert State Park
El Centro
Yuma
DESERT SUNLIGHT SOLAR FARM PROJECT DESERT SUNLIGHT HOLDINGS, LLC
0 75 150 300
Miles
Figure 1 Regional Location
Prepared by Ironwood Consulting, Inc. - Dec. 16, 2010



177
Coxcomb Mountains
Solar Farm
Gen-Tie Line A2
Kaiser Road
Telecommunications Site
Gen-Tie Line A1
177
Eagle Mountain Road
Desert Center
10
Red Bluff Substation
10
DPV1 & 2
Distribution Line
Transmission Line Loop-In
Access Road
Chuckwalla Mountains
0 0.5 1 2
Miles
Corn Springs Rd.
Project Area
Sunlight Component
SCE Component
Chuckwalla DWMA
Alligator Rock ACEC
Desert Lily Preserve
Desert Tortoise Critical Habitat
Wilderness Area
DESERT SUNLIGHT SOLAR FARM PROJECT
DESERT SUNLIGHT HOLDINGS, LLC.
Figure 2
Project Components
Prepared by Ironwood Consulting, Inc. - Dec 16, 2010

2.0 Common Raven Biology

The common raven is resourceful and adaptable. It has a world-wide range that covers almost the entirety of North America, Europe, Siberia and Eastern Asia. Food sources vary greatly and the raven eats everything from grains to young livestock (Larsen 1970). The common raven population has soared over the last half-century with an estimated population increase in the Mojave and Colorado Deserts ranges from 700 to 1,500 percent (Boarman 1993; USFWS 2008a). The most widely accepted cause of this population growth is from human infrastructure expanding into the desert and a dependency on easy food sources found at landfills, illegal dump sites, and agricultural land (Boarman 1993).

The common raven in California has a unique genetic clade (ancestral grouping) that separates it from the other common ravens of North America and the world (USGS 2000). Although there are no superficial differences in appearance between the two populations, the California clade is actually a closer relative to the Chihuahuan Raven. In contrast, the Holarctic clade, the more common northern hemisphere raven, is more related to the Pied Crow (USGS 2000), which is not present in the Project region. The ranges of the two raven clades overlap but they do not interbreed. This indicates that the California clade is endemic (USGS 2000) to the state, although not to the desert regions, and requires careful management versus an exotic invader, which in most cases could be eradicated where it is becoming a problem to native wildlife.

The raven overpopulation at the edges of human settlements has resulted in ravens learning to identify food sources in desert areas, which they historically avoided, including preying on juvenile desert tortoises. Studies of the desert tortoise population indicate that uneven age classes exist within desert tortoise populations and very little recruitment (young entering the population) is occurring (USFWS 2008). Common ravens are known to prey on juvenile desert tortoises and an increase in the raven populations has had a negative effect on the number of young tortoises recruited into the population. The predation of juvenile tortoises by ravens led to creation of a plan to reduce raven predation, which was included and analyzed in the *Final Environmental Assessment to Implement a Desert Tortoise Recovery Plan Task: Reduce Common Raven Predation on the Desert Tortoise* (USFWS 2008a). The purpose of this document is to outline measures that would reduce raven predation on hatchling and juvenile desert tortoises thereby increasing hatchling and juvenile desert tortoise survivorship and recruitment into the adult population, which is expected to contribute to the recovery of the species (USFWS 2008b).

Human subsidies that attract ravens include roads (where vehicles cause road kills or litter accumulates that provide forage), open water sources, trash, and structures suitable for sheltering and nesting (trees, radar towers, power poles, telephone poles, and buildings) or perch sites (security fencing). In addition, at the Project site, ground disturbance during construction, decommissioning, and site restoration would likely result in unearthing of natural food sources for ravens such as rodents and insects. Increased subsidies lead to an increase in the raven population in the immediate area. The establishment of new raven nests can have dire effects on the local juvenile tortoise population because nesting ravens spend 75 percent of their foraging time within 400 meters of their nest (Boarman 2002). Reducing human subsidies is a key element in the *Final Environmental Assessment to Implement a Desert Tortoise Recovery Plan Task: Reduce Common Raven Predation on the Desert Tortoise* (USFWS 2008a) and this goal should be incorporated into all projects that would likely provide such subsidies within desert tortoise habitat.

3.0 Baseline Conditions

3.1 Solar Farm Site and Gen-Tie Line

3.1.1 Existing Raven Subsidies

Existing raven subsidies at and near the Desert Sunlight Holdings components of the Proposed Action include roads, human developments, and open water sources. There are several existing paved roads (e.g., Interstate 10, Highway 177, Kaiser Road, and Eagle Mountain Road) in the vicinity of the Proposed Action, which potentially attract ravens because they may provide food from litter and road kill. The Lake Tamarisk Golf Club housing development is located south of the Solar Farm site and there are several other human settlements within the project area including Desert Center south of the Solar Farm site, Metropolitan Water District (MWD) housing near the MWD substation west of the Solar Farm site, and Eagle Mountain Mine northwest of the Solar Farm site. These settlements have small human populations, which likely provide food, shelter, and nesting opportunities for ravens. Open water sources include three artificial lakes at the Lake Tamarisk Golf Club, located south of the Proposed Action, as well as the Colorado River aqueduct north and northwest of the Solar Farm site.

3.1.2 Raven Presence at the Proposed Action

Common raven are known to occur at the Solar Farm site and along the Gen-Tie Line. Several methods have been useful in approximating the abundance of common raven at the Desert Sunlight Holdings components of the Proposed Action, including those used by Ironwood Consulting during Project surveys (incidental sightings from other surveys, bird point counts, and nest surveys – documented in Ironwood 2010), and Wildlife Research Institute (WRI) during aerial surveys for nesting golden eagles (WRI 2010). Figure 3 depicts the results of surveys of raven presence at the Desert Sunlight Holdings components of the Proposed Action.

Incidental Sightings

During all project biological surveys, all common ravens were tallied on standardized data forms with approximately 192 individuals counted (Ironwood Consulting 2010).

Aerial nest surveys by WRI were conducted for golden eagle on April 2-3 and May 14, 2010 following draft protocols (USFWS 2010). No common ravens were observed on or within three miles of the Desert Sunlight Holdings project components during these surveys. These surveys focused on the more mountainous regions of the region, but did cross the valley where the Project Action is located. Common ravens and nests observed by helicopter within 10 miles of the Solar Farm site boundaries were recorded and are included on Figure 3.

Point Counts

Point count surveys for all birds were conducted between April 7 and 17, 2010 and between October 10 and November 15, 2010 by an experienced desert avian biologist at a total of 15 locations, 9 on Solar Farm Site locations and 6 controls, using point count methodology as described in *Monitoring Bird Populations by Point Counts* (Ralph et al. 1995). The surveys are intended to allow compilation of bird species and their relative numbers at each fixed study point location (point counts). Point count methodology is well described and widely used in bird studies. Each point is visited for a fixed amount of time and all birds detected within an often fixed radius are recorded. Research suggests that the amount of time spent at a sampling location increases standard error especially at times greater than 10 minutes (Smith et al. 1997). Each count was limited to 10 minutes to minimize standard error introduced by double counting and flyovers. Additionally, incidental flyovers were recorded separately from typical observations and each count was divided into three survey periods consisting of the first three minutes, minutes 3 to 5, and minutes 5 to 10.

Nest Surveys

Driving surveys were conducted on April 23-24 and May 20, 2010 following draft protocols for identifying raptor nests (CEC and CDFG, 2010 draft) to look for existing raven nests within and adjacent to the Desert Sunlight Holdings Project components. Nests located during this survey included those found on existing transmission lines and trees. The surveys confirmed presence of two existing active nests just northeast of the Solar Farm site and none near the Gen-Tie Line (Figure 3).

3.2 SCE Project Components

3.2.1 Existing Raven Subsidies

Existing raven subsidies near the SCE components of the Proposed Action include roads and human developments, and open water sources. There are several existing paved roads (e.g., Interstate 10, Highway 177, and Kaiser Road) in the vicinity of the SCE components of the Proposed Action, which potentially attract ravens because they may provide food from litter and road-kill. There are several other human settlements within the project area including Desert Center northeast of the Proposed Action, and several homes and farms along Highway 177. These settlements have small human populations which likely provide food and shelter opportunities for ravens. Open water sources include three artificial lakes at the Lake Tamarisk Golf Club, located northeast of the SCE components of the Proposed Action. Four ravens were detected during these surveys (two individual birds and one pair), all as flyovers. These are shown on Figure 3.

3.2.2 Raven Presence at the Proposed Action Site

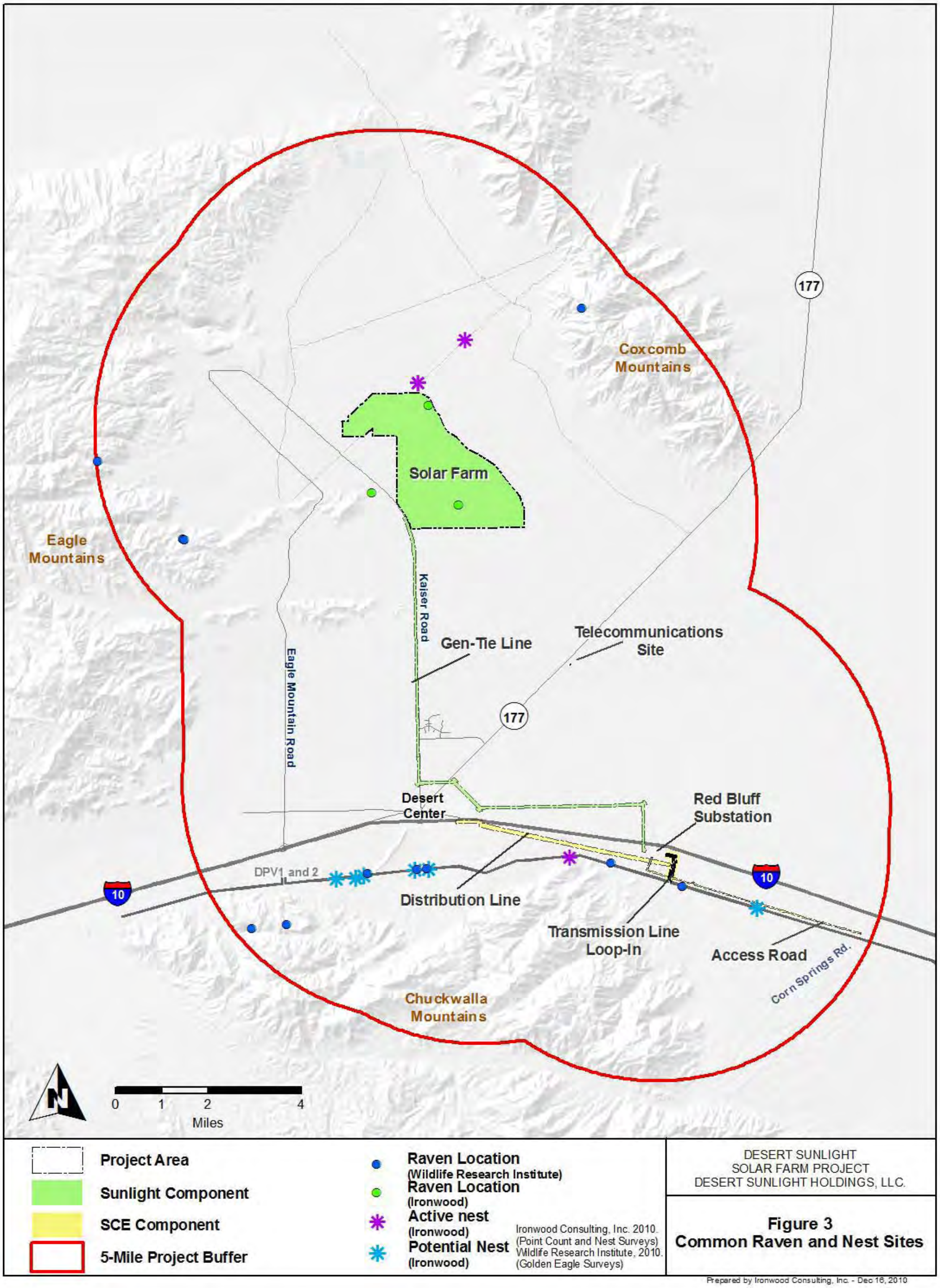
Common ravens are known to occur at all areas of the SCE components of the Proposed Action, including near the Red Bluff Substation, along the access road and distribution line, and at the telecommunications site. Several methods have been used to determine the presence and quantify approximate abundance of common raven at the SCE components of the Proposed Action, including tallying incidental sightings and conducting nest surveys. Figure 3 shows raven presence at the SCE components of the Proposed Action. Four ravens were detected during these surveys (two individual birds and one pair), all as flyovers. These are shown on Figure 3.

Incidental Sightings

During all Project biological surveys, common ravens were tallied on standardized data forms with approximately 55 individuals counted (Ironwood Consulting 2010). Aerial surveys were conducted for golden eagle in April and May 2010 following draft protocols (USFWS 2010). These surveys also recorded common ravens and nests observed by helicopter and are included on Figure 3. Six common ravens were observed on or within three miles of the SCE project components and several more within five miles (Figure 3).

Nest Surveys

Surveys were conducted on April 23-24 and May 20, 2010 following draft protocols for identifying raptor nests (CEC and CDFG, 2010) to look for existing raven nests within and adjacent to the SCE Project components. Nests located during this survey included those found on existing transmission lines and within trees. The survey confirmed presence of two existing active nests and seven potential raven nests observed without ravens present (Figure 3).


177
Coxcomb Mountains
Solar Farm
Eagle Mountains
Kaiser Road
Gen-Tie Line
Telecommunications Site
Eagle Mountain Road
177
Desert Center
Red Bluff Substation
DPV1 and 2
10
10
Distribution Line
Transmission Line Loop-In
Access Road
Corn Springs Rd.
Chuckwalla Mountains
N
0 1 2 4
Miles
Project Area
Sunlight Component
SCE Component
5-Mile Project Buffer
Raven Location (Wildlife Research Institute)
Raven Location (Ironwood)
Active nest (Ironwood)
Potential Nest (Ironwood)
Ironwood Consulting, Inc. 2010. (Point Count and Nest Surveys) Wildlife Research Institute, 2010. (Golden Eagle Surveys)
DESERT SUNLIGHT SOLAR FARM PROJECT DESERT SUNLIGHT HOLDINGS, LLC.
Figure 3
Common Raven and Nest Sites
Prepared by Ironwood Consulting, Inc. - Dec 16, 2010

4.0 Potential Project-Specific Raven Subsidies

The Project could result in additional opportunities for raven attractants and subsidies, including those during the construction, O&M, and decommissioning phases of the Proposed Action.

4.1 Solar Farm Site and Gen-Tie Line

The following activities associated with the construction, O&M, and decommissioning of the Solar Farm and Gen-Tie Line could provide raven attractants or subsidies.

<u>Construction</u>

- Temporary water supply ponds
- Ponding water from incidental flooding due to leaking water tanks or trucks
- Surface disturbance unearthing food sources such as rodent remains
- Additional traffic increasing road kills on local and Project roads
- Increased trash availability from increased human presence
- Additional temporary and permanent nesting, perching, and roosting sites created by project components, such as the Solar Farm Site fence and structures, and the Gen-Tie Line

<u>Operations and Maintenance</u>

- Trash and water availability from human presence
- Temporary and permanent nesting perching, and roosting sites created by project components, such as the Solar Farm Site fence and structures, and the Gen-Tie Line

<u>Decommissioning</u>

- Ponding water from incidental flooding due to leaking water tanks or trucks
- Ponding water associated with revegetation efforts
- Surface disturbance unearthing food sources such as rodent remains
- Additional traffic increasing road kills on local and Project roads
- Increased trash availability from increased human presence

4.2 SCE Project Components

The following activities associated with the construction, O&M, and decommissioning of the SCE Project components could provide raven attractants or subsidies.

<u>Construction</u>

- Ponding water from incidental flooding due to leaking water tanks or trucks
- Surface disturbance unearthing food sources such as rodent remains
- Additional traffic increasing road kills on local and Project roads
- Increased trash availability from increased human presence
- Additional temporary and permanent nesting, perching, and roosting sites created by project components, such as the Red Bluff Substation wall and structures, and associated distribution line, transmission connection lines, and telecommunications tower and structures

<u>Operations and Maintenance</u>

No additional attractants or subsidies are expected from the operation and maintenance of the SCE Project components. Most of these components are within an established utility ROW with an existing level of operations and maintenance activities that will not substantially increase due to the Project.

Decommissioning

- Ponding water from incidental flooding due to leaking water tanks or trucks;
- Ponding water associated with revegetation efforts;
- Surface disturbance unearthing food sources such as rodent remains;
- Additional traffic increasing road kills on local and Project roads; and
- Increased trash availability from increased human presence.

5.0 Roles and Responsibilities

The Applicant and SCE will each appoint an Environmental Compliance Manager and Designated Biologist who will be responsible for the implementation of common raven control and management (Section 6.0) and adaptive management (Section 8.0). If at any time a change is proposed to the Environmental Compliance Manager and/or Designated Biologist, the Applicant and SCE will obtain concurrence with the experience of new personnel from BLM, USFWS, and CDFG.

5.1 Environmental Compliance Manager

The Environmental Compliance Manager (ECM) will be independently or jointly assigned by the Applicant and SCE for their components of the Project. The ECM will be responsible for facilitating the implementation of all environmental management components of the project, including avoidance, minimization and mitigation measures for air quality, water quality and streambed permits, and other biological permits. The name, contact info, and qualifications of the ECM(s) will be listed in the Project's *Final Biological Resources Mitigation, Implementation, and Monitoring Plan*.

The ECM will have specific experience in the implementation of similar environmental compliance programs. The ECM will complete an extensive training program with the Project's Designated Biologist(s) and work closely together to ensure compliance with all environmental avoidance, minimization, and mitigation measures for the Project.

5.2 Designated Biologist

The Designated Biologist (DB) will be independently or jointly assigned by the Applicant and SCE for their components of the Project. The DB will be responsible for facilitating the implementation of avoidance, minimization and mitigation measures for streambed permits and other biological permits.

The name, contact info, and qualifications of the DB(s) will be listed in the Project's *Final Biological Resources Mitigation, Implementation, and Monitoring Plan* and their resume(s) will have been previously confirmed by BLM, USFWS, and CDFG as appropriate individuals for this position.

The DB will have specific experience in the implementation of similar environmental compliance programs. The DB will complete an extensive training program with the Project's ECM(s) and work closely together to ensure compliance with all biological avoidance, minimization, and mitigation measures for the Project. In addition, the DB will hold a Bachelor's or higher degree in Biological Sciences, Zoological Sciences, or a related field and will have at least five years of field experience in California desert habitats.

6.0 Common Raven Control and Management

All of the raven control and management measures discussed in this section apply to both the Sunlight and SCE components of the Proposed Action. Measures are discussed for the construction, O&M, and decommissioning phases of the Proposed Action.

6.1 Construction

The Applicant and SCE propose the following minimization and avoidance measures during Project design and construction:

1. Design facilities to discourage ravens
2. Minimize or eliminate food and water subsidies
3. Provide training to on-site personnel
4. Monitor common raven presence

6.1.1 Design Facilities to Discourage Ravens

Temporary construction ponds will include raven deterrents in their design to minimize these areas becoming raven attractants. These ponds will not remain on the solar farm site after the construction phase of the Project. The following design features and deterrents will be incorporated into the ponds as raven avoidance and minimization measures:

- ♦ Using anti-perching devices around the perimeter of each pond to exclude ravens and other birds from accessing the edge of the ponds to drink.
- ♦ Lining the ponds and maintaining two feet of freeboard in the ponds at all times
- ♦ Designing the ponds with interior side slopes at a 33 percent slope (3:1, horizontal:vertical)
- ♦ Netting will be used to cover ponds when not in use to reduce avian access. Appropriate material will be used to ensure that nocturnal bird species and bats will not become entangled in the netting

Project facilities will be designed to discourage roosting and nesting by comment ravens to the extent practicable by including deterrents such as bird spikes and auditory and visual deterrents. The Project's Gen-Tie Line design will incorporate these deterrents in all areas where it passes through the Chuckwalla DWMA and CHU.

6.1.2 Minimize or Eliminate Food and Water Subsidies

Raven food subsidies generated by the project will be avoided and/or minimized by maintaining a clean construction site, minimizing road kill due to project vehicle traffic, minimizing dead animals present on the Project, and minimizing open water sources. The following measures will be implemented:

- ♦ Temporary construction water supply ponds will include design features as described above to avoid and minimize these areas become raven attractants.
- ♦ Traffic speeds on all project-related dirt roads will be limited to 15 miles per hour to reduce the potential for road-killed animals. Biological monitors will be monitoring vehicle speeds during construction activities.
- ♦ Construction methods will be designed to minimize disturbance to burrowing rodents. By discing the site and minimizing grading, less dirt is moved and fewer rodents are likely to be unearthed during the construction process.
- ♦ Refuse management will be an integral part of the construction process. A sufficient number of refuse containers will be supplied and all containers will have sealable and lockable lids with the goal of

preventing strong winds from blowing garbage around, wildlife from entering refuse containers, and unauthorized people from tampering with refuse. On a daily basis biological monitors will check refuse containers to ensure they are not overflowing and are being closed properly.

- All work vehicles will have a sufficient supply of strong garbage bags to aid in collection and of any refuse found onsite. At the end of each day, bagged refuse will be placed into the large containers discussed above.
- Waste management contractors will supply an adequate number of portable toilets to promote a hygienic environment.

The following measures will be implemented to reduce incidental ponding during construction:

- Water used to prevent fugitive dust generation will not be allowed to pond onsite and will be dissipated immediately if such ponding occurs.
- Water sources for the project (such as wells) will be checked regularly by biological monitors to ensure they are not creating open water sources by leaking or consistently overfilling trucks.

6.1.3 Provide Training to On-Site Personnel

All Project-related personnel that enter any component of the Project site during construction will be required to complete a Worker Education and Awareness Program (WEAP) for Biological Resources. This program will be standardized and conducted by the Project's ECM or DB. A portion of this program will be focused on the natural history and biology of the common raven and will discuss the Project's Common Raven Management Plan including the necessity of avoiding and minimizing the creation of new raven subsidies as part of the approved Terms and Conditions of Project permits.

6.1.4 Monitor Common Raven Presence

During construction of the Proposed Action, biological monitors will continue to record raven sightings incidentally, during follow-up surveys of baseline point count locations, and during annual nest surveys. The goals of this monitoring are to:

1. Measure any potential increase or decrease in the numbers of common raven sighted within a 1-mile radius of the Project components
2. Identify offending ravens (those who are preying on desert tortoise), to include the removal of problem raven nests and reporting to USFWS and request raven removal of individual birds as required by wildlife agencies.

Incidental Sightings

During construction, all common ravens sighted by biological monitors will be recorded on standardized data forms during regular daily monitoring activities.

Point Counts

Point count surveys for all birds will continue to be conducted by an experienced desert avian biologist at the same locations on the Solar Farm Site and controls using the same methods employed in baseline surveys (Ralph et al. 1995). These point counts will be conducted twice every year (fall and spring) during Project construction.

Nest Surveys

Driving surveys according to current raptor protocols (CDFG 2010) will be conducted during construction at least twice yearly between February 15 and June 1, and separated by at least 30 days to look for existing raven nests within and adjacent to the Project components. The ground beneath confirmed raven nests would be inspected for any desert tortoise remains. If the DB recommends nest or problem raven removal, the DB will contact the project personnel at BLM, USFWS, and CDFG for guidance as discussed in Section 7.0.

6.2 Operations and Maintenance

The Applicant and SCE propose the following minimization and avoidance measures during the O&M phase of the Project:

1. Minimize or eliminate food and water subsidies
2. Provide training to on-site personnel
3. Long-term monitoring of common raven presence

6.2.1 Minimize or Eliminate Food and Water Subsidies

Raven food subsidies generated by the project will be avoided and/or minimized by implementing the following measures:

- Traffic speeds on all project-related dirt roads will be limited to 15 miles per hour to reduce the potential for road-killed animals. Biological monitors will be monitoring vehicle speeds during construction activities.
- Refuse management will be an integral part of the construction process. A sufficient number of refuse containers will be supplied and all containers will have sealable and lockable lids with the goal of preventing strong winds from blowing garbage around, wildlife from entering refuse containers, and unauthorized people from tampering with refuse. On a daily basis, Project personnel will check refuse containers to ensure they are not overflowing and are closed properly.
- All work vehicles will have a sufficient supply of strong garbage bags to aid in collection and of any refuse found onsite. At the end of each day, bagged refuse will be placed into the large containers discussed above.
- Waste management contractors will supply an adequate number of portable toilets to promote a hygienic environment.

No additional water (apart from sanitary facilities for project personnel and visitors) will be used on site during the O&M phase of the project.

6.2.2 Provide Training to On-Site Personnel

All Project-related personnel that enter any component of the Project site during the O&M phase of the Project will be required to complete the same WEAP for Biological Resources discussed above for the construction phase.

6.2.3 Monitor Common Raven Presence

During the O&M phase of the Proposed Action, project personnel and biological monitors will continue to record raven sightings incidentally, during follow-up surveys of baseline point count locations, and during nest surveys.

Incidental Sightings

During the O&M phase of the Project, all common ravens sighted by regular Project personnel will be recorded on standardized data forms during their daily activities.

Point Counts
Point count surveys for all birds will continue to be conducted by an experienced desert avian biologist at the same locations on the Solar Farm Site and controls using the same methods employed in baseline surveys (Ralph et al. 1995). These point counts will be conducted every five years during the O&M phase of the Project.

Nest Surveys
Driving surveys, according to current raptor protocols (CDFG 2010), will be conducted during the O&M phase of the Project to look for existing raven nests within and adjacent to the Project components. The ground beneath confirmed raven nests would be inspected for any desert tortoise remains. If the DB recommends nest or problem raven removal, the DB will contact the project personnel at BLM, USFWS, and CDFG for guidance as discussed in Section 7.0.
These nest surveys would be conducted" (1) twice yearly between February 15 and June 1, and separated by at least 30 days during the first five years post-construction, and (2) twice (between February 15 and June 1, and separated by at least 30 days) every five years subsequently until decommissioning.

6.3 Decommissioning

The Applicant and SCE propose the following minimization and avoidance measures during the decommissioning phase of the Project:

1. Minimize or eliminate food and water subsidies
2. Provide training to on-site personnel
3. Long-term monitoring of common raven presence

6.3.1 Minimize or Eliminate Food and Water Subsidies
Raven food subsidies generated by the project will be avoided and/or minimized by implementing the following measures:

- Traffic speeds on all project-related dirt roads will be limited to 15 miles per hour to reduce the potential for road-killed animals. Biological monitors will be monitoring vehicle speeds during construction activities.
- Refuse management will be an integral part of the construction process. A sufficient number of refuse containers will be supplied and all containers will have sealable and lockable lids with the goal of preventing strong winds from blowing garbage around, wildlife from entering refuse containers, and unauthorized people from tampering with refuse. On a daily basis, Project personnel will check refuse containers to ensure they are not overflowing and are closed properly.
- All work vehicles will have a sufficient supply of strong garbage bags to aid in collection and of any refuse found onsite. At the end of each day, bagged refuse will be placed into the large containers discussed above.
- Waste management contractors will supply an adequate number of portable toilets to promote a hygienic environment.

Water will be used to prevent fugitive dust generation and for revegetation during the decommissioning phase of the Project, with the following measures implemented to avoid or minimize creating additional raven subsidies:

- Water will not be allowed to pond onsite and will be dissipated immediately if such ponding occurs.
- Water sources for the project (such as wells) will be checked regularly by biological monitors to ensure they are not creating open water sources by leaking or consistently overfilling trucks.

6.3.2 Provide Training to On-Site Personnel

All Project-related personnel that enter any component of the Project site during the decommissioning phase of the Project will be required to complete the same WEAP for Biological Resources discussed above for the construction phase.

6.3.3 Monitor Common Raven Presence

During the decommissioning phase of the Proposed Action, project personnel and biological monitors will continue to record raven sightings incidentally, during follow-up surveys of baseline point count locations, and during annual nest surveys.

Incidental Sightings

During the decommissioning phase of the Project, all common ravens sighted by project personnel or biological monitors will be recorded on standardized data forms during their daily activities.

Point Counts

Point count surveys for all birds will continue to be conducted by an experienced desert avian biologist at the same locations on the Solar Farm Site and controls using the same methods employed in baseline surveys (Ralph et al. 1995). These point counts will be twice a year (fall and spring) during the decommissioning phase of the Project.

Nest Surveys

Driving surveys, according to current raptor protocols (CDFG 2010), will be conducted during the decommissioning phase of the Project to look for existing raven nests within and adjacent to the Project components. The ground beneath confirmed raven nests would be inspected for any desert tortoise remains. If the DB recommends nest or problem raven removal, the DB will contact the project personnel at BLM, USFWS, and CDFG for guidance as discussed in Section 7.0.

These nest surveys would be conducted twice yearly between February 15 and June 1, and separated by at least 30 days.

6.4 Reporting

Results from all monitoring activities will be recorded on standardized reporting forms and included in the annual raven monitoring report to be submitted to BLM on or before January 15th.This will provide necessary reporting to the USFWS and CDFG in their annual permitting report, which is due on or before February 1 of each year. The annual report shall summarize the activities and results of the monitoring conducted during the year and include an assessment of the effectiveness of the monitoring and the potential need to incorporate adaptive management measures (Section 7.0) into the monitoring program.

This annual report will also include a section reporting on the long-term monitoring program for common raven. This section will include number of ravens observed incidentally, results of nest surveys conducted during that year, and a discussion of whether these observations represent an increase or decrease in raven activity and associated theories of cause.

7.0 Regionwide Raven Management and Monitoring Program

Although the Project is not under the jurisdiction of the California Energy Commission (CEC), the Applicant will participate in the regional raven management and monitoring program as specified by the October 2010 Draft Summary *Renewable Energy Development in the California Desert: Common Raven Predation on the Desert Tortoise.* This document describes the regional raven management and monitoring program that includes agreements with state and local governments as well as private project applicants. Pursuant to this program, the Applicant and SCE would contribute to the region-wide effort in an amount related to the anticipated level of the Project's adverse impacts to desert tortoise populations from predation by ravens. The amount to be contributed are summarized below in Tables 3 and 4 and discussed in further detail in the Project's Habitat Compensation Plan (First Solar and Ironwood Consulting 2010).

Table 1. Raven Compensation Desert Sunlight Solar Farm and Gen-Tie Line

Resource	Acres of Impact	Compensation
Solar Farm Site	3,912	$410,760
Gen-Tie Line	104	$10,920
Total Compensation for Raven Mitigation		**$421,680**

Table 2. Raven Compensation for SCE Project Components

Resource	Acres of Impact	Compensation
Red Bluff Substation	149	$15,645
Total Compensation for Raven Mitigation		**$15,645**

8.0 Adaptive Management

Adaptive management will be implemented as necessary to continually improve upon previous decision-making. Any adaptive management strategies would be proposed by the Applicant or SCE and approved by BLM, USFWS, and CDFG prior to implementation. If monitoring data suggest the need for adaptive management, several additional measures may be implemented to minimize the attractiveness of the Project site to this species, to include devices to discourage roosting or nesting on project-related structures.

8.1 Solar Farm Site and Gen-Tie Line

If monitoring data show a significant increase in roosting by common ravens, measures to discourage roosting on the Sunlight Project components will be implemented using one or more of the following methods, decided in conjunction with the wildlife agencies:

- Bird spikes installed on top of potential perches designed to prevent birds from gaining a foothold on the perch because of their porcupine design
- Repellent coils installed on top of potential perches to deter birds from gaining footholds because of their destabilizing coil design
- Bird control wire designed so that a line or grid of variable height posts is interconnected by a wire. This creates a confusing landing area in the same spirit as trip wires used for unsuspecting people.
- Visual or auditory deterrents (hazing)
- Electric shock deterrents with low voltage pulses.

If monitoring data show a substantial and sustained (e.g., over several consecutive years) increase in nesting by common ravens that could lead to increased desert tortoise predation, then measures to discourage nesting on the Sunlight Project components will be implemented using one or more of the methods described above for discouraging roosting. Inactive raven nests discovered during the monitoring efforts will be dismantled and passive nest deterrents would be installed to inhibit future nest building at the site. In the event that an active nest is found, it will be monitored closely throughout the season by a biological monitor to determine number of fledglings and status of development. As soon as it is determined that the nest is no longer active, it will be removed and passive deterrents installed.

Non-lethal deterrents previously described will be the first course of action. However, ravens may adapt quickly to avoid passive deterrents. If problem ravens on the Sunlight Project components are proven to be an active threat to resident desert tortoises, then they could be subjected to lethal removal in coordination with BLM, USFWS, and CDFG if all required governmental authorizations can be obtained. Because ravens and their active nests are protected under the Migratory Bird Treaty Act (MBTA) they cannot be indiscriminately killed, harmed, trapped, or harassed. Any management action would need to be coordinated with and possibly carried out by the USFWS, BLM and CDFG.

8.2 SCE Project Components

If monitoring data show a substantial and sustained (e.g. over several consecutive years) increase in nesting by common ravens near the Red Bluff Substation and other SCE components that could lead to increased desert tortoise predation, SCE shall coordinate with the resource agencies on the appropriateness of implementing additional common raven control measures that will be conducted by SCE within the adjacent to DPV 1, including the potential to use methods to discourage roosting and nesting, or the removal of problem ravens as discussed above.

9.0 References

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Jurisdictional Delineation Plan

Investigation of the Presence of Wetlands and Other Waters of the United States, Desert Sunlight Solar Farm Project, Riverside County, California

Prepared for

Desert Sunlight Holdings, LLC
1111 Broadway
4th Floor
Oakland, CA 94607

By

Ironwood Consulting Inc
20 Nevada Street, Suite 300
Redlands, CA 92373

And

HUFFMAN-BROADWAY GROUP, INC.
828 Mission Avenue
San Rafael, CA 94901

June 2010

TABLE OF CONTENTS

LIST OF TABLES

List of EXHIBITS

List of EXHIBITS

This report should be cited as: Ironwood Consulting Inc. and Huffman-Broadway Group, Inc. 2010. *Investigation of the Presence of Wetlands and Other Waters of the United States Desert Sunlight Solar Farm Project, Riverside County, California.. Prepared for Desert Sunlight Holdings, LLC Oakland, CA. June. 39 pp. Exhibits.*

1.0 INTRODUCTION

1.1 Purpose and Scope of Work

At the request of Desert Sunlight Holdings, LLC (Sunlight), a wholly owned subsidiary of First Solar Development, Inc. (First Solar), Ironwood Consulting, Inc. and Huffman-Broadway Group, Inc. investigated the potential presence of wetlands and other waters of the United States subject to Corps of Engineers (Corps) jurisdiction under Section 404 of the Clean Water Act (CWA). The investigation covered a contiguous Study Area where a proposed new photovoltaic solar power generation facility (Solar Farm), generation interconnection transmission line (Gen-Tie Line) and substation would be located (Exhibit A, Figure 1). This study was conducted in accordance with Code of Federal Regulations (CFR) definitions of jurisdictional waters, the Corps' 1987 *Wetlands Delineation Manual*, the Corps' 2008 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)*, and supporting Corps and U.S. Environmental Protection Agency (EPA) guidance documents. Wetland determination data forms are provided in Exhibit C; and WETS analysis data are provided in Exhibit F. This investigation was conducted to seek a Corps Verified Jurisdictional Determination pursuant to applicable Corps guidance documents.

1.2 General Site Description

The Solar Farm is proposed to be located approximately six miles north of the rural community of Desert Center and four miles north of Lake Tamarisk, between the cities of Coachella (to the west) and Blythe (to the east) in an unincorporated part of Riverside County, California (Exhibit A, Figure 1). Approximate latitude and longitude coordinates for the center of the Study Area (Solar Farm area) are 33 degrees 49'20.0894N /' 115 degrees 23'37.427"W in the Pinto Wells, Coxcomb Mts., Victory Pass, East of Victory Pass, Desert Center, and Corn Springs United States Geological Survey (USGS) 7.5-minute series quadrangles (Exhibit A, Figure 2). Beyond the Solar Farm, the Study Area also encompasses the interconnection transmission line (Gen-Tie Line) and Red Bluff Substation, where the project would interconnect with the Southern California Edison (SCE) regional transmission system.

The Study Area for this investigation is defined as the area where potential ground disturbing components of the proposed project would occur based on the alternatives identified and analyzed in conjunction with the Environmental Impact Statement presently being prepared for the project by the Bureau of Land Management (BLM) (Exhibit A, Figure 3). The Study Area predominantly encompasses federal public lands under the jurisdiction of the BLM, but also includes portions of private property for the Gen-Tie Line alternatives and one of the substation locations.

1.3 Project Description

The Project consists of three main components associated with generating and delivering electricity from a photovoltaic (PV) solar facility:

- Solar Farm site (the main PV generating facility);
- 220-kV Gen-Tie Line; and
- 500/220-kV Substation (the Red Bluff Substation).

The Solar Farm site, where the power would be generated, would encompass between 3,045 and 4,245 acres, depending on the layout selected. The Solar Farm site would consist of several components:

- Main generation area, which includes PV arrays, combining switchgear, overhead lines, and access corridors;
- Operations and Maintenance (O&M) Facility;
- Solar Energy Visitor's Center;
- On-site substation (where the voltage of the Solar Farm-generated electricity would be stepped up to 220 kV, which is the voltage of the Gen-Tie Line); and
- Site security and fencing.

The Gen-Tie Line would transmit the electricity generated at the Solar Farm to the regional transmission system, through the Red Bluff Substation where the power from the Solar Farm would feed into the SCE's existing Devers Palo Verde 1 (DPV1) 500-kV transmission line. The length of the Gen-Tie Line would vary from 9.3 to 12.2 miles long, encompassing 177 to 236 acres, depending on the Gen-Tie Line route selected.

The Red Bluff Substation would consist of a 500/220-kV substation on approximately 90 acres, with an additional 20 to 30 acres needed for related features, access roads, and drainage control. It would interconnect the power from the Solar Farm (through the Gen-Tie Line) to SCE's DPV1 transmission line, which passes immediately adjacent to the two substation sites evaluated in this EIS.

1.4 Contact Information

Applicant Contact	***Wetland and Biological Consultant***	***Wetland Regulatory Scientist***
Applicant: Lisa Bodensteiner, Vice President, Business Development **Desert Sunlight Holdings, LLC** 1111 Broadway, 4th Floor Oakland, CA 94607 ***Applicant Contact***: Amanda Beck (510) 625-7408 ABeck@FirstSolar.com	**Ironwood Consulting Inc.** 20 Nevada Street, Suite 300 Redlands, CA 92373 *Contact*: Chris Blandford (949) 351-0192 chris@ironwoodconsultinginc.com	**Huffman-Broadway Group, Inc** 828 Mission Avenue San Rafael, California 94901 *Contact*: Terry Huffman, Ph.D. (415) 925-2000 thuffman@h-bgroup.com

1.5 Driving Directions to Study Area from Corps Office

***From*:** U.S. Army Corps of Engineers
Regulatory Division, Los Angeles Office
915 Wilshire
Los Angeles, CA 90017

***To*:** Solar Farm Area

Route Changes	Directions	Miles
1.	Head **northwest** on **Wilshire Blvd** toward **Francisco St**	**0.2 mi**
2.	Take the 3rd **left** onto **S Bixel St**	**0.2 mi**
3.	Take the **CA-110 S/Harbor Fwy/I-110** ramp	**0.1 mi**
4.	Merge onto **CA-110 S/I-110 S**	**0.6 mi**
5.	Take the exit toward **Adams Blvd**	**0.3 mi**
6.	Keep **right** at the fork, follow signs for **I-10 E** and merge onto **I-10 E**	**2.7 mi**
7.	Take exit **16A** for **Santa Fe Ave**	**0.2 mi**
8.	Keep **left** at the fork, follow signs for **Freeway**	**0.5 mi**
9.	Keep **right** at the fork, follow signs for **CA-60 E/I-5 S/Pomona/Santa Ana** and merge onto **CA-60 E**	**52.2 mi**
10.	Take exit **53B** for **I-215 N** toward **San Bernardino/Barstow**	**0.1 mi**
11.	Merge onto **CA-91 E**	**0.2 mi**
12.	Continue onto **I-215 N**	**5.5 mi**
13.	Take the exit onto **I-10 E** toward **Redlands**	**119.0 mi**
14.	Take exit **192** for **Desert Center Rice Rd/CA-177**	**0.2 mi**
15.	Turn **left** at **CA-177 N/Desert Center Rice Rd**	**0.2 mi**
16.	Take the 1st **left** onto **Ragsdale Rd**	**0.1 mi**
Estimated Driving Time & Distance	About **2 hours 58 mins** ***(up to 4 hours 50 mins in traffic)***	**183 miles**

1.6 Environmental Setting

1.6.1 Topography

The majority of the Study Area consists of relatively flat desert terrain located in the Chuckwalla Valley of the Sonora Desert. Elevations range from approximately 180 to 320 feet (55 to 100 meters) above mean sea level.

1.6.2 Land Use

The Study Area consists of a largely vacant, undeveloped land area in eastern Riverside County. The Study Area contains existing transmission lines, telephone lines and pipelines, as well as dirt roads. Joshua Tree National Park is located to the north, east, and west of the Study Area; at its closest point, and is approximately 1.4 miles southwest of the National Park boundary. The inactive Eagle Mountain Mine is located approximately one mile from the closest point west of the Study Area (Exhibit A, Figures 1 and 2).

1.6.3 Geology

Regional and site surficial geology are discussed in the 2007 *Phase 1 Geologic Reconnaissance Report* prepared for the Project by Eberhart /United Consultants (EUC). The site is in the east-northeastern Colorado Desert Geomorphic Province. The San Andreas Fault defines the southwestern boundary of the eastern Colorado Desert while the San Bernardino Mountains form a lesser defined boundary to the north. The proposed Solar Farm site and associated Gen-Tie Line and Substations are located in the Chuckwalla Valley, which was formed from multiple alluvial fans disseminating from the Eagle Mountains in the west and the Coxcomb Mountains in the east. Pinto Wash bisects the valley and forms the eastern boundary of the Solar Farm site. Review of recent aerial imagery and site photographs indicates that two significant geologic environments occur within the Study Area:

- Older alluvial sediments with developed desert pavement
- Active younger sediments with no evidence of desert pavement

1.6.3.1 Older Alluvial Sediments. EUC (2007) describes the established alluvial sediments as follows:

> *Older alluvial fan deposits consisting of Pleistocene nonmarine sediments extend outward into the valley from both the Eagle Mountains on the west and the Coxcomb Mountains on the east. Desert pavement type deposits (manganese and iron oxidized coatings on cobbles and sand) blanket the top three (3) to six (6) inches of the older alluvial fan material.*

1.6.3.2 Active Younger Sediments. The active younger sediments are of Holocene age and consist of fine to coarse sand, interbedded with clay, silt and gravel. There is no evidence of desert pavement. Topography in these areas tends to be consistent, with channel depths generally less than 1 foot deep.

1.6.3.3 Stream Channels. Lateral migration of stream channels is typically evaluated based on the analysis of historical aerial photographs. AECOM (2009) reviewed aerial photographs of the Study Area from 1978, 1996 and 2002. Stream channels within the Study Area appear to have been relatively stable over this period. On the basis of the authors' study of similar environments, it is expected that ephemeral stream channels in the older alluvial regions would remain relatively stable over time. It is more difficult to determine the stability of smaller channels in the more active portions of the site Study Area; the shallow channels within the younger sediments would likely exhibit frequent channel avulsion and lateral migration during flood flows.

1.6.3.4 Active Floodplain Characteristics. Desert regions pose a unique set of environmental and natural resource conditions that require careful review and evaluation to fully determine the existence and extent of the active floodplain. Traditional streams with clearly definable bed, bank and channels are not common. Broad alluvial systems that form from erosive processes that commence in surrounding rugged mountains are more typical. These areas generally contain young soils and numerous, very dynamic smaller drainage features. The most comprehensive and current guide for determining the active floodplain in desert regions is A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States (Lichvar and McColley 2008).

Lichvar states that ephemeral drainages in xeric regions are more dynamic than intermittent/perennial systems in more mesic regions. Desert ephemeral washes may include active floodplains that consist of multiple low-flow channels. These low-flow channels may be redirected and change course as a result of low to moderate discharge events (i.e., 5 to 10 year frequencies). Discharge events are periods of precipitation that induce surface flow and are typically episodic, meaning they range in intensity and do not persist for long periods of time. Under these conditions, low-flow channels typically exhibit poorly formed soils and reduced vegetation cover and are spatially dynamic. The boundaries of the active floodplain may be determined by visual observations, both in the field and from aerial images, of changes in soil texture and vegetation cover. Exhibit A, Figure 4 presents a representative arrangement of low-flow channels within the active floodplain and adjacent terrace.

Alluvial fan systems can be described as either active or inactive. Key characteristics of active alluvial fans include discontinuous channels, presence of sheetflow, uniform topography, and relatively uniform vegetation cover. Characteristics of inactive alluvial fans include continuous and defined channels, presence of desert pavement, diverse topography, and relatively diverse vegetation cover. Local geological conditions substantially influence alluvial fan characteristics.

1.6.4 Soils

Soils data for the Study Area has not been mapped and is therefore not available from the U.S. Department of Agriculture National Resources Conservation Service (USDA 2009). This is similarly true for a large portion of the Chuckwalla Valley and other remote portions of the California desert. Although soils have not been mapped, on site observation of surface conditions and interpretation of aerial photography reveal two primary soil types within the Study Area: desert pavement and more active wash sediments. These soils consist of alluvial materials primarily made up of sorted sands and gravel.

1.6.5 Vegetation

The Study Area is dominated by two distinctive vegetation types, creosote bush scrub and desert dry wash woodland (following the Holland 1986 California Vegetation Classification System). Plant species typical of the creosote bush scrub vegetation type include creosote bush (*Larrea tridentata*), burro bush (*Ambrosia dumosa*), boxthorn (*Lycium* sp.), brittlebush (*Encelia farinose*), Schott's indigo bush (*Psorothamnus schottii*) and prickly pear cactus (*Opuntia* and *Cylindropuntia* sp.). The evergreen creosote shrub visually appears relatively uniformly spaced within the desert landscape where it occurs. Vegetation density and height become noticeably reduced at locations within the Study Area exhibiting poor water infiltration capability such as stone covered desert pavement areas. Plants species typical of the desert dry wash woodland vegetation type include blue palo verde (*Cercidium floridum*), ironwood (*Olneya tesota*), smoke tree (*Psorothamnus spinosa*), and desert willow (*Chilopsis linearis*). Desert dry wash woodland was found to occur within the Study Area adjacent to ephemeral dry wash areas with braided channels that support dynamic flow.

1.6.6 Climate

The National Oceanic and Atmospheric Administration (NOAA) Atlas 14 defines southwestern California as a semi-arid region. The Riverside County Hydrology Manual describes the inland valley and desert areas as extremely hot and dry during the summer months and moderate during the winter. The mean seasonal precipitation is 3 inches in the eastern desert regions where the Study Area is located, which contrasts with the 35 to 40 inches of precipitation occurring in the San Bernardino and San Jacinto Mountains.

Three types of storms occur within the region: (1) general winter storms; (2) general summer storms; and (3) high intensity thunderstorms. General winter storms originate as extra tropical cyclones (warm Pacific Ocean air masses) that occur in the late fall or winter months. Monthly precipitation totals obtained from the Western Regional Climate Center Cooperative Observer Program for the Eagle Mountain, California Station, averaged for the winter months of October through March for the last ten years indicate that, from 2007 to 2010, average precipitation has been historically high and therefore represents a conservative baseline for Corps jurisdictional analysis (Exhibit A, Figure 6; Exhibit B). In the winter of 2009-2010, the average precipitation was 5.15 inches. High rates of precipitation occur over the interior mountain ranges, but precipitation decreases rapidly over the desert areas within the watershed basins. General summer storms can result in heavy precipitation and may include durations of several days. These storms typically occur between the months of July and September as a result of tropical air masses from either the Gulf of Mexico or the South Pacific Ocean. Thunderstorms that generate extremely high precipitation rates for short durations can occur at any time of year.

1.6.7 Hydrology

The Study Area is located within the Southern Mojave Watershed (HUC 18100100) (Exhibit A, Figure 7). The Study Area and ancillary project components would be located on portions of ten smaller (i.e., HUC 12) watersheds within the Southern Mojave Watershed. (Exhibit A, Figure 8). The Study Area is located within watersheds originating in the Eagle Mountains, with general flow directions of northwest to southeast. The alternative Gen-Tie Lines parallel to Eagle Mountain Road and Kaiser Road are also located within HUC 12 watersheds originating in the Eagle Mountains, with general flow directions of west to east. Big Wash is a major hydrological feature that crosses the Gen-Tie Lines and merges with other watersheds in upper Chuckwalla

Valley between Kaiser Road and Highway 177. The remaining project components – the Red Bluff Substation alternatives and southern extensions of the Gen-Tie Lines – are located within watersheds originating in the Chuckwalla Mountains, with general flow directions of southwest to northeast. Pinto Wash is east of the Solar Farm alternatives and flows from north to south while receiving surface flow from Eagle Mountain watersheds on the west and Coxcomb Mountain watersheds on the east; Pinto Wash does not intersect any of the proposed project features.

Surface and channel flooding can occur within the Study Area any time of year; however, many years can pass between surface flow events. General winter and summer storms generate low amounts of precipitation that typically infiltrates into the ground where it falls with little or no surface flow generated; or, if flow does occur, it typically runs within small localized areas before it can infiltrate below the ground surface. Flooding as a result of high intensity thunderstorms typically lasts only a few hours at most and may not necessarily occur over the entire site, but in localized areas.

1.6.8 FEMA Flood Zone

The Federal Emergency Management Agency (FEMA) has not conducted a flood hazard analysis of the Study Area and therefore no FEMA flood zone designation exists.

1.7 Disclaimer

Ironwood Consulting, Inc. and Huffman-Broadway Group, Inc., have conducted a thorough historic review and site investigation and made a good-faith effort herein to thoroughly describe and document the presence of potential factors that the Corps may consider in determining jurisdiction under their CWA jurisdiction as part of the Corps jurisdictional verification/determination process; however, Sunlight reserves the right to challenge or seek revision to any areas over which the Corps may assert jurisdiction.

2.0 REGULATORY FRAMEWORK

2.1 Definition of Wetlands and Other Waters of the U.S.

Section 404 of the Federal Clean Water Act authorizes the Corps to regulate activities that discharge dredged or fill material to wetlands and other waters of the United States. As described by EPA's and the Corps' regulations (40 CFR § 230.3(s) and 33 CFR § 328.3(a), respectively), the term "waters of the United States" encompasses the following resources:

(1) All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

(2) All interstate waters including interstate wetlands;

(3) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:

(i) Which are or could be used by interstate or foreign travelers for recreational or other purposes; or

(ii) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

(iii) Which are used or could be used for industrial purpose by industries in interstate commerce

(4) All impoundments of waters otherwise defined as waters of the United States under the definition;

(5) Tributaries of waters identified in paragraphs (a) (1) through (4) of this section;

(6) The territorial seas;

(7) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) (1) through (6) of this section.

EPA and the Corps define wetlands as:

> [T]hose areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. (EPA regulations at 40 CFR § 230.3(t); Corps regulations at 33 CFR § 328.3(b)).

2.2 Limits of Jurisdiction

The following provides the regulatory definitions and criteria followed in determining the geographic extent of potential EPA/Corps jurisdiction as applicable to inland waters.

The geographic limits of relevant federal jurisdiction for non-tidal waters of the U.S. are defined as follows at 33 CFR § 328.4(c):

> *Non-Tidal Waters of the United States*: The limits of jurisdiction in non-tidal waters:
>
> (1) In the absence of adjacent wetlands, the jurisdiction extends to the ordinary high water mark.
>
> (2) When adjacent wetlands are present, the jurisdiction extends beyond the ordinary high water mark to the limit of the adjacent wetlands.
>
> (3) When the water of the United States consists only of wetlands the jurisdiction extends to the limit of the wetland.

The terms "adjacent" and "ordinary high water mark," used in the above definition, are defined at 33 CFR § 328.3 as follows:

> The term *adjacent* means bordering, contiguous, or neighboring. Wetlands separated from other waters of the United States by man-made dikes or barriers, natural river berms, beach dunes and the like are "adjacent wetlands." (33 CFR § 328.3(c))
>
> The term *ordinary high water mark* means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas. (33 CFR § 328.3(e))

Wetlands: Implicit in the definition is the need for a site to meet certain water, soil, and vegetation criteria to qualify as a jurisdictional wetland. These criteria and the methods used to determine whether they are met and determine the geographic extent of wetland areas identified in the field are described in the Corps' 1987 *Wetlands Delineation Manual* and various regional supplements.

2.3 Identification of the Ordinary High Water Mark

The Corps definition of Ordinary High Water Mark (OHWM) provides the criterion by which the OHWM line can be identified which consists of "that *line on the shore established by fluctuations of water and indirect physical characteristics*." These associated physical characteristics are indicators that can be used to identify the OHWM caused by surface water fluctuations. Tables 1a and 1b, below provide a listing of indicators associated with areas that become flood or ponded, but are not dominated by wetland vegetation and the duration of flooding, ponding and/or near surface soil saturation (≤12 inches) is not sufficient to cause hydric soils to form or wetland hydrology conditions to occurs.

2008 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0).

Table 1a. Potential Geomorphic Indicators of Ordinary High Water Marks for the Arid West *

Potential Geomorphic OHWM Indicators		
(A) Below OHW	**(B) At OHW**	**(C) Above OHW**
1. In-stream dunes 2. Crested ripples 3. Flaser bedding 4. Harrow marks 5. Gravel sheets to rippled sands 6. Meander bars 7. Sand tongues 8. Muddy point bars 9. Long gravel bars 10. Cobble bars behind obstructions 11. Scour holes downstream of obstructions 12. Obstacle marks 13. Stepped-bed morphology in gravel 14. Narrow berms and levees 15. Streaming lineations 16. Dessication/mud cracks 17. Armored mud balls 18. Knick Points	1. Valley flat 2. Active floodplain 3. Benches: low, mid, most prominent 4. Highest surface of channel bars 5. Top of point bars 6. Break in bank slope 7. Upper limit of sand-sized particles 8. Change in particle size distribution 9. Staining of rocks 10. Exposed root hairs below intact soil layer 11. Silt deposits 12. Litter (organic debris, small twigs and leaves) 13. Drift (organic debris, larger than twigs)	1. Desert pavement 2. Rock varnish 3. Clast weathering 4. Salt splitting 5. Carbonate etching 6. Depositional topography 7. Caliche rubble 8. Soil development 9. Surface color/tone 10. Drainage development 11. Surface relief 12. Surface rounding

* Adapted from *2008 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Version 2.0)

Table 1b. Potential Vegetation Indicators of Ordinary High Water Marks for the Arid West *			
Potential Vegetation OHWM Indicators			
	(D) Below OHW	**(E) At OHW**	**(F) Above OHW**
Hydroriparian indicators	1. Herbaceous marsh species 2. Pioneer tree seedlings 3. Sparse, low vegetation 4. Annual herbs, hydromesic ruderals 5. Perennial herbs, hydromesic clonals	1. Annual herbs, hydromesic ruderals 2. Perennial herbs, hydromesic clonals 3. Pioneer tree seedlings 4. Pioneer tree saplings	1. Annual herbs, xeric ruderals 2. Perennial herbs, non-clonal 3. Perennial herbs, clonal and non-clonal co-dominant 4. Mature pioneer trees, no young trees 5. Mature pioneer trees w/upland species 6. Late-successional species
Mesoriparian indicators	6. Pioneer tree seedlings 7. Sparse, low vegetation 8. Pioneer tree saplings 9. Xeroriparian species	5. Sparse, low vegetation Annual herbs, hydromesic 6. ruderals 7. Perennial herbs, hydromesic clonals 8. Pioneer tree seedlings 9. Pioneer tree saplings 10. Xeroriparian species 11. Annual herbs, xeric ruderals	7. Xeroriparian species 8. Annual herbs, xeric ruderals 9. Perennial herbs, non-clonal 10. Perennial herbs, clonal and non-clonal codominent 11. Mature pioneer trees, no young trees 12. Mature pioneer trees, xeric understory 13. Mature pioneer trees w/upland species 14. Late-successional species 15. Upland species
Xeroriparian indicators	10. Sparse, low vegetation 11. Xeroriparian species 12. Annual herbs, xeric ruderals	12. Sparse, low vegetation 13. Xeroriparian species 14. Annual herbs, xeric ruderals	16. Annual herbs, xeric ruderals 17. Mature pioneer trees w/upland species 18. Upland species

* Adapted from *2008 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Version 2.0).

2.4 Wetlands Delineation Criteria

The Corps' 1987 *Wetlands Delineation Manual* identifies the key diagnostic criteria for determining the presence of wetlands. These include:

1. Wetland Hydrology: Inundation or saturation to the surface during the growing season.
2. Hydric Soils: Soils classified as hydric or that possess characteristics associated with reducing soil conditions.
3. Predominance of Wetland Vegetation: Vegetation classified as facultative, facultative wet, or obligate according to its tolerance of saturated (i.e., anaerobic) soil conditions.

Specific criteria used to determine the presence or absence of wetland hydrology, soil, and vegetation conditions are described in the sections below.

2.4.1 Wetland Hydrology

The 1987 Corps *Manual* states that wetland hydrology conditions occur when a "site is inundated either permanently or periodically at mean water depths less than or equal to 6.6 feet, or the soil is saturated to the surface at some time during the growing season of the prevalent vegetation." Whether a site meets either of these criteria is determined by the presence of diagnostic indicators of wetland hydrology, which include listed in Table 2.

Table 2. Wetland Hydrology Indicators
(Based on 1987 Corps Manual and Corps Guidance Documents)

Primary Indicators	Secondary Indicators
Watermarks	Oxidized Rhizospheres Associated with Living Roots
Drift Lines	Water-Stained Leaves
Water-Borne Sediment Deposits	FAC-Neutral Test
Drainage Patterns Within Wetlands	Local Soil Survey Data

A March 8, 1992 Corps memorandum entitled *Clarification and Interpretation of the 1987 Manual* provides further clarification:

> Areas which are seasonally inundated and/or saturated to the surface for a consecutive number of days for more than 12.5 percent of the growing season are wetlands, provided the soil and vegetation parameters are met. Areas wet between 5 percent and 12.5 percent of the growing season in most years may or may not be wetlands. Sites saturated to the surface for less than 5 percent of the growing season are non-wetlands.

Wetland hydrology indicators have also been further defined and described in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (Corps 2008). These indicators are similar to the indicators listed above from the 1987 Corps *Manual* and are presented in Table 3.

Table 3. Wetland Hydrology Indicators for the Arid West (Based on Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0)		
	Primary Indicators (*any one indicator is sufficient to make a determination that wetland hydrology is present*)	**Secondary Indicators** (*two or more indicators are required to make a determination that wetland hydrology is present*)
Group A – Observation of Surface Water or Saturated Soils		
A1* – Surface Water	**X**	
A2 – High Water Table	**X**	
A3 – Saturation	**X**	
Group B – Evidence of Recent Inundation		
B1 – Water Marks	**X** (Nonriverine)	**X** (Riverine)
B2 – Sediment Deposits	**X** (Nonriverine)	**X** (Riverine)
B3 – Drift Deposits	**X** (Nonriverine)	**X** (Riverine)
B6 – Surface Soil Cracks	**X**	
B7 – Inundation Visible on Aerial Imagery	**X**	
B9 –Water-Stained Leaves	**X**	
B10 – Drainage		**X**
B11 – Salt Crust	**X**	
B12 – Biotic Crust	**X**	
B13 – Aquatic Invertebrates	**X**	
Group C – Evidence of Current or Recent Soil Saturation		
C1 – Hydrogen Sulfide Odor	**X**	
C2 – Dry-Season Water Table		**X**
C3 – Oxidized Rhizospheres along Living Roots	**X**	
C4 – Presence of Reduced Iron	**X**	
C6 – Recent Iron Reduction in Tilled Soils	**X**	
C7 – Thin Muck Surface	**X**	
C8 – Crayfish Burrows		**X**

Table 3. Wetland Hydrology Indicators for the Arid West (Based on Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0)		
	Primary Indicators (*any one indicator is sufficient to make a determination that wetland hydrology is present*)	**Secondary Indicators** (*two or more indicators are required to make a determination that wetland hydrology is present*)
C9 – Saturation Visible on Aerial Imagery		**X**
Group D – Evidence from Other Site Conditions or Data		
D3 – Shallow Aquitard		**X**
D5 – FAC-Neutral Test		**X**
***** Denotes number of wetland hydrology indicator described in detail in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0).*		

2.4.2 Hydric Soils

The 1987 Corps *Manual* states that the diagnostic environmental characteristics indicative of wetland soil conditions are met when "soils are present and have been classified as hydric, or they possess characteristics that are associated with reducing soil conditions." According to the Manual, indicators of soils developed under reducing conditions may include:

1. Organic soils (Histosols);
2. Histic epipedons;
3. Sulfidic material;
4. Aquic or peraquic moisture regime;
5. Reducing soil conditions;
6. Soil colors (chroma of 2 or less);
7. Soil appearing on hydric soils list; and
8. Iron and manganese concretions.

A February 20, 1992, Corps memorandum entitled *Regional Interpretation of the 1987 Manual* states that the most recent version of National Technical Committee for Hydric Soils (NTCHS) hydric soil criteria will be used (to make hydric soil determinations). These soil criteria specify at least 15 consecutive days of saturation or 7 days of inundation (flooding or ponding) during the growing season in most years.

The concept of hydric soils includes soils developed under sufficiently wet conditions to support the growth and regeneration of hydrophytic vegetation. Soils that are sufficiently wet because of artificial measures are included in the concept of hydric soils. Also, soils in which the hydrology has been artificially modified are hydric if the soil, in an unaltered state, was hydric. Some series, designated as hydric, have phases that are not hydric depending on water table, flooding, and ponding characteristics. As indicated above, like the NRCS, the Corps has typically accepted guidance for the identification of hydric soils developed by the NTCHS. The NTCHS, a working group organized by NRCS, has developed criteria for identifying and mapping hydric soils throughout the United States and defines a hydric soil as "a soil that formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper part [of the soil profile]" (http://soils.usda.gov/use/hydric/intro.html). The most recent (2000) version of the NTCHS hydric soils criteria identifies those soils that are likely to meet this definition. These criteria, which are accepted by most state and federal agencies, are as follows (http://soils.usda.gov/use/hydric/criteria.html):

1. All Histels except Folistels and Histosols except Folists, or
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Andic, Vitrandic, and Pachic subgroups, or Cumulic subgroups that are:
    a. Somewhat poorly drained with a water table equal to 0.0 foot (ft) from the surface during the growing season, or
    b. poorly drained or very poorly drained and have either:
        (i.) water table equal to 0.0 ft during the growing season if textures are coarse sand, sand, or fine sand in all layers within 20 inches (in), or for other soils'
        (ii.) water table at less than or equal to 0.5 ft from the surface during the growing season if permeability is equal to or greater than 6.0 in/hour (h) in all layers within 20 in, or
        (iii.) water table at less than or equal to 1.0 ft from the surface during the growing season if permeability is less than 6.0 in/h in any layer within 20 in, or
3. Soils that are frequently ponded for a long duration or a very long duration (7 to 30 days) during the growing season, or
4. Soils that are frequently flooded for a long duration or a very long duration (7 to 30 days) during the growing season.

On the basis of computer database searches for soils meeting the second criterion, NRCS has developed hydric soils lists for many parts of the country. Although they are useful for determining whether a particular soil series *has the potential to support current hydric soil conditions*, caution should be used when using these lists for site-specific hydric soil determinations. Many soils on the lists have ranges in water table depths and other characteristics that allow them to be either hydric or nonhydric depending on landscape position and other site-specific factors (e.g., soil clay content, depth to bedrock). Accordingly, hydric soils lists are good ancillary tools to facilitate wetland determinations, but are not a substitute for onsite investigations.

Field indicators of hydric soils are morphological properties known to be associated with soils that meet the definition of a hydric soil. Presence of one or more field indicators suggests that processes associated with hydric soil formation have taken place on the site being observed. The field indicators are essential for hydric soil identification because once formed, they persist in the soil during both wet and dry seasonal periods. However, few hydric soil indicators identify soils at a site as being currently hydric in accordance with the NTCHS hydric soils criteria described above. Field indicators of hydric soil conditions are listed in Table 4:

Table 4. Field Indicators of Hydric Soil Conditions
(Based on 1987 Corps Manual and Corps Guidance Documents)

1. Indicators of Historical Hydric Soil Conditions:	2. Indicators of Current Hydric Soil Conditions:
a. Histosols b. Histic epipedons; c. Soil colors (e.g., gleyed or low-chroma colors, soils with bright mottles (Redoximorphic features) and/or depleted soil matrix d. High organic content in surface of sandy soils e. Organic streaking in sandy soils f. Iron and manganese concretions g. Soil listed on county hydric soils list	a. Aquic or peraquic moisture regime (inundation and/or soil saturation for ≥7 continuous days) b. Reducing soil conditions (inundation and/or soil saturation for ≥ 7 continuous days) c. Sulfidic material (rotten egg smell)

The presence of one or more of the field indicators in “1 a, b, c, and/or d” above suggests that historical processes associated with hydric soil development have taken place at a given site. These indicators are useful in determining if soils at a site were historically formed under hydric soil conditions because the indicators persist in soils during both wet and dry periods and may remain for decades and even centuries after changes in site conditions occur that inhibit subsequent wetland development, such as the elimination of wetland hydrology (NRCS 1995). However, only the presence of field indicators “2 a, b, and/or c” confirms that hydric soils occur at a site during the period of observation.

Hydric soil indicators have also been further defined and described in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (Corps 2008). These indicators are similar to those listed above from the 1987 Corps *Manual* and are presented in Table 5:

Table 5. Hydric Soil Indicators for the Arid West
(Based on Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0)

Hydric Soil Indicators			Hydric Soil Indicators for Problem Soils**
All Soils	**Sandy Soils**	**Loamy & Clayey Soils**	
A1* – Histosol	S1 – Sandy Mucky Mineral	F1 – Loamy Mucky Mineral	A9 – 1 cm Muck
A2 – Histic Epipedon	S4 – Sandy Gleyed Matrix	F2 – Loamy Gleyed Matrix	A10 – 2 cm Muck
A3 – Black Histic	S5 – Sandy Redox	F3 – Depleted Matrix	F18 – Reduced Vertic
A4 – Hydrogen Sulfide	S6 – Stripped Matrix	F6 – Redox Dark Surface	TF2 – Red Parent Material
A5 – Stratified Layers	--	F7 – Depleted Dark Surface	Other (See Section 5 of the Regional Supplement, Version 2.0)--
A9 – 1 cm Muck	--	F8 – Redox Depressions	--
A11 – Depleted Below Dark Surface	--	F9 – Vernal Pools	--
A12 – Thick Dark Surface	--	--	--

* Denotes number of hydric soil indicator described in detail in *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0).*
** Indicators of hydrophytic vegetation and wetland hydrology must be present.

It should also be noted for problematic areas that the 2008 Corps Regional Supplement specifies 14 days continuous ponding as an acceptable indicator of problematic hydric soils (USACE 2008, p. 101).

2.4.3 Prevalence of Wetland Vegetation

Species Classifications

Species classifications (e.g., tolerance of anaerobic soil conditions) are determined by consulting the *National List of Plant Species that Occur in Wetlands* (Reed 1988) and the relevant regional lists, which are published by FWS's National Wetlands Inventory (NWI). Regional Interagency Review Panels develop the lists by determining species' estimated probability of occurrence in wetlands vs. non-wetlands. Classifications are made by unanimous agreement of the Panel. If the Panel is unable to reach a unanimous decision on the status of a species, "no agreement" (NA) is recorded. If insufficient information exists to determine the status of a species, "no indicator" (NI) is recorded. Species that are not included in the NWI list are assigned a "not listed" (NL) designation in this report.

The resulting NWI lists include plants that grow in a range of soil conditions from permanently wet to dry. Species are divided into the following "indicator categories:"

1. **"Obligate wetland" (OBL)** species, which, under natural conditions, occur almost always in wetlands (estimated probability >99 percent);
2. **"Facultative wetland" (FACW)** species, which usually occur in wetlands (estimated probability 67 – 99 percent), but are occasionally found in non-wetlands;
3. **"Facultative" (FAC)** species, which are equally likely to occur in wetlands or non-wetlands (estimated probability 34 – 66 percent);
4. **"Facultative upland" (FACU)** species, which sometimes occur in wetlands (estimated probability 1 – 33 percent), but more often occur in non-wetlands; and
5. **"Obligate upland" (UPL)** species, which occur in wetlands in other regions, but, under natural conditions, occur almost always in non-wetlands in the region specified (estimated probability >99 percent).

Species that have an indicator status of OBL, FACW, and FAC are typically considered to be adapted for life in anaerobic soil conditions (Corps 1987) and are used as evidence of hydrophytic vegetation when they dominate plant community composition or cover. Despite widespread use of the lists for wetland delineations, it is important to note that wetland indicator species assignments are not based on the results of a statistical analysis of species occurrence.

The indicator assignments are approximations of wetland affinity based on a synthesis of submitted review comments, published botanical literature, and the field experience of the members of the Interagency Review Panel. For this reason and because many plants have properties that enable them to occur in a range of microhabitats (i.e., wetlands and non-wetlands), the presence of wetland indicator species is not unequivocal evidence of the presence of wetland hydrology and hydric soils. A positive indicator or indicators of wetlands should be emphasized, such as an assemblage of plants that can only be considered "hydrophytes" when they are growing in water or partly drained hydric soils (not effectively drained hydric soils) (Corps 1987). From the FWS's perspective, all species on the NWI plant lists are hydrophytes at one time or another and the wetland indicator status (OBL, FACW, FAC, or FACU) reflects the likelihood that a given individual of a species is a hydrophyte or a certain population of these plants is hydrophytic. While OBL and FACW species are the most reliable plant indicators of wetlands, FAC and FACU species also contain populations of hydrophytes (Tiner 2006).

For the reasons stated above, the 1987 Corps *Manual* does not solely rely on the presence of hydrophytic vegetation to make wetland determinations.

Hydrophytic Vegetation Definitions

The Corps' 1987 *Manual* states that the wetland vegetation conditions are met when the prevalent vegetation (i.e., more than 50 percent of vegetation cover or tree basal area) consists of macrophytes that are typically adapted to sites having wetland hydrologic and soil conditions (e.g., periodic or continuous inundation or soil saturation). Hydrophytic vegetation is defined as "plant life growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content" (Cowardin *et al*.

1979). Hydrophytic vegetative species, due to morphological, physiological, and/or reproductive adaptation(s), have the ability to grow, effectively compete, reproduce, and/or persist in anaerobic soil conditions. Positive indicators of the presence of hydrophytic vegetation include:

1. More than 50 percent of the dominant species are rated as Obligate ("OBL"), Facultative Wet ("FACW"), or Facultative ("FAC") on lists of plant species that occur in wetlands (see Reed 1988 for California);
2. Visual observations of plant species growing in sites of prolonged inundation or soil saturation; and
3. Reports in the technical literature indicating the prevalent vegetation is commonly found in saturated soils.

Hydrophytic vegetation indicators have been further defined and described in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (Corps 2008). These indicators include:

1. Dominance Test. More than 50 percent of the dominant plant species across all strata are rated OBL, FACW, or FAC.
2. Prevalence Index. The prevalence index is 3.0 or less with indicators of hydric soils and wetland hydrology being present.
3. Morphological adaptations. The plant community passes either the dominance test or the prevalence index after reconsideration of the indicator status of certain plant species that exhibit morphological adaptations for life in wetlands.

3.0 DELINEATION METHOD

The study will be conducted in accordance with Code of Federal Regulations (CFR) definitions of jurisdictional waters, the Corps' 1987 *Wetlands Delineation Manual*, the Corps' 2008 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)*, *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States, A Delineation Manual,* and supporting Corps and EPA guidance documents. The following provides an overview of the objective of the delineation approach, how the Study Area is defined, and the methods used to identify and map (delineate) areas potentially subject to Corps jurisdiction under Section 404 of the CWA.

3.1 Objective and Establishment of Study Area Boundary

The objective of this investigation was to identify and map areas potentially subject to CWA Section 404 jurisdiction under the Corps' Regulatory Program within the Study Area. The approach taken by this study was to identify, using field indicators, the location of potential wetlands or other waters of the United States subject to Corps jurisdiction. A description of these field indicators can be found in sections 2.3 and 2.4, above and the above referenced documents.

3.2 Field Data Collection

Prior to initiating detailed field survey work, existing land forms within the Study Area that may potentially contain wetlands or other waters of the United States were identified by conducting on-site reconnaissance inspections during the months of September through December 2009 and January 2010 in conjunction with review of the following information:

- Aerial photography of the area;
- USGS Topographic Mapping;
- Topographical Light Detection and Range (LIDAR) data (12 inch contours);
- USGS National Hydrology Dataset;
- Hydrological models of flood events; and
- Preliminary level vegetation and soils mapping conducted during January 2007.

It should be noted that no soils mapping for the Study Area has been prepared by BLM or the U.S. Department of Agriculture National Resources Conservation Service and therefore was not available for review. This is similarly true for a large portion of the Chuckwalla Valley where the Study Area is located and other remote portions of the California desert. Although soils have not been mapped, on site observation of surface conditions and interpretation of aerial photography reveal two primary soil types within the Study Area: desert pavement and more active wash sediments. These soils consist of alluvial materials primarily made up of sorted sands and gravel.

Based on the above site reconnaissance and document review, land features were identified that had the potential to be the types of areas that may flood, pond, and /or the soils become saturated. This review indicated that low-lying landscape features such as channels and depressions within the Study Area have the potential to have field indicators which would provide indication of wetlands or other waters of the United States.

Detailed field investigations within areas identified as having potential areas subject to Corps CWA jurisdiction were initiated in February 2010 and ended in May 2010 (see Exhibit C for field investigation dates). These on-site field surveys were designed to collect data that would provide evidence of areas potentially subject to Corps jurisdiction. Field data was collected along linear transects systematically plotted across portions of the Study Area that were determined to be representative of existing soils, vegetation and drainage conditions that may contain wetlands or other waters of the United States (Exhibit D). The linear transects were oriented perpendicular to the general surface water drainage pattern.

Each potential jurisdictional land feature encountered along an identified transect, such as a low-lying depressional area or channel, was sampled (sample point) and if any indicators of wetland hydrology, hydric soils, wetland vegetation, and/or a OHWM were found, this information was documented using a Trimble YUMA handheld computer with built-in GPS and ESRI ArcPad software. The widths of each channel's OHWM encountered in the field were measured to the nearest foot. Measurement of channel width was taken by measuring across the active channel from one OHWM to the OHWM on the opposite side of the channel. Each of the above described sample point locations was also documented as a point feature using the above described GPS unit. The GPS united allowed for real-time GIS data collection unit with sub-meter accuracy after post-processing. Photographs were also taken of representative channels during the survey effort.

3.3 Rainfall Analysis

A "Climate Analysis" (WETS analysis) was conducted to assess whether rainfall periods during the 2009 to 2010 period of study fall well within the normal range of precipitation based on long-term records collected at the nearest appropriate NWS cooperative weather station. The method for rainfall analysis followed the Technical Standard for Water-Table Monitoring of Potential Wetland Sites (Corps 2005), which is a technical standard by which the Corps determines what is normal, below normal and above normal rainfall month for any given year of record. The purpose of this analysis was to aid in establishing whether surface hydrology indicators observed on site were likely the result of the amount of rainfall received during the period of study. Daily weather data for 2009 and 2010 were compared with historical average monthly rainfall data (averaged for the years 1971 to 2000) from the Western Regional Climatic Center for the Eagle Mountain rainfall station (CA 2598, see Exhibit B).

3.4 Mapping

Areas potentially subject to Corps jurisdiction were identified and entered as geo-referenced attribute data into a GIS data base (1) using the field data collected at each GIS documented sample location (Exhibit C), and (2) by digitizing active drainage features identified through interpretation of orthorectified digital satellite imagery with ≤ 60 cm pixel resolution. The photointerpretation process was aided through the use of the above referenced field data, topographic data derived from modeled Topographical Light Detection and Range (LIDAR) data, and field verification of the mapped land features. This photointerpretation approach allowed for qualitative photointerpretation of drainages and individual shrubs and trees at intervals of less than 2 feet in width. Active linear drainage features were mapped as line features due to their narrow width. Desert Dry Wash Woodland habitat included linear drainage features and adjacent riparian shrubs and trees were mapped as polygons.

4.0 TECHNICAL FINDINGS

The following sections describe the landscape features and field indicators found within the Study Area that provide a technical basis for (a) determining the presence or absence of a potential water of the United States; and (b) defining the geographic extent of any potential water of the United States identified. Two types of landscape features were found that potentially contain waters of the United States. These include:

1. Natural drainages
2. Man Made Drainages

4.1 Field Indicators of Hydric Soils

Based on field observations within the Study Area, soil indicators were <u>not</u> found that meet the hydric soils criteria defined by current Corps' regulatory guidance, including the *2008 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Version 2.0). On site observations of surface conditions, including road and channel bank cuts and interpretation of aerial photography, revealed two primary soil types, desert pavement and more active wash sediments. On site examination revealed that soils or substrates within both natural drainages and man made drainages consist of alluvial materials primarily made up of sorted sands and gravel, and are well drained, ranging from moderately well drained to excessively well drained.

4.2 Field Indicators of Wetland Hydrology Conditions

Based on field observations within the Study Area, wetland hydrology indicators were <u>not</u> found that meet the hydric soils criteria defined by current Corps' regulatory guidance, including the *2008 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Version 2.0). On site observations revealed evidence of flooding within the low-lying natural and man made drainages. These observations also showed that there was no evidence of ponding and soil saturation for long to very long periods of time. The lack ponding and soil saturation conditions meeting the wetland hydrology criteria is a direct result of the moderately well drained to excessively well drained alluvial soils.

Although wetland hydrology conditions were not found within the Study Area, the field indicators of active surface water flow or flooding found within natural and man made drainages were sufficient enough to form an OHWM. As indicated in Section 2.0, an OHWM provides a technical basis for (a) determining the presence a potential water of the United States; and (b) defining the geographic extent of potential waters of the United States.

The natural and man made drainages within the Study Area with an OHWM exhibited the following characteristics which are discussed in detail in the following subsections:

1. identifiable field indicators of surface flow

2. identifiable landscape features that supports surface flow
3. identifiable landscape features with a recognizable OHWM

4.2.1 Field Indicators of Surface Flow

Review of topographic mapping (USGS and LIDAR modeling) and imagery of the Study Area provided visual indication of the presence of curvilinear depressional land surface features where focused surface water flow could potentially be directed. Field investigations confirmed the presence of surface flow within a number of these channels or drainages while others lacked evidence / field indicators of active ephemeral surface water flow. No drainages were found to contain evidence of perennial or intermittent surface water flow, and no evidence of subsurface flow was found in the form of spring discharges, artesian flows or evidence of a high groundwater table. The active ephemeral drainages had downstream surface channel and evidence of surface water / hydrologic connectivity with other active drainages within and outside the Study Area. These ephemeral drainages are locally referred to as desert dry washes. Indicators of drainages having active surface water flow paths included (1) water marks defined by linear deposits of fine grained sediment, minerals and/or plant debris; (2) bank scour, erosion and/or shelving; (3) deposits of sorted alluvial materials; and (4) flow deposited woody and soft tissue plant debris (Exhibit C).

Flow-deposited woody and soft tissue plant debris were typically absent in drainages that did not have active surface flow. If woody debris was present, the pieces observed were relatively thick (i.e., greater that ¼ inch) weathered limb or root material or milled posts or lumber. The wood pieces found were randomly placed and were not part of a collective flow line of deposited woody and/or soft tissue plant debris, which would be indicative of an active channel. The historical drainages were found to possess one or more of the same type of indicators found in active drainages, but the indicators found were considerably weathered. Surface flow indicators such as bank scour, erosion and shelving areas had rounded edges in contrast to those found in active drainages having angular edges. Water marks defined by linear deposits of fine grained sediment and minerals, and sorted alluvial materials such as gravels, cobbles and boulders were etched or varnished from weathering. The historical drainages were found to consist of the historical remains of channel drainages that were abandoned due to upslope changes in drainage due to either channel down-cutting or the channel becoming abandoned as the surface drainage became redirected or changed course due to deposition of alluvial material damming the channel flow path.

Surface water flow patterns were also found within various portions of the landscape that were relatively flat. These surface flow areas were defined by flow-deposited fine grained sediment or soft tissue plant debris. The visible surface flow pattern at these locations would continue for several feet then disappear either on a relatively flat soil surface or localized depression.

The results of the WETS analysis described in subsection 3.3, above show that the level of monthly precipitation received for water year 2009-2010 was above normal (Exhibit

B). This confirms that the field indicators located within the Study Area provide technical evidence of active surface water flow resulting from precipitation and resulting channel flooding (Exhibit C). In addition, the observed flow patterns are consistent with the general discussion of surface and channel flooding described in subsection 1.6.7, above.

Based on the above technical findings and as documented in Exhibit C, drainages were found with indicators of active surface water flows within the Study Area.

4.2.2 Landscape Features that Support Surface Flow

Detailed field surveys identified land surface features that have the potential to convey surface flows. These features included a bed or channel and abutting banks. These physical features were found associated with both active flow areas and historical drainages. These drainage types can be summarized as follows:

1. Active drainage channel and abutting banks containing evidence of recent surface flows as indicated by the presence of unweathered sediment material (sand, gravel, cobbles, etc.) with unweathered surfaces, and the presence of flow deposited woody debris and/or soft tissue plant debris.
2. Active drainage channel and abutting banks containing evidence of historical surface flows as indicated by the presence of unweathered sediment material (sand, gravel, cobbles, etc.) with unweathered surfaces, but lacked the presence of flow deposited woody debris and/or soft tissue plant debris.
3. Historical drainage channels and abutting banks having no evidence of recent surface flow as indicated by weathered sedimentary gravel, cobbles, boulders, erosional or depositional deposits, and the lack of flow deposited woody debris and/ or soft tissue plant debris.

Based on hydrologic modeling (AECOM 2001, 2010a&b) for the Study Area, the frequency interval of flow events within drainages with observable plant debris (1 above) and unweathered sediment material was found to be in a 1 to 15 year range. Strojan, et. al. (1987) found that the surface litter decomposition rates for creosote bush and burro bush in the Mojave Desert was 42.5% and 58.4%, respectively. Kemp, et. al. (2003) reported a similar one year decompositions rate for creosote bush and a 74% loss within a 41 month period. This lends support to qualitative observations made by one of the preparers of this report, Dr. Terry Huffman, who has observed over 20 + years of delineating wetlands within arid environments that that soft plant tissue (i.e., pieces of plant leaves and thin bark) will decompose in arid drainage environments within a 2 to 3 year period. In addition, field observations by Dr. Huffman indicated that small woody stems (<1/4 inch) decompose over many more years, perhaps 10 + years. For older drainages where the surfaces of the sediment material (e.g., sand, gravel, cobbles, etc.) is no longer smoothed by the interaction of surface water flow and transport, but weathered, and lacks flow deposited woody and thin tissue plant debris, the frequency interval likely ranges to well over a decade in shallower channels to prehistoric times for deeply incised channels (i.e., > 6 feet in desert pavement areas).

The land surface of the Study Area is characterized by the presence of active and inactive alluvial fan systems. Ephemeral drainage channels are found on both types of these alluvial fan types. The majority of the ephemeral channels supporting active surface water flow were narrow, with an average width of 2 feet. Active alluvial fans were characterized by sandy soils, uniform vegetation, and evidence by surface flow patterns indicative of surface water sheetflow. Channels within these areas were weakly expressed and discontinuous. This discontinuity indicated that new channels could be formed with each major flood event resulting in the current channels being bypassed and blocked off. Evidence was found where previously bypassed cutoff channels had become filled with sediment. The specific conditions varied within the Study Area. For example, the central-southern Solar Farm contained very sandy soils with weakly expressed washes and uniformly spaced creosote evergreen shrub vegetation. The portion of Big Wash that crossed Kaiser Road also contained sandy soils, but contained more indicators of recent flow and abutting and adjacent uniformly distributed desert dry wash woodland vegetation. Inactive alluvial fans, which were generally more stable, supported well-defined channels among older sediments often containing upland terraces of desert pavement and rock. These areas were found in the northwest and southwest portions of the Solar Farm alternatives, along the southern portion of Gen-Tie A-1, along the northern portion of Gen-Tie B-1 that parallels Eagle Mountain Road, Redbluff Substation A, and the Redbluff Substation A access road alternatives.

Based on the above technical findings, drainages with active surface flow were found within the Study Area with physical features that allow for the conveyance of surface flows.

4.2.3 Landscape Features with a Recognizable OHWM

The desert dry washes with active flow were found to have identifiable features which represented the geographic reach of lateral surface water. These features included channels or beds with evidence of active flow abutting banks which demarcated the lateral reach or extent of flow. Field indicators of the extent of active flow along the banks included water marks defined by linear deposits of fine grained sediment, minerals and/or plant debris, bank scour, erosion and/or shelving, and flow deposited woody and soft tissue plant debris.

Based on the above technical findings, the active drainages, described in the above subsections, have recognizable landscape features from which the lateral extent of surface water flow can be geographically delineated. The upper limit of this active flow was used to identify the OHWM. Exhibit D shows the location of these active ephemeral drainages.

4.3 Field Indicators of Wetland Vegetation

Based on field observations within the Study Area, a dominance of wetland plant species or hydrophytes was not found. Based on this result, the criteria defined by current Corps' regulatory guidance, including the *2008 Regional Supplement to the Corps of Engineers*

Wetland Delineation Manual: Arid West Region (Version 2.0) for wetland vegetation was not met.

4.3.1 Natural and Man Made Drainages

Two vegetation types occur within the Study Area, creosote bush scrub and Desert Dry Wash Woodland. The majority of natural and man made ephemeral drainages found within the Study Area occur within the creosote bush scrub vegetation type. The dominant plant species typical of this vegetation type, creosote bush, burro bush, and brittlebush are classified as upland species by the U.S. Fish and Wildlife Service, National Wetlands Inventory (Reed 1988).

Desert Dry Wash Woodland vegetation located within and directly abutting active drainages likely benefit from both surface and subsurface flows that periodically occur. Desert Dry Wash Woodland occurs in several locations within the Study Area. The dominant plant species typical of this vegetation type, blue ironwood, palo verde, and smoke tree are not considered plants that can occur in wetland conditions, however, the plants do occur in washes with braided channels that support dynamic flow. Although this vegetation type is typically associated with active drainages and commonly referred to as riparian vegetation, these woody shrub and tree species are classified as "upland" plant species by the U.S. Fish and Wildlife Service, National Wetlands Inventory (Reed 1988). According to the Corps, wetland species occur in habitats where soils and substrates are flooded or ponded for long to very long continuous periods of time that are ≥ 7 days (Corps 2008). The National Wetlands Inventory classification indicates that the frequency of upland plants occurring within wetlands about 1%.

These riparian plant species do, however, possess a unique ability to survive in arid systems where ephemeral drainages convey limited periodic surface flows as they can grow root systems which follow soil moisture to considerable depths. These phreatophytes are likely providing indication of subsurface flow where they occur within the Study Area.

5.0 AREAS POTENTIALLY SUBJECT TO FEDERAL JURISDICTION

This section presents the findings of this delineation with respect to the identification and geographic extent of areas found that could potentially constitute wetlands or other waters of the United States under Section 404 of the Clean Water Act for purposes of this jurisdictional determination by the Corps.

5.1 Wetlands

No areas meeting the Corps technical criteria for wetlands were identified within the Study Area. These findings are based on the absence of one or more of hydric soil, wetland hydrology, and wetland vegetation indicators as required by the Corps' *1987 Manual, the Arid West Regional Supplement*, guidance documents, and regulations.

5.2 Other Waters

Ephemeral drainages within the Study Area were found that meet the technical criteria to potentially be subject to CWA Section 404 jurisdiction as "other waters" of the United States (Exhibit D). This finding is based on the presence of an OHWM as defined by Corps regulations. Length and width measurements for each ephemeral drainage found to contain an observable OHWM are provided in Exhibit C. The total length of drainages identified is ___ feet or ___ miles and the average widths between ordinary high water marks within these ephemeral drainages ranges from ___ to _____ within the Study Area.

6.0 CWA JURISDICTIONAL ANALYSIS

This section analyzes the potential for waters identified within the Study Area to constitute waters of the United States subject to jurisdiction under the CWA. Section 6.1 provides an explanation of the jurisdictional determination process following EPA and Corps guidance. Section 6.2 defines the area to be analyzed (i.e., the Review Area). Section 6.3 analyzes the potential for waters of the United States to be present in the Review Area. Section 6.4 describes any jurisdictional and /or non-jurisdictional waters found. Section 6.5 summarizes the findings of this jurisdictional analysis.

6.1 Regulatory Background

Beyond the Corps and EPA regulatory definitions of "waters of the United States" as described in Section 2.0, recent judicial decisions have further limited and refined the scope of CWA jurisdiction with regard to isolated waters and certain wetlands and non-navigable tributaries. Two of these decisions are relevant to this jurisdictional analysis.

First, in *Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers, No. 99-1178* (531 U. S. 159; January 2001) ("SWANCC"), both statutory and constitutional challenges were made to the assertion of CWA jurisdiction over isolated, non-navigable, intrastate waters solely on the basis that those waters were used as habitat by migratory birds. The U.S. Supreme Court in SWANCC rejected the "migratory bird rule," and held that CWA jurisdiction does not exist over "isolated, non-navigable, intrastate waters" where there is no interstate or foreign commerce nexus.

Second, in *Rapanos v. United States* and *Carabell v. United States* (547 U.S. 715 [126 S. Ct. 2208] [2006]) (*Rapanos*), the U.S. Supreme Court addressed jurisdiction over wetlands and other waters that themselves did not constitute navigable waters. In Rapanos, the Court held that CWA jurisdiction extends to traditionally navigable waters, tributaries of such waters that flow year-round or contain continuous flow at least seasonally, and wetlands that directly abut such waters or tributaries. The Court held that jurisdiction does not exist, however, where such waters (1) do not have "a continuous surface water connection to bodies that are 'waters of the United States' in their own right"; or (2) do not have a hydrological connection that constitutes a "significant nexus" to or otherwise "significantly affect the chemical, physical, and biological integrity of other covered waters more readily understood as 'navigable.'"

In response to *Rapanos*, EPA and the Corps issued guidance to EPA regions and Corps districts (Rapanos guidance; EPA and Corps, 2008). The Rapanos guidance identifies which waters the agencies will categorically assert jurisdiction over and which will be subject to a case-by-case analysis to identify whether the water has a "significant nexus" to a "traditional navigable water" (TNW) based on the *Rapanos decision*. The Rapanos guidance focuses only on those definitions of "waters of the United States" in 33 CFR § 328.3(a)(1), (a)(5) and (a)(7).[1] Neither the Court's decision nor the guidance draws a

[1] The Rapanos guidance covers the following 33 CFR § 328.3(a) definitions of "waters of the United States":

bright line with regard to the geographic reach of jurisdiction, particularly in drainages where flows are ephemeral and where wetlands are adjacent to, but not directly abutting relatively permanent waters. In the Rapanos guidance (p. 8), significant nexus is defined as follows:

> [A] significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW.

According to the Rapanos guidance, a significant nexus analysis "will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary, to determine if they significantly affect the chemical, physical and biological integrity of downstream traditional navigable waters."(Rapanos guidance, p. 8) The analysis will consider both hydrologic and ecologic factors. Hydrologic factors include volume, duration, and frequency of flow, proximity to the TNW, size of the watershed, and average annual rainfall. Ecologic factors include the potential of tributaries to carry pollutants and flood waters to TNWs, provision of aquatic habitat to support a TNW, and the potential of wetlands to trap and filter pollutants or store flood waters. The guidance states (on p.10), "[w]here it is determined that a tributary and its adjacent wetlands collectively have a significant nexus with traditional navigable waters, the tributary and all of its adjacent wetlands are jurisdictional."

6.2 Review Area

For the purpose of this analysis, the Study Area used for the delineation process is also to be considered the Review Area. A Review Area as defined by the Rapanos guidance is the area of interest for the verification of the location and extent of waters of the United States. Exhibit D provides maps that show the extent of the Review Area (also referred to as the Study Area).

6.3 CWA Analysis

Section 5.0 of this report discusses a number of active ephemeral drainages (locally known as desert dry washes) identified and delineated within the Study Area / Review Area that meet the technical criteria of "other waters" *potentially* subject to CWA jurisdiction. Maps showing the geographic extent of these drainages within the Review Area are included in Exhibit D.

The following discussion follows the Corps Approved Jurisdictional Determination Form developed following the *Rapanos* decision.

(a)(1) All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
(a)(5) Tributaries of waters identified in paragraphs (a)(1)-(4) of this section;
(a)(7) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a)(1)-(6) of this section.

6.3.1 Are Jurisdictional Waters Present within the Study Area (*Rapanos Analysis*)?

Table 6 provides a summary of the Rapanos guidance process for determining jurisdiction over waters of the United States under Section 404 of the CWA.

Table 6. Summary of Process for Determining Jurisdiction Over Waters of the U.S. Under Section 404 of the Clean Water Act Following EPA and Corps Rapanos Guidance

Categories of Water or Water Body*	Corps Will Categorically Assert Jurisdiction	Corps Will Assert Jurisdiction Based on a Fact-Specific Analysis to Determine Whether Waters Identified Have a Significant Nexus With a TNW	
		Analysis Based on Significant Nexus Testing	*Analysis Based on Other Factors*
1. TNW, including territorial seas, and adjacent wetlands	Yes	Not Applicable (NA)	NA
2. Relatively permanent waters (RPWs)[2] that flow directly or indirectly into TNWs	Yes	NA	NA
3. Non-RPWs that flow directly or indirectly into TNWs	NA	Yes	Need to document that drainage flows directly or indirectly into a TNW.
4. Wetlands directly abutting RPWs that flow directly or indirectly into TNWs	NA	NA	Need to document that wetland abuts "permanent" or "seasonal" tributary that flows directly or indirectly into a TNW
5. Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs	NA	Yes	NA
6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs	NA	Yes	NA
7. Impoundments of jurisdictional waters	NA	NA	Need to document that: • Impoundment created from WOUS • Water meets one of above 1 thru 6 waters categories • Water is isolated with a nexus to interstate or foreign commerce

* *U.S. Army Corps of Engineers. 2007. U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook. May 30.*

2 Under the Corps / EPA Rapanos guidance, RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

As described in the technical findings of this report (Section 4.0), the active ephemeral drainages identified in the Review Area are not permanent or even seasonal, but rather flow or flood for few hours during heavy precipitation events. The climate data in Section 1.6.6 indicates that the Review Area receives an annual average rainfall amount of 3 inches. Thus, these ephemeral drainages are non-Relatively Permanent Waters (non-RPWs). (A Relatively Permanent Water is defined in the Rapanos guidance as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months). These drainages (non-RPWs) are shown on the maps in Exhibit D and are listed in the Exhibit B field data table. In addition, no areas were found within the Review Area that meet the Corps criteria for wetlands in the 1987 Corps of Engineers *Wetlands Delineation Manual* and/or the 2008 Arid West Supplement.

Using the Rapanos guidance analysis as summarized by Table 6, the non-RPWs were determined *not* to meet any of the seven categories of waters, as shown below in Table 7.

Table 7. Summary of EPA and Corps Rapanos Analysis

Category of Water or Water Body*	Wetlands (acs)	Other Waters (acs)	Rationale For Determination if Waters in Review Area are Subject to Corps Jurisdiction under CWA Section 404
1. TNW, including territorial seas, and adjacent wetlands	Not Applicable	Not Applicable	Criteria for type of water not met; waters are non-RPWs.
2. Relatively permanent waters (RPWs) that flow directly or indirectly into TNWs	Not Applicable	Not Applicable	Criteria for type of water not met; waters are non-RPWs, but do not flow directly or indirectly into TNWs.
3. Non-RPWs that flow directly or indirectly into TNWs	Not Applicable	Not Applicable	Criteria for type of water not met; waters are non-RPWs.
4. Wetlands directly abutting RPWs that flow directly or indirectly into TNWs	Not Applicable	Not Applicable	Criteria for type of water not met; no wetlands present within Review Area.
5. Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs	Not Applicable	Not Applicable	Criteria for type of water not met; no wetlands present within Review Area.
6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs	Not Applicable	Not Applicable	Criteria for type of water not met; no wetlands present within Review Area.
7. Impoundments of jurisdictional waters	Not Applicable	Not Applicable	Criteria for type of water not met; waters are non-RPWs.

* *U.S. Army Corps of Engineers. 2007. U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook. May 30.*

6.3.2 Are There Isolated Waters within the Study Area?

When the non-RPWs identified within the Review Area flow, they flow toward the western boundary of Palen Dry Lake. The linear distance from the eastern boundary of the Study Area to the approximate western boundary of Palen Dry Lake ranges from approximately 23,000 to 33,000 feet. Review of topographic mapping on USGS 7.5-minute series quadrangles for the area (i.e., East of Victory Pass [1987 Provisional Edition]; Palen Lake [1983 Provisional Edition]; Corn Springs [1986 Provisional Edition]; and Sidewinder Well [1983 Provisional Edition]) indicates a historical lack of surface channel and surface hydrologic connectivity between the Review Area non-RPWs and Palen Dry Lake (Exhibit E). In addition the USGS 1:25K high resolution National Hydrography Dataset (NHD) shows this same lack of hydrologic connection (Exhibit E). The above-referenced USGS topographic maps show that the elevations along the eastern edge of the Review Area are above 600 feet mean sea level (msl). Elevations along the western margin of Palen Dry Lake range from approximately 423 to 426 feet msl. Although these elevation ranges provide indication that surface flow should naturally move toward Palen Lake, the drainages shown on the USGS quadrangle maps named above run to higher local ground elevations and abruptly stop before reaching the western Palen Dry lake margin (Exhibit E). Field studies conducted by HBG during March 2010 confirmed the general local accuracy of the USGS topographic and NHD mapping. The field investigations found that downstream surface channel and resulting surface hydrologic connectivity from the Review Area to Palen Dry Lake does not occur due to being blocked by higher ground surface elevations. The distance between where the non-RPW drainages cease, due to higher ground elevations that end surface flow, ranges from approximately 1,000 to 7,000 linear feet from the closest boundary of Palen Dry Lake (Exhibit E). Based on the finding that the flows end before reaching another water body, the non-RPWs within the Study Area are determined to be“isolated” non-RPW waters.

Given the relative proximity of Palen Dry Lake to the Study Area and the potential, although not foreseeable, connectivity, this dry lake area was also tested using Rapanos guidance analysis as summarized by Table 6. Review of satellite and high resolution imagery and the above-described the USGS mapping and USGS NHD show that any potential overflow or drainage out of the lake is blocked by the Palen Mountains to the east and by the extensive active sand dune formations that extend southeasterly over 20,000 linear feet from the south-southeast Palen Dry Lake boundary through Chuckwalla Valley toward Ford Dry Lake and Interstate I-10 (Exhibit E). Field studies conducted by HBG during March 2010 confirmed the general local accuracy of the USGS topographic and NHD mapping. The field study also found the presence of an OHWM along the approximated western and southern boundary line indicated on the USGS and USGS NHD mapping (Exhibits C and E). Based on the finding that the flows end before reaching another water body, Palen Dry Lake was determined to be an “isolated” water. Palen Dry Lake was also determined *not* to meet any of the seven categories of waters for the same reasons as stated for the above-described fact analysis for the non-RPWs within the Study Area.

Fact-specific analysis was conducted to determine if the non-RPWs within the Study Area have a substantial nexus to interstate or foreign commerce of which the “use, degradation or destruction of” could affect interstate or foreign commerce. The results of the analysis indicate for these intrastate waters that there is no substantial nexus (current or potential) to interstate or foreign commerce associated with the non-RPWs within the Review Area

(Table 8). The same analysis was also conducted for Palen Dry Lake. The analysis found for this intrastate water no substantial nexus (current or potential) to interstate or foreign commerce associated with Palen Dry Lake (Table 8).

Table 8. Interstate / Foreign Commerce Analysis

Factors Used to Determine Substantial Nexus to Interstate or Foreign Commerce	**Do Isolated Interstate or Intrastate Waters the Use, Degradation or Destruction of Which Could Affect Interstate or Foreign Commerce Occur in Review Area or Palen Dry Lake?**	**Fact-Specific Analysis**
Waters which are or could be used by interstate or foreign travelers for recreational purposes.	No	*Review Area*: Given the ephemeral as well as unpredictable nature of surface flows no recreational use of the ephemeral drainages occurs. *Palen Dry Lake*: Given the ephemeral as well as unpredictable nature of surface ponding no recreational use of the dry lake occurs. There are no boat ramps at the lake or vehicle access roads to the edge of the lake. BLM prohibits vehicle use on the lake and adjacent dune areas. Review of advertizing brochures and billboard postings for local recreational opportunities at the Blythe Chamber of Commerce, the Desert Center Restaurant and Desert Station Restaurant provided no indication of recreational opportunities at Palen Dry Lake. Staff at the Blythe Chamber of Commerce indicted there were no recreational opportunities at the dry lake. An internet search for Palen Dry Lake yielded the same result and no indication that any interstate or foreign travel occurs for recreational purposes.
Waters from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.	No	*Review Area*: Given the ephemeral as well as unpredictable nature of surface flows no fish or shellfish habitat is associated with the ephemeral drainages. *Palen Dry Lake*: Given the ephemeral as well as unpredictable nature of surface ponding no fish or shellfish habitat is associated with this dry lake.
Waters which are or could be used for industrial purposes by industries in interstate commerce.	No	*Review Area*: Given the ephemeral as well as unpredictable nature of surface flows the waters associated with the ephemeral drainages are not used and could not be used for industrial purposes, including but not limited to mineral extraction, power generation, and agricultural irrigation. *Palen Dry Lake*: Given the ephemeral as well as unpredictable nature of surface ponding the waters associated with the dry lake are not used and could not be used for industrial purposes, including but not limited to mineral extraction, power generation, and agricultural irrigation.
Waters which are interstate isolated waters	Not Applicable	Waters are intrastate isolated waters

Table 8. Interstate / Foreign Commerce Analysis		
Factors Used to Determine Substantial Nexus to Interstate or Foreign Commerce	**Do Isolated Interstate or Intrastate Waters the Use, Degradation or Destruction of Which Could Affect Interstate or Foreign Commerce Occur in Review Area or Palen Dry Lake?**	**Fact-Specific Analysis**
Other factors	Not Applicable	None are known to occur.

6.4 Are Non-Jurisdictional Waters Present within the Study Area?

On the basis of the above analysis and findings within the Review Area, no areas were found within the Review Area that meet the Corps criteria for wetlands in the 1987 Corps of Engineers *Wetlands Delineation Manual* and/or the 2008 Arid West Supplement. The above analysis also found that the Review Area contains non-RPWs that are isolated, non-navigable and wholly intrastate waters with no substantial nexus to interstate or foreign commence. As required as part of the determination process under the Rapanos Guidance it should be noted that:

1. Prior to the January 2001 Supreme Court decision in *SWANCC*, the non-RPWs in the Review Area would have been regulated based solely on the Migratory Bird Rule (51 F.R. 41217), given the presence of a federally listed endangered species, the desert tortoise (*Gopherus agassizii*).

2. The waters are isolated with no significant nexus to interstate or foreign commerce and therefore no significant nexus standard analysis for connectivity to a TNW is required by the Rapanos Guidance as non-RPWs are not in a category of water requiring such analysis.

6.5 Jurisdictional Analysis Summary

On the basis of the above analysis and as summarized by Table 9, the active ephemeral drainages (non-RPWs or desert dry washes) found within the Review Area and as shown by Exhibit D would be considered non-jurisdictional under the CWA (Exhibit D). The non-RPWs within the Review Area are *not* jurisdictional waters of the United States based on the fact that:

1. No wetlands were found with the Review Area as there were no areas that met the criteria in the 1987 Corps of Engineers *Wetlands Delineation Manual* and/or the 2008 Arid West Supplement.
2. The non-jurisdictional non-RPWs found are isolated waters with no substantial connection to interstate or foreign commerce.

Table 9. Jurisdictional Analysis Summary

Category of Waters	Category of Waters Found	Type of Water (s)	Nexus to Interstate or Foreign Commerce?	Jurisdictional Water Found?	Non-Jurisdictional Water Found?
1. TNW, including territorial seas, and adjacent wetlands	Not present	NA	No	No	No
2. Relatively permanent waters (RPWs) that flow directly or indirectly into TNWs	Not present	NA	No	No	No
3. Non-RPWs that flow directly or indirectly into TNWs	Not present	NA	No	No	No
4. Wetlands directly abutting RPWs that flow directly or indirectly into TNWs	Not present	NA	No	No	No
5. Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs	Not present	NA	No	No	No
6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs	Not present	NA	No	No	No
7. Impoundments of jurisdictional waters	Not present	NA	No	No	No
Isolated	**X**	Non-RPWs	No	No	**X**

6.6 Disclaimer

HBG has made a good-faith effort herein to thoroughly describe and document the presence of potential factors that the Corps may consider. Nevertheless, Sunlight reserves the right to challenge or seek revision to any areas over which the Corps may assert such jurisdiction, as the implementation of the Corps / EPA Rapanos Guidance is further clarified or altered through formal guidance, assertions or disclaimers of jurisdiction over other properties, court decisions, or other relevant actions.

7.0 REFERENCES

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Exhibit A. Figures

Figure 1. Regional Location Map
Desert Sunlight Solar Farm Project,
Desert Center, Riverside County, California

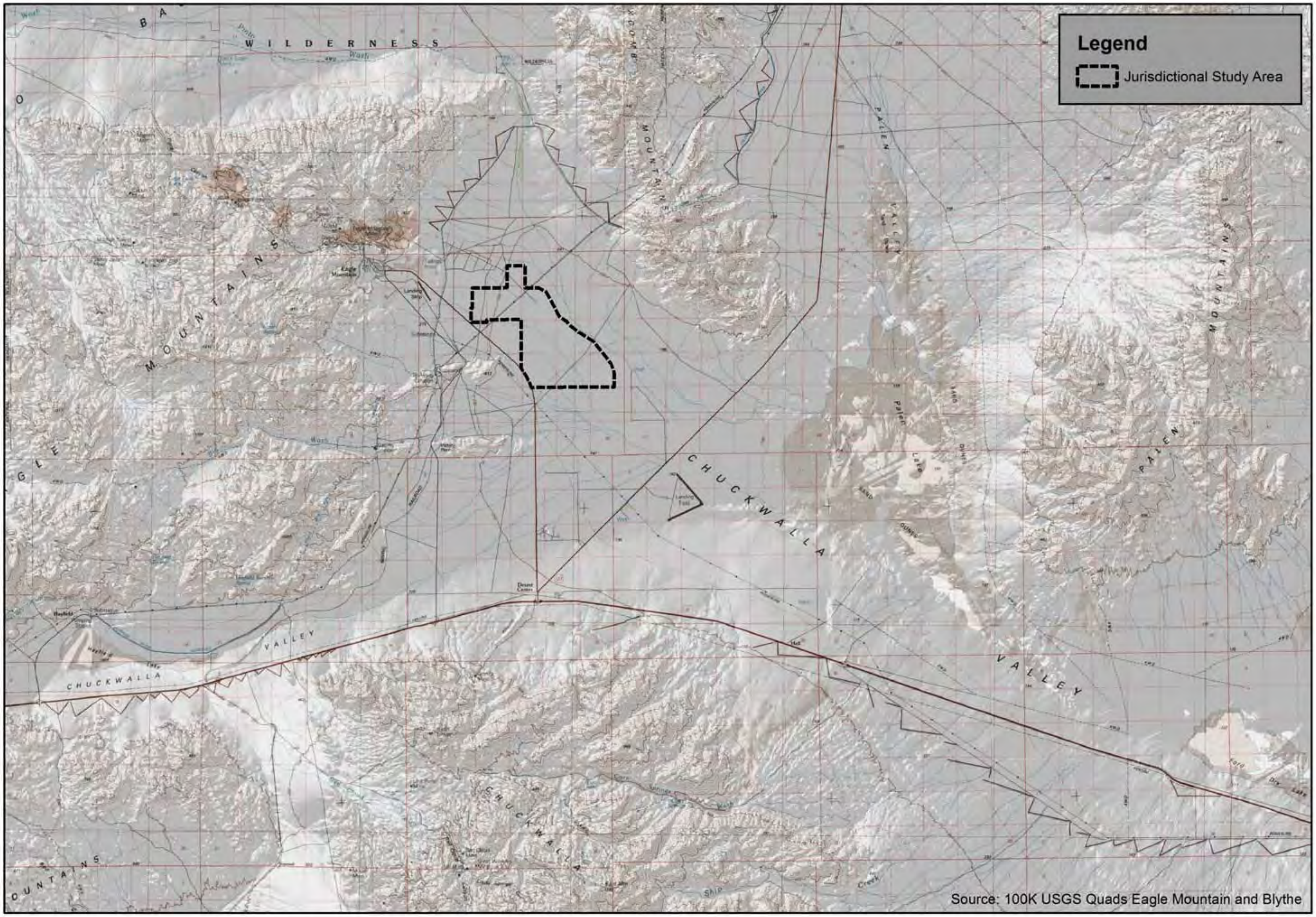

Figure 2. USGS Topographic Map of the Study Area
Desert Sunlight Solar Farm Project,
Desert Center, Riverside County, California

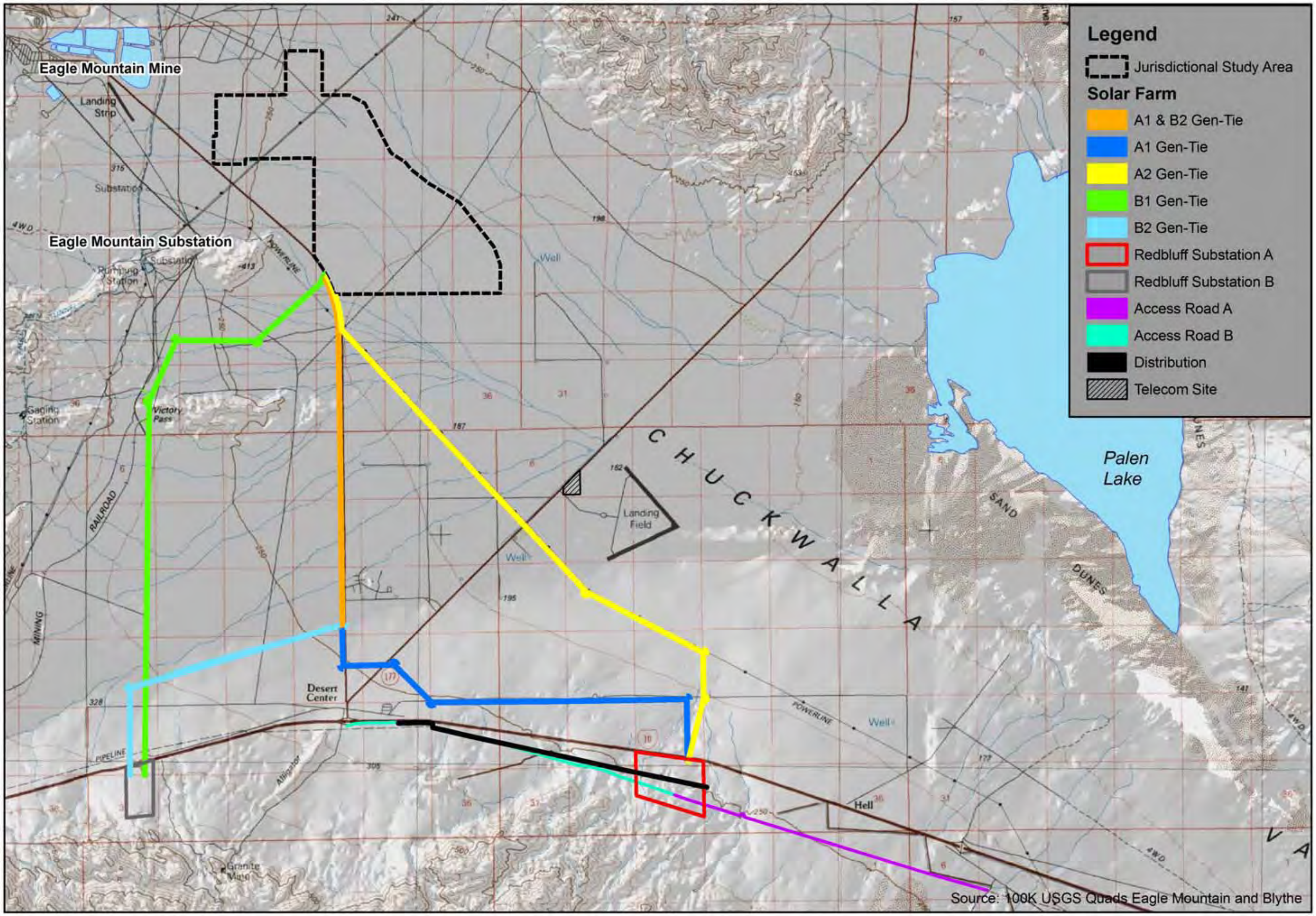

Figure 3. Project Components and Alternatives
Desert Sunlight Solar Farm Project,
Desert Center, Riverside County, California

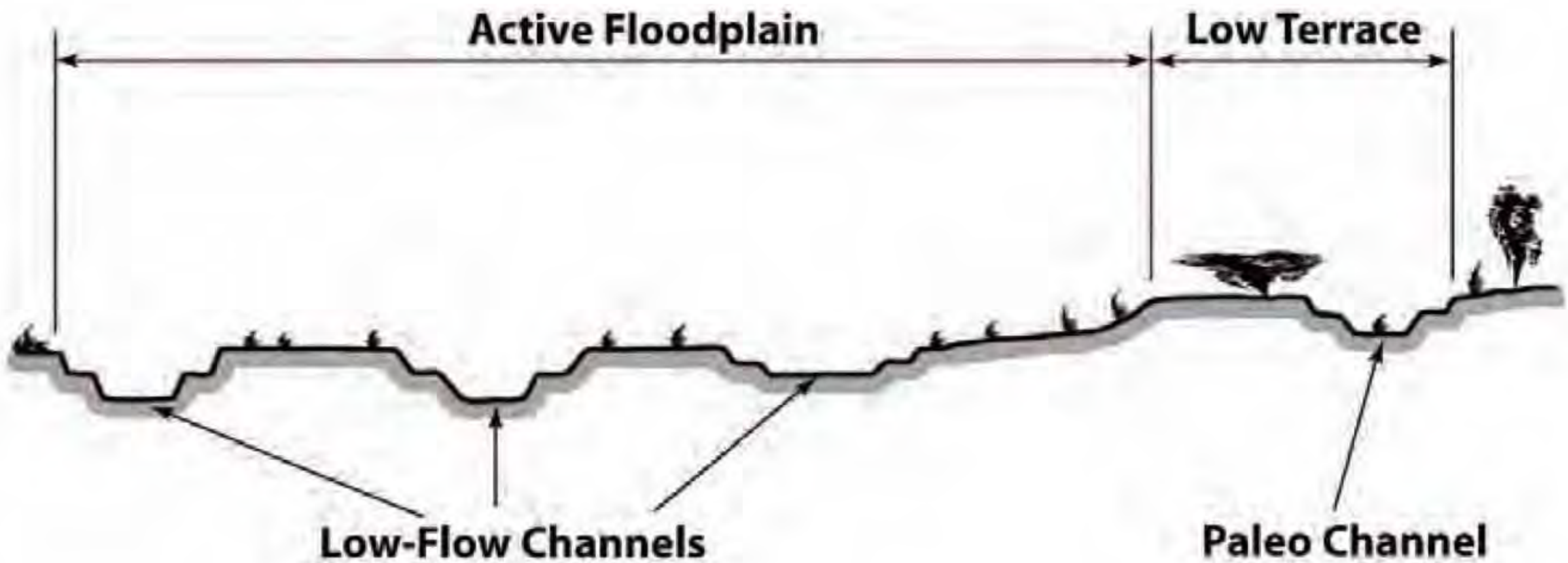

Figure 4. Typical Cross Section of Desert Ephemeral Wash (Lichvar et al. 2008)

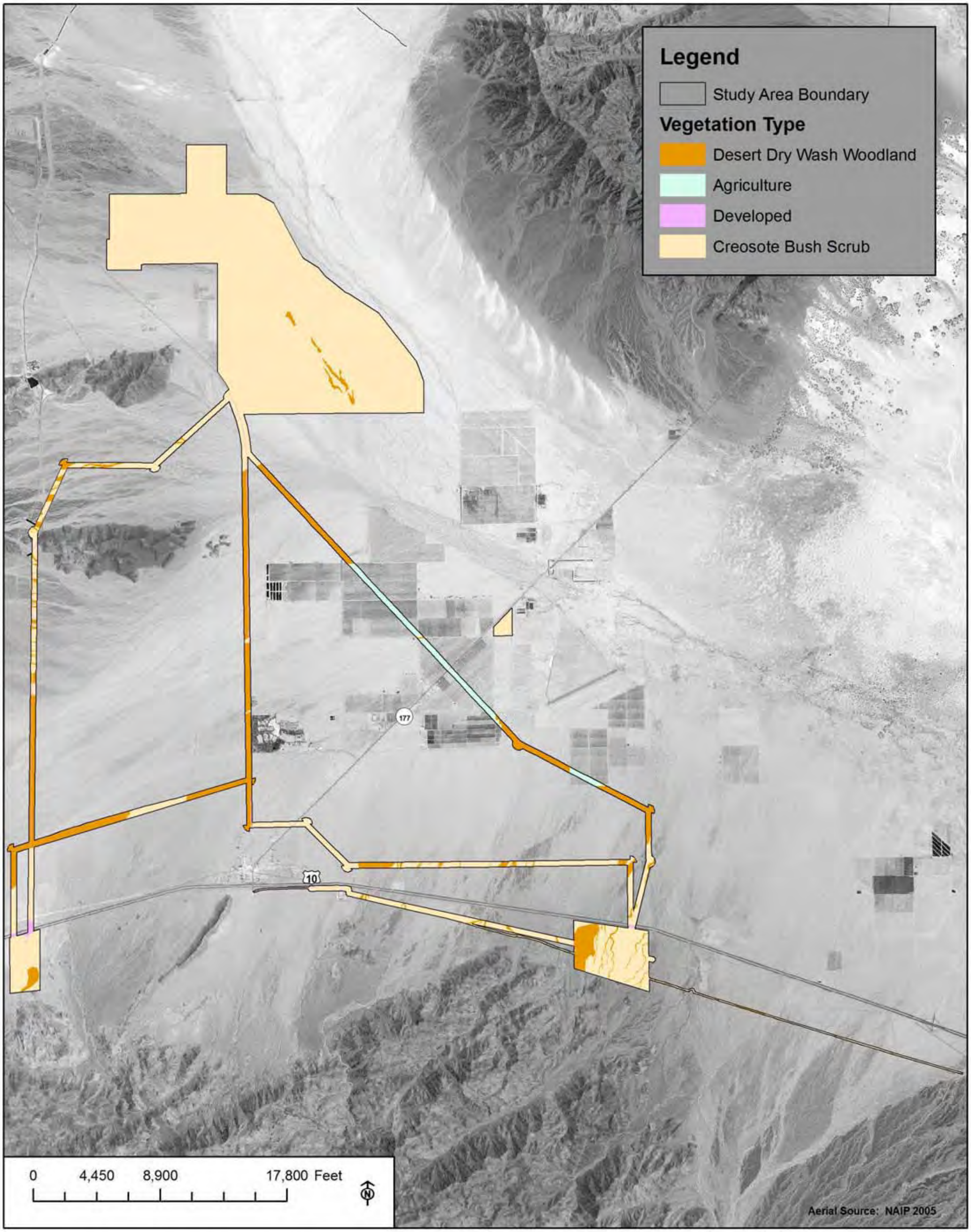

Figure 5. Vegetation Map of the Study Area
First Solar Desert Sunlight Solar Farm,
Desert Center, Riverside County, California

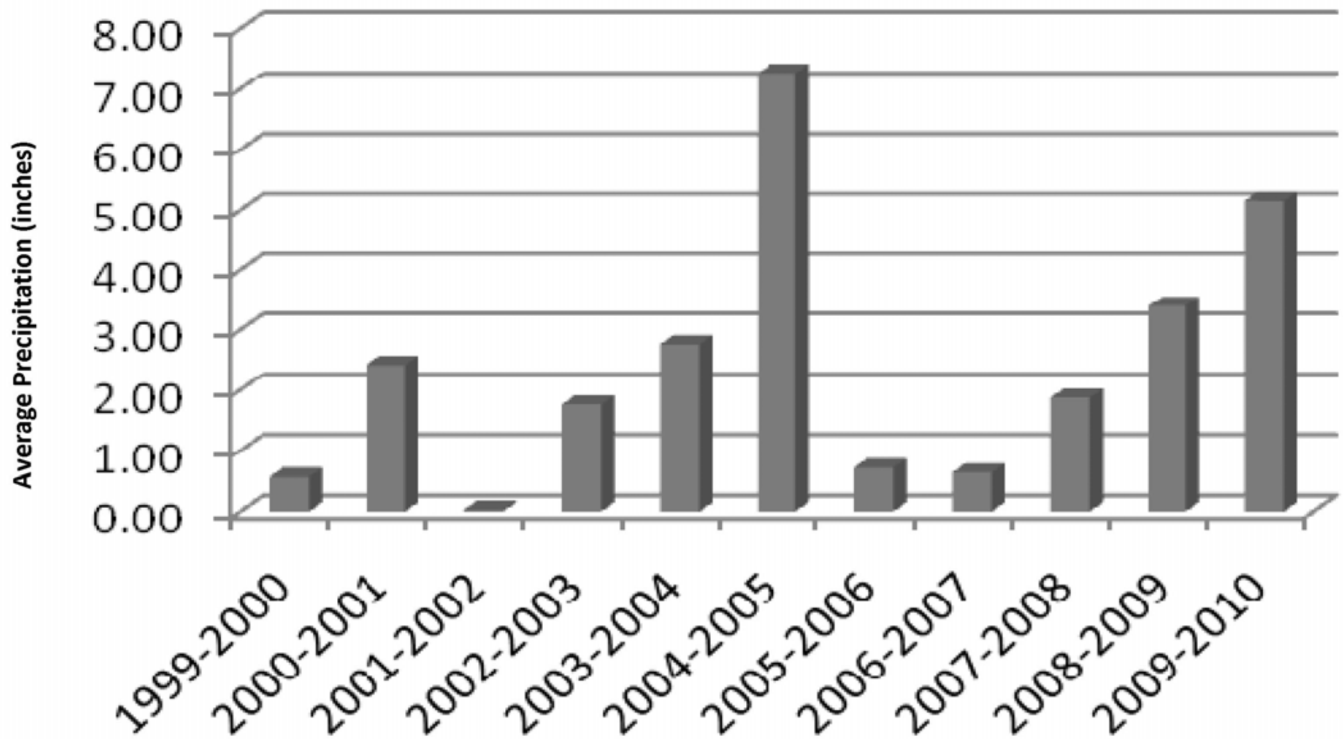

Figure 6. Precipitation Averages for Winter Months (October-March)

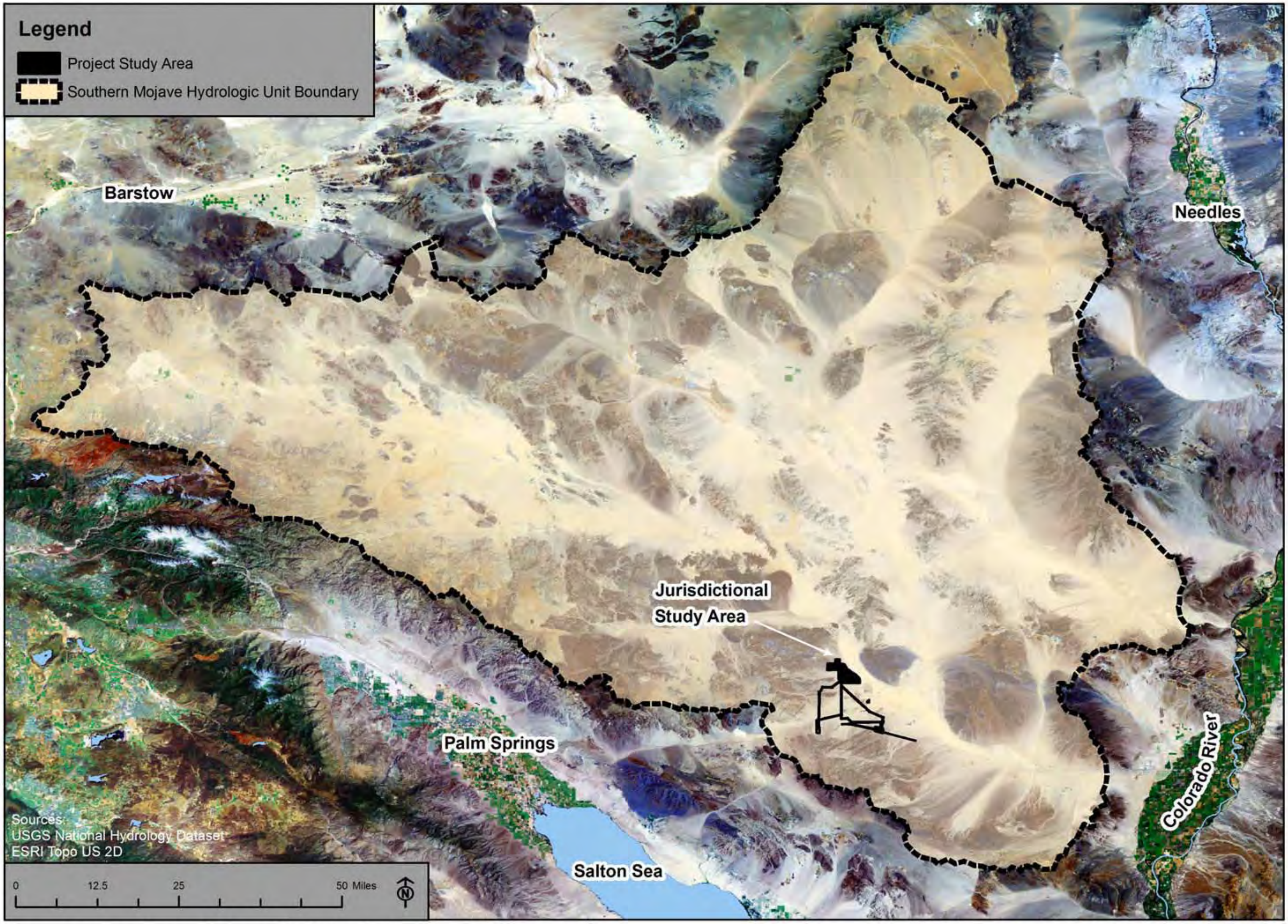

Figure 7. Southern Mojave Hydrologic Unit Boundary
Desert Sunlight Solar Farm Project,
Desert Center, Riverside County, California

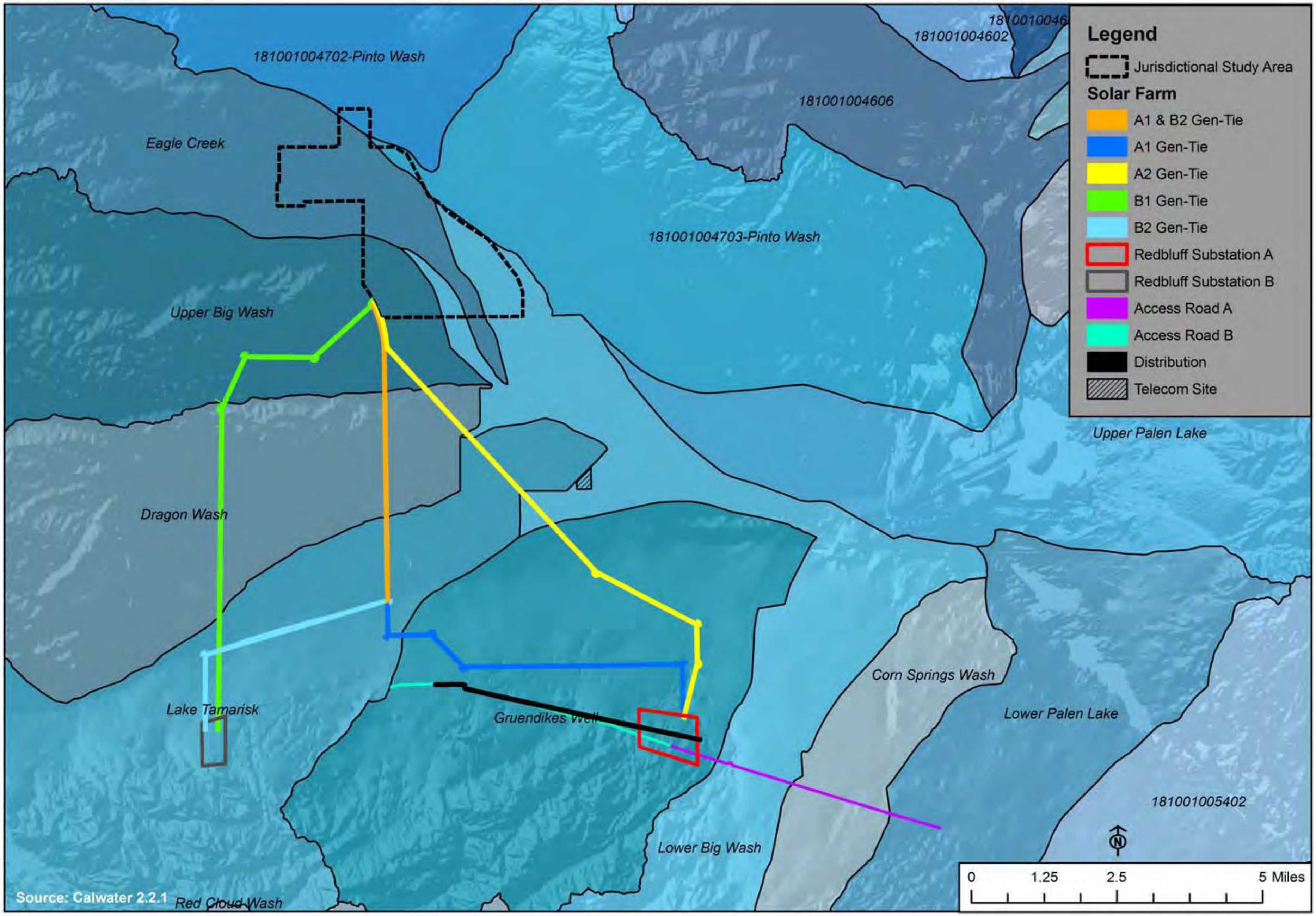

Figure 8. Watershed Units
Desert Sunlight Solar Farm Project,
Desert Center, Riverside County, California

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Exhibit B.

Monthly Precipitation Totals

WETS Station : EAGLE MOUNTAIN, CA2598 Creation Date: 08/29/2002
Latitude: 3348 Longitude: 11527 Elevation: 00970
State FIPS/County(FIPS): 06065 County Name: Riverside
Start yr. - 1971 End yr. - 2000

Month	Temperature (Degrees F.) avg daily max	avg daily min	avg	Precipitation (Inches) avg	30% chance will have less than	more than	avg # of days w/.1 or more	avg total snow fall
January	65.0	45.5	55.3	0.59	0.07	0.68	1	0.0
February	69.7	49.3	59.5	0.53	0.00	0.69	1	0.0
March	75.1	53.6	64.4	0.50	0.04	0.56	1	0.0
April	82.8	60.3	71.5	0.08	0.00	0.07	0	0.0
May	90.5	68.2	79.4	0.08	0.00	0.09	0	0.0
June	100.7	77.5	89.1	0.06	0.00	0.00	0	0.0
July	104.5	82.8	93.6	0.22	0.00	0.22	0	0.0
August	103.2	81.3	92.2	0.94	0.04	0.97	1	0.0
September	97.5	75.4	86.4	0.47	0.00	0.37	0	0.0
October	86.3	64.4	75.4	0.24	0.00	0.27	0	0.0
November	73.4	52.9	63.2	0.18	0.00	0.13	0	0.0
December	65.3	45.7	55.5	0.42	0.00	0.50	1	0.0
Annual	-----	-----	-----	------	2.66	5.19	--	----
Average	84.5	63.1	73.8	------	------	------	--	----
Total	-----	-----	-----	4.31	------	------	5	0.0

GROWING SEASON DATES

Probability	Temperature 24 F or higher	28 F or higher	32 F or higher
	Beginning and Ending Dates Growing Season Length		
50 percent *	---------- > 365 days	---------- > 365 days	> 365 days > 365 days
70 percent *	---------- > 365 days	---------- > 365 days	> 365 days > 365 days

* Percent chance of the growing season occurring between the Beginning and Ending dates.

total 1948-2002 prcp

Station : CA2598, EAGLE MOUNTAIN
------- Unit = inches

yr	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	annl
48							0.14	M0.00	0.00	1.45	0.00	M0.22	1.81
49	2.56	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.04	0.15	0.50	3.35
50	0.00	0.06	0.07	0.00	0.03	0.00	2.68	0.00	0.57	0.00	0.00	0.00	3.41
51	M0.26	M0.00	0.03	0.28	M0.07	0.00	0.20	1.57	0.06	0.49	M0.56	M0.15	3.67
52	1.24	0.00	0.28	1.11	0.00	0.00	0.22	0.00	0.07	0.00	0.74	0.86	4.52
53	0.00	0.03	0.00	0.00	0.00	0.00	0.00	1.23	0.00	0.00	0.07	M0.00	1.33
54	0.84	0.09	0.89	0.00	0.00	0.00	0.19	0.00	0.30	0.03	0.04	0.00	2.38
55	1.14	0.00	0.00	0.00	0.00	0.00	0.45	1.62	0.00	0.00	0.00	0.01	3.22
56	M0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.07	0.00	0.00	0.10
57	0.61	0.05	0.04	0.07	0.05	0.00	0.00	1.53	0.00	0.98	0.00	0.07	3.40
58	0.00	0.53	0.27	0.30	0.05	0.00	0.00	0.10	0.00	0.15	0.00	0.00	1.40
59	0.00	0.01	0.00	0.07	0.00	0.00	0.23	0.49	0.13	0.28	0.00	2.54	3.75
60	0.44	0.59	0.18	0.00	0.00	0.00	0.08	0.00	1.11	0.00	0.87	0.21	3.48
61	0.00	0.00	0.04	0.00	0.00	0.00	0.04	0.88	0.15	0.00	0.01	0.56	1.68
62	0.18	0.08	0.30	0.00	0.00	0.00	0.01	0.00	0.54	0.11	0.00	0.52	1.74
63	0.31	0.30	0.06	0.00	0.00	0.00	0.00	0.27	1.75	0.10	0.40	0.00	3.19
64	0.01	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.02	0.31	0.19	0.11	0.78
65	0.00	0.00	0.30	0.88	0.00	0.00	0.00	0.10	0.00	0.00	M1.20	2.29	4.77
66	0.20	0.00	0.46	0.00	0.00	0.03	0.00	M0.63	0.10	0.91	0.06	0.24	2.63
67	0.05	0.00	0.00	0.08	0.00	0.00	0.00	0.88	1.19	0.00	0.36	0.35	2.91
68	0.00	0.06	0.00	0.03	0.00	0.00	2.15	0.14	0.00	0.03	0.05	0.08	2.54
69	0.80	0.02	0.04	0.00	0.22	0.03	0.00	0.00	1.40	0.00	0.52	0.20	3.23
70	M0.16	0.21	0.16	0.00	0.00	0.00	0.00	0.07	0.02	0.07	0.00	0.35	1.04
71	0.00	0.07	0.00	0.05	0.04	0.00	0.00	4.79	0.12	0.24	0.00	0.12	5.43
72	0.00	0.00	0.00	0.00	0.00	1.13	0.00	0.10	0.06	0.93	0.25	0.00	2.47
73	0.00	0.53	0.67	0.00	0.03	0.00	0.00	0.11	0.00	0.00	0.03	0.00	1.37
74	0.97	0.00	0.51	0.00	0.00	0.00	0.00	0.02	0.00	0.05	0.00	0.94	2.49
75	0.00	0.00	0.02	0.06	0.00	0.00	0.35	0.00	0.00	0.07	0.00	0.05	0.55
76	0.06	1.50	0.23	0.36	0.05	0.00	0.13	0.00	5.03	0.18	0.00	0.00	7.54
77	0.41	0.00	0.01	0.01	0.06	0.08	0.08	2.24	0.00	0.02	0.00	0.57	3.48
78	2.18	0.66	0.91	0.34	0.00	0.00	0.00	0.00	0.00	2.39	0.07	M0.00	6.55
79	1.34	0.47	0.81	0.00	0.14	0.00	1.53	3.68	0.00	0.00	0.00	0.27	8.24
80	1.07	2.05	0.68	0.52	0.04	0.00	0.19	0.00	0.04	0.00	0.00	0.00	4.59
81	0.52	0.11	1.10	0.00	0.31	0.01	0.00	0.35	0.25	0.23	0.18	0.00	3.06
82	0.39	0.41	0.61	0.01	0.36	0.00	0.34	0.29	0.12	0.00	0.00	1.72	4.25
83	0.32	0.37	2.42	0.00	0.00	0.00	0.00	5.72	2.52	0.48	0.09	0.96	12.88
84	0.16	0.00	0.00	0.00	0.00	0.00	1.30	0.44	0.00	0.00	0.96	1.92	4.78
85	0.20	0.19	0.03	0.02	0.00	0.00	0.33	0.00	0.73	0.16	1.13	0.54	3.33
86	0.16	1.21	0.09	0.02	0.00	0.00	0.88	0.03	0.00	0.69	0.21	0.23	3.52
87	0.03	0.00	0.07	0.00	0.05	0.06	0.00	0.00	0.04	0.22	1.53	0.80	2.80
88	0.67	0.97	0.02	0.42	0.00	0.03	0.00	2.37	0.00	0.00	0.00	0.00	4.48
89	M1.53	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.00	0.00	0.00	2.28
90		0.00	0.04	0.00	0.00	0.40	0.00	1.04	0.27	0.25	0.00	0.00	2.00
91	0.83	0.61	1.71	0.00	0.00	0.00	0.61	0.03	1.28	0.28	0.01	0.60	5.96
92	0.38	1.86	2.56	0.21	0.21	0.00	0.00	0.44	0.00	0.49	0.00	1.52	7.67
93	3.54	1.79	0.39	0.00	0.08	0.00	0.00	2.58	0.00	0.00	0.23	0.00	8.61
94	0.01	0.37	1.05	0.00	0.84	0.00	0.00	0.31	0.00	0.00	0.41	1.33	4.32
95	1.77	0.27	0.24	0.08	0.04	0.00	0.03	0.65	0.11	0.00	0.00	0.00	3.19
96	0.07	0.24	0.05	0.00	0.10	0.00	0.01	0.01	0.80	0.07	0.25	0.05	1.65
97	0.16	0.00	0.00	0.10	0.02	0.00	0.19	0.05	2.28	0.15	0.00	0.73	3.68
98	0.27	1.85	0.59		0.00		0.35	0.78	0.21	0.00	0.00	0.14	4.19
99	0.00	M0.19	0.00	0.06	0.09	0.00	0.34	0.09	0.32	0.00	0.00	0.00	1.09
0	0.02	M0.31	0.23	0.00	0.00	0.15	0.00	M1.28	0.00	0.22	0.02	0.00	2.23
1	0.60	1.28	0.30	0.00	0.00	0.00	2.25	0.00	M0.00	0.00	0.01	0.01	4.45
2													

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Exhibit C

Field Data

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Exhibit C. Field Data Summary

FID_channe	Id	project_co	length	width	category	Watershed	Vegetation	Waters_Nam	Cowardin_C [1]	HGM_Code	Area__acre	Linear_ft	Waters_Typ	Lat_nad83	Long_nad83	Lcl_Wtrway	FID_Cal_Wa	HU_12_NAME
0	0	subB	936.96766311600	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.05377454449	936.96766311700	ISOLATE	-115.45620585900	33.69661836620	BIG WASH	21	Lake Tamarisk
1	0	subB	1805.19973858000	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.10360420906	1805.19973859000	ISOLATE	-115.45605046800	33.69702807120	BIG WASH	21	Lake Tamarisk
2	0	subB	584.35336237800	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.03353726827	584.35336237700	ISOLATE	-115.45332802000	33.69774880700	BIG WASH	21	Lake Tamarisk
3	0	subB	1376.95654263000	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.07902643151	1376.95654263000	ISOLATE	-115.45181108100	33.69845926490	BIG WASH	21	Lake Tamarisk
4	0	subB	1759.59636482000	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.10098693554	1759.59636483000	ISOLATE	-115.45484937800	33.69739699850	BIG WASH	21	Lake Tamarisk
5	0	access_east	143.64201507900	2.50000000000	E	Lower Palen Lake	CBS	unnamed	RISIF	RIVERINE	0.00824391730	143.64201507100	ISOLATE	-115.23910520600	33.67359531990	BIG WASH	15	Lower Palen Lake
6	0	access_east	130.06962137100	2.50000000000	E	Lower Palen Lake	CBS	unnamed	RISIF	RIVERINE	0.00746496909	130.06962137300	ISOLATE	-115.24053331700	33.67395607630	BIG WASH	15	Lower Palen Lake
7	0	access_east	127.64835853000	2.50000000000	E	Lower Palen Lake	CBS	unnamed	RISIF	RIVERINE	0.00732600772	127.64835853200	ISOLATE	-115.24088382900	33.67404782300	BIG WASH	15	Lower Palen Lake
8	0	access_east	133.46278114900	2.50000000000	E	Lower Palen Lake	CBS	unnamed	RISIF	RIVERINE	0.00765970966	133.46278115000	ISOLATE	-115.24283339000	33.67453551360	BIG WASH	15	Lower Palen Lake
9	0	access_east	122.73646966100	2.50000000000	E	Lower Palen Lake	CBS	unnamed	RISIF	RIVERINE	0.00704410409	122.73646966200	ISOLATE	-115.24436381800	33.67491557530	BIG WASH	15	Lower Palen Lake
10	0	access_east	128.86534716300	2.50000000000	E	Lower Palen Lake	CBS	unnamed	RISIF	RIVERINE	0.00739585326	128.86534716300	ISOLATE	-115.24514539800	33.67509681800	BIG WASH	15	Lower Palen Lake
11	0	access_east	121.55973194000	2.50000000000	E	Lower Palen Lake	CBS	unnamed	RISIF	RIVERINE	0.00697656864	121.55973194000	ISOLATE	-115.24548542500	33.67519926370	BIG WASH	15	Lower Palen Lake
12	0	access_east	122.00721113500	2.50000000000	E	Lower Palen Lake	CBS	unnamed	RISIF	RIVERINE	0.00700225041	122.00721114300	ISOLATE	-115.24622474800	33.67537215280	BIG WASH	15	Lower Palen Lake
13	0	access_east	127.85511831200	2.50000000000	E	Lower Palen Lake	CBS	unnamed	RISIF	RIVERINE	0.00733787410	127.85511831300	ISOLATE	-115.24892457800	33.67602038880	BIG WASH	15	Lower Palen Lake
14	0	access_east	134.37005578600	2.50000000000	E	Lower Palen Lake	CBS	unnamed	RISIF	RIVERINE	0.00771178006	134.37005578400	ISOLATE	-115.25065164800	33.67646995930	BIG WASH	15	Lower Palen Lake
15	0	access_east	66.40118784500	2.50000000000	E	Lower Palen Lake	CBS	unnamed	RISIF	RIVERINE	0.00381090380	66.40118784460	ISOLATE	-115.25152130500	33.67658977340	BIG WASH	15	Lower Palen Lake
16	0	access_east	131.48842772700	2.50000000000	E	Lower Palen Lake	CBS	unnamed	RISIF	RIVERINE	0.00754639737	131.48842773400	ISOLATE	-115.25136019800	33.67662920610	BIG WASH	15	Lower Palen Lake
17	0	access_east	126.87372895100	2.50000000000	E	Corn Springs Wash	CBS	unnamed	RISIF	RIVERINE	0.00728155010	126.87372894900	ISOLATE	-115.25653128800	33.67802195020	BIG WASH	13	Corn Springs Wash
18	0	access_east	121.04907453700	2.50000000000	E	Corn Springs Wash	CBS	unnamed	RISIF	RIVERINE	0.00694726094	121.04907453600	ISOLATE	-115.26241900700	33.67957071620	BIG WASH	13	Corn Springs Wash
19	0	access_east	144.77506452900	2.50000000000	E	Corn Springs Wash	CBS	unnamed	RISIF	RIVERINE	0.00830894539	144.77506452700	ISOLATE	-115.26267714000	33.67967102920	BIG WASH	13	Corn Springs Wash
20	0	access_east	121.37437088900	2.50000000000	E	Corn Springs Wash	CBS	unnamed	RISIF	RIVERINE	0.00696593038	121.37437088900	ISOLATE	-115.26483543700	33.68019831800	BIG WASH	13	Corn Springs Wash
21	0	access_east	124.75387149400	2.50000000000	E	Corn Springs Wash	CBS	unnamed	RISIF	RIVERINE	0.00715988702	124.75387149500	ISOLATE	-115.26862208200	33.68121399000	BIG WASH	13	Corn Springs Wash
22	0	access_east	124.17658758200	2.50000000000	E	Corn Springs Wash	CBS	unnamed	RISIF	RIVERINE	0.00712675549	124.17658758600	ISOLATE	-115.27097413800	33.68185119640	BIG WASH	13	Corn Springs Wash
23	0	access_east	119.80690365500	2.50000000000	E	Corn Springs Wash	CBS	unnamed	RISIF	RIVERINE	0.00687597014	119.80690365400	ISOLATE	-115.27984523500	33.68419277420	BIG WASH	13	Corn Springs Wash
24	0	access_east	126.35919946800	2.50000000000	E	Lower Big Wash	CBS	unnamed	RISIF	RIVERINE	0.00725202017	126.35919946900	ISOLATE	-115.28170004300	33.68469119840	BIG WASH	27	Lower Big Wash
25	0	access_east	124.75811022800	2.50000000000	E	Lower Big Wash	DWW	unnamed	RISIF	RIVERINE	0.00716013029	124.75811022700	ISOLATE	-115.28299474900	33.68502271570	BIG WASH	27	Lower Big Wash
26	0	access_east	123.24334008000	2.50000000000	E	Lower Big Wash	DWW	unnamed	RISIF	RIVERINE	0.00707319445	123.24334007900	ISOLATE	-115.28429742200	33.68538402800	BIG WASH	27	Lower Big Wash
27	0	access_east	123.17920852900	2.50000000000	E	Lower Big Wash	DWW	unnamed	RISIF	RIVERINE	0.00706951380	123.17920852600	ISOLATE	-115.28414832600	33.68534686590	BIG WASH	27	Lower Big Wash
28	0	access_east	127.75799467500	2.50000000000	E	Lower Big Wash	DWW	unnamed	RISIF	RIVERINE	0.00733229997	127.75799467700	ISOLATE	-115.28693390800	33.68605368540	BIG WASH	27	Lower Big Wash
29	0	access_east	113.92003564400	2.50000000000	E	Lower Big Wash	CBS	unnamed	RISIF	RIVERINE	0.00653811040	113.92003564400	ISOLATE	-115.29634544900	33.68857310500	BIG WASH	27	Lower Big Wash
30	0	access_east	173.86920506400	2.50000000000	E	Lower Big Wash	CBS	unnamed	RISIF	RIVERINE	0.00997871930	173.86920507300	ISOLATE	-115.29857893500	33.68922440720	BIG WASH	27	Lower Big Wash
31	0	access_east	122.14966960100	2.50000000000	E	Lower Big Wash	CBS	unnamed	RISIF	RIVERINE	0.00701042640	122.14966960600	ISOLATE	-115.30150325400	33.68993138990	BIG WASH	27	Lower Big Wash
32	0	access_east	160.86672697800	2.50000000000	E	Lower Big Wash	DWW	unnamed	RISIF	RIVERINE	0.00923247974	160.86672697600	ISOLATE	-115.30217293500	33.69016157650	BIG WASH	27	Lower Big Wash
33	0	access_east	150.53075712300	2.50000000000	E	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.00863927669	150.53075711800	ISOLATE	-115.30756360000	33.69153999570	BIG WASH	16	Gruendikes Well
34	0	subA	123.35717378500	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00707972761	123.35717379200	ISOLATE	-115.31457363300	33.69347087570	BIG WASH	16	Gruendikes Well
35	0	subA	120.61473947200	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00692233353	120.61473947200	ISOLATE	-115.31871112800	33.69473716910	BIG WASH	16	Gruendikes Well
36	0	subA	119.83534001600	2.50000000000	E	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.00687760216	119.83534001500	ISOLATE	-115.32156984500	33.69558277000	BIG WASH	16	Gruendikes Well
37	0	subA	122.59207892200	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00703581720	122.59207891300	ISOLATE	-115.32231746900	33.69582045340	BIG WASH	16	Gruendikes Well
38	0	access_west	123.34257718600	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00707888988	123.34257718500	ISOLATE	-115.32821542800	33.69746447280	BIG WASH	16	Gruendikes Well
39	0	access_west	122.56660382500	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00703435513	122.56660382400	ISOLATE	-115.32848873300	33.69756223370	BIG WASH	16	Gruendikes Well
40	0	access_west	124.54458639300	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00714787571	124.54458638900	ISOLATE	-115.33221274100	33.69868977790	BIG WASH	16	Gruendikes Well
41	0	access_west	109.95115171700	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00631032781	109.95115171900	ISOLATE	-115.34025836900	33.70044677330	BIG WASH	16	Gruendikes Well
42	0	access_west	121.72554579900	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00698608504	121.72554580100	ISOLATE	-115.34544864300	33.70161562180	BIG WASH	16	Gruendikes Well
43	0	access_west	188.77920342200	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01083443546	188.77920342200	ISOLATE	-115.34457571800	33.70137380010	BIG WASH	16	Gruendikes Well
44	0	access_west	141.90818090500	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00814440891	141.90818090700	ISOLATE	-115.34852888000	33.70233864740	BIG WASH	16	Gruendikes Well
45	0	access_west	48.97008061830	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00281049590	48.97008061510	ISOLATE	-115.34798257100	33.70231708320	BIG WASH	16	Gruendikes Well
46	0	access_west	121.92187658000	2.50000000000	E	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.00699735288	121.92187658200	ISOLATE	-115.34955681800	33.70261415390	BIG WASH	16	Gruendikes Well
47	0	access_west	117.41168772000	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00673850366	117.41168772000	ISOLATE	-115.35365133700	33.70360123930	BIG WASH	16	Gruendikes Well
48	0	access_west	120.03862924700	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00688926936	120.03862924600	ISOLATE	-115.35447779200	33.70379750690	BIG WASH	16	Gruendikes Well
49	0	access_west	120.85452708000	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00693609545	120.85452707900	ISOLATE	-115.35625992100	33.70423175800	BIG WASH	16	Gruendikes Well
50	0	access_west	112.03356620000	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00642984195	112.03356620100	ISOLATE	-115.35988233600	33.70506329740	BIG WASH	16	Gruendikes Well
51	0	access_west	118.00976439500	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00677282854	118.00976439500	ISOLATE	-115.36153027200	33.70543316380	BIG WASH	16	Gruendikes Well
52	0	access_west	146.74691804900	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00842211421	146.74691804900	ISOLATE	-115.36174021900	33.70552197220	BIG WASH	16	Gruendikes Well
53	0	access_west	130.50792463200	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00749012423	130.50792463300	ISOLATE	-115.36426668100	33.70601906280	BIG WASH	16	Gruendikes Well
54	0	access_west	131.46184607200	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00754487179	131.46184607400	ISOLATE	-115.36848995100	33.70690783300	BIG WASH	16	Gruendikes Well
55	0	access_west	116.80718887900	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00670381020	116.80718887600	ISOLATE	-115.37140717600	33.70744075800	BIG WASH	16	Gruendikes Well
56	0	access_west	132.69894430300	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00761587146	132.69894429800	ISOLATE	-115.37068393600	33.70731009570	BIG WASH	16	Gruendikes Well
57	0	access_west	134.60993573700	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00772554728	134.60993573500	ISOLATE	-115.37268374700	33.70765175080	BIG WASH	16	Gruendikes Well
58	0	access_west	58.58347095240	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00336222859	58.58347095330	ISOLATE	-115.38171158800	33.71000248460	BIG WASH	16	Gruendikes Well
59	0	access_west	169.75914090100	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00974283407	169.75914089900	ISOLATE	-115.39856325400	33.70969610290	BIG WASH	16	Gruendikes Well
60	0	access_west	47.25265205500	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00271192907	47.25265204820	ISOLATE	-115.39755531400	33.70978422400	BIG WASH	16	Gruendikes Well
61	0	access_west	53.25802883270	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00305659027	53.25802883520	ISOLATE	-115.39678982900	33.70981486930	BIG WASH	16	Gruendikes Well
62	0	access_west	50.18114868440	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00288000165	50.18114868130	ISOLATE	-115.39641083500	33.70982938990	BIG WASH	16	Gruendikes Well
63	0	access_west	46.31174624750	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00265792850	46.31174624600	ISOLATE	-115.39422871200	33.70987386370	BIG WASH	16	Gruendikes Well
64	0	access_west	52.94909248220	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00303885976	52.94909248380	ISOLATE	-115.39261835300	33.70989603440	BIG WASH	16	Gruendikes Well
65	0	access_west	48.41944601180	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00277889383	48.41944600930	ISOLATE	-115.39101831700	33.70992752980	BIG WASH	16	Gruendikes Well
66	0	access_west	63.64300472250	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00365260587	63.64300471750	ISOLATE	-115.39031671100	33.70991250750	BIG WASH	16	Gruendikes Well
67	0	access_west	48.81867039390	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00280180615	48.81867039310	ISOLATE	-115.38848629900	33.70993849630	BIG WASH	16	Gruendikes Well
68	0	subA	1189.84516924000	2.50000000000	E	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.06828771632	1189.84516924000	ISOLATE	-115.31844079000	33.69659475100	BIG WASH	16	Gruendikes Well
69	0	subA	979.80399115500	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.05623301143	979.80399115500	ISOLATE	-115.31899840200	33.69336880730	BIG WASH	16	Gruendikes Well
70	0	subA	728.68026055400	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.04182049246	728.68026055700	ISOLATE	-115.31990102900	33.69388431980	BIG WASH	16	Gruendikes Well

[1] RISIF = RIVERINE INTERMITTENT STREAMBED INTERMITTENTLY FLOODED

Exhibit C. Field Data Summary																			
FID_channe	Id	project_co	length	width	category	Watershed	Vegetation	Waters_Nam	Cowardin_C [1]	HGM_Code	Area__acre	Linear_ft	Waters_Typ	Lat_nad83	Long_nad83	Lcl_Wtrway	FID_Cal_Wa	HU_12_NAME
71	0	subA	806.30743438600	2.50000000000	E	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.04627567920	806.30743438800	ISOLATE	-115.32046610100	33.69384371240	BIG WASH	16	Gruendikes Well
72	0	subA	777.44196087400	2.50000000000	E	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.04461902898	777.44196087800	ISOLATE	-115.32130403800	33.69438303390	BIG WASH	16	Gruendikes Well
73	0	subA	407.46701469100	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02338538881	407.46701469900	ISOLATE	-115.32209305700	33.69455386960	BIG WASH	16	Gruendikes Well
74	0	subA	393.65418428900	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02259264143	393.65418429000	ISOLATE	-115.32279758500	33.69519951780	BIG WASH	16	Gruendikes Well
75	0	subA	403.65412759400	2.50000000000	E	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.02316655921	403.65412759800	ISOLATE	-115.32128169500	33.69621505460	BIG WASH	16	Gruendikes Well
76	0	subA	440.36213064400	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02527330869	440.36213064700	ISOLATE	-115.32170816400	33.69635992830	BIG WASH	16	Gruendikes Well
77	0	subA	736.39465688400	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.04226323788	736.39465688300	ISOLATE	-115.31530118800	33.69336306890	BIG WASH	16	Gruendikes Well
78	0	subA	155.67465232300	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00893449566	155.67465232200	ISOLATE	-115.31445581800	33.69380731300	BIG WASH	16	Gruendikes Well
79	0	subA	636.54601672500	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.03653271446	636.54601673000	ISOLATE	-115.31405360400	33.69150070160	BIG WASH	16	Gruendikes Well
80	0	subA	633.57557298200	2.50000000000	E	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.03636223445	633.57557298600	ISOLATE	-115.31193004600	33.69084968610	BIG WASH	16	Gruendikes Well
81	0	sfAB	1066.70466007000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.06122042356	1066.70466006000	ISOLATE	-115.41638052200	33.83874527080	BIG WASH	31	Eagle Creek
82	0	sfAB	383.16675247700	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.02199074567	383.16675247600	ISOLATE	-115.41668400100	33.83889941790	BIG WASH	31	Eagle Creek
83	0	sfAB	1154.60990425000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.06626549037	1154.60990425000	ISOLATE	-115.41784943800	33.84036120460	BIG WASH	31	Eagle Creek
84	0	sfAB	1893.64672110000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.10868036737	1893.64672109000	ISOLATE	-115.41490871300	33.84245817190	BIG WASH	31	Eagle Creek
85	0	sfAB	819.45362920700	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.04703016697	819.45362920600	ISOLATE	-115.41489043300	33.83721308480	BIG WASH	31	Eagle Creek
86	0	sfAB	233.01014700400	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01337294232	233.01014700100	ISOLATE	-115.41511743100	33.83746756020	BIG WASH	31	Eagle Creek
87	0	sfAB	1628.47371046000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.09346153067	1628.47371046000	ISOLATE	-115.41720976300	33.83809440580	BIG WASH	31	Eagle Creek
88	0	sfAB	389.61154785100	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.02236062602	389.61154785100	ISOLATE	-115.41335085700	33.83756191400	BIG WASH	31	Eagle Creek
89	0	sfAB	730.40493730000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.04191947528	730.40493730500	ISOLATE	-115.41528042900	33.83591520280	BIG WASH	31	Eagle Creek
90	0	sfAB	112.67110892700	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.00646643187	112.67110892400	ISOLATE	-115.41346659600	33.83098668370	BIG WASH	31	Eagle Creek
91	0	sfAB	127.38846714800	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.00731109201	127.38846714700	ISOLATE	-115.41334341200	33.83100841140	BIG WASH	31	Eagle Creek
92	0	sfAB	152.16576942700	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.00873311349	152.16576943100	ISOLATE	-115.41293731700	33.83098075810	BIG WASH	31	Eagle Creek
93	0	sfAB	354.34769954900	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.02033675962	354.34769954900	ISOLATE	-115.41459897300	33.83167758630	BIG WASH	31	Eagle Creek
94	0	sfAB	302.89082197700	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01738354121	302.89082197600	ISOLATE	-115.41524151200	33.83215900050	BIG WASH	31	Eagle Creek
95	0	sfAB	583.70244075700	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03349991051	583.70244076200	ISOLATE	-115.42312297900	33.83239278800	BIG WASH	31	Eagle Creek
96	0	sfAB	320.53811123100	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01839635625	320.53811123200	ISOLATE	-115.42271669300	33.83254148020	BIG WASH	31	Eagle Creek
97	0	sfAB	200.43573574700	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01150342836	200.43573575200	ISOLATE	-115.42274253600	33.83270491290	BIG WASH	31	Eagle Creek
98	0	sfAB	183.36345566800	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01052361431	183.36345566900	ISOLATE	-115.42344475600	33.83298038520	BIG WASH	31	Eagle Creek
99	0	sfAB	646.81839958400	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03712226811	646.81839958600	ISOLATE	-115.42190945200	33.83234280590	BIG WASH	31	Eagle Creek
100	0	sfAB	2837.19491395000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.16283258230	2837.19491396000	ISOLATE	-115.42372261100	33.83214040770	BIG WASH	31	Eagle Creek
101	0	sfAB	512.49338508300	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.02941307307	512.49338508700	ISOLATE	-115.42817795700	33.83261644550	BIG WASH	31	Eagle Creek
102	0	sfAB	590.75461807500	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03390464980	590.75461807000	ISOLATE	-115.42727833400	33.83233373950	BIG WASH	31	Eagle Creek
103	0	sfAB	2059.22676720000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.11818335441	2059.22676720000	ISOLATE	-115.42452771600	33.83148305470	BIG WASH	31	Eagle Creek
104	0	sfAB	2074.26039538000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.11904616594	2074.26039538000	ISOLATE	-115.42205420100	33.83174636280	BIG WASH	31	Eagle Creek
105	0	sfAB	1373.13181747000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.07880692249	1373.13181747000	ISOLATE	-115.41946968300	33.83109314850	BIG WASH	31	Eagle Creek
106	0	sfAB	209.60506584800	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01202967550	209.60506584900	ISOLATE	-115.41831586200	33.83088848150	BIG WASH	31	Eagle Creek
107	0	sfAB	1095.52852827000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.06287468597	1095.52852826000	ISOLATE	-115.41691298300	33.83120323020	BIG WASH	31	Eagle Creek
108	0	sfAB	586.71433673800	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03367276956	586.71433673700	ISOLATE	-115.41525282400	33.83109207920	BIG WASH	31	Eagle Creek
109	0	sfAB	264.23787575300	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01516516734	264.23787575000	ISOLATE	-115.41673508100	33.83103880590	BIG WASH	31	Eagle Creek
110	0	sfAB	374.84530338100	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.02151316020	374.84530338200	ISOLATE	-115.41746086300	33.83095057740	BIG WASH	31	Eagle Creek
111	0	sfAB	1493.64455668000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.08572340201	1493.64455668000	ISOLATE	-115.41784271800	33.83143360920	BIG WASH	31	Eagle Creek
112	0	sfAB	1367.45295789000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.07848100080	1367.45295789000	ISOLATE	-115.42508910400	33.83299888850	BIG WASH	31	Eagle Creek
113	0	sfAB	526.99041257400	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03024508796	526.99041257500	ISOLATE	-115.42596728600	33.83251134920	BIG WASH	31	Eagle Creek
114	0	sfAB	404.57503720400	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.02321941214	404.57503720300	ISOLATE	-115.42531180000	33.83286461910	BIG WASH	31	Eagle Creek
115	0	sfAB	530.61351557700	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03045302546	530.61351557400	ISOLATE	-115.42473793200	33.83328068650	BIG WASH	31	Eagle Creek
116	0	sfAB	516.16310673700	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.02962368611	516.16310673900	ISOLATE	-115.42467586800	33.83307158470	BIG WASH	31	Eagle Creek
117	0	sfAB	808.75338590400	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.04641605750	808.75338590200	ISOLATE	-115.42986036500	33.83362317530	BIG WASH	31	Eagle Creek
118	0	sfAB	883.15019639400	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.15205754070	883.15019639700	ISOLATE	-115.43086185400	33.83404709520	BIG WASH	31	Eagle Creek
119	0	sfAB	500.30613588100	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.02871362121	500.30613588000	ISOLATE	-115.42803067000	33.83402808760	BIG WASH	31	Eagle Creek
120	0	sfAB	855.80750886100	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.04911659257	855.80750886800	ISOLATE	-115.42712058700	33.83352430390	BIG WASH	31	Eagle Creek
121	0	sfAB	302.92675811100	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01738560366	302.92675811600	ISOLATE	-115.42536722000	33.83390584080	BIG WASH	31	Eagle Creek
122	0	sfAB	1487.41238540000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.08536572460	1487.41238540000	ISOLATE	-115.42728238300	33.83405754360	BIG WASH	31	Eagle Creek
123	0	sfAB	1569.03431247000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.09005017863	1569.03431247000	ISOLATE	-115.43052360300	33.83440682410	BIG WASH	31	Eagle Creek
124	0	sfAB	175.40445425100	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01006683048	175.40445425000	ISOLATE	-115.43161135900	33.83466227200	BIG WASH	31	Eagle Creek
125	0	sfAB	677.37610954900	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03887603935	677.37610956000	ISOLATE	-115.42647678800	33.83440344930	BIG WASH	31	Eagle Creek
126	0	sfAB	423.48069269600	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.02430444747	423.48069269400	ISOLATE	-115.42742628400	33.83486319580	BIG WASH	31	Eagle Creek
127	0	sfAB	875.21021967400	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.05023015494	875.21021967800	ISOLATE	-115.42424083100	33.83509227350	BIG WASH	31	Eagle Creek
128	0	sfAB	906.08990205100	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.05200240485	906.08990204700	ISOLATE	-115.42502866400	33.83486754120	BIG WASH	31	Eagle Creek
129	0	sfAB	260.22095221700	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01493462765	260.22095221800	ISOLATE	-115.42398407200	33.83521372620	BIG WASH	31	Eagle Creek
130	0	sfAB	728.50869269600	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.04181064582	728.50869269600	ISOLATE	-115.42154482800	33.83495978590	BIG WASH	31	Eagle Creek
131	0	sfAB	1218.27472981000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.06991934859	1218.27472981000	ISOLATE	-115.42099736000	33.83294506670	BIG WASH	31	Eagle Creek
132	0	sfAB	1176.54569794000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.06752443170	1176.54569794000	ISOLATE	-115.42346197500	33.83348964020	BIG WASH	31	Eagle Creek
133	0	sfAB	1565.76190278000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.08986236816	1565.76190278000	ISOLATE	-115.42124209900	33.83360269630	BIG WASH	31	Eagle Creek
134	0	sfAB	612.44415887600	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03514945815	612.44415888200	ISOLATE	-115.42305185100	33.83431400040	BIG WASH	31	Eagle Creek
135	0	sfAB	2134.78430480000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.12251976038	2134.78430481000	ISOLATE	-115.41995911600	33.83467295830	BIG WASH	31	Eagle Creek
136	0	sfA	1751.63345796000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.10052992757	1751.63345796000	ISOLATE	-115.42794566700	33.83543701810	BIG WASH	31	Eagle Creek
137	0	sfA	554.22030628700	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03180786882	554.22030629500	ISOLATE	-115.42965137400	33.83653843340	BIG WASH	31	Eagle Creek
138	0	sfA	325.70011768900	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01869261465	325.70011768800	ISOLATE	-115.43086878600	33.83695302470	BIG WASH	31	Eagle Creek
139	0	sfA	249.12914492200	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01429804551	249.12914492000	ISOLATE	-115.43129280800	33.83673156930	BIG WASH	31	Eagle Creek
140	0	sfA	447.96198412800	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.02570948026	447.96198412500	ISOLATE	-115.42922874300	33.83654181420	BIG WASH	31	Eagle Creek
141	0	sfA	494.10843870000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.02835792233	494.10843870000	ISOLATE	-115.42644373300	33.83609511720	BIG WASH	31	Eagle Creek

[1] RISIF = RIVERINE INTERMITTENT STREAMBED INTERMITTENTLY FLOODED

Exhibit C. Field Data Summary

FID_channe	Id	project_co	length	width	category	Watershed	Vegetation	Waters_Nam	Cowardin_C [1]	HGM_Code	Area__acre	Linear_ft	Waters_Typ	Lat_nad83	Long_nad83	Lcl_Wtrway	FID_Cal_Wa	HU_12_NAME
142	0	sfA	696.54957448800	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03997644482	696.54957448600	ISOLATE	-115.42617483500	33.83658734300	BIG WASH	31	Eagle Creek
143	0	sfAB	663.01549099200	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03805185325	663.01549099300	ISOLATE	-115.42214475600	33.83593928300	BIG WASH	31	Eagle Creek
144	0	sfAB	2835.06608329000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.16271040423	2835.06608329000	ISOLATE	-115.41818774600	33.83585269500	BIG WASH	31	Eagle Creek
145	0	sfAB	368.94336554600	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.02117443558	368.94336555000	ISOLATE	-115.41506487300	33.83521604200	BIG WASH	31	Eagle Creek
146	0	sfAB	1846.32108299000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.10596424948	1846.32108298000	ISOLATE	-115.41546939900	33.83515845630	BIG WASH	31	Eagle Creek
147	0	sfAB	833.42139556800	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.04783180645	833.42139556800	ISOLATE	-115.41997655900	33.83509410120	BIG WASH	31	Eagle Creek
148	0	sfAB	964.80619436300	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.05537225633	964.80619437100	ISOLATE	-115.42178973500	33.83526355350	BIG WASH	31	Eagle Creek
149	0	sfAB	233.78760517800	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01341756228	233.78760518000	ISOLATE	-115.42078691800	33.83494700770	BIG WASH	31	Eagle Creek
150	0	sfAB	282.03979642200	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01618685700	282.03979642500	ISOLATE	-115.41862231000	33.83364402780	BIG WASH	31	Eagle Creek
151	0	sfAB	382.93610579400	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.02197750837	382.93610579800	ISOLATE	-115.41810301200	33.83298831930	BIG WASH	31	Eagle Creek
152	0	sfAB	548.97571212300	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03150687053	548.97571212000	ISOLATE	-115.41987198700	33.83421600030	BIG WASH	31	Eagle Creek
153	0	sfAB	412.11430170100	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.02365210639	412.11430170200	ISOLATE	-115.42094906500	33.83564039630	BIG WASH	31	Eagle Creek
154	0	sfAB	2363.36919910000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.13563872814	2363.36919911000	ISOLATE	-115.41738249700	33.83638103410	BIG WASH	31	Eagle Creek
155	0	sfAB	2558.19369574000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.14682011569	2558.19369574000	ISOLATE	-115.41553763300	33.83684993380	BIG WASH	31	Eagle Creek
156	0	sfAB	3090.24568647000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.17735569826	3090.24568648000	ISOLATE	-115.42015415400	33.83736823110	BIG WASH	31	Eagle Creek
157	0	sfAB	1096.29164066000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.06291848259	1096.29164066000	ISOLATE	-115.42300826400	33.83790715200	BIG WASH	31	Eagle Creek
158	0	sfAB	327.12598221800	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01877444802	327.12598221400	ISOLATE	-115.42346027700	33.83807807530	BIG WASH	31	Eagle Creek
159	0	sfA	332.81576146100	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01910099641	332.81576146100	ISOLATE	-115.42482430600	33.83803554520	BIG WASH	31	Eagle Creek
160	0	sfAB	831.79257969800	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.04773832528	831.79257969100	ISOLATE	-115.41939397300	33.83812777930	BIG WASH	31	Eagle Creek
161	0	sfA	2277.46862859000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.13070871376	2277.46862859000	ISOLATE	-115.42658607300	33.83846846920	BIG WASH	31	Eagle Creek
162	0	sfA	2792.38813474000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.16026102702	2792.38813473000	ISOLATE	-115.42774556700	33.83952232750	BIG WASH	31	Eagle Creek
163	0	sfA	1085.99094761000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.06232730416	1085.99094761000	ISOLATE	-115.42739860000	33.83771511090	BIG WASH	31	Eagle Creek
164	0	sfAB	1050.80596569000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.06030796405	1050.80596568000	ISOLATE	-115.41932477300	33.84005325050	BIG WASH	31	Eagle Creek
165	0	sfA	463.03339624500	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.02657446030	463.03339624400	ISOLATE	-115.42288964900	33.83973103980	BIG WASH	31	Eagle Creek
166	0	sfA	826.03311901500	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.04740777772	826.03311902200	ISOLATE	-115.42270066000	33.84021388090	BIG WASH	31	Eagle Creek
167	0	sfA	2866.25995539000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.16450068615	2866.25995539000	ISOLATE	-115.42788456600	33.84030433870	BIG WASH	31	Eagle Creek
168	0	sfA	311.99383927200	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01790598251	311.99383927500	ISOLATE	-115.43016769800	33.84036764890	BIG WASH	31	Eagle Creek
169	0	sfA	2379.95817001000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.13659080406	2379.95817001000	ISOLATE	-115.42699799500	33.84146296930	BIG WASH	31	Eagle Creek
170	0	sfA	1180.24841281000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.06773693829	1180.24841281000	ISOLATE	-115.42156127200	33.84127931650	BIG WASH	31	Eagle Creek
171	0	sfA	2023.90803530000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.11615633811	2023.90803530000	ISOLATE	-115.42891680300	33.84214895210	BIG WASH	31	Eagle Creek
172	0	sfA	234.39911493900	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01345265811	234.39911493900	ISOLATE	-115.42720328000	33.84198282990	BIG WASH	31	Eagle Creek
173	0	sfA	3699.76225910000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.21233713608	3699.76225910000	ISOLATE	-115.42527901800	33.84322112270	BIG WASH	31	Eagle Creek
174	0	sfA	2089.40421631000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.11991530167	2089.40421632000	ISOLATE	-115.42465498300	33.84232874580	BIG WASH	31	Eagle Creek
175	0	sfA	802.26927996800	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.04604392103	802.26927996500	ISOLATE	-115.41949477100	33.84377758160	BIG WASH	31	Eagle Creek
176	0	sfA	670.38962392000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03847507024	670.38962392200	ISOLATE	-115.41935234200	33.84321376600	BIG WASH	31	Eagle Creek
177	0	sfA	594.81831379800	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03413787384	594.81831379200	ISOLATE	-115.41971325200	33.84282515470	BIG WASH	31	Eagle Creek
178	0	sfA	331.07303121100	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01900097746	331.07303121500	ISOLATE	-115.41948413900	33.84237152910	BIG WASH	31	Eagle Creek
179	0	sfAB	2200.16062033000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.12627184460	2200.16062033000	ISOLATE	-115.41391395300	33.84005472830	BIG WASH	31	Eagle Creek
180	0	sfAB	613.09911448900	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03518704743	613.09911448800	ISOLATE	-115.41145984600	33.83877462610	BIG WASH	31	Eagle Creek
181	0	sfB	2352.56670380000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.13501875022	2352.56670380000	ISOLATE	-115.40941163900	33.84573431410	BIG WASH	31	Eagle Creek
182	0	sfB	602.16107594100	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03455929040	602.16107594100	ISOLATE	-115.41150261100	33.84699128990	BIG WASH	31	Eagle Creek
183	0	sfB	1059.60706898000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.06081307788	1059.60706898000	ISOLATE	-115.41307252800	33.84607301040	BIG WASH	31	Eagle Creek
184	0	sfB	499.10517831700	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.02864469573	499.10517831800	ISOLATE	-115.41355669700	33.84602068810	BIG WASH	31	Eagle Creek
185	0	sfB	403.42506542700	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.02315341285	403.42506542600	ISOLATE	-115.41376603900	33.84533042860	BIG WASH	31	Eagle Creek
186	0	sfAB	2125.86717900000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.12200798778	2125.86717899000	ISOLATE	-115.40653201700	33.84291840340	BIG WASH	31	Eagle Creek
187	0	sfAB	2575.45006908000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.14781049524	2575.45006907000	ISOLATE	-115.40812491300	33.84276372260	BIG WASH	31	Eagle Creek
188	0	sfAB	3931.17323463000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.22561829859	3931.17323464000	ISOLATE	-115.41084449300	33.84121116870	BIG WASH	31	Eagle Creek
189	0	sfAB	462.81848936300	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.02656212634	462.81848936100	ISOLATE	-115.41474973200	33.84293115690	BIG WASH	31	Eagle Creek
190	0	sfAB	441.04258709000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.02531236152	441.04258709200	ISOLATE	-115.41502296600	33.84334361670	BIG WASH	31	Eagle Creek
191	0	sfAB	1556.08232927000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.08930683708	1556.08232927000	ISOLATE	-115.40916363700	33.84183269930	BIG WASH	31	Eagle Creek
192	0	sfAB	534.75362698100	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03069063516	534.75362697600	ISOLATE	-115.41355381300	33.84330471040	BIG WASH	31	Eagle Creek
193	0	sfB	1169.33406053000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.06711054066	1169.33406053000	ISOLATE	-115.40678119600	33.84588488810	BIG WASH	31	Eagle Creek
194	0	sfB	247.61472129400	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01421112955	247.61472129000	ISOLATE	-115.40809508000	33.84632519610	BIG WASH	31	Eagle Creek
195	0	sfB	560.02411411700	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03214096155	560.02411411800	ISOLATE	-115.40840008800	33.84604127370	BIG WASH	31	Eagle Creek
196	0	sfB	3048.53674637000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.11823473757	2060.12206734000	ISOLATE	-115.40975403000	33.84851777050	BIG WASH	31	Eagle Creek
196	0	sfB	3048.53674637000	2.50000000000	E	181001004702-Pinto Wash	CBS	unnamed	RISIF	RIVERINE	0.05672719691	988.41467903200	ISOLATE	-115.40975403000	33.84851777050	BIG WASH	34	181001004702-Pinto Wash
197	0	sfB	2932.95428444000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.13377131159	2330.83133320000	ISOLATE	-115.40964095300	33.84800762270	BIG WASH	31	Eagle Creek
197	0	sfB	2932.95428444000	2.50000000000	E	181001004702-Pinto Wash	CBS	unnamed	RISIF	RIVERINE	0.03455710234	602.12295124300	ISOLATE	-115.40964095300	33.84800762270	BIG WASH	34	181001004702-Pinto Wash
198	0	sfB	1145.46410547000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.05560258028	968.81935885000	ISOLATE	-115.40670850900	33.84666207130	BIG WASH	31	Eagle Creek
198	0	sfB	1145.46410547000	2.50000000000	E	181001004703-Pinto Wash	CBS	unnamed	RISIF	RIVERINE	0.01013801347	176.64474662200	ISOLATE	-115.40670850900	33.84666207130	BIG WASH	32	181001004703-Pinto Wash
199	0	sfB	985.36056987300	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03541940726	617.14775212000	ISOLATE	-115.40656606100	33.84698287270	BIG WASH	31	Eagle Creek
199	0	sfB	985.36056987300	2.50000000000	E	181001004703-Pinto Wash	CBS	unnamed	RISIF	RIVERINE	0.02113250791	368.21281773900	ISOLATE	-115.40656606100	33.84698287270	BIG WASH	32	181001004703-Pinto Wash
200	0	sfB	1331.84435947000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01521555532	265.11583596400	ISOLATE	-115.40986190600	33.84951597400	BIG WASH	31	Eagle Creek
200	0	sfB	1331.84435947000	2.50000000000	E	181001004702-Pinto Wash	CBS	unnamed	RISIF	RIVERINE	0.06122179313	1066.72852351000	ISOLATE	-115.40986190600	33.84951597400	BIG WASH	34	181001004702-Pinto Wash
201	0	sfB	3262.49312282000	2.50000000000	E	181001004702-Pinto Wash	CBS	unnamed	RISIF	RIVERINE	0.18724134084	3262.49312282000	ISOLATE	-115.40984186900	33.85017259430	BIG WASH	34	181001004702-Pinto Wash
202	0	sfB	3147.53551906000	2.50000000000	E	181001004702-Pinto Wash	CBS	unnamed	RISIF	RIVERINE	0.17449252945	3040.35783315000	ISOLATE	-115.40899389900	33.85169001970	BIG WASH	34	181001004702-Pinto Wash
203	0	sfB	2537.29580715000	2.50000000000	E	181001004702-Pinto Wash	CBS	unnamed	RISIF	RIVERINE	0.13946958914	2430.11812124000	ISOLATE	-115.41070510600	33.85153047860	BIG WASH	34	181001004702-Pinto Wash
204	0	sfB	400.30159667200	2.50000000000	E	181001004702-Pinto Wash	CBS	unnamed	RISIF	RIVERINE	0.02297415041	400.30159667500	ISOLATE	-115.41100545500	33.85125759290	BIG WASH	34	181001004702-Pinto Wash
205	0	sfB	836.01760462700	2.50000000000	E	181001004702-Pinto Wash	CBS	unnamed	RISIF	RIVERINE	0.04798080835	836.01760462700	ISOLATE	-115.41299221400	33.85206068060	BIG WASH	34	181001004702-Pinto Wash
206	0	sfB	2453.89946212000	2.50000000000	E	181001004702-Pinto Wash	CBS	unnamed	RISIF	RIVERINE	0.14083445031	2453.89946212000	ISOLATE	-115.40838650800	33.85240469600	BIG WASH	34	181001004702-Pinto Wash
207	0	sfB	608.16641788400	2.50000000000	E	181001004702-Pinto Wash	CBS	unnamed	RISIF	RIVERINE	0.03490394960	608.16641788200	ISOLATE	-115.40938117700	33.85311794180	BIG WASH	34	181001004702-Pinto Wash

[1] RISIF = RIVERINE INTERMITTENT STREAMBED INTERMITTENTLY FLOODED

Exhibit C. Field Data Summary

FID_channe	Id	project_co	length	width	category	Watershed	Vegetation	Waters_Nam	Cowardin_C [1]	HGM_Code	Area__acre	Linear_ft	Waters_Typ	Lat_nad83	Long_nad83	Lcl_Wtrway	FID_Cal_Wa	HU_12_NAME
208	0	sfB	1435.80711989000	2.50000000000	E	181001004702-Pinto Wash	CBS	unnamed	RISIF	RIVERINE	0.08240398989	1435.80711989000	ISOLATE	-115.40668140500	33.85271987350	BIG WASH	34	181001004702-Pinto Wash
209	0	sfAB	1537.32599624000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.08823037169	1537.32599624000	ISOLATE	-115.40516293200	33.83240310030	BIG WASH	31	Eagle Creek
210	0	sfAB	1648.95428682000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.09463695402	1648.95428681000	ISOLATE	-115.40764655000	33.83402195860	BIG WASH	31	Eagle Creek
211	0	sfAB	1984.81318743000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.11391260258	1984.81318743000	ISOLATE	-115.40843667800	33.83496686270	BIG WASH	31	Eagle Creek
212	0	sfAB	1227.17378095000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.07043008385	1227.17378095000	ISOLATE	-115.41105092600	33.83571305860	BIG WASH	31	Eagle Creek
213	0	sfAB	1423.43926372000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.08169417262	1423.43926372000	ISOLATE	-115.41306899100	33.83250681770	BIG WASH	31	Eagle Creek
214	0	sfAB	1982.42422619000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.11377549508	1982.42422619000	ISOLATE	-115.41027167200	33.83292850170	BIG WASH	31	Eagle Creek
215	0	sfAB	1029.29853806000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.05907360756	1029.29853806000	ISOLATE	-115.40975438400	33.83335098050	BIG WASH	31	Eagle Creek
216	0	sfAB	961.66833479000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.05519216797	961.66833479200	ISOLATE	-115.41178172800	33.83429421200	BIG WASH	31	Eagle Creek
217	0	sfAB	2461.66413109000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.14128008099	2461.66413109000	ISOLATE	-115.41112918100	33.83669447820	BIG WASH	31	Eagle Creek
218	0	sfAB	1792.22001562000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.09837551743	1714.09501562000	ISOLATE	-115.40775180700	33.83809280470	BIG WASH	31	Eagle Creek
219	0	sfAB	9770.58234986000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.56075426709	9770.58234985000	ISOLATE	-115.39347894100	33.82958185510	BIG WASH	31	Eagle Creek
220	0	sfAB	9157.46050366000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.52556591504	9157.46050365000	ISOLATE	-115.39360489500	33.83363529110	BIG WASH	31	Eagle Creek
221	0	sfAB	1764.97048515000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.10129536760	1764.97048514000	ISOLATE	-115.38929402700	33.82714221970	BIG WASH	31	Eagle Creek
222	0	sfAB	12898.39534450000	7.50000000000	D	Lower Big Wash	CBS	unnamed	RISIF	RIVERINE	1.15492440547	6707.80094696000	ISOLATE	-115.38022315800	33.81635852740	BIG WASH	27	Lower Big Wash
222	0	sfAB	12898.39534450000	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	1.06587369104	6190.59439756000	ISOLATE	-115.38022315800	33.81635852740	BIG WASH	31	Eagle Creek
223	0	sfAB	11740.20539830000	7.50000000000	D	Lower Big Wash	CBS	unnamed	RISIF	RIVERINE	1.60292177422	9309.76966466000	ISOLATE	-115.37586372500	33.81322831810	BIG WASH	27	Lower Big Wash
223	0	sfAB	11740.20539830000	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.41846345277	2430.43573366000	ISOLATE	-115.37586372500	33.81322831810	BIG WASH	31	Eagle Creek
224	0	sfAB	1965.74015168000	2.50000000000	E	Lower Big Wash	CBS	unnamed	RISIF	RIVERINE	0.11281796096	1965.74015168000	ISOLATE	-115.37307828300	33.80938092140	BIG WASH	27	Lower Big Wash
225	0	sfAB	6037.99133765000	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	1.03959905951	6037.99133765000	ISOLATE	-115.38831469400	33.82965050670	BIG WASH	31	Eagle Creek
226	0	sfAB	401.49568300000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.02304268153	401.49568300500	ISOLATE	-115.38659521600	33.82534070340	BIG WASH	31	Eagle Creek
227	0	sfAB	1530.25496979000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.08782455061	1530.25496979000	ISOLATE	-115.38597828700	33.82916646580	BIG WASH	31	Eagle Creek
228	0	sfAB	2342.97076134000	2.50000000000	E	181001004703-Pinto Wash	CBS	unnamed	RISIF	RIVERINE	0.13446801890	2342.97076133000	ISOLATE	-115.39674203100	33.84025947970	BIG WASH	32	181001004703-Pinto Wash
229	0	sfAB	3544.63692383000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.20343416689	3544.63692384000	ISOLATE	-115.39897911800	33.83869723670	BIG WASH	31	Eagle Creek
230	0	sfAB	2324.36526936000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.13340021059	2324.36526935000	ISOLATE	-115.40168930300	33.83900692710	BIG WASH	31	Eagle Creek
231	0	sfAB	885.42601637900	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.05081646100	885.42601637800	ISOLATE	-115.40849487300	33.84001428480	BIG WASH	31	Eagle Creek
232	0	sfAB	378.19379599700	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.02170533724	378.19379599300	ISOLATE	-115.40886059700	33.84040320470	BIG WASH	31	Eagle Creek
233	0	sfAB	3674.83928862000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.21090675440	3674.83928861000	ISOLATE	-115.39395073500	33.83147596890	BIG WASH	31	Eagle Creek
234	0	sfAB	4144.44619203000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.23785848210	4144.44619203000	ISOLATE	-115.39548713300	33.83403385920	BIG WASH	31	Eagle Creek
235	0	sfAB	2283.12700924000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.13103346013	2283.12700923000	ISOLATE	-115.39805434600	33.83452064860	BIG WASH	31	Eagle Creek
236	0	sfAB	964.38716867600	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.05534820757	964.38716867300	ISOLATE	-115.39850096400	33.80570584320	BIG WASH	28	Upper Big Wash
237	0	sfAB	650.92405779800	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.03735790047	650.92405779800	ISOLATE	-115.39969479500	33.80664940940	BIG WASH	28	Upper Big Wash
238	0	sfAB	459.22811312200	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.02635606710	459.22811312100	ISOLATE	-115.39947476600	33.80683959950	BIG WASH	28	Upper Big Wash
239	0	sfAB	475.77049338500	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.02730546909	475.77049338200	ISOLATE	-115.39612373100	33.80331024500	BIG WASH	28	Upper Big Wash
240	0	sfAB	484.38475831200	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.02779985987	484.38475831700	ISOLATE	-115.39783928800	33.80429392290	BIG WASH	28	Upper Big Wash
241	0	sfAB	442.34617146600	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.02538717697	442.34617146600	ISOLATE	-115.39930180300	33.80488234070	BIG WASH	28	Upper Big Wash
242	0	sfAB	475.55039883400	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.02729283740	475.55039882800	ISOLATE	-115.39961163500	33.80425379530	BIG WASH	28	Upper Big Wash
243	0	sfAB	4872.67025803000	2.50000000000	E	Lower Big Wash	CBS	unnamed	RISIF	RIVERINE	0.21059520040	3669.41077173000	ISOLATE	-115.38267031200	33.80764677820	BIG WASH	27	Lower Big Wash
243	0	sfAB	4872.67025803000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.06905759219	1203.25948631000	ISOLATE	-115.38267031200	33.80764677820	BIG WASH	31	Eagle Creek
244	0	sfAB	6898.50608806000	7.50000000000	D	Lower Big Wash	CBS	unnamed	RISIF	RIVERINE	0.90718683009	5268.94110914000	ISOLATE	-115.38602110000	33.80968462070	BIG WASH	27	Lower Big Wash
244	0	sfAB	6898.50608806000	7.50000000000	D	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.00652577153	37.90168106580	ISOLATE	-115.38602110000	33.80968462070	BIG WASH	28	Upper Big Wash
244	0	sfAB	6898.50608806000	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.27404671106	1591.66329785000	ISOLATE	-115.38602110000	33.80968462070	BIG WASH	31	Eagle Creek
245	0	sfAB	7499.84172697000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.43043168773	7499.84172697000	ISOLATE	-115.39659220900	33.81561330230	BIG WASH	28	Upper Big Wash
246	0	sfAB	7751.45043130000	2.50000000000	E	Lower Big Wash	CBS	unnamed	RISIF	RIVERINE	0.11811636342	2058.05951624000	ISOLATE	-115.39567491900	33.81820122110	BIG WASH	27	Lower Big Wash
246	0	sfAB	7751.45043130000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.32675567694	5693.39091506000	ISOLATE	-115.39567491900	33.81820122110	BIG WASH	28	Upper Big Wash
247	0	sfAB	3036.07673722000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.17424682835	3036.07673723000	ISOLATE	-115.40262679800	33.81933594190	BIG WASH	28	Upper Big Wash
248	0	sfAB	11250.54267560000	7.50000000000	D	Lower Big Wash	CBS	unnamed	RISIF	RIVERINE	1.93707690696	11250.54267560000	ISOLATE	-115.37299878800	33.81517319920	BIG WASH	27	Lower Big Wash
249	0	sfAB	8142.89011155000	2.50000000000	E	Lower Big Wash	CBS	unnamed	RISIF	RIVERINE	0.46733758675	8142.89011155000	ISOLATE	-115.36878453000	33.81183010380	BIG WASH	27	Lower Big Wash
250	0	sfAB	2529.41530312000	2.50000000000	E	Lower Big Wash	CBS	unnamed	RISIF	RIVERINE	0.14516846322	2529.41530312000	ISOLATE	-115.37316621700	33.81794523180	BIG WASH	27	Lower Big Wash
251	0	sfAB	1269.79036594000	2.50000000000	E	Lower Big Wash	CBS	unnamed	RISIF	RIVERINE	0.07287593928	1269.79036594000	ISOLATE	-115.37186926200	33.82056988220	BIG WASH	27	Lower Big Wash
252	0	B1	746.27520572300	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.03768272761	656.58384583700	ISOLATE	-115.40557953500	33.80464131440	BIG WASH	28	Upper Big Wash
253	0	B1	414.83473939000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.02380823803	414.83473939100	ISOLATE	-115.40533542200	33.80437740040	BIG WASH	28	Upper Big Wash
254	0	B1	154.53922610500	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.00372175541	64.84786622380	ISOLATE	-115.40544972400	33.80385415570	BIG WASH	28	Upper Big Wash
255	0	B1	106.82999933000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.00613119831	106.82999933100	ISOLATE	-115.40592071200	33.80448944420	BIG WASH	28	Upper Big Wash
256	0	B1	405.84446103200	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.02329226705	405.84446104100	ISOLATE	-115.40610413800	33.80383241980	BIG WASH	28	Upper Big Wash
257	0	B1	723.42432925100	2.50000000000	E	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.04151884351	723.42432925600	ISOLATE	-115.41006194300	33.80083388360	BIG WASH	28	Upper Big Wash
258	0	B1	797.62974879600	2.50000000000	E	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.04577764858	797.62974878900	ISOLATE	-115.40955110900	33.80138449360	BIG WASH	28	Upper Big Wash
259	0	B1	654.86548523300	2.50000000000	E	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.03758410728	654.86548523900	ISOLATE	-115.41063487400	33.80044464090	BIG WASH	28	Upper Big Wash
260	0	B1	702.86843164100	2.50000000000	E	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.04033909732	702.86843163900	ISOLATE	-115.41164763500	33.79976665900	BIG WASH	28	Upper Big Wash
261	0	B1	345.41600849300	2.50000000000	E	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.01850900088	322.50083137400	ISOLATE	-115.41775706100	33.79541845420	BIG WASH	28	Upper Big Wash
262	0	B1	428.92852570600	2.50000000000	E	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.02461711006	428.92852570100	ISOLATE	-115.41730421900	33.79548282470	BIG WASH	28	Upper Big Wash
263	0	B1	416.03031246400	2.50000000000	E	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.02387685448	416.03031246600	ISOLATE	-115.41968241700	33.79371648310	BIG WASH	28	Upper Big Wash
264	0	B1	350.51611206000	2.50000000000	E	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.02011685675	350.51611206500	ISOLATE	-115.41929065900	33.79456762130	BIG WASH	28	Upper Big Wash
265	0	B1	385.95980093100	2.50000000000	E	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.02215104459	385.95980093400	ISOLATE	-115.42015550100	33.79352856930	BIG WASH	28	Upper Big Wash
266	0	B1	528.38325507200	2.50000000000	E	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.03032502612	528.38325507900	ISOLATE	-115.42065679800	33.79282990780	BIG WASH	28	Upper Big Wash
267	0	B1	406.42072710800	2.50000000000	E	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.02332534017	406.42072710200	ISOLATE	-115.42360665400	33.79156454870	BIG WASH	28	Upper Big Wash
268	0	B1	563.50347153400	2.50000000000	E	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.03234064919	563.50347152900	ISOLATE	-115.42420757800	33.79162148850	BIG WASH	28	Upper Big Wash
269	0	B1	272.49308259100	2.50000000000	E	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.01563895102	272.49308259200	ISOLATE	-115.44664299800	33.78461241640	BIG WASH	28	Upper Big Wash
270	0	B1	217.76132419600	2.50000000000	E	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.01249778031	217.76132419800	ISOLATE	-115.44681210500	33.78412558960	BIG WASH	28	Upper Big Wash
271	0	B1	683.58643329200	2.50000000000	E	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.03923246288	683.58643329300	ISOLATE	-115.44380939200	33.79048881010	BIG WASH	28	Upper Big Wash
272	0	B1	503.35453502500	2.50000000000	E	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.02888857524	503.35453502800	ISOLATE	-115.44461986200	33.78860253150	BIG WASH	28	Upper Big Wash

[1] RISIF = RIVERINE INTERMITTENT STREAMBED INTERMITTENTLY FLOODED

Exhibit C. Field Data Summary

FID_channe	Id	project_co	length	width	category	Watershed	Vegetation	Waters_Nam	Cowardin_C [1]	HGM_Code	Area__acre	Linear_ft	Waters_Typ	Lat_nad83	Long_nad83	Lcl_Wtrway	FID_Cal_Wa	HU_12_NAME
273	0	B1	532.20296818200	2.50000000000	E	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.03054424749	532.20296818300	ISOLATE	-115.44500841500	33.78801049520	BIG WASH	28	Upper Big Wash
274	0	B1	184.92026613600	2.50000000000	E	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.01061296293	184.92026613500	ISOLATE	-115.44830204800	33.78199053200	BIG WASH	28	Upper Big Wash
275	0	B1	371.92238121100	2.50000000000	E	Dragon Wash	CBS	unnamed	RISIF	RIVERINE	0.02134540755	371.92238121800	ISOLATE	-115.45002564400	33.77433543700	BIG WASH	23	Dragon Wash
276	0	B1	314.52805607300	2.50000000000	E	Dragon Wash	CBS	unnamed	RISIF	RIVERINE	0.01805142654	314.52805607700	ISOLATE	-115.44996512600	33.77340600840	BIG WASH	23	Dragon Wash
277	0	B1	278.37545311600	2.50000000000	E	Dragon Wash	CBS	unnamed	RISIF	RIVERINE	0.01597655264	278.37545311600	ISOLATE	-115.45004968200	33.76317412950	BIG WASH	23	Dragon Wash
278	0	B1	278.76835173800	2.50000000000	E	Dragon Wash	CBS	unnamed	RISIF	RIVERINE	0.01599910191	278.76835173800	ISOLATE	-115.45004664900	33.76265435440	BIG WASH	23	Dragon Wash
279	0	sfAB	647.37740633100	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03715435069	647.37740633600	ISOLATE	-115.42576945800	33.83100579190	BIG WASH	31	Eagle Creek
280	0	sfAB	419.86266801900	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.02409680142	419.86266802000	ISOLATE	-115.42797633100	33.83123924420	BIG WASH	31	Eagle Creek
281	0	sfAB	263.53276508000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01512469956	263.53276508000	ISOLATE	-115.42759747000	33.83174236740	BIG WASH	31	Eagle Creek
282	0	sfAB	1234.34032970000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.07084138715	1234.34032970000	ISOLATE	-115.42961142300	33.83183461590	BIG WASH	31	Eagle Creek
283	0	sfAB	1051.54639343000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.06035045876	1051.54639344000	ISOLATE	-115.43164563800	33.83224452360	BIG WASH	31	Eagle Creek
284	0	sfb	230.68057180400	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01323924310	230.68057180600	ISOLATE	-115.43248374300	33.83248178860	BIG WASH	31	Eagle Creek
285	0	sfAB	593.48284402500	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03406122842	593.48284402600	ISOLATE	-115.42929987100	33.83212151170	BIG WASH	31	Eagle Creek
286	0	sfAB	2119.54359032000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.10419061274	1815.41723629000	ISOLATE	-115.40313814000	33.84318332450	BIG WASH	31	Eagle Creek
286	0	sfAB	2119.54359032000	2.50000000000	E	181001004703-Pinto Wash	CBS	unnamed	RISIF	RIVERINE	0.01745445099	304.12635403300	ISOLATE	-115.40313814000	33.84318332450	BIG WASH	32	181001004703-Pinto Wash
287	0	sfB	664.35472015600	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03812871443	664.35472015500	ISOLATE	-115.41045877500	33.84479112670	BIG WASH	31	Eagle Creek
288	0	sfB	469.18063827500	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.02692726345	469.18063827900	ISOLATE	-115.41232942500	33.84473635570	BIG WASH	31	Eagle Creek
289	0	sfA	206.17260937500	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01183267960	206.17260938100	ISOLATE	-115.41813907600	33.84298944410	BIG WASH	31	Eagle Creek
290	0	sfAB	841.61090562400	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.04830181965	841.61090562500	ISOLATE	-115.41831875200	33.84150429860	BIG WASH	31	Eagle Creek
291	0	sfA	814.61983967600	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.04675274562	814.61983967400	ISOLATE	-115.42224733300	33.84069035610	BIG WASH	31	Eagle Creek
292	0	sfAB	553.48014934300	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03176538965	553.48014934100	ISOLATE	-115.42053524400	33.84016024120	BIG WASH	31	Eagle Creek
293	0	sfAB	334.71212389400	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01920983264	334.71212389300	ISOLATE	-115.42166722100	33.83941136800	BIG WASH	31	Eagle Creek
294	0	sfAB	1045.42807903000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.05999931583	1045.42807903000	ISOLATE	-115.42140363700	33.83806619890	BIG WASH	31	Eagle Creek
295	0	sfA	302.22214574000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01734516447	302.22214574500	ISOLATE	-115.42440340000	33.83835133310	BIG WASH	31	Eagle Creek
296	0	sfAB	303.01269384300	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01739053569	303.01269384100	ISOLATE	-115.42383916300	33.83780535150	BIG WASH	31	Eagle Creek
297	0	sfA	308.78796278900	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01772199052	308.78796278800	ISOLATE	-115.42516390100	33.83751512780	BIG WASH	31	Eagle Creek
298	0	subB	441.09121603500	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.02531515244	441.09121603600	ISOLATE	-115.45640495700	33.69578149380	BIG WASH	21	Lake Tamarisk
299	0	B1	121.43621989500	2.50000000000	E	Dragon Wash	CBS	unnamed	RISIF	RIVERINE	0.00696948002	121.43621990100	ISOLATE	-115.45050196500	33.77035803060	BIG WASH	23	Dragon Wash
300	0	B1	252.24406819100	2.50000000000	E	Dragon Wash	CBS	unnamed	RISIF	RIVERINE	0.01447681750	252.24406818600	ISOLATE	-115.45012394600	33.75985067120	BIG WASH	23	Dragon Wash
301	0	B1	351.64737248100	2.50000000000	E	Dragon Wash	CBS	unnamed	RISIF	RIVERINE	0.02018178217	351.64737247900	ISOLATE	-115.45006903300	33.75939196830	BIG WASH	23	Dragon Wash
302	0	B1	181.45738496500	2.50000000000	E	Dragon Wash	CBS	unnamed	RISIF	RIVERINE	0.01041422090	181.45738496000	ISOLATE	-115.45024348700	33.75912738270	BIG WASH	23	Dragon Wash
303	0	B1	219.42520331700	2.50000000000	E	Dragon Wash	CBS	unnamed	RISIF	RIVERINE	0.01259327384	219.42520332300	ISOLATE	-115.45016497200	33.75602950000	BIG WASH	23	Dragon Wash
304	0	B1	241.89891922300	2.50000000000	E	Dragon Wash	CBS	unnamed	RISIF	RIVERINE	0.01388308765	241.89891922300	ISOLATE	-115.45032529100	33.74992358470	BIG WASH	23	Dragon Wash
305	0	B1	103.38413716900	2.50000000000	E	Dragon Wash	CBS	unnamed	RISIF	RIVERINE	0.00593343303	103.38413716800	ISOLATE	-115.45110780700	33.74985863520	BIG WASH	23	Dragon Wash
306	0	B1	164.18358244900	2.50000000000	E	Dragon Wash	CBS	unnamed	RISIF	RIVERINE	0.00942284105	164.18358245000	ISOLATE	-115.45113704400	33.74892232840	BIG WASH	23	Dragon Wash
307	0	B1	380.94862778500	2.50000000000	E	Dragon Wash	CBS	unnamed	RISIF	RIVERINE	0.02186344283	380.94862778400	ISOLATE	-115.45049920500	33.74803135850	BIG WASH	23	Dragon Wash
308	0	B2	322.43139441800	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.01850501575	322.43139442000	ISOLATE	-115.45175910600	33.70533842430	BIG WASH	21	Lake Tamarisk
309	0	subB	352.38010002400	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.02022383494	352.38010002400	ISOLATE	-115.45388711000	33.69941327120	BIG WASH	21	Lake Tamarisk
310	0	subB	334.37152135200	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.01919028474	334.37152134500	ISOLATE	-115.45474739300	33.69982308010	BIG WASH	21	Lake Tamarisk
311	0	subB	445.25929985700	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.02555436753	445.25929985300	ISOLATE	-115.45449423400	33.69960104600	BIG WASH	21	Lake Tamarisk
312	0	subB	454.53262880900	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.02608658338	454.53262880900	ISOLATE	-115.45577370000	33.70032595190	BIG WASH	21	Lake Tamarisk
313	0	subB	408.19956643000	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.02342743150	408.19956642800	ISOLATE	-115.45557571300	33.70031182640	BIG WASH	21	Lake Tamarisk
314	0	subB	320.64270087000	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.01840235887	320.64270087200	ISOLATE	-115.45513635000	33.70022746030	BIG WASH	21	Lake Tamarisk
315	0	subB	94.85484565800	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.00544391906	94.85484565620	ISOLATE	-115.45518603300	33.70007138210	BIG WASH	21	Lake Tamarisk
316	0	subB	599.97121543400	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.03443360970	599.97121543900	ISOLATE	-115.45589520600	33.70005267480	BIG WASH	21	Lake Tamarisk
317	0	subB	421.52845297600	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.02419240433	421.52845297800	ISOLATE	-115.45631848900	33.70009511680	BIG WASH	21	Lake Tamarisk
318	0	subB	456.81164804500	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.02621738109	456.81164804100	ISOLATE	-115.45414190600	33.69577222120	BIG WASH	21	Lake Tamarisk
319	0	subB	465.44772823600	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.02671302389	465.44772823000	ISOLATE	-115.45391641800	33.69611056010	BIG WASH	21	Lake Tamarisk
320	0	subB	750.34868080800	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.04306408866	750.34868080600	ISOLATE	-115.45458290900	33.69659408850	BIG WASH	21	Lake Tamarisk
321	0	subB	303.35862704300	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.01741038952	303.35862704100	ISOLATE	-115.45464379200	33.69542649940	BIG WASH	21	Lake Tamarisk
322	0	subB	146.58168066300	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.00841263089	146.58168066400	ISOLATE	-115.45646979300	33.69659255160	BIG WASH	21	Lake Tamarisk
323	0	subB	446.27832104600	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.02561285130	446.27832104200	ISOLATE	-115.45626967100	33.69614282410	BIG WASH	21	Lake Tamarisk
324	0	subB	181.99207920700	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.01044490813	181.99207920700	ISOLATE	-115.45615229300	33.69559854780	BIG WASH	21	Lake Tamarisk
325	0	subB	680.69685615000	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.03906662398	680.69685614800	ISOLATE	-115.45435368100	33.69922962520	BIG WASH	21	Lake Tamarisk
326	0	sfAB	1531.71140454000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.08790813846	1531.71140453000	ISOLATE	-115.40039788000	33.80430029540	BIG WASH	28	Upper Big Wash
327	0	sfAB	447.08133849700	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.02565893816	447.08133849600	ISOLATE	-115.40063299600	33.80472816050	BIG WASH	28	Upper Big Wash
328	0	sfAB	406.15877255000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.02331030605	406.15877254900	ISOLATE	-115.40203405800	33.80706868660	BIG WASH	28	Upper Big Wash
329	0	sfAB	275.91879910800	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.01583556010	275.91879910800	ISOLATE	-115.40243802200	33.80709931940	BIG WASH	28	Upper Big Wash
330	0	sfAB	628.15518341200	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.03605114689	628.15518341800	ISOLATE	-115.40378177500	33.80758455400	BIG WASH	28	Upper Big Wash
331	0	sfAB	181.51524254800	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.01041754147	181.51524255000	ISOLATE	-115.40325362000	33.80821909910	BIG WASH	28	Upper Big Wash
332	0	sfAB	552.41172864100	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.03170407074	552.41172864300	ISOLATE	-115.40551846500	33.80899800570	BIG WASH	28	Upper Big Wash
333	0	sfAB	878.76249096200	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.05043402726	878.76249095500	ISOLATE	-115.40141229100	33.80902865010	BIG WASH	28	Upper Big Wash
334	0	sfAB	903.82384748100	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.05187235121	903.82384747700	ISOLATE	-115.40098356100	33.80839466210	BIG WASH	28	Upper Big Wash
335	0	sfAB	529.02437114800	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.03036182112	529.02437114600	ISOLATE	-115.40546484400	33.81111649590	BIG WASH	28	Upper Big Wash
336	0	sfAB	606.09916489100	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.03478530561	606.09916489300	ISOLATE	-115.40604067300	33.81136091610	BIG WASH	28	Upper Big Wash
337	0	sfAB	676.71681534200	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.03883820106	676.71681534300	ISOLATE	-115.40679782800	33.81125997530	BIG WASH	28	Upper Big Wash
338	0	sfAB	314.27372019700	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.01803682967	314.27372020300	ISOLATE	-115.40543039900	33.81245363490	BIG WASH	28	Upper Big Wash
339	0	sfAB	658.58851466700	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.03779777977	658.58851466300	ISOLATE	-115.40487239300	33.80935471690	BIG WASH	28	Upper Big Wash
340	0	sfAB	379.23743029900	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.02176523360	379.23743030000	ISOLATE	-115.40591974800	33.80964270410	BIG WASH	28	Upper Big Wash
341	0	sfAB	671.12725727000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.03851740457	671.12725727200	ISOLATE	-115.40573203200	33.81016058750	BIG WASH	28	Upper Big Wash
342	0	sfAB	1818.19176024000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.10434984850	1818.19176024000	ISOLATE	-115.40305939000	33.80579662630	BIG WASH	28	Upper Big Wash

[1] RISIF = RIVERINE INTERMITTENT STREAMBED INTERMITTENTLY FLOODED

Exhibit C. Field Data Summary																		
FID_channe	Id	project_co	length	width	category	Watershed	Vegetation	Waters_Nam	Cowardin_C [1]	HGM_Code	Area__acre	Linear_ft	Waters_Typ	Lat_nad83	Long_nad83	Lcl_Wtrway	FID_Cal_Wa	HU_12_NAME
343	0	sfAB	210.40931472800	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.01207583303	210.40931472500	ISOLATE	-115.40265896300	33.80563521500	BIG WASH	28	Upper Big Wash
344	0	A1	488.31081846300	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02802518471	488.31081845900	ISOLATE	-115.33326105900	33.71439159370	BIG WASH	16	Gruendikes Well
345	0	A1	451.83440395400	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02593172658	451.83440395500	ISOLATE	-115.33385655900	33.71427687960	BIG WASH	16	Gruendikes Well
346	0	A1	449.52395420500	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02579912501	449.52395420800	ISOLATE	-115.33607354300	33.71435650610	BIG WASH	16	Gruendikes Well
347	0	A1	534.68920435000	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.03068693781	534.68920435400	ISOLATE	-115.33631635900	33.71443122260	BIG WASH	16	Gruendikes Well
348	0	A1	432.78496124500	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02483843901	432.78496124600	ISOLATE	-115.33848506200	33.71426520220	BIG WASH	16	Gruendikes Well
349	0	A1	431.63140670800	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02477223409	431.63140670500	ISOLATE	-115.33888796500	33.71425467960	BIG WASH	16	Gruendikes Well
350	0	A1	443.63935279300	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02546139536	443.63935279200	ISOLATE	-115.34480860400	33.71429814550	BIG WASH	16	Gruendikes Well
351	0	A1	111.92257069700	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00642347169	111.92257069700	ISOLATE	-115.34555254400	33.71387242200	BIG WASH	16	Gruendikes Well
352	0	A1	244.30902290100	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01402140857	244.30902290600	ISOLATE	-115.34528702000	33.71405267550	BIG WASH	16	Gruendikes Well
353	0	A1	425.78282509500	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02443657169	425.78282509000	ISOLATE	-115.34703644900	33.71429718360	BIG WASH	16	Gruendikes Well
354	0	A1	440.17437504600	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02526253300	440.17437504600	ISOLATE	-115.35341456400	33.71425248630	BIG WASH	16	Gruendikes Well
355	0	A1	199.68522709900	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01146035509	199.68522709700	ISOLATE	-115.35326900100	33.71400152350	BIG WASH	16	Gruendikes Well
356	0	A1	211.25582718400	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01212441616	211.25582718200	ISOLATE	-115.35971823400	33.71463507160	BIG WASH	16	Gruendikes Well
357	0	A1	174.92239828700	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01003916427	174.92239829100	ISOLATE	-115.35978857300	33.71418535260	BIG WASH	16	Gruendikes Well
358	0	A1	240.26036182900	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01378904740	240.26036183000	ISOLATE	-115.36041857200	33.71400786600	BIG WASH	16	Gruendikes Well
359	0	A1	299.47777415100	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01718765921	299.47777415000	ISOLATE	-115.36231030000	33.71445021360	BIG WASH	16	Gruendikes Well
360	0	A1	454.71977107700	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02609732387	454.71977107600	ISOLATE	-115.36263253800	33.71429474760	BIG WASH	16	Gruendikes Well
361	0	A1	436.40712366700	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02504632252	436.40712366800	ISOLATE	-115.36343943800	33.71429652320	BIG WASH	16	Gruendikes Well
362	0	A1	440.81039093700	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02529903529	440.81039094000	ISOLATE	-115.36361380700	33.71426978360	BIG WASH	16	Gruendikes Well
363	0	A1	370.32365006900	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02125365301	370.32365007300	ISOLATE	-115.36391831900	33.71431567570	BIG WASH	16	Gruendikes Well
364	0	A1	242.86443852500	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01393850083	242.86443852400	ISOLATE	-115.36416737600	33.71404852990	BIG WASH	16	Gruendikes Well
365	0	A1	519.60150498400	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02982102301	519.60150497900	ISOLATE	-115.36746863300	33.71424859270	BIG WASH	16	Gruendikes Well
366	0	A1	199.23283275100	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01143439123	199.23283274500	ISOLATE	-115.36707418200	33.71435339100	BIG WASH	16	Gruendikes Well
367	0	A1	107.41205957700	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00616460397	107.41205957500	ISOLATE	-115.36635935900	33.71409203380	BIG WASH	16	Gruendikes Well
368	0	A1	318.90423785300	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01830258482	318.90423784900	ISOLATE	-115.31339137800	33.70338620550	BIG WASH	16	Gruendikes Well
369	0	A1	233.77544412200	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01341686433	233.77544412000	ISOLATE	-115.31352569600	33.70299476070	BIG WASH	16	Gruendikes Well
370	0	A1	110.04716798000	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00631583838	110.04716797700	ISOLATE	-115.31338652200	33.70308561220	BIG WASH	16	Gruendikes Well
371	0	A2	389.83056170100	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02237319569	389.83056169800	ISOLATE	-115.31197036900	33.70446402750	BIG WASH	16	Gruendikes Well
372	0	A2	153.17887004600	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00879125746	153.17887004900	ISOLATE	-115.31166492700	33.70354504770	BIG WASH	16	Gruendikes Well
373	0	A2	265.95061734000	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01526346518	265.95061734300	ISOLATE	-115.31224252600	33.70271917850	BIG WASH	16	Gruendikes Well
374	0	A2	96.02651651590	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00551116371	96.02651652050	ISOLATE	-115.31209948500	33.70258861750	BIG WASH	16	Gruendikes Well
375	0	A2	236.28641435500	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01356097419	236.28641435600	ISOLATE	-115.31155129300	33.70511182400	BIG WASH	16	Gruendikes Well
376	0	A1	125.71899136100	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00721527728	125.71899136000	ISOLATE	-115.31337866400	33.70706719650	BIG WASH	16	Gruendikes Well
377	0	A1	200.71040846200	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01151919241	200.71040846500	ISOLATE	-115.31262637000	33.70737671490	BIG WASH	16	Gruendikes Well
378	0	A1	155.83666729100	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00894379404	155.83666729700	ISOLATE	-115.31269918500	33.70638024790	BIG WASH	16	Gruendikes Well
379	0	A1	303.54190408900	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01742090818	303.54190409200	ISOLATE	-115.31274392800	33.70609533740	BIG WASH	16	Gruendikes Well
380	0	A1	252.51471762400	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01449235064	252.51471762200	ISOLATE	-115.31342541300	33.70610716010	BIG WASH	16	Gruendikes Well
381	0	A1	578.93887970400	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.03322651973	578.93887970400	ISOLATE	-115.31271368700	33.71106895790	BIG WASH	16	Gruendikes Well
382	0	A1	552.50019155900	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.03170914782	552.50019157000	ISOLATE	-115.31364131500	33.70791649350	BIG WASH	16	Gruendikes Well
383	0	A1	311.75883518100	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01789249513	311.75883518000	ISOLATE	-115.31269845500	33.70826724100	BIG WASH	16	Gruendikes Well
384	0	A1	39.64478183440	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00227529740	39.64478183370	ISOLATE	-115.31250389800	33.71029319610	BIG WASH	16	Gruendikes Well
385	0	A1	161.31985196700	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00925848554	161.31985196700	ISOLATE	-115.31318915900	33.71017528270	BIG WASH	16	Gruendikes Well
386	0	A2	346.82725754700	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01990514564	346.82725754800	ISOLATE	-115.30907289100	33.71612455090	BIG WASH	16	Gruendikes Well
387	0	A2	239.40131121700	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01373974467	239.40131121400	ISOLATE	-115.30845878400	33.71609771330	BIG WASH	16	Gruendikes Well
388	0	A2	181.71103848000	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01042877861	181.71103847600	ISOLATE	-115.30834026000	33.71683472730	BIG WASH	16	Gruendikes Well
389	0	A2	702.29940691000	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.04030643979	702.29940690700	ISOLATE	-115.30941871500	33.71415365730	BIG WASH	16	Gruendikes Well
390	0	A2	156.43560060900	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00897816808	156.43560061000	ISOLATE	-115.30871495500	33.71473619180	BIG WASH	16	Gruendikes Well
391	0	subA	299.80390162000	2.50000000000	E	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.01720637636	299.80390162300	ISOLATE	-115.32150240000	33.69864359560	BIG WASH	16	Gruendikes Well
392	0	subA	395.13806142400	2.50000000000	E	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.02267780426	395.13806142300	ISOLATE	-115.32105662400	33.69749038390	BIG WASH	16	Gruendikes Well
393	0	subA	263.27429093900	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01510986518	263.27429093300	ISOLATE	-115.32053432500	33.69773919360	BIG WASH	16	Gruendikes Well
394	0	subA	250.94025271400	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01440198879	250.94025271400	ISOLATE	-115.31678815300	33.69801873150	BIG WASH	16	Gruendikes Well
395	0	subA	315.86916912800	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01812839584	315.86916912600	ISOLATE	-115.31655337800	33.69786835350	BIG WASH	16	Gruendikes Well
396	0	subA	105.02621105600	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00602767511	105.02621106300	ISOLATE	-115.31651589300	33.69759495850	BIG WASH	16	Gruendikes Well
397	0	subA	1823.93062642000	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.10467921410	1823.93062641000	ISOLATE	-115.31519496800	33.69958148340	BIG WASH	16	Gruendikes Well
398	0	subA	1180.87091175000	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.06777266482	1180.87091174000	ISOLATE	-115.31434674200	33.70034662480	BIG WASH	16	Gruendikes Well
399	0	subA	590.04932199500	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.03386417137	590.04932200200	ISOLATE	-115.31536643300	33.69798683400	BIG WASH	16	Gruendikes Well
400	0	subA	832.99163404400	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.04780714153	832.99163404100	ISOLATE	-115.31349129000	33.69972479100	BIG WASH	16	Gruendikes Well
401	0	subA	481.98765377200	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02766228500	481.98765378100	ISOLATE	-115.31373374400	33.69965113830	BIG WASH	16	Gruendikes Well
402	0	subA	1094.29685188000	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.06280399747	1094.29685188000	ISOLATE	-115.31373095800	33.69862626890	BIG WASH	16	Gruendikes Well
403	0	subA	1437.19007585000	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.08248336064	1437.19007586000	ISOLATE	-115.31225618700	33.69960497780	BIG WASH	16	Gruendikes Well
404	0	subA	504.68972705100	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02896520472	504.68972705100	ISOLATE	-115.31364623200	33.69793272700	BIG WASH	16	Gruendikes Well
405	0	subA	481.90850980000	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02765774276	481.90850979400	ISOLATE	-115.31324353800	33.69774083780	BIG WASH	16	Gruendikes Well
406	0	subA	653.80466203700	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.03752322441	653.80466204000	ISOLATE	-115.30957225700	33.69964199850	BIG WASH	16	Gruendikes Well
407	0	subA	175.98549297000	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01010017751	175.98549296800	ISOLATE	-115.30924113400	33.69976157880	BIG WASH	16	Gruendikes Well
408	0	subA	358.89502992600	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02059774047	358.89502992100	ISOLATE	-115.30938278100	33.69920908190	BIG WASH	16	Gruendikes Well
409	0	subA	302.02912246600	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01733408646	302.02912246800	ISOLATE	-115.31046329400	33.69922468190	BIG WASH	16	Gruendikes Well
410	0	subA	289.20335813500	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01659798887	289.20335813700	ISOLATE	-115.31087526400	33.69801381640	BIG WASH	16	Gruendikes Well
411	0	subA	1246.22994196000	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.07152375700	1246.22994195000	ISOLATE	-115.31537811500	33.70031281460	BIG WASH	16	Gruendikes Well
412	0	subA	711.52820726400	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.04083610005	711.52820726400	ISOLATE	-115.31609963000	33.70001038510	BIG WASH	16	Gruendikes Well
413	0	subA	163.67319433000	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00939354880	163.67319432700	ISOLATE	-115.32082360900	33.69896004550	BIG WASH	16	Gruendikes Well

[1] RISIF = RIVERINE INTERMITTENT STREAMBED INTERMITTENTLY FLOODED

Exhibit C. Field Data Summary																			
FID_channe	Id	project_co	length	width	category	Watershed	Vegetation	Waters_Nam	Cowardin_C [1]	HGM_Code	Area__acre	Linear_ft	Waters_Typ	Lat_nad83	Long_nad83	Lcl_Wtrway	FID_Cal_Wa	HU_12_NAME
414	0	subA	350.00633981100	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02008759985	350.00633981300	ISOLATE	-115.32058154500	33.70001852000	BIG WASH	16	Gruendikes Well
415	0	subA	440.18394247000	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02526308210	440.18394247300	ISOLATE	-115.31948534300	33.70033752390	BIG WASH	16	Gruendikes Well
416	0	subA	428.94368064000	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02461797983	428.94368064100	ISOLATE	-115.31993024200	33.70037016000	BIG WASH	16	Gruendikes Well
417	0	subA	156.03398545600	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00895511854	156.03398545000	ISOLATE	-115.31998427400	33.70146060530	BIG WASH	16	Gruendikes Well
418	0	subA	506.45400643500	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02906646042	506.45400643200	ISOLATE	-115.31837737400	33.70154163980	BIG WASH	16	Gruendikes Well
419	0	subA	263.62254233400	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01512985206	263.62254233100	ISOLATE	-115.31855532600	33.70060453330	BIG WASH	16	Gruendikes Well
420	0	subA	686.74396099800	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.03941368004	686.74396099400	ISOLATE	-115.31762937000	33.70128782040	BIG WASH	16	Gruendikes Well
421	0	subA	276.70567255300	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01588072042	276.70567255400	ISOLATE	-115.31721823100	33.70171355010	BIG WASH	16	Gruendikes Well
422	0	subA	239.88568824400	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01376754409	239.88568823600	ISOLATE	-115.31695843200	33.70148894990	BIG WASH	16	Gruendikes Well
423	0	subA	992.82801042700	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.05698048728	992.82801043400	ISOLATE	-115.31012352800	33.69386542740	BIG WASH	16	Gruendikes Well
424	0	subA	1166.65712307000	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.06695690559	1166.65712307000	ISOLATE	-115.31220522100	33.69143869990	BIG WASH	16	Gruendikes Well
425	0	subA	324.51042858000	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01862433589	324.51042858200	ISOLATE	-115.31942932000	33.69625493200	BIG WASH	16	Gruendikes Well
426	0	subA	294.80214103600	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01691931480	294.80214104000	ISOLATE	-115.31965575000	33.69596411500	BIG WASH	16	Gruendikes Well
427	0	subA	180.42757911600	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01035511818	180.42757911300	ISOLATE	-115.31925191600	33.69632121480	BIG WASH	16	Gruendikes Well
428	0	subA	366.11217916300	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02101194784	366.11217915800	ISOLATE	-115.31823816300	33.69591365810	BIG WASH	16	Gruendikes Well
429	0	subA	286.06516008500	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01641788109	286.06516008800	ISOLATE	-115.31786238000	33.69692930730	BIG WASH	16	Gruendikes Well
430	0	subA	206.74019323800	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01186525443	206.74019323500	ISOLATE	-115.31800886400	33.69668871400	BIG WASH	16	Gruendikes Well
431	0	subA	280.03295161300	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01607167996	280.03295161600	ISOLATE	-115.31693154300	33.69672786580	BIG WASH	16	Gruendikes Well
432	0	subA	519.47083460700	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02981352357	519.47083460800	ISOLATE	-115.31636880900	33.69638102690	BIG WASH	16	Gruendikes Well
433	0	subA	678.95867090200	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.03896686587	678.95867090400	ISOLATE	-115.31623921900	33.69607442030	BIG WASH	16	Gruendikes Well
434	0	subA	449.53594961100	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02579981345	449.53594961000	ISOLATE	-115.31570251800	33.69635674980	BIG WASH	16	Gruendikes Well
435	0	subA	445.59732055600	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02557376725	445.59732055700	ISOLATE	-115.31551833900	33.69611713580	BIG WASH	16	Gruendikes Well
436	0	subA	827.38378502800	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.04748529528	827.38378503100	ISOLATE	-115.31562966100	33.69555495930	BIG WASH	16	Gruendikes Well
437	0	subA	485.00845208600	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02783565496	485.00845208200	ISOLATE	-115.31413545000	33.69621983220	BIG WASH	16	Gruendikes Well
438	0	subA	613.14209367700	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.03518951410	613.14209367700	ISOLATE	-115.31475950400	33.69562224990	BIG WASH	16	Gruendikes Well
439	0	subA	1219.73155564000	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.07000295889	1219.73155565000	ISOLATE	-115.31449583000	33.69551120720	BIG WASH	16	Gruendikes Well
440	0	subA	243.01950048400	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01394740017	243.01950048300	ISOLATE	-115.31393924300	33.69544652050	BIG WASH	16	Gruendikes Well
441	0	subA	448.29184657100	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02572841176	448.29184657800	ISOLATE	-115.31426623000	33.69510663190	BIG WASH	16	Gruendikes Well
442	0	subA	391.26429401300	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02245548060	391.26429401400	ISOLATE	-115.31548443800	33.69472496040	BIG WASH	16	Gruendikes Well
443	0	subA	404.22413351400	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02319927304	404.22413351800	ISOLATE	-115.31487219100	33.69430114810	BIG WASH	16	Gruendikes Well
444	0	subA	272.24481323900	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01562470232	272.24481323700	ISOLATE	-115.31458236700	33.69447650090	BIG WASH	16	Gruendikes Well
445	0	subA	350.58887321800	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02012103267	350.58887321400	ISOLATE	-115.31425944400	33.69485781350	BIG WASH	16	Gruendikes Well
446	0	subA	499.71412408200	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02867964440	499.71412408000	ISOLATE	-115.31780639900	33.69211501590	BIG WASH	16	Gruendikes Well
447	0	subA	231.27856979700	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01327356346	231.27856979500	ISOLATE	-115.31589554200	33.69319600440	BIG WASH	16	Gruendikes Well
448	0	subA	240.34888833700	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01379412812	240.34888833500	ISOLATE	-115.31781795100	33.69390664590	BIG WASH	16	Gruendikes Well
449	0	subA	249.40206091500	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01431370873	249.40206091700	ISOLATE	-115.31765172900	33.69522370370	BIG WASH	16	Gruendikes Well
450	0	subA	143.92179444200	2.50000000000	E	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00825997443	143.92179444600	ISOLATE	-115.31785295300	33.69506621290	BIG WASH	16	Gruendikes Well
451	0	sfAB	485.22160452600	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.02784788823	485.22160452300	ISOLATE	-115.39941785000	33.80846330580	BIG WASH	28	Upper Big Wash
452	0	sfAB	1071.82033780000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.06151402306	1071.82033780000	ISOLATE	-115.39771392200	33.80733235280	BIG WASH	28	Upper Big Wash
453	0	sfAB	2650.12357187000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.15209616459	2650.12357186000	ISOLATE	-115.40124668400	33.81228433220	BIG WASH	28	Upper Big Wash
454	0	sfAB	1240.59410686000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.07120030457	1240.59410685000	ISOLATE	-115.40144615000	33.81284493940	BIG WASH	28	Upper Big Wash
455	0	sfAB	893.33275350900	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.05127024527	893.33275350900	ISOLATE	-115.40049983200	33.81158285860	BIG WASH	28	Upper Big Wash
456	0	sfAB	3645.28325824000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.20921047166	3645.28325824000	ISOLATE	-115.40026156000	33.81348359070	BIG WASH	28	Upper Big Wash
457	0	sfAB	1329.69559537000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.07631402636	1329.69559537000	ISOLATE	-115.40448809600	33.81444933580	BIG WASH	28	Upper Big Wash
458	0	sfAB	3471.57206203000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.19924082082	3471.57206202000	ISOLATE	-115.39097940300	33.80593696150	BIG WASH	28	Upper Big Wash
459	0	sfAB	1168.13090293000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.06704148892	1168.13090293000	ISOLATE	-115.38925493800	33.80505045150	BIG WASH	28	Upper Big Wash
460	0	sfAB	1707.86515281000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.09801797250	1707.86515281000	ISOLATE	-115.39481942100	33.80661134730	BIG WASH	28	Upper Big Wash
461	0	sfAB	3611.84725422000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.20729150908	3611.84725423000	ISOLATE	-115.39850109700	33.81302709060	BIG WASH	28	Upper Big Wash
462	0	sfAB	3921.08245501000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.22503916753	3921.08245500000	ISOLATE	-115.40140204900	33.81559499100	BIG WASH	28	Upper Big Wash
463	0	sfAB	2080.39107991000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.11939801882	2080.39107991000	ISOLATE	-115.39713435700	33.80900979520	BIG WASH	28	Upper Big Wash
464	0	sfAB	1375.41584682000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.07893800774	1375.41584682000	ISOLATE	-115.39669930400	33.80983280130	BIG WASH	28	Upper Big Wash
465	0	sfAB	363.07202504200	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.02083746700	363.07202504000	ISOLATE	-115.39642329600	33.81020302550	BIG WASH	28	Upper Big Wash
466	0	sfAB	3004.96102588000	7.50000000000	D	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.51738309674	3004.96102588000	ISOLATE	-115.38617495900	33.80571292700	BIG WASH	28	Upper Big Wash
467	0	sfAB	2505.18843844000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.14377803251	2505.18843844000	ISOLATE	-115.40332016700	33.81704532270	BIG WASH	28	Upper Big Wash
468	0	sfAB	6091.33812656000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.34959470423	6091.33812655000	ISOLATE	-115.39765943900	33.82236892320	BIG WASH	31	Eagle Creek
469	0	sfAB	2650.25193769000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.15210353178	2650.25193770000	ISOLATE	-115.40160166000	33.82322432260	BIG WASH	31	Eagle Creek
470	0	sfAB	4701.11822218000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.09493941643	1654.22439186000	ISOLATE	-115.39983048100	33.82095909770	BIG WASH	28	Upper Big Wash
470	0	sfAB	4701.11822218000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.17486764407	3046.89383032000	ISOLATE	-115.39983048100	33.82095909770	BIG WASH	31	Eagle Creek
471	0	A1B1	185.22980109500	2.50000000000	E	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.01063072779	185.22980109300	ISOLATE	-115.40132005500	33.79252333570	BIG WASH	28	Upper Big Wash
472	0	A2	194.99498187200	2.50000000000	E	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.01119117205	194.99498187700	ISOLATE	-115.39856431100	33.79169278070	BIG WASH	28	Upper Big Wash
473	0	A2	528.90722912900	2.50000000000	E	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.03035509809	528.90722912500	ISOLATE	-115.39936791400	33.79280762380	BIG WASH	28	Upper Big Wash
474	0	A2	382.17054925900	2.50000000000	E	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.02193357147	382.17054926100	ISOLATE	-115.39978446300	33.79309794180	BIG WASH	28	Upper Big Wash
475	0	A2	429.02780008200	2.50000000000	E	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.02462280763	429.02780008200	ISOLATE	-115.40002008200	33.79328698100	BIG WASH	28	Upper Big Wash
476	0	A2	381.63621381900	2.50000000000	E	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.02190290483	381.63621381700	ISOLATE	-115.40010988500	33.79356410120	BIG WASH	28	Upper Big Wash
477	0	A2	1231.85920397000	2.50000000000	E	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.07069899013	1231.85920397000	ISOLATE	-115.39901182400	33.79321523170	BIG WASH	28	Upper Big Wash
478	0	sfAB	1543.14848275000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.08856453643	1543.14848275000	ISOLATE	-115.39180486200	33.80290906960	BIG WASH	28	Upper Big Wash
479	0	sfAB	2131.95798765000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.12235755209	2131.95798765000	ISOLATE	-115.39180789800	33.80372852400	BIG WASH	28	Upper Big Wash
480	0	sfAB	1566.47860972000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.08990350148	1566.47860972000	ISOLATE	-115.39260264100	33.80849361780	BIG WASH	28	Upper Big Wash
481	0	sfAB	2419.99604988000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.13888866218	2419.99604989000	ISOLATE	-115.39469791300	33.81224049670	BIG WASH	28	Upper Big Wash
482	0	sfAB	486.93233427600	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.02794607061	486.93233427600	ISOLATE	-115.39639572200	33.81271612590	BIG WASH	28	Upper Big Wash
483	0	sfAB	926.27166595700	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.05316067872	926.27166595800	ISOLATE	-115.39895672200	33.81361552750	BIG WASH	28	Upper Big Wash

[1] RISIF = RIVERINE INTERMITTENT STREAMBED INTERMITTENTLY FLOODED

Exhibit C. Field Data Summary

FID_channe	Id	project_co	length	width	category	Watershed	Vegetation	Waters_Nam	Cowardin_C [1]	HGM_Code	Area__acre	Linear_ft	Waters_Typ	Lat_nad83	Long_nad83	Lcl_Wtrway	FID_Cal_Wa	HU_12_NAME
484	0	subB	1055.71764076000	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.06058985542	1055.71764076000	ISOLATE	-115.45056586900	33.70049824640	BIG WASH	21	Lake Tamarisk
485	0	subB	1138.55584389000	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.06534411409	1138.55584388000	ISOLATE	-115.45226170100	33.69877125650	BIG WASH	21	Lake Tamarisk
486	0	subB	448.77817252000	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.02575632303	448.77817252200	ISOLATE	-115.45001634700	33.69749408400	BIG WASH	21	Lake Tamarisk
487	0	subB	964.56760582400	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.05535856324	964.56760581700	ISOLATE	-115.45588746100	33.69827368400	BIG WASH	21	Lake Tamarisk
488	0	subB	340.87589994000	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.01956358471	340.87589994000	ISOLATE	-115.45621125200	33.69827317120	BIG WASH	21	Lake Tamarisk
489	0	subB	240.89749810700	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.01382561399	240.89749810300	ISOLATE	-115.45507737900	33.69762370870	BIG WASH	21	Lake Tamarisk
490	0	subB	785.94964132500	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.04510730265	785.94964132700	ISOLATE	-115.45409512400	33.69789923330	BIG WASH	21	Lake Tamarisk
491	0	subB	684.18778612900	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.03926697579	684.18778612500	ISOLATE	-115.45387702800	33.69832767540	BIG WASH	21	Lake Tamarisk
492	0	subB	638.62397842700	2.50000000000	E	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.03665197305	638.62397843000	ISOLATE	-115.45003178800	33.70081769910	BIG WASH	21	Lake Tamarisk
493	0	subB	1323.55155182000	7.50000000000	D	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.22788422036	1323.55155182000	ISOLATE	-115.44999809300	33.69848831310	BIG WASH	21	Lake Tamarisk
494	0	subB	562.35798498000	7.50000000000	D	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.09682472193	562.35798497800	ISOLATE	-115.45054538200	33.69775886120	BIG WASH	21	Lake Tamarisk
495	0	subB	1085.66285681000	7.50000000000	D	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.18692542300	1085.66285681000	ISOLATE	-115.45302248300	33.69707233410	BIG WASH	21	Lake Tamarisk
496	0	subB	1870.11668146000	7.50000000000	D	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.32198978675	1870.11668146000	ISOLATE	-115.45553227300	33.69717306150	BIG WASH	21	Lake Tamarisk
497	0	subB	1392.26646232000	7.50000000000	D	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.23971529999	1392.26646233000	ISOLATE	-115.45117160300	33.70100605910	BIG WASH	21	Lake Tamarisk
498	0	access_east	118.88431592300	7.50000000000	D	Lower Palen Lake	CBS	unnamed	RISIF	RIVERINE	0.02046906266	118.88431592300	ISOLATE	-115.24497131100	33.67507368280	BIG WASH	15	Lower Palen Lake
499	0	access_east	165.29062218100	7.50000000000	D	Lower Palen Lake	CBS	unnamed	RISIF	RIVERINE	0.02845912916	165.29062217800	ISOLATE	-115.24306785200	33.67459011850	BIG WASH	15	Lower Palen Lake
500	0	access_east	144.45526331300	7.50000000000	D	Lower Palen Lake	CBS	unnamed	RISIF	RIVERINE	0.02487177399	144.45526331600	ISOLATE	-115.24709988600	33.67559400020	BIG WASH	15	Lower Palen Lake
501	0	access_east	119.89588329500	7.50000000000	D	Lower Palen Lake	CBS	unnamed	RISIF	RIVERINE	0.02064323059	119.89588329500	ISOLATE	-115.24815222900	33.67585506320	BIG WASH	15	Lower Palen Lake
502	0	access_east	138.64145360700	7.50000000000	D	Lower Palen Lake	CBS	unnamed	RISIF	RIVERINE	0.02387077369	138.64145361100	ISOLATE	-115.24964553300	33.67622378910	BIG WASH	15	Lower Palen Lake
503	0	access_east	99.59940420670	7.50000000000	D	Lower Palen Lake	CBS	unnamed	RISIF	RIVERINE	0.01714865775	99.59940420910	ISOLATE	-115.25099874100	33.67667194120	BIG WASH	15	Lower Palen Lake
504	0	access_east	115.30538804400	7.50000000000	D	Corn Springs Wash	CBS	unnamed	RISIF	RIVERINE	0.01985285607	115.30538804400	ISOLATE	-115.25307770100	33.67707620190	BIG WASH	13	Corn Springs Wash
505	0	access_east	119.71584246000	7.50000000000	D	Corn Springs Wash	CBS	unnamed	RISIF	RIVERINE	0.02061223183	119.71584245800	ISOLATE	-115.25948419800	33.67879003300	BIG WASH	13	Corn Springs Wash
506	0	access_east	122.57204663300	7.50000000000	D	Corn Springs Wash	CBS	unnamed	RISIF	RIVERINE	0.02110400252	122.57204663000	ISOLATE	-115.26003366700	33.67894629340	BIG WASH	13	Corn Springs Wash
507	0	access_east	122.74475461300	7.50000000000	D	Corn Springs Wash	CBS	unnamed	RISIF	RIVERINE	0.02113373874	122.74475461100	ISOLATE	-115.26094246600	33.67918505400	BIG WASH	13	Corn Springs Wash
508	0	access_east	123.16965382500	7.50000000000	D	Corn Springs Wash	CBS	unnamed	RISIF	RIVERINE	0.02120689632	123.16965382900	ISOLATE	-115.26180215500	33.67940443470	BIG WASH	13	Corn Springs Wash
509	0	access_east	116.70445649500	7.50000000000	D	Corn Springs Wash	DWW	unnamed	RISIF	RIVERINE	0.02009374251	116.70445649000	ISOLATE	-115.26595504100	33.68050419690	BIG WASH	13	Corn Springs Wash
510	0	access_east	117.48686948000	7.50000000000	D	Corn Springs Wash	DWW	unnamed	RISIF	RIVERINE	0.02022845549	117.48686947900	ISOLATE	-115.26629144100	33.68059597420	BIG WASH	13	Corn Springs Wash
511	0	access_east	118.84119578400	7.50000000000	D	Corn Springs Wash	CBS	unnamed	RISIF	RIVERINE	0.02046163839	118.84119578200	ISOLATE	-115.26816013200	33.68108663950	BIG WASH	13	Corn Springs Wash
512	0	access_east	133.41269768000	7.50000000000	D	Corn Springs Wash	CBS	unnamed	RISIF	RIVERINE	0.02297050580	133.41269767700	ISOLATE	-115.27003617000	33.68158501180	BIG WASH	13	Corn Springs Wash
513	0	access_east	123.33661996900	7.50000000000	D	Corn Springs Wash	CBS	unnamed	RISIF	RIVERINE	0.02123564393	123.33661996300	ISOLATE	-115.27211603100	33.68213901230	BIG WASH	13	Corn Springs Wash
514	0	access_east	118.63748246800	7.50000000000	D	Corn Springs Wash	CBS	unnamed	RISIF	RIVERINE	0.02042656379	118.63748247200	ISOLATE	-115.27184891000	33.68205686360	BIG WASH	13	Corn Springs Wash
515	0	access_east	125.43991979900	7.50000000000	D	Corn Springs Wash	CBS	unnamed	RISIF	RIVERINE	0.02159778234	125.43991980300	ISOLATE	-115.27360128200	33.68251594800	BIG WASH	13	Corn Springs Wash
516	0	access_east	125.30526359000	7.50000000000	D	Corn Springs Wash	CBS	unnamed	RISIF	RIVERINE	0.02157459773	125.30526358800	ISOLATE	-115.27577527300	33.68308523880	BIG WASH	13	Corn Springs Wash
517	0	access_east	116.61424800000	7.50000000000	D	Corn Springs Wash	CBS	unnamed	RISIF	RIVERINE	0.02007821074	116.61424799900	ISOLATE	-115.27679045900	33.68336661390	BIG WASH	13	Corn Springs Wash
518	0	access_east	127.14785428600	7.50000000000	D	Corn Springs Wash	DWW	unnamed	RISIF	RIVERINE	0.02189184819	127.14785428700	ISOLATE	-115.27890529100	33.68392318880	BIG WASH	13	Corn Springs Wash
519	0	access_east	121.38437407700	7.50000000000	D	Lower Big Wash	DWW	unnamed	RISIF	RIVERINE	0.02089951344	121.38437408200	ISOLATE	-115.28347297900	33.68515107920	BIG WASH	27	Lower Big Wash
520	0	access_east	118.74911637300	7.50000000000	D	Lower Big Wash	DWW	unnamed	RISIF	RIVERINE	0.02044578450	118.74911636800	ISOLATE	-115.28448474900	33.68541394370	BIG WASH	27	Lower Big Wash
521	0	access_east	117.27195618500	7.50000000000	D	Lower Big Wash	DWW	unnamed	RISIF	RIVERINE	0.02019145251	117.27195618300	ISOLATE	-115.28468706300	33.68547068970	BIG WASH	27	Lower Big Wash
522	0	access_east	119.22818705700	7.50000000000	D	Lower Big Wash	DWW	unnamed	RISIF	RIVERINE	0.02052826912	119.22818705800	ISOLATE	-115.28792244800	33.68631600800	BIG WASH	27	Lower Big Wash
523	0	access_east	127.46848697700	7.50000000000	D	Lower Big Wash	CBS	unnamed	RISIF	RIVERINE	0.02194705354	127.46848697800	ISOLATE	-115.28962441500	33.68678034510	BIG WASH	27	Lower Big Wash
524	0	access_east	145.96483953200	7.50000000000	D	Lower Big Wash	CBS	unnamed	RISIF	RIVERINE	0.02513168725	145.96483953500	ISOLATE	-115.29039159200	33.68698345100	BIG WASH	27	Lower Big Wash
525	0	access_east	121.95978221300	7.50000000000	D	Lower Big Wash	CBS	unnamed	RISIF	RIVERINE	0.02099858509	121.95978220900	ISOLATE	-115.29164915300	33.68731622170	BIG WASH	27	Lower Big Wash
526	0	access_east	139.30914359800	7.50000000000	D	Lower Big Wash	DWW	unnamed	RISIF	RIVERINE	0.02398573409	139.30914359600	ISOLATE	-115.29296317600	33.68767133550	BIG WASH	27	Lower Big Wash
527	0	access_east	121.27899384000	7.50000000000	D	Lower Big Wash	DWW	unnamed	RISIF	RIVERINE	0.02088136946	121.27899384500	ISOLATE	-115.29363510200	33.68783926150	BIG WASH	27	Lower Big Wash
528	0	access_east	120.52531488800	7.50000000000	D	Lower Big Wash	DWW	unnamed	RISIF	RIVERINE	0.02075160380	120.52531488600	ISOLATE	-115.29325561400	33.68773063180	BIG WASH	27	Lower Big Wash
529	0	access_east	134.08952154400	7.50000000000	D	Lower Big Wash	CBS	unnamed	RISIF	RIVERINE	0.02308703883	134.08952154300	ISOLATE	-115.29806451100	33.68903108310	BIG WASH	27	Lower Big Wash
530	0	access_east	117.73734308700	7.50000000000	D	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.02027158111	117.73734308200	ISOLATE	-115.30440461400	33.69072748810	BIG WASH	16	Gruendikes Well
531	0	access_east	127.35728547800	7.50000000000	D	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.02192790728	127.35728547600	ISOLATE	-115.30502421400	33.69089003440	BIG WASH	16	Gruendikes Well
532	0	subA	118.38339620200	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02038281615	118.38339620300	ISOLATE	-115.31207084500	33.69275561540	BIG WASH	16	Gruendikes Well
533	0	subA	118.70079323800	7.50000000000	D	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.02043746440	118.70079323700	ISOLATE	-115.31976528800	33.69505063130	BIG WASH	16	Gruendikes Well
534	0	access_west	120.43226587100	7.50000000000	D	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.02073558297	120.43226586900	ISOLATE	-115.32755616800	33.69728066900	BIG WASH	16	Gruendikes Well
535	0	access_west	150.39507441500	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02589446874	150.39507441600	ISOLATE	-115.33650034900	33.69989960810	BIG WASH	16	Gruendikes Well
536	0	access_west	128.31807755900	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02209333291	128.31807755700	ISOLATE	-115.34268517200	33.70097559120	BIG WASH	16	Gruendikes Well
537	0	access_west	153.59854648600	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02644603073	153.59854648400	ISOLATE	-115.34503037800	33.70164344720	BIG WASH	16	Gruendikes Well
538	0	access_west	124.12477225800	7.50000000000	D	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.02137134509	124.12477226400	ISOLATE	-115.34722711700	33.70205318770	BIG WASH	16	Gruendikes Well
539	0	access_west	121.48268571000	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02091644038	121.48268571000	ISOLATE	-115.35275855600	33.70340130870	BIG WASH	16	Gruendikes Well
540	0	access_west	120.04256804700	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02066848623	120.04256804800	ISOLATE	-115.35544346600	33.70402305610	BIG WASH	16	Gruendikes Well
541	0	access_west	129.11012725000	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02222970511	129.11012725400	ISOLATE	-115.35726197000	33.70446395250	BIG WASH	16	Gruendikes Well
542	0	access_west	122.93628108600	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02116671506	122.93628108600	ISOLATE	-115.35787545100	33.70459989470	BIG WASH	16	Gruendikes Well
543	0	access_west	119.75279381000	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02061859398	119.75279381200	ISOLATE	-115.35906818300	33.70490044550	BIG WASH	16	Gruendikes Well
544	0	access_west	123.70271068600	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02129867608	123.70271068400	ISOLATE	-115.35953394200	33.70499612870	BIG WASH	16	Gruendikes Well
545	0	access_west	117.13978029900	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02016869495	117.13978029500	ISOLATE	-115.36079133100	33.70527619910	BIG WASH	16	Gruendikes Well
546	0	access_west	124.23032285300	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02138951840	124.23032285500	ISOLATE	-115.36248419400	33.70564869320	BIG WASH	16	Gruendikes Well
547	0	access_west	125.39460759100	7.50000000000	D	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.02158998065	125.39460759800	ISOLATE	-115.36581656100	33.70633086780	BIG WASH	16	Gruendikes Well
548	0	access_west	129.66238408700	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02232479065	129.66238408900	ISOLATE	-115.36975388200	33.70711247870	BIG WASH	16	Gruendikes Well
549	0	access_west	129.78635810600	7.50000000000	D	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.02234613604	129.78635810400	ISOLATE	-115.37347951800	33.70783244990	BIG WASH	16	Gruendikes Well
550	0	access_west	121.95238821700	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02099731202	121.95238822000	ISOLATE	-115.37666444200	33.70858189410	BIG WASH	16	Gruendikes Well
551	0	access_west	53.90406993990	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00928100378	53.90406994270	ISOLATE	-115.39518198500	33.70986213250	BIG WASH	16	Gruendikes Well
552	0	subA	1093.82547115000	7.50000000000	D	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.18833083181	1093.82547115000	ISOLATE	-115.31965988000	33.69663373760	BIG WASH	16	Gruendikes Well
553	0	subA	1113.25120075000	7.50000000000	D	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.19167548222	1113.25120075000	ISOLATE	-115.31348097300	33.69522484260	BIG WASH	16	Gruendikes Well
554	0	subA	2232.56254300000	7.50000000000	D	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.38439437724	2232.56254299000	ISOLATE	-115.31031309400	33.69659854510	BIG WASH	16	Gruendikes Well

[1] RISIF = RIVERINE INTERMITTENT STREAMBED INTERMITTENTLY FLOODED

Exhibit C. Field Data Summary																		
FID_channe	Id	project_co	length	width	category	Watershed	Vegetation	Waters_Nam	Cowardin_C [1]	HGM_Code	Area__acre	Linear_ft	Waters_Typ	Lat_nad83	Long_nad83	Lcl_Wtrway	FID_Cal_Wa	HU_12_NAME
555	0	subA	614.29426336600	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.10576691862	614.29426336400	ISOLATE	-115.31138649700	33.69350945010	BIG WASH	16	Gruendikes Well
556	0	subA	414.83724580600	7.50000000000	D	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.07142514563	414.83724580500	ISOLATE	-115.31253705500	33.69207340900	BIG WASH	16	Gruendikes Well
557	0	subA	1285.89949081000	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.22140142748	1285.89949081000	ISOLATE	-115.31347805000	33.69747492750	BIG WASH	16	Gruendikes Well
558	0	sfAB	5629.23520222000	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.95576966291	5551.11020220000	ISOLATE	-115.41298807300	33.83784627860	BIG WASH	31	Eagle Creek
559	0	sfAB	5060.13167559000	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.87123479263	5060.13167559000	ISOLATE	-115.41083228400	33.84040172120	BIG WASH	31	Eagle Creek
560	0	sfAB	801.50997479600	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.13800102872	801.50997479800	ISOLATE	-115.41350359400	33.83722117490	BIG WASH	31	Eagle Creek
561	0	sfAB	505.84557139500	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.08709462317	505.84557139100	ISOLATE	-115.41320347400	33.83567921020	BIG WASH	31	Eagle Creek
562	0	sfAB	1765.51948189000	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.30398062705	1765.51948190000	ISOLATE	-115.41563393100	33.83217977750	BIG WASH	31	Eagle Creek
563	0	sfAB	1067.08512830000	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.18372677829	1067.08512829000	ISOLATE	-115.41753096100	33.83232758680	BIG WASH	31	Eagle Creek
564	0	sfAB	1085.75149698000	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.18694068474	1085.75149699000	ISOLATE	-115.41606346600	33.83176532540	BIG WASH	31	Eagle Creek
565	0	sfAB	1197.77355114000	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.20622822850	1197.77355115000	ISOLATE	-115.42029422900	33.83244349570	BIG WASH	31	Eagle Creek
566	0	sfAB	301.50217267400	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.05191153111	301.50217267500	ISOLATE	-115.42349380100	33.83281822680	BIG WASH	31	Eagle Creek
567	0	sfAB	152.50579694900	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.02625788515	152.50579695300	ISOLATE	-115.42341561400	33.83270591900	BIG WASH	31	Eagle Creek
568	0	sfAB	397.47974480600	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.06843659518	397.47974481200	ISOLATE	-115.42870496000	33.83284514940	BIG WASH	31	Eagle Creek
569	0	sfAB	1285.67900314000	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.22136346473	1285.67900315000	ISOLATE	-115.42757561000	33.83332772260	BIG WASH	31	Eagle Creek
570	0	sfAB	772.52116621500	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.13300984267	772.52116622000	ISOLATE	-115.42382472900	33.83451602260	BIG WASH	31	Eagle Creek
571	0	sfAB	2388.05792758000	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.41116699855	2388.05792758000	ISOLATE	-115.41677004900	33.83426343990	BIG WASH	31	Eagle Creek
572	0	sfAB	686.26066721400	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.11815782838	686.26066720600	ISOLATE	-115.42423908500	33.83607715020	BIG WASH	31	Eagle Creek
573	0	sfA	553.06309347800	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.09522436182	553.06309347900	ISOLATE	-115.43131663700	33.83614314470	BIG WASH	31	Eagle Creek
574	0	sfA	479.65723055500	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.08258561132	479.65723055300	ISOLATE	-115.42570148300	33.83699211860	BIG WASH	31	Eagle Creek
575	0	sfA	925.38376821800	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.15932916119	925.38376821300	ISOLATE	-115.42631091200	33.83741484200	BIG WASH	31	Eagle Creek
576	0	sfAB	853.03966695800	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.14687322089	853.03966695500	ISOLATE	-115.42376241900	33.83681093490	BIG WASH	31	Eagle Creek
577	0	sfA	1980.23720465000	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.34094993193	1980.23720465000	ISOLATE	-115.42913095600	33.84283938310	BIG WASH	31	Eagle Creek
578	0	sfA	488.12260365000	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.08404314801	488.12260364400	ISOLATE	-115.43139630000	33.84062505720	BIG WASH	31	Eagle Creek
579	0	sfA	1112.85875675000	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.19160791266	1112.85875674000	ISOLATE	-115.42451817700	33.84147079480	BIG WASH	31	Eagle Creek
580	0	sfAB	6418.48146789000	15.00000000000	C	Eagle Creek	DWW	unnamed	RISIF	RIVERINE	2.21022089115	6418.48146789000	ISOLATE	-115.38048397900	33.80905750670	BIG WASH	31	Eagle Creek
581	0	sfAB	5799.52142315000	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.99854018994	5799.52142314000	ISOLATE	-115.40451835200	33.83105711570	BIG WASH	31	Eagle Creek
582	0	sfAB	2753.74364688000	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.47412941579	2753.74364688000	ISOLATE	-115.40939535900	33.83184925240	BIG WASH	31	Eagle Creek
583	0	sfAB	4584.65857755000	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.78936958980	4584.65857755000	ISOLATE	-115.40401191500	33.83393229050	BIG WASH	31	Eagle Creek
584	0	sfAB	3141.07956819000	7.50000000000	D	181001004703-Pinto Wash	CBS	unnamed	RISIF	RIVERINE	0.54081948488	3141.07956819000	ISOLATE	-115.39366580400	33.83892440250	BIG WASH	32	181001004703-Pinto Wash
585	0	sfAB	5183.42385123000	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.89246278430	5183.42385122000	ISOLATE	-115.39948262600	33.82698141530	BIG WASH	31	Eagle Creek
586	0	sfAB	2672.71898174000	7.50000000000	D	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.46017888804	2672.71898174000	ISOLATE	-115.39867658400	33.80672479950	BIG WASH	28	Upper Big Wash
587	0	sfAB	3298.27114873000	7.50000000000	D	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.56788415095	3298.27114873000	ISOLATE	-115.40051200400	33.80604370700	BIG WASH	28	Upper Big Wash
588	0	sfAB	1732.32324729000	7.50000000000	D	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.29826502192	1732.32324729000	ISOLATE	-115.39650132400	33.80306901040	BIG WASH	28	Upper Big Wash
589	0	sfAB	3831.06977869000	7.50000000000	D	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.65961945226	3831.06977870000	ISOLATE	-115.40030819500	33.80516640820	BIG WASH	28	Upper Big Wash
590	0	sfAB	1550.69631770000	7.50000000000	D	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.26699316765	1550.69631771000	ISOLATE	-115.40303993400	33.81034825840	BIG WASH	28	Upper Big Wash
591	0	sfAB	903.59039136100	7.50000000000	D	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.15557685802	903.59039135900	ISOLATE	-115.40594954600	33.81264735340	BIG WASH	28	Upper Big Wash
592	0	sfAB	492.62336513700	7.50000000000	D	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.08481807251	492.62336513200	ISOLATE	-115.40351999300	33.81137003160	BIG WASH	28	Upper Big Wash
593	0	sfAB	1801.04317540000	7.50000000000	D	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.31009696546	1801.04317540000	ISOLATE	-115.39822840200	33.80713439240	BIG WASH	28	Upper Big Wash
594	0	sfAB	2369.48172780000	15.00000000000	C	Lower Big Wash	DWW	unnamed	RISIF	RIVERINE	0.81593723409	2369.48172780000	ISOLATE	-115.38123255600	33.80766288400	BIG WASH	27	Lower Big Wash
595	0	B1	269.23825761800	7.50000000000	D	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.04635644932	269.23825762600	ISOLATE	-115.40581301900	33.80429702060	BIG WASH	28	Upper Big Wash
596	0	B1	265.00002475100	7.50000000000	D	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.04562672602	265.00002475000	ISOLATE	-115.40589446300	33.80461050050	BIG WASH	28	Upper Big Wash
597	0	B1	425.71766330000	7.50000000000	D	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.07329849575	425.71766329100	ISOLATE	-115.40663766200	33.80341699770	BIG WASH	28	Upper Big Wash
598	0	B1	409.42219905700	7.50000000000	D	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.07049280287	409.42219905000	ISOLATE	-115.40673852300	33.80332487930	BIG WASH	28	Upper Big Wash
599	0	B1	646.44949141800	7.50000000000	D	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.11130328709	646.44949142000	ISOLATE	-115.41446257700	33.79773031280	BIG WASH	28	Upper Big Wash
600	0	B1	155.25638342200	7.50000000000	D	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.02673147097	155.25638341600	ISOLATE	-115.41449565700	33.79795063970	BIG WASH	28	Upper Big Wash
601	0	B1	315.87086413800	7.50000000000	D	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.05438547936	315.87086413600	ISOLATE	-115.41342604800	33.79795339180	BIG WASH	28	Upper Big Wash
602	0	B1	694.61374605600	7.50000000000	D	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.11959603066	694.61374605900	ISOLATE	-115.41635465100	33.79625507380	BIG WASH	28	Upper Big Wash
603	0	B1	763.69239789800	7.50000000000	D	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.12754428733	740.77722079100	ISOLATE	-115.41784202300	33.79504140180	BIG WASH	28	Upper Big Wash
604	0	B1	737.42358583700	7.50000000000	D	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.12696687084	737.42358583900	ISOLATE	-115.42038511900	33.79334435370	BIG WASH	28	Upper Big Wash
605	0	B1	837.19305581400	7.50000000000	D	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.14414480989	837.19305581800	ISOLATE	-115.42267719500	33.79186329670	BIG WASH	28	Upper Big Wash
606	0	B1	629.39903790100	7.50000000000	D	Dragon Wash	CBS	Big Wash	RISIF	RIVERINE	0.10836760295	629.39903790900	ISOLATE	-115.45043735700	33.77922261690	BIG WASH	23	Dragon Wash
607	0	B1	672.69318476900	7.50000000000	D	Dragon Wash	CBS	Big Wash	RISIF	RIVERINE	0.11582182933	672.69318477400	ISOLATE	-115.45035723900	33.77874613900	BIG WASH	23	Dragon Wash
608	0	B1	411.00105045200	7.50000000000	D	Dragon Wash	CBS	unnamed	RISIF	RIVERINE	0.07076464367	411.00105045700	ISOLATE	-115.45010849100	33.77209497070	BIG WASH	23	Dragon Wash
609	0	sfAB	298.70270487400	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.05142952908	298.70270487500	ISOLATE	-115.41285191200	33.83078199630	BIG WASH	31	Eagle Creek
610	0	sfA	175.51687897000	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03021984831	175.51687897100	ISOLATE	-115.41853543500	33.84254867290	BIG WASH	31	Eagle Creek
611	0	B1	380.66329234400	7.50000000000	D	Dragon Wash	CBS	unnamed	RISIF	RIVERINE	0.06554120047	380.66329233600	ISOLATE	-115.45029396900	33.77225784520	BIG WASH	23	Dragon Wash
612	0	B1	372.85110052000	7.50000000000	D	Dragon Wash	CBS	unnamed	RISIF	RIVERINE	0.06419612612	372.85110052100	ISOLATE	-115.45014380100	33.77258092910	BIG WASH	23	Dragon Wash
613	0	B1	175.93589464600	7.50000000000	D	Dragon Wash	CBS	unnamed	RISIF	RIVERINE	0.03029199288	175.93589464300	ISOLATE	-115.45011570000	33.77272602800	BIG WASH	23	Dragon Wash
614	0	B1	283.56286626300	7.50000000000	D	Dragon Wash	CBS	unnamed	RISIF	RIVERINE	0.04882280755	283.56286625700	ISOLATE	-115.45015810100	33.75837623800	BIG WASH	23	Dragon Wash
615	0	B1	276.42188922800	7.50000000000	D	Dragon Wash	CBS	unnamed	RISIF	RIVERINE	0.04759330049	276.42188922600	ISOLATE	-115.45016234200	33.75866238080	BIG WASH	23	Dragon Wash
616	0	B1	348.98921377300	7.50000000000	D	Dragon Wash	CBS	unnamed	RISIF	RIVERINE	0.06008767455	348.98921377800	ISOLATE	-115.45021612000	33.75711401070	BIG WASH	23	Dragon Wash
617	0	B1	294.66635708800	7.50000000000	D	Dragon Wash	CBS	unnamed	RISIF	RIVERINE	0.05073456562	294.66635709300	ISOLATE	-115.45035843200	33.74928809280	BIG WASH	23	Dragon Wash
618	0	B1	109.20541281800	7.50000000000	D	Dragon Wash	CBS	unnamed	RISIF	RIVERINE	0.01880258485	109.20541282200	ISOLATE	-115.45111497100	33.74964006770	BIG WASH	23	Dragon Wash
619	0	B1	370.94135161300	7.50000000000	D	Dragon Wash	CBS	unnamed	RISIF	RIVERINE	0.06386731261	370.94135161700	ISOLATE	-115.45093898600	33.74823635090	BIG WASH	23	Dragon Wash
620	0	B1	736.03110862200	7.50000000000	D	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.12672711925	736.03110862000	ISOLATE	-115.45172673800	33.70680466690	BIG WASH	21	Lake Tamarisk
621	0	subB	1070.86090260000	7.50000000000	D	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.18437687717	1070.86090260000	ISOLATE	-115.45480318200	33.70036634640	BIG WASH	21	Lake Tamarisk
622	0	subB	348.42337956500	7.50000000000	D	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.05999025130	348.42337956300	ISOLATE	-115.45533207400	33.69690566180	BIG WASH	21	Lake Tamarisk
623	0	subB	448.61418711900	7.50000000000	D	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.07724073470	448.61418712500	ISOLATE	-115.45303793800	33.69912395630	BIG WASH	21	Lake Tamarisk
624	0	subB	578.27556646800	7.50000000000	D	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.09956535235	578.27556646300	ISOLATE	-115.45346331500	33.69544845550	BIG WASH	21	Lake Tamarisk
625	0	subB	125.31050343700	7.50000000000	D	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.02157549990	125.31050344100	ISOLATE	-115.45411187900	33.69655587910	BIG WASH	21	Lake Tamarisk

[1] RISIF = RIVERINE INTERMITTENT STREAMBED INTERMITTENTLY FLOODED

Exhibit C. Field Data Summary

FID_channe	Id	project_co	length	width	category	Watershed	Vegetation	Waters_Nam	Cowardin_C [1]	HGM_Code	Area__acre	Linear_ft	Waters_Typ	Lat_nad83	Long_nad83	Lcl_Wtrway	FID_Cal_Wa	HU_12_NAME
626	0	subB	356.54256442100	7.50000000000	D	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.06138818258	356.54256442100	ISOLATE	-115.45380231200	33.69592918080	BIG WASH	21	Lake Tamarisk
627	0	sfAB	979.41690426200	7.50000000000	D	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.16863238710	979.41690426400	ISOLATE	-115.40598614900	33.81317718260	BIG WASH	28	Upper Big Wash
628	0	sfAB	5042.78488345000	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.86824808599	5042.78488345000	ISOLATE	-115.39914200300	33.82341829730	BIG WASH	31	Eagle Creek
629	0	sfAB	8323.70670724000	7.50000000000	D	Lower Big Wash	CBS	unnamed	RISIF	RIVERINE	0.49198912711	2857.47285023000	ISOLATE	-115.39497586900	33.81882924430	BIG WASH	27	Lower Big Wash
629	0	sfAB	8323.70670724000	7.50000000000	D	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.46431429120	2696.73740327000	ISOLATE	-115.39497586900	33.81882924430	BIG WASH	28	Upper Big Wash
629	0	sfAB	8323.70670724000	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.47684167592	2769.49645375000	ISOLATE	-115.39497586900	33.81882924430	BIG WASH	31	Eagle Creek
630	0	A1	449.35289779200	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.07736792317	449.35289778500	ISOLATE	-115.33257315600	33.71429146320	BIG WASH	16	Gruendikes Well
631	0	A1	429.09290540800	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.07387963247	429.09290540900	ISOLATE	-115.33798549400	33.71427360270	BIG WASH	16	Gruendikes Well
632	0	A1	422.36478542700	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.07272120961	422.36478542700	ISOLATE	-115.34436557900	33.71424770830	BIG WASH	16	Gruendikes Well
633	0	A1	566.75210991100	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.09758128614	566.75210990600	ISOLATE	-115.34552908500	33.71410890750	BIG WASH	16	Gruendikes Well
634	0	A1	466.51725522900	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.08032321888	466.51725522900	ISOLATE	-115.36050647800	33.71422330630	BIG WASH	16	Gruendikes Well
635	0	A1	601.02309245300	7.50000000000	D	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.10348193741	601.02309245100	ISOLATE	-115.36183034400	33.71436089060	BIG WASH	16	Gruendikes Well
636	0	A1	362.44309764400	7.50000000000	D	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.06240411461	362.44309764500	ISOLATE	-115.36166990700	33.71411090680	BIG WASH	16	Gruendikes Well
637	0	A2	301.97610414200	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.05199313088	301.97610414200	ISOLATE	-115.31170723800	33.70531985060	BIG WASH	16	Gruendikes Well
638	0	A2	159.27232388300	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.02742292078	159.27232388400	ISOLATE	-115.31165606000	33.70397056240	BIG WASH	16	Gruendikes Well
639	0	A2	46.41988303140	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.00799240410	46.41988302720	ISOLATE	-115.31140247500	33.70417293090	BIG WASH	16	Gruendikes Well
640	0	A1	78.00426297210	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.01343048605	78.00426297410	ISOLATE	-115.31329339900	33.70734537220	BIG WASH	16	Gruendikes Well
641	0	A1	238.31460364900	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.04103212873	238.31460364400	ISOLATE	-115.31299230900	33.70651570540	BIG WASH	16	Gruendikes Well
642	0	A1	358.20238722900	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.06167396474	358.20238722600	ISOLATE	-115.31272109300	33.71233417870	BIG WASH	16	Gruendikes Well
643	0	A1	785.60469395300	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.13526251618	785.60469395600	ISOLATE	-115.31318601400	33.70997453320	BIG WASH	16	Gruendikes Well
644	0	A1	273.13269813400	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.04702697971	273.13269813400	ISOLATE	-115.31352867100	33.71040858060	BIG WASH	16	Gruendikes Well
645	0	A1	519.14208382500	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.08938396760	519.14208382300	ISOLATE	-115.31293056700	33.71470022570	BIG WASH	16	Gruendikes Well
646	0	A2	522.28005391900	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.08992425171	522.28005392000	ISOLATE	-115.31013007800	33.70925923780	BIG WASH	16	Gruendikes Well
647	0	A2	495.00610417800	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.08522832372	495.00610417900	ISOLATE	-115.31044262200	33.70936202480	BIG WASH	16	Gruendikes Well
648	0	A2	386.22142877700	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.06649817989	386.22142877300	ISOLATE	-115.31008911300	33.71182300730	BIG WASH	16	Gruendikes Well
649	0	A2	263.90909448900	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.04543889368	263.90909448600	ISOLATE	-115.30935519700	33.71727264240	BIG WASH	16	Gruendikes Well
650	0	A2	311.76607126200	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.05367873128	311.76607126100	ISOLATE	-115.30894132400	33.71702496200	BIG WASH	16	Gruendikes Well
651	0	A2	387.48170189800	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.06671516906	387.48170190200	ISOLATE	-115.30832410000	33.71531140020	BIG WASH	16	Gruendikes Well
652	0	subA	1567.49856967000	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.26988611737	1567.49856967000	ISOLATE	-115.32029825500	33.69997887170	BIG WASH	16	Gruendikes Well
653	0	subA	440.61183786600	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.07586291974	440.61183786600	ISOLATE	-115.32054458200	33.69862856320	BIG WASH	16	Gruendikes Well
654	0	subA	1094.32069762000	7.50000000000	D	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.18841609808	1094.32069762000	ISOLATE	-115.32130577100	33.69959395440	BIG WASH	16	Gruendikes Well
655	0	subA	421.92344445800	7.50000000000	D	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.07264522115	421.92344446100	ISOLATE	-115.32097678900	33.69970532240	BIG WASH	16	Gruendikes Well
656	0	subA	1921.34361773000	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.33080985154	1921.34361773000	ISOLATE	-115.31442818300	33.69954402560	BIG WASH	16	Gruendikes Well
657	0	subA	1452.62181487000	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.25010706179	1452.62181488000	ISOLATE	-115.31636510700	33.70029262240	BIG WASH	16	Gruendikes Well
658	0	subA	1434.10870276000	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.24691954249	1434.10870276000	ISOLATE	-115.31141815100	33.69973505910	BIG WASH	16	Gruendikes Well
659	0	subA	964.43384094700	7.50000000000	D	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.16605265857	964.43384095000	ISOLATE	-115.31899378400	33.70112708180	BIG WASH	16	Gruendikes Well
660	0	subA	381.24436721100	7.50000000000	D	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.06564124780	381.24436721300	ISOLATE	-115.31992978500	33.70191864540	BIG WASH	16	Gruendikes Well
661	0	subA	452.97636993200	7.50000000000	D	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.07799179923	452.97636993500	ISOLATE	-115.31960854600	33.70163226150	BIG WASH	16	Gruendikes Well
662	0	sfAB	2911.77807666000	7.50000000000	D	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.50133920053	2911.77807666000	ISOLATE	-115.39870078900	33.81093722370	BIG WASH	28	Upper Big Wash
663	0	sfAB	2447.45614534000	7.50000000000	D	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.42139396442	2447.45614534000	ISOLATE	-115.39820992400	33.80845306180	BIG WASH	28	Upper Big Wash
664	0	sfAB	142.32556040500	7.50000000000	D	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.02450508960	142.32556040000	ISOLATE	-115.39602816800	33.80560243960	BIG WASH	28	Upper Big Wash
665	0	A1B2	336.49893274100	7.50000000000	D	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.05793714407	336.49893274200	ISOLATE	-115.40156309400	33.79405947660	BIG WASH	28	Upper Big Wash
666	0	A1B2	278.89260566500	7.50000000000	D	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.04801869932	278.89260566500	ISOLATE	-115.40159182700	33.79320722940	BIG WASH	28	Upper Big Wash
667	0	A1B2	270.67861861200	7.50000000000	D	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.04660444535	270.67861860700	ISOLATE	-115.40156462100	33.79265729500	BIG WASH	28	Upper Big Wash
668	0	A1B2	283.26530539900	7.50000000000	D	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.04877157462	283.26530540100	ISOLATE	-115.40155324900	33.79147510440	BIG WASH	28	Upper Big Wash
669	0	B1	224.38905256300	7.50000000000	D	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.03863447875	224.38905256300	ISOLATE	-115.44863076900	33.78232408080	BIG WASH	28	Upper Big Wash
670	0	A1	203.20213943000	7.50000000000	D	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.03498659425	203.20213942700	ISOLATE	-115.37819792100	33.71453623970	BIG WASH	16	Gruendikes Well
671	0	subB	1248.42477489000	15.00000000000	C	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.42989833846	1248.42477489000	ISOLATE	-115.45085059500	33.69773740800	BIG WASH	21	Lake Tamarisk
672	0	subB	1989.35287144000	15.00000000000	C	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.68503886757	1989.35287143000	ISOLATE	-115.45436952500	33.69730753970	BIG WASH	21	Lake Tamarisk
673	0	access_east	147.16718038700	15.00000000000	C	Lower Palen Lake	DWW	unnamed	RISIF	RIVERINE	0.05067740372	147.16718039000	ISOLATE	-115.23723048700	33.67313280970	BIG WASH	15	Lower Palen Lake
674	0	access_east	118.20862035500	15.00000000000	C	Lower Palen Lake	CBS	unnamed	RISIF	RIVERINE	0.04070544778	118.20862035700	ISOLATE	-115.24166638100	33.67424209180	BIG WASH	15	Lower Palen Lake
675	0	access_east	138.11983110600	15.00000000000	C	Corn Springs Wash	CBS	unnamed	RISIF	RIVERINE	0.04756192531	138.11983110500	ISOLATE	-115.25194782200	33.67678919890	BIG WASH	13	Corn Springs Wash
676	0	access_east	122.31646019100	15.00000000000	C	Corn Springs Wash	CBS	unnamed	RISIF	RIVERINE	0.04211999318	122.31646019800	ISOLATE	-115.25370059300	33.67724863150	BIG WASH	13	Corn Springs Wash
677	0	access_east	122.22473739100	15.00000000000	C	Corn Springs Wash	CBS	unnamed	RISIF	RIVERINE	0.04208840819	122.22473738800	ISOLATE	-115.25469988300	33.67751212980	BIG WASH	13	Corn Springs Wash
678	0	access_east	159.40623532000	15.00000000000	C	Corn Springs Wash	CBS	unnamed	RISIF	RIVERINE	0.05489195431	159.40623532000	ISOLATE	-115.25750902000	33.67824921850	BIG WASH	13	Corn Springs Wash
679	0	access_east	122.90055311400	15.00000000000	C	Corn Springs Wash	CBS	unnamed	RISIF	RIVERINE	0.04232112711	122.90055311300	ISOLATE	-115.26138849700	33.67929169190	BIG WASH	13	Corn Springs Wash
680	0	access_east	142.51493081900	15.00000000000	C	Corn Springs Wash	DWW	unnamed	RISIF	RIVERINE	0.04907538940	142.51493081900	ISOLATE	-115.26372553500	33.67992172950	BIG WASH	13	Corn Springs Wash
681	0	access_east	122.45031985500	15.00000000000	C	Corn Springs Wash	DWW	unnamed	RISIF	RIVERINE	0.04216608810	122.45031985100	ISOLATE	-115.26611820700	33.68054261600	BIG WASH	13	Corn Springs Wash
682	0	access_east	115.27114194800	15.00000000000	C	Corn Springs Wash	CBS	unnamed	RISIF	RIVERINE	0.03969391940	115.27114194900	ISOLATE	-115.26740215500	33.68089088990	BIG WASH	13	Corn Springs Wash
683	0	access_east	120.23948509700	15.00000000000	C	Corn Springs Wash	CBS	unnamed	RISIF	RIVERINE	0.04140478137	120.23948509400	ISOLATE	-115.27132679500	33.68192039080	BIG WASH	13	Corn Springs Wash
684	0	access_east	121.11618560200	15.00000000000	C	Corn Springs Wash	CBS	unnamed	RISIF	RIVERINE	0.04170667548	121.11618560500	ISOLATE	-115.27277895700	33.68230735770	BIG WASH	13	Corn Springs Wash
685	0	access_east	155.66674119800	15.00000000000	C	Corn Springs Wash	CBS	unnamed	RISIF	RIVERINE	0.05360424972	155.66674119600	ISOLATE	-115.27497272000	33.68287028390	BIG WASH	13	Corn Springs Wash
686	0	access_east	125.22927611400	15.00000000000	C	Corn Springs Wash	CBS	unnamed	RISIF	RIVERINE	0.02746473520	79.75759103460	ISOLATE	-115.28071879500	33.68442634740	BIG WASH	13	Corn Springs Wash
686	0	access_east	125.22927611400	15.00000000000	C	Lower Big Wash	CBS	unnamed	RISIF	RIVERINE	0.01565829376	45.47168508160	ISOLATE	-115.28071879500	33.68442634740	BIG WASH	27	Lower Big Wash
687	0	access_east	119.21806925600	15.00000000000	C	Lower Big Wash	DWW	unnamed	RISIF	RIVERINE	0.04105305415	119.21806925300	ISOLATE	-115.28237919300	33.68485808120	BIG WASH	27	Lower Big Wash
688	0	access_east	118.77183921600	15.00000000000	C	Lower Big Wash	DWW	unnamed	RISIF	RIVERINE	0.04089939367	118.77183921200	ISOLATE	-115.28322479500	33.68508802780	BIG WASH	27	Lower Big Wash
689	0	access_east	146.79075806200	15.00000000000	C	Lower Big Wash	DWW	unnamed	RISIF	RIVERINE	0.05054778170	146.79075805100	ISOLATE	-115.28518283700	33.68560757160	BIG WASH	27	Lower Big Wash
690	0	access_east	123.71133210400	15.00000000000	C	Lower Big Wash	DWW	unnamed	RISIF	RIVERINE	0.04260032097	123.71133210400	ISOLATE	-115.28600045400	33.68581489490	BIG WASH	27	Lower Big Wash
691	0	access_east	123.72545640100	15.00000000000	C	Lower Big Wash	DWW	unnamed	RISIF	RIVERINE	0.04260518471	123.72545640200	ISOLATE	-115.28887074000	33.68656229300	BIG WASH	27	Lower Big Wash
692	0	access_east	125.75766182700	15.00000000000	C	Lower Big Wash	DWW	unnamed	RISIF	RIVERINE	0.04330497997	125.75766183100	ISOLATE	-115.29746389500	33.68886379730	BIG WASH	27	Lower Big Wash
693	0	access_east	123.95435498400	15.00000000000	C	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.04268400654	123.95435498200	ISOLATE	-115.30546063400	33.69102219560	BIG WASH	16	Gruendikes Well

[1] RISIF = RIVERINE INTERMITTENT STREAMBED INTERMITTENTLY FLOODED

Exhibit C. Field Data Summary

FID_channe	Id	project_co	length	width	category	Watershed	Vegetation	Waters_Nam	Cowardin_C [1]	HGM_Code	Area__acre	Linear_ft	Waters_Typ	Lat_nad83	Long_nad83	Lcl_Wtrway	FID_Cal_Wa	HU_12_NAME
694	0	subA	118.13020460200	15.00000000000	C	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.04067844511	118.13020460500	ISOLATE	-115.31720277800	33.69428698280	BIG WASH	16	Gruendikes Well
695	0	access_west	119.86668905600	15.00000000000	C	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.04127640808	119.86668905700	ISOLATE	-115.32980253600	33.69789562320	BIG WASH	16	Gruendikes Well
696	0	access_west	124.95364183400	15.00000000000	C	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.04302811358	124.95364183700	ISOLATE	-115.33286785600	33.69893566140	BIG WASH	16	Gruendikes Well
697	0	access_west	117.30695593300	15.00000000000	C	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.04039495728	117.30695592700	ISOLATE	-115.34686464100	33.70195950030	BIG WASH	16	Gruendikes Well
698	0	access_west	125.39625940300	15.00000000000	C	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.04318053010	125.39625939700	ISOLATE	-115.36503267800	33.70615975400	BIG WASH	16	Gruendikes Well
699	0	access_west	135.73575156000	15.00000000000	C	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.04674096128	135.73575155800	ISOLATE	-115.39973109500	33.70943203380	BIG WASH	16	Gruendikes Well
700	0	subA	1290.18092503000	15.00000000000	C	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.44427717804	1290.18092503000	ISOLATE	-115.31750234600	33.69608495740	BIG WASH	16	Gruendikes Well
701	0	subA	919.42843757200	15.00000000000	C	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.31660758870	919.42843757200	ISOLATE	-115.31812879800	33.69315954530	BIG WASH	16	Gruendikes Well
702	0	subA	2533.92342622000	15.00000000000	C	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.87256316330	2533.92342621000	ISOLATE	-115.31088274300	33.69910600990	BIG WASH	16	Gruendikes Well
703	0	sfAB	1575.48710945000	15.00000000000	C	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.54252310932	1575.48710945000	ISOLATE	-115.43039129700	33.83281543370	BIG WASH	31	Eagle Creek
704	0	sfAB	1875.63525464000	15.00000000000	C	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.64587990862	1875.63525464000	ISOLATE	-115.42931801000	33.83717543850	BIG WASH	31	Eagle Creek
705	0	sfAB	1598.33353843000	15.00000000000	C	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.55039033693	1598.33353843000	ISOLATE	-115.43001946900	33.83784750950	BIG WASH	31	Eagle Creek
706	0	sfAB	3267.41048316000	15.00000000000	C	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	1.12514135095	3267.41048316000	ISOLATE	-115.40357701900	33.81213928880	BIG WASH	28	Upper Big Wash
707	0	sfAB	1912.86964491000	15.00000000000	C	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.65870166836	1912.86964491000	ISOLATE	-115.40474334400	33.80995323220	BIG WASH	28	Upper Big Wash
708	0	B1	424.16344857000	15.00000000000	C	Upper Big Wash	DWW	Big Wash	RISIF	RIVERINE	0.14606179359	424.16344857000	ISOLATE	-115.41562047600	33.79669740160	BIG WASH	28	Upper Big Wash
709	0	B1	430.81668927000	15.00000000000	C	Dragon Wash	CBS	unnamed	RISIF	RIVERINE	0.14835285443	430.81668926600	ISOLATE	-115.45020903200	33.77636021740	BIG WASH	23	Dragon Wash
710	0	B1	257.34475081900	15.00000000000	C	Dragon Wash	CBS	unnamed	RISIF	RIVERINE	0.08861733844	257.34475081700	ISOLATE	-115.45003454200	33.76426975880	BIG WASH	23	Dragon Wash
711	0	B1	107.20936128300	15.00000000000	C	Dragon Wash	CBS	unnamed	RISIF	RIVERINE	0.03691782413	107.20936128500	ISOLATE	-115.45076952200	33.76433935470	BIG WASH	23	Dragon Wash
712	0	subB	494.02119649400	15.00000000000	C	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.17011749191	494.02119649100	ISOLATE	-115.44977585200	33.69733793040	BIG WASH	21	Lake Tamarisk
713	0	B1	269.90001991500	15.00000000000	C	Dragon Wash	CBS	unnamed	RISIF	RIVERINE	0.09294077821	269.90001991400	ISOLATE	-115.45004853700	33.76362871100	BIG WASH	23	Dragon Wash
714	0	B1	109.24106470800	15.00000000000	C	Dragon Wash	CBS	unnamed	RISIF	RIVERINE	0.03761744652	109.24106470100	ISOLATE	-115.45078277100	33.76370860140	BIG WASH	23	Dragon Wash
715	0	B1	107.41541328200	15.00000000000	C	Dragon Wash	CBS	unnamed	RISIF	RIVERINE	0.03698877868	107.41541328200	ISOLATE	-115.45079646700	33.76306733540	BIG WASH	23	Dragon Wash
716	0	B1	1115.72190532000	15.00000000000	C	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.38420175803	1115.72190531000	ISOLATE	-115.45174062700	33.70935673030	BIG WASH	21	Lake Tamarisk
717	0	subB	268.73924156200	15.00000000000	C	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.09254106114	268.73924156200	ISOLATE	-115.45384566400	33.69703763810	BIG WASH	21	Lake Tamarisk
718	0	subB	416.01290977400	15.00000000000	C	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.14325513422	416.01290977400	ISOLATE	-115.45370974900	33.69700057870	BIG WASH	21	Lake Tamarisk
719	0	sfAB	4776.45262912000	15.00000000000	C	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	1.64478396319	4776.45262911000	ISOLATE	-115.40120837900	33.80390187910	BIG WASH	28	Upper Big Wash
720	0	A1	452.83734570900	15.00000000000	C	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.15593572511	452.83734570600	ISOLATE	-115.33454308100	33.71430704810	BIG WASH	16	Gruendikes Well
721	0	A1	478.72761613800	15.00000000000	C	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.16485110749	478.72761613800	ISOLATE	-115.33753892600	33.71420941380	BIG WASH	16	Gruendikes Well
722	0	A1	435.83221702900	15.00000000000	C	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.15007996454	435.83221703000	ISOLATE	-115.34670357500	33.71429561400	BIG WASH	16	Gruendikes Well
723	0	A1	494.43293572100	15.00000000000	C	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.17025927539	494.43293572300	ISOLATE	-115.35951421200	33.71436468210	BIG WASH	16	Gruendikes Well
724	0	A2	738.89969865300	15.00000000000	C	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.25444204499	738.89969864500	ISOLATE	-115.31124357800	33.70498134770	BIG WASH	16	Gruendikes Well
725	0	A1	268.07853314600	15.00000000000	C	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.09231354447	268.07853315000	ISOLATE	-115.31283216600	33.70755456980	BIG WASH	16	Gruendikes Well
726	0	A1	542.38221864800	15.00000000000	C	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.18677073645	542.38221864000	ISOLATE	-115.31302845300	33.70924044620	BIG WASH	16	Gruendikes Well
727	0	A1	264.09979024100	15.00000000000	C	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.09094345394	264.09979023400	ISOLATE	-115.31362388400	33.71112071270	BIG WASH	16	Gruendikes Well
728	0	A2	439.63124118000	15.00000000000	C	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.15138816845	439.63124118000	ISOLATE	-115.30928642800	33.71266187310	BIG WASH	16	Gruendikes Well
729	0	A1	470.08960850500	15.00000000000	C	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.16187658695	470.08960850200	ISOLATE	-115.37836077300	33.71434645200	BIG WASH	16	Gruendikes Well
730	0	subB	832.11864948700	28.00000000000	B	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	0.53487883805	832.11864948600	ISOLATE	-115.45350670300	33.69850299710	BIG WASH	21	Lake Tamarisk
731	0	subB	1805.47887638000	28.00000000000	B	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	1.16054656884	1805.47887638000	ISOLATE	-115.45224411000	33.69807424810	BIG WASH	21	Lake Tamarisk
732	0	subB	2089.65816042000	28.00000000000	B	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	1.34321461185	2089.65816043000	ISOLATE	-115.45129575200	33.69833949480	BIG WASH	21	Lake Tamarisk
733	0	subB	1887.90031122000	28.00000000000	B	Lake Tamarisk	CBS	unnamed	RISIF	RIVERINE	1.21352637085	1887.90031122000	ISOLATE	-115.45016066900	33.69894344090	BIG WASH	21	Lake Tamarisk
734	0	access_east	117.13563138200	28.00000000000	B	Corn Springs Wash	CBS	unnamed	RISIF	RIVERINE	0.07529379428	117.13563138300	ISOLATE	-115.25554025600	33.67774003870	BIG WASH	13	Corn Springs Wash
735	0	access_east	116.58247729000	28.00000000000	B	Corn Springs Wash	CBS	unnamed	RISIF	RIVERINE	0.07493823150	116.58247728500	ISOLATE	-115.26059523200	33.67908204930	BIG WASH	13	Corn Springs Wash
736	0	access_east	121.69013424400	28.00000000000	B	Lower Big Wash	DWW	unnamed	RISIF	RIVERINE	0.07822139024	121.69013423900	ISOLATE	-115.28730178800	33.68615661770	BIG WASH	27	Lower Big Wash
737	0	access_east	216.37195025300	28.00000000000	B	Lower Big Wash	DWW	unnamed	RISIF	RIVERINE	0.13908206169	216.37195025100	ISOLATE	-115.29954684000	33.68972599540	BIG WASH	27	Lower Big Wash
738	0	subA	117.47509730800	28.00000000000	B	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.07551200011	117.47509730700	ISOLATE	-115.31029452300	33.69227107070	BIG WASH	16	Gruendikes Well
739	0	access_west	144.24678419500	28.00000000000	B	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.09272061427	144.24678419900	ISOLATE	-115.33953940500	33.70041289970	BIG WASH	16	Gruendikes Well
740	0	access_west	126.81538044200	28.00000000000	B	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.08151585520	126.81538044300	ISOLATE	-115.37501274300	33.70821198240	BIG WASH	16	Gruendikes Well
741	0	access_west	1761.45465190000	28.00000000000	B	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	1.13224816927	1761.45465190000	ISOLATE	-115.39697040100	33.71010002760	BIG WASH	16	Gruendikes Well
742	0	subA	587.62627034100	28.00000000000	B	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.37772120224	587.62627033500	ISOLATE	-115.30978845000	33.69312962560	BIG WASH	16	Gruendikes Well
743	0	subA	864.21930048300	28.00000000000	B	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.55551286532	864.21930047200	ISOLATE	-115.31099502300	33.69108193470	BIG WASH	16	Gruendikes Well
744	0	sfAB	1798.36141254000	28.00000000000	B	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	1.15597152321	1798.36141254000	ISOLATE	-115.39511587200	33.80306489770	BIG WASH	28	Upper Big Wash
745	0	B1	384.67489585800	28.00000000000	B	Dragon Wash	DWW	Big Wash	RISIF	RIVERINE	0.24726577328	384.67489586100	ISOLATE	-115.45058372400	33.77968008020	BIG WASH	23	Dragon Wash
746	0	B1	251.78928390800	28.00000000000	B	Dragon Wash	CBS	unnamed	RISIF	RIVERINE	0.16184802455	251.78928390200	ISOLATE	-115.45027228800	33.75314381400	BIG WASH	23	Dragon Wash
747	0	A1	459.71297084800	28.00000000000	B	Gruendikes Well	DWW	unnamed	RISIF	RIVERINE	0.29549961395	459.71297083900	ISOLATE	-115.33710879300	33.71426685530	BIG WASH	16	Gruendikes Well
748	0	A1	784.52039851500	28.00000000000	B	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.50428308445	784.52039851900	ISOLATE	-115.31259712600	33.70428790080	BIG WASH	16	Gruendikes Well
749	0	A1A2	255.22665263100	28.00000000000	B	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.16405753613	255.22665263000	ISOLATE	-115.31271579100	33.70279431560	BIG WASH	16	Gruendikes Well
750	0	A2	217.73652396300	28.00000000000	B	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.13995919814	217.73652396700	ISOLATE	-115.31016531100	33.71021933330	BIG WASH	16	Gruendikes Well
751	0	A2	285.25615080700	28.00000000000	B	Gruendikes Well	CBS	unnamed	RISIF	RIVERINE	0.18336024386	285.25615081000	ISOLATE	-115.30866215800	33.71767208570	BIG WASH	16	Gruendikes Well
752	0	B1	406.95062097400	15.00000000000	C	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.14013451135	406.95062097200	ISOLATE	-115.40495620600	33.80561364460	BIG WASH	28	Upper Big Wash
753	0	sfAB	326.60388469100	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01874448374	326.60388469400	ISOLATE	-115.41650054400	33.84311406560	BIG WASH	31	Eagle Creek
754	0	sfAB	163.65534233400	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.00939252424	163.65534233300	ISOLATE	-115.41634252900	33.84316152880	BIG WASH	31	Eagle Creek
755	0	sfAB	97.54893775880	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.00559853867	97.54893776010	ISOLATE	-115.41688338300	33.84323369500	BIG WASH	31	Eagle Creek
756	0	sfA	819.86062540200	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.04705352533	819.86062539800	ISOLATE	-115.41824399100	33.84370550780	BIG WASH	31	Eagle Creek
757	0	sfA	537.90765126200	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03087165124	537.90765126800	ISOLATE	-115.41760437300	33.84378106800	BIG WASH	31	Eagle Creek
758	0	sfA	550.67885511000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03160461749	550.67885511700	ISOLATE	-115.41709124500	33.84400474750	BIG WASH	31	Eagle Creek
759	0	sfA	573.15046963700	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03289431070	573.15046963600	ISOLATE	-115.42089467500	33.84260747360	BIG WASH	31	Eagle Creek
760	0	sfA	891.90801807000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.05118847670	891.90801807500	ISOLATE	-115.42195055600	33.84344133310	BIG WASH	31	Eagle Creek
761	0	sfA	1162.68935181000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.06672918686	1162.68935180000	ISOLATE	-115.42200421300	33.84375291060	BIG WASH	31	Eagle Creek
762	0	sfA	327.23401392000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01878064818	327.23401392400	ISOLATE	-115.43062215500	33.84252448630	BIG WASH	31	Eagle Creek
763	0	sfA	596.43731377000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03423079165	596.43731377500	ISOLATE	-115.43131057800	33.84286946520	BIG WASH	31	Eagle Creek
764	0	sfA	453.92414025400	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.02605166094	453.92414024500	ISOLATE	-115.42903225500	33.84250107510	BIG WASH	31	Eagle Creek

[1] RISIF = RIVERINE INTERMITTENT STREAMBED INTERMITTENTLY FLOODED

Exhibit C. Field Data Summary

FID_channe	Id	project_co	length	width	category	Watershed	Vegetation	Waters_Nam	Cowardin_C[1]	HGM_Code	Area__acre	Linear_ft	Waters_Typ	Lat_nad83	Long_nad83	Lcl_Wtrway	FID_Cal_Wa	HU_12_NAME
765	0	sfA	483.76666205500	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.02776438602	483.76666205600	ISOLATE	-115.42710895700	33.84101085800	BIG WASH	31	Eagle Creek
766	0	sfA	479.32977638100	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.02750974382	479.32977638500	ISOLATE	-115.42841872300	33.84007944490	BIG WASH	31	Eagle Creek
767	0	sfA	2638.71526748000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.15144141801	2638.71526748000	ISOLATE	-115.42709193900	33.83982831960	BIG WASH	31	Eagle Creek
768	0	sfB	220.37604111000	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03794353325	220.37604110500	ISOLATE	-115.43255330200	33.83367248160	BIG WASH	31	Eagle Creek
769	0	sfAB	550.23091376400	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03157890919	550.23091376900	ISOLATE	-115.42844061900	33.83530911890	BIG WASH	31	Eagle Creek
770	0	sfAB	1380.66692531000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.07923937817	1380.66692530000	ISOLATE	-115.42958600700	33.83515432880	BIG WASH	31	Eagle Creek
771	0	sfAB	757.63138042200	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.04348205811	757.63138042300	ISOLATE	-115.42979807500	33.83486529670	BIG WASH	31	Eagle Creek
772	0	sfAB	363.80477864500	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.02087952127	363.80477864400	ISOLATE	-115.43166438100	33.83532426370	BIG WASH	31	Eagle Creek
773	0	sfAB	183.22494831400	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01051566508	183.22494831500	ISOLATE	-115.43194015900	33.83543061290	BIG WASH	31	Eagle Creek
774	0	sfB	200.55548708900	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01151030114	200.55548708700	ISOLATE	-115.43254205500	33.83518879610	BIG WASH	31	Eagle Creek
775	0	sfAB	635.63960590800	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03648069364	635.63960591100	ISOLATE	-115.40677717900	33.83219324340	BIG WASH	31	Eagle Creek
776	0	sfAB	240.17788973900	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01378431415	240.17788973500	ISOLATE	-115.40701848400	33.83238920460	BIG WASH	31	Eagle Creek
777	0	sfAB	877.02341548900	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.05033421806	877.02341549400	ISOLATE	-115.41165301400	33.83146795600	BIG WASH	31	Eagle Creek
778	0	sfAB	942.76459777600	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.05410724276	942.76459777400	ISOLATE	-115.40602705900	33.82913178980	BIG WASH	31	Eagle Creek
779	0	sfAB	955.08913455700	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.05481457384	955.08913455900	ISOLATE	-115.39788473000	33.83111495900	BIG WASH	31	Eagle Creek
780	0	sfAB	958.26418533500	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.05499679668	958.26418533000	ISOLATE	-115.40037894300	33.83298929230	BIG WASH	31	Eagle Creek
781	0	sfAB	215.69131377700	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01237897806	215.69131377600	ISOLATE	-115.41120027200	33.83215055350	BIG WASH	31	Eagle Creek
782	0	sfAB	296.52383294700	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01701812632	296.52383294600	ISOLATE	-115.41043758400	33.83192910380	BIG WASH	31	Eagle Creek
783	0	sfAB	864.60716251300	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.04962162319	864.60716250800	ISOLATE	-115.40976265000	33.83133487530	BIG WASH	31	Eagle Creek
784	0	sfAB	1911.60531407000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.10971104879	1911.60531406000	ISOLATE	-115.40287721800	33.83216391120	BIG WASH	31	Eagle Creek
785	0	sfAB	1669.97934470000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.09584362630	1669.97934470000	ISOLATE	-115.40726492700	33.83126449940	BIG WASH	31	Eagle Creek
786	0	sfAB	2229.01355547000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.12792777522	2229.01355546000	ISOLATE	-115.39611581500	33.81760406050	BIG WASH	28	Upper Big Wash
787	0	sfAB	1914.97221705000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.10990428243	1914.97221705000	ISOLATE	-115.40253489700	33.82943024630	BIG WASH	31	Eagle Creek
788	0	sfAB	660.10523099200	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03715085127	647.31643246100	ISOLATE	-115.40361730300	33.82844468960	BIG WASH	31	Eagle Creek
789	0	sfAB	829.37594953600	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.04686565375	816.58715100900	ISOLATE	-115.40243834600	33.82847169860	BIG WASH	31	Eagle Creek
790	0	sfAB	2266.81721185000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.13009740656	2266.81721185000	ISOLATE	-115.39792438500	33.82649907930	BIG WASH	31	Eagle Creek
791	0	sfAB	4304.26021822000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.24703054512	4304.26021821000	ISOLATE	-115.39587273700	33.82561679280	BIG WASH	31	Eagle Creek
792	0	sfAB	3367.26808047000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.19325459599	3367.26808047000	ISOLATE	-115.40210708400	33.82658709350	BIG WASH	31	Eagle Creek
793	0	sfAB	4337.17828020000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.24891978192	4337.17828021000	ISOLATE	-115.40082238900	33.82443880500	BIG WASH	31	Eagle Creek
794	0	sfAB	2185.21955016000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.12541434517	2185.21955016000	ISOLATE	-115.40420964900	33.82455447010	BIG WASH	31	Eagle Creek
795	0	sfAB	1218.79799749000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.06994938002	1218.79799749000	ISOLATE	-115.40542331500	33.82452994760	BIG WASH	31	Eagle Creek
796	0	sfAB	788.77894832000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.04526968253	788.77894832300	ISOLATE	-115.40607868700	33.82433788690	BIG WASH	31	Eagle Creek
797	0	sfAB	688.12094943100	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.03949270830	688.12094943000	ISOLATE	-115.40619558300	33.82581942000	BIG WASH	31	Eagle Creek
798	0	sfAB	1506.24626422000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.08644664051	1506.24626422000	ISOLATE	-115.39516383400	33.82773456270	BIG WASH	31	Eagle Creek
799	0	sfAB	2562.99238775000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.14709552271	2562.99238774000	ISOLATE	-115.39529263600	33.82637540240	BIG WASH	31	Eagle Creek
800	0	sfAB	2296.48314321000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.13179999674	2296.48314322000	ISOLATE	-115.39825720900	33.82832198720	BIG WASH	31	Eagle Creek
801	0	sfAB	1350.20752637000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.07749124922	1350.20752636000	ISOLATE	-115.40163323800	33.82968836160	BIG WASH	31	Eagle Creek
802	0	sfAB	2335.08791124000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.13401560556	2335.08791124000	ISOLATE	-115.40354916500	33.81975110840	BIG WASH	28	Upper Big Wash
803	0	sfAB	2201.35370815000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.12634031842	2201.35370815000	ISOLATE	-115.40387786300	33.81894648800	BIG WASH	28	Upper Big Wash
804	0	sfAB	1504.79898378000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.08636357804	1504.79898378000	ISOLATE	-115.39316791300	33.81940105750	BIG WASH	31	Eagle Creek
805	0	sfAB	3873.77653714000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.22232418142	3873.77653714000	ISOLATE	-115.39095796300	33.81059049640	BIG WASH	28	Upper Big Wash
806	0	sfAB	3973.84016026000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.22806704317	3973.84016027000	ISOLATE	-115.39117330100	33.81261336660	BIG WASH	28	Upper Big Wash
807	0	sfAB	2005.95785028000	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.11512613925	2005.95785028000	ISOLATE	-115.39709638900	33.81721051220	BIG WASH	28	Upper Big Wash
808	0	sfAB	1205.18090220000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.06916786629	1205.18090219000	ISOLATE	-115.37907910900	33.80933635110	BIG WASH	31	Eagle Creek
809	0	sfAB	1195.15916270000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.06859269758	1195.15916270000	ISOLATE	-115.37625133400	33.80557083010	BIG WASH	31	Eagle Creek
810	0	A2	83.85718212600	2.50000000000	E	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.00481274002	83.85718212690	ISOLATE	-115.39837783600	33.79273791660	BIG WASH	28	Upper Big Wash
811	0	A1B2	260.98240440500	2.50000000000	E	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.01497832900	260.98240440900	ISOLATE	-115.40171622300	33.79516444100	BIG WASH	28	Upper Big Wash
812	0	sfAB	7102.18929242000	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	1.22282873492	7102.18929242000	ISOLATE	-115.39680482400	33.83008796300	BIG WASH	31	Eagle Creek
813	0	sfAB	1197.82939321000	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.20623784319	1197.82939322000	ISOLATE	-115.38742391300	33.81748304050	BIG WASH	31	Eagle Creek
814	0	sfAB	1450.27689897000	7.50000000000	D	Lower Big Wash	CBS	unnamed	RISIF	RIVERINE	0.24493750082	1422.59700477000	ISOLATE	-115.37786508500	33.80343665120	BIG WASH	27	Lower Big Wash
814	0	sfAB	1450.27689897000	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.00476582200	27.67989419550	ISOLATE	-115.37786508500	33.80343665120	BIG WASH	31	Eagle Creek
815	0	sfAB	1448.33925979000	15.00000000000	C	Eagle Creek	DWW	unnamed	RISIF	RIVERINE	0.49873941453	1448.33925979000	ISOLATE	-115.39043388300	33.81974749600	BIG WASH	31	Eagle Creek
202	0	sfB	3147.53551906000	2.50000000000	E	181001004702-Pinto Wash	CBS	unnamed	RISIF	RIVERINE	0.00615115277	107.17768591000	ISOLATE	-115.40899389900	33.85169001970	BIG WASH	34	181001004702-Pinto Wash
203	0	sfB	2537.29580715000	2.50000000000	E	181001004702-Pinto Wash	CBS	unnamed	RISIF	RIVERINE	0.00615115277	107.17768591000	ISOLATE	-115.41070510600	33.85153047860	BIG WASH	34	181001004702-Pinto Wash
218	0	sfAB	1792.22001562000	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.00448375804	78.12500000210	ISOLATE	-115.40775180700	33.83809280470	BIG WASH	31	Eagle Creek
558	0	sfAB	5629.23520222000	7.50000000000	D	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.01345127411	78.12500000210	ISOLATE	-115.41298807300	33.83784627860	BIG WASH	31	Eagle Creek
252	0	B1	746.27520572300	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.00514757575	89.69135987900	ISOLATE	-115.40557953500	33.80464131440	BIG WASH	28	Upper Big Wash
254	0	B1	154.53922610500	2.50000000000	E	Upper Big Wash	CBS	unnamed	RISIF	RIVERINE	0.00514757575	89.69135987900	ISOLATE	-115.40544972400	33.80385415570	BIG WASH	28	Upper Big Wash
261	0	B1	345.41600849300	2.50000000000	E	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.00131515020	22.91517711220	ISOLATE	-115.41775706100	33.79541845420	BIG WASH	28	Upper Big Wash
603	0	B1	763.69239789800	7.50000000000	D	Upper Big Wash	CBS	Big Wash	RISIF	RIVERINE	0.00394545060	22.91517711220	ISOLATE	-115.41784202300	33.79504140180	BIG WASH	28	Upper Big Wash
788	0	sfAB	660.10523099200	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.00073397604	12.78879853170	ISOLATE	-115.40361730300	33.82844468960	BIG WASH	31	Eagle Creek
789	0	sfAB	829.37594953600	2.50000000000	E	Eagle Creek	CBS	unnamed	RISIF	RIVERINE	0.00073397604	12.78879853170	ISOLATE	-115.40243834600	33.82847169860	BIG WASH	31	Eagle Creek

[1] RISIF = RIVERINE INTERMITTENT STREAMBED INTERMITTENTLY FLOODED

[1] RISIF = RIVERINE INTERMITTENT STREAMBED INTERMITTENTLY FLOODED

Exhibit D

Maps of Potential Jurisdictional Areas

Index Map and Location of Transects Used for Field Sampling
Solar Farm Area A Alternative
Solar Farm Area B Alternative
Solar Farm Area C Alternative
Gen-Tie A1 (overhead transmission line corridor)
Gen-Tie A2 (overhead transmission line corridor)
Gen-Tie B1 (overhead transmission line corridor)
Gen-Tie B2 (overhead transmission line corridor)
Redbluff Substation A
Redbluff Substation B
Redbluff Substation A – Access Road A
Redbluff Substation A – Access Road B

Exhibit E

Hydrology Maps for CWA Jurisdictional Analysis

Integrated Weed Management Plan

INTEGRATED WEED MANAGEMENT PLAN
DESERT SUNLIGHT SOLAR FARM PROJECT
BLM CASE FILE NUMBER CACA-48649
RIVERSIDE COUNTY, CALIFORNIA

Prepared for:
BUREAU OF LAND MANAGEMENT
Palm Springs South Coast Field Office
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December 17, 2010

Table of Contents

List of Tables

List of Figures

List of Acronyms

AC	Alternating Current
ACEC	Area of Critical Environmental Concern
BLM	U.S. Bureau of Land Management
Cal-IPC	California Invasive Plant Council
CDFA	California Department of Food and Agriculture
CDFG	California Department of Fish and Game
CHU	Critical Habitat Unit
CNPS	California Native Plant Society
DB	Designated Biologist
DPV1	SCE's Devers to Palo Verde I transmission line
DWMA	Desert Wildlife Management Area
ECM	Environmental Compliance Manager
GIS	Geographic Information Systems
I-10	Interstate 10
IWMP	Integrated Weed Management Plan
kV	Kilovolt
MW	Megawatt
NECO	Northern and Eastern Colorado Coordinated Management Plan and EIS
O&M	Operations and Maintenance
PV	Photovoltaic
ROW	Right of Way
SCE	Southern California Edison
USFWS	U.S. Fish and Wildlife Service

1.0 Introduction

This discussion provides a brief summary of the project description for the Applicant and SCE project components of the Proposed Action. Complete details of project locations and description are found in the *Desert Sunlight Solar Farm Final Environmental Impact Statement* (BLM 2010) and in the Biological Assessment, *Desert Sunlight Solar Farm Project* (Ironwood 2010).

Desert Sunlight has applied to the BLM for an issuance of a right-of-way (ROW) grant that would authorize construction, operation, maintenance, and decommission of a commercial solar power-generating facility and new substation facility on over 7,600 hectares (19,000 acres) of BLM-managed lands. The proposed project is located in Riverside County, California, approximately 6 miles north of the rural community of Desert Center and approximately (10.5 km or 6.5 miles north of the Interstate 10 corridor (Figure 1). Project components generally include construction, operation, and maintenance of the solar farm site, a gen-tie transmission line, and construction, operation and maintenance of the Southern California Edison (SCE) Red Bluff substation and related components (Figure 2). While the Red Bluff substation is included as part of this project description for planning and environmental considerations, it would be constructed, owned, and operated by SCE, not by the Applicant.

Desert Sunlight Holdings, LLC (Applicant), a wholly owned subsidiary of First Solar Development, Inc. (First Solar), proposes to develop a 550-megawatt (MW) alternating current (AC) solar photovoltaic (PV) energy-generating project known as the Desert Sunlight Solar Farm Project (Project). The Project consists of a PV generating solar facility (Solar Farm Site), a 220-kilovolt (kV) generation interconnection transmission line (Gen-Tie Line). The Solar Farm Site and most of the corridor for the Project's Gen-Tie Line would be located on lands administered by the U.S. Department of Interior, Bureau of Land Management (BLM), Palm Springs-South Coast Field Office. In addition, the Project includes development of the 500- to 220- (500/220) kilovolt (kV) Red Bluff Substation, where the Project would interconnect with the Southern California Edison (SCE) regional transmission system. While the substation is included as part of the Project for planning and environmental review purposes, it would will be independently constructed and operated by SCE.

This Integrated Weed Management Plan (IWMP) is intended to reduce and/or eliminate the propagation and further spread of noxious and invasive weeds in the Colorado Desert due to the construction and operation of the Solar Farm and Gen-Tie Line and by SCE in the construction and operation of their Project components. While the IWMP specifically describes a proposed project configuration, it is intended to be adaptable to any Project configuration selected. The objectives of this plan are as follows:

- Identify and map weed species currently present on the Project components and evaluate their ability to spread into adjacent wildlands.
- Identify weeds not seen on the Project components that may have the potential to be present in the Project area and have the potential to invade the Project site due to construction and operation activities.
- Evaluate the characteristics of each species known onsite or that could invade the site from adjacent areas and determine the best treatment methods for each of these species and the most appropriate timing for these treatments.
- Identify construction, operations and maintenance activities that may increase the presence of weeds or introduce new weed species on and adjacent to the Project components.
- Specify steps that will be taken to ensure that the presence of weed populations on and adjacent to the Project components will not increase in numbers or spread to other areas because of Project

construction, operations and maintenance activities. These steps would be intended to (1) prevent weeds already present on the site from spreading to other areas, and (2) prevent weeds not currently found on the Project site from becoming established there.

Additionally, the IWMP is consistent with applicable federal and state laws, regulations and weed management guidelines established by the BLM and other regulatory agencies. These include, but are not limited to the Federal Noxious Weed Act of 1974 including the 1994 amendment; the Federal Plant Protection Act of 2000; Section 403 of the California Food and Agriculture Code; the BLM Manual 9015 *Integrated Weed Management* (1992); and the *Northern and Eastern Colorado Desert Coordinated Management Plan* (NECO, BLM 2002).

Figure 1 Regional Location

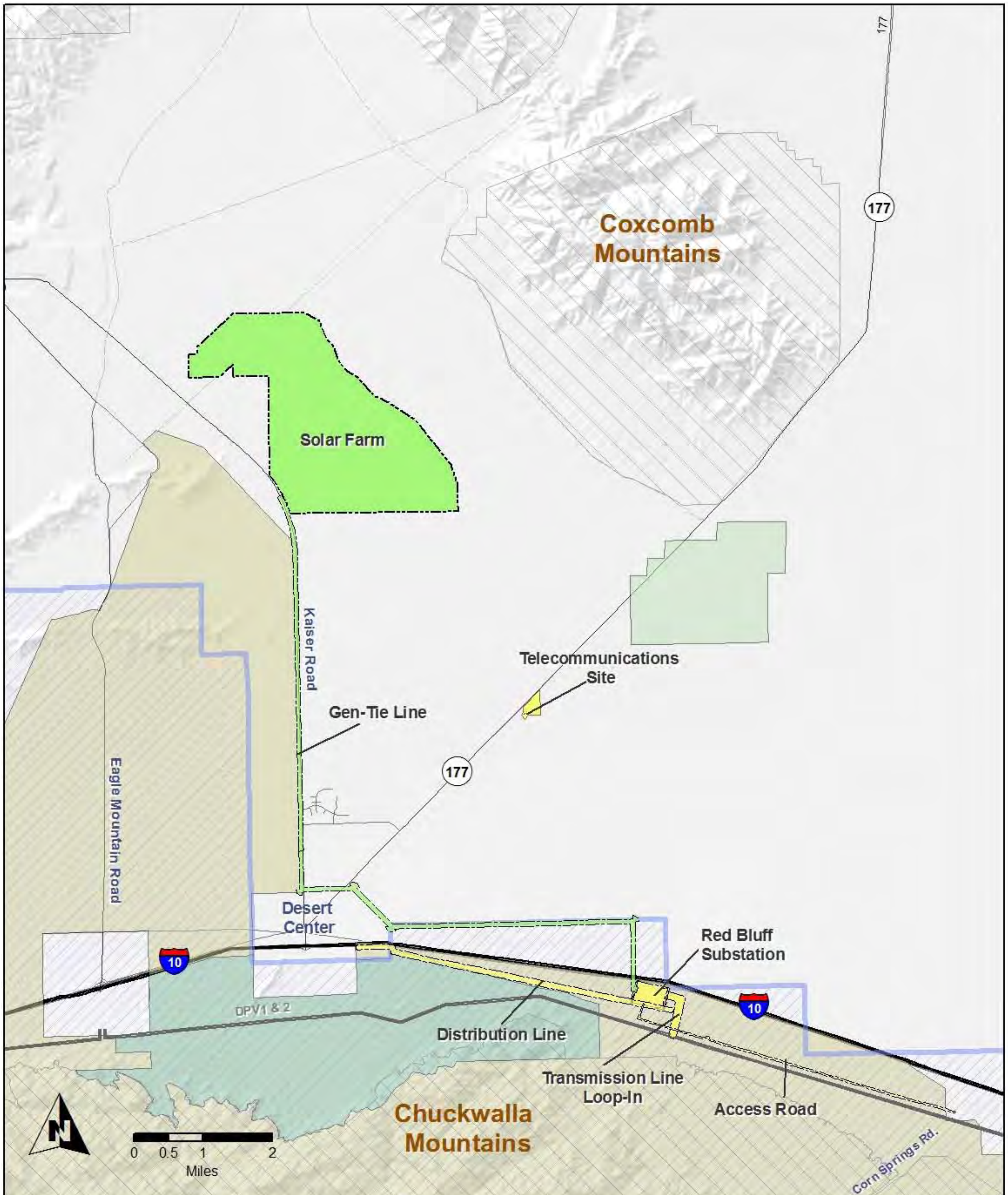


Figure 2
Project Components

Prepared by Ironwood Consulting, Inc. - Dec 16, 2010

2.0 Weeds

According to the California Native Plant Society (CNPS 2010) invasive weeds are the second greatest threat to biodiversity and ecosystems after human caused habitat destruction.

2.1 Definitions and Assessments

Weeds are defined for this document as species of non-native plants that are included on the weed lists of the California Department of Food and Agriculture (CDFA, 2007), BLM's National List of Invasive Weed Species of Concern (2008), and the California Invasive Plant Council's (Cal-IPC) Invasive Plant Inventory (2006, updated 2007).

The CDFA maintains California's Noxious Weed List and defines a noxious weed as any plant or plant product that can directly or indirectly injure or cause damage to crops (including nursery stock or plant products), livestock, poultry, or other interests of agriculture, irrigation, navigation, the natural resources of the United States, the public health, or the environment. James, et al. (1991) defines a noxious weed as a plant that grows out of place and is "competitive, persistent, and pernicious."

Invasive weeds are not legally defined but they are commonly categorized based on their proven ability to invade and dominate natural landscapes, and on the economic or ecological damage they cause. All noxious weeds are invasive, but the reverse is not always true. Many invasive weeds have not been added to California's Noxious Weed List because they do not impact agriculture or because they are a low priority for regulatory action.

BLM's Weed Risk Assessment uses two factors to calculate the risk score of a weed species: (1) the likelihood of a weed spreading to a project area, and (2) the consequence of a weed becoming established in a project area. These two factors multiplied together provide a score, which can range from 0 to 100; specific management actions are assigned for each and value ranging from none (0), low (1-10), moderate (25), to high (50-100). Specific management actions are then assigned to the project to address the assessed rating, up to and including modifying the project to reduce the risk level through preventative management measures.

The 2006 Cal-IPC Invasive Plant Inventory rates non-native species according to degree of invasiveness using 13 different criteria and scoring them according to: (1) ecological impact, (2) invasive potential, and (3) distribution. Each of the three categories are interpreted as A=high, B=moderate, C=limited, D=none, and U=unknown. The documentation level for each species is based on the average level of references used to evaluate a particular species from 0 (no information) to 4 (all information). These three categories reflect the level of each species' negative ecological impact on California wildlands and are generally accepted in California as a reliable measure of a plant species' potential harmfulness:

High – "These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically."

Moderate – "These species have substantial and apparent-but generally not severe-ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread."

Limited –"These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic."

These categories are based upon statewide cumulative trends and the actual harm caused by invasive species may be more or less severe at local levels.

2.2 Weed Identification and Risk Assessment

Consistent with BLM guidelines for weed management (BLM's 1992 Integrated Weed Management Manual 9015), a weed risk assessment was conducted for each component of the Project that involves soil disturbance and/or alteration of site vegetation. An explanation of the risk assessment process is provided in Attachment 1.

A total of eleven weed species were identified during full coverage surveys of the Project components conducted in spring 2010, as shown in Table 1. Those shaded were found on the Proposed Action area of the Project and the others are addressed here as species that are known from the Project area. Figures 3 through 5 show the locations of those weeds found on the Proposed Action.

Table 1 All Weed Species found during Project Surveys

Common Name ***Scientific Name***	**Project Locations**
Sahara mustard *Brassica tournefortii*	Found throughout all project components and all areas adjacent to the Project
Red brome *Bromus madritensis* ssp. *rubens*	Found only along the SCE access road
Bermuda grass *Cynodon dactylon*	Found only along Gen-Tie Alternatives B-1 and B-2
Cape marigold *Dimorphoteca sinuata*	Found only on the northern portion of the Solar Farm Site
Foxtail barley *Hordeum murinum*	Found only on the SCE telecommunications site
Prickly lettuce *Lactuca serriola*	Found only in a small area of the Solar farm Site (Figure 3)
Russian thistle *Salsola tragus*	Found only along Gen-Tie alternative A-2
Mediterranean grass *Schismus arabicus*	Found on western side of Solar Farm Site and Gen-Tie A-1
Mediterranean grass *Schismus barbatus*	Found throughout all project components and all areas adjacent to the Project
Athel *Tamarix aphylla*	Found only along Gen-Tie alternative A-2
Six weeks fescue *Vulpia bromoides*	Found on northern portion of Solar Farm Site, Gen-Tie alternatives A-1, A-2, and B-1; and at the SCE western access road and substation alternative B

2.2.1 Solar Farm Site and Gen-Tie Line

Seven non-native weed species are known to occur on or near the Solar Farm Site and proposed A-1 Gen-Tie Line Corridor with two of these (Sahara mustard and Mediterranean grass) found widespread through the Solar farm Site and adjacent areas. These species and their Cal-IPC scores are listed below in Table 2 and depicted in Figures 3 and 4. Saharan mustard, red brome, and the Mediterranean grasses are included on BLM's National List of Invasive Weed Species of Concern.

Table 2. Weeds found on and near the Sunlight Project Components and their Cal-IPC Scores

Common Name ***Scientific Name***	**Impact**	**Invasiveness**	**Distribution**	**Documented Level**
Sahara mustard *Brassica tournefortii*	A High	A High	B Moderate	2.3
Bermuda grass *Cynodon dactylon*	B Moderate	B Moderate	B Moderate	3.3
Cape marigold *Dimorphotheca sinuate*	D None	C Limited	B Moderate	1.8
Prickly lettuce *Lactuca serriola*	D None	B Moderate	B Moderate	3.1
Mediterranean grass *Schismus arabicus*	B Moderate	C Limited	A High	2.3
Mediterranean grass *Schismus barbatus*	B Moderate	C Limited	A High	2.3
Six-weeks fescue *Vulpia bromoides*	D None	C Limited	B Moderate	2.9

1. **Sahara mustard** (*Brassica tournefortii*) is a winter annual that grows in desert, desert dunes, and coastal scrub. It germinates and flowers earlier than most native forbs and tends to crowd them out and displace them in the landscape over time. Cal-IPC considers this plant highly invasive, and it is one of the weed species of greatest concern to desert land managers throughout the southwest.

   Risk: Sahara mustard is rated high for likelihood of spread and moderate for consequence of spread. Adverse effects onsite and possible expansion of infestation with Project implementation are possible. Cumulative effects on local native plant communities are likely but limited.

   Spread could occur from the soil disturbance that comes with clearing and grubbing of vegetation and from plants with dried seed pods tumbling in the wind. Seeds can also be transported to the project site on vehicle tires and potentially on workers' footwear and clothing. This species is already widespread throughout the Chuckwalla Valley and other desert regions of southern California and increases in its spread would likely be into areas already supporting this species. However, the spread of *B. tournefortii* can be reduced by controlling it along roads, which provide corridors for rapid invasion into new habitats. In small areas Sahara mustard can be eradicated by pulling plants before they bolt and set seed or by herbicide treatment using the wick method on seedlings. This is most effective in new invasions where a seed bank has not been established.

2. **Bermuda grass** (*Cynodon dactyon*) is a creeping perennial grass commonly used in gardens and lawns. Bermuda grass can escape cultivation and out-compete native species where it forms large dense mats. It is found throughout the California deserts, particularly in washes. Cal-IPC considers

this plant moderately invasive.

Risk: Bermuda grass is rated moderate for likelihood of spread and moderate for consequence of spread as the seeds of this species disperse by wind and can remain viable for several years. Adverse effects onsite and possible expansion of infestation with Project implementation are possible. Cumulative effects on local native plant communities are likely to be limited.

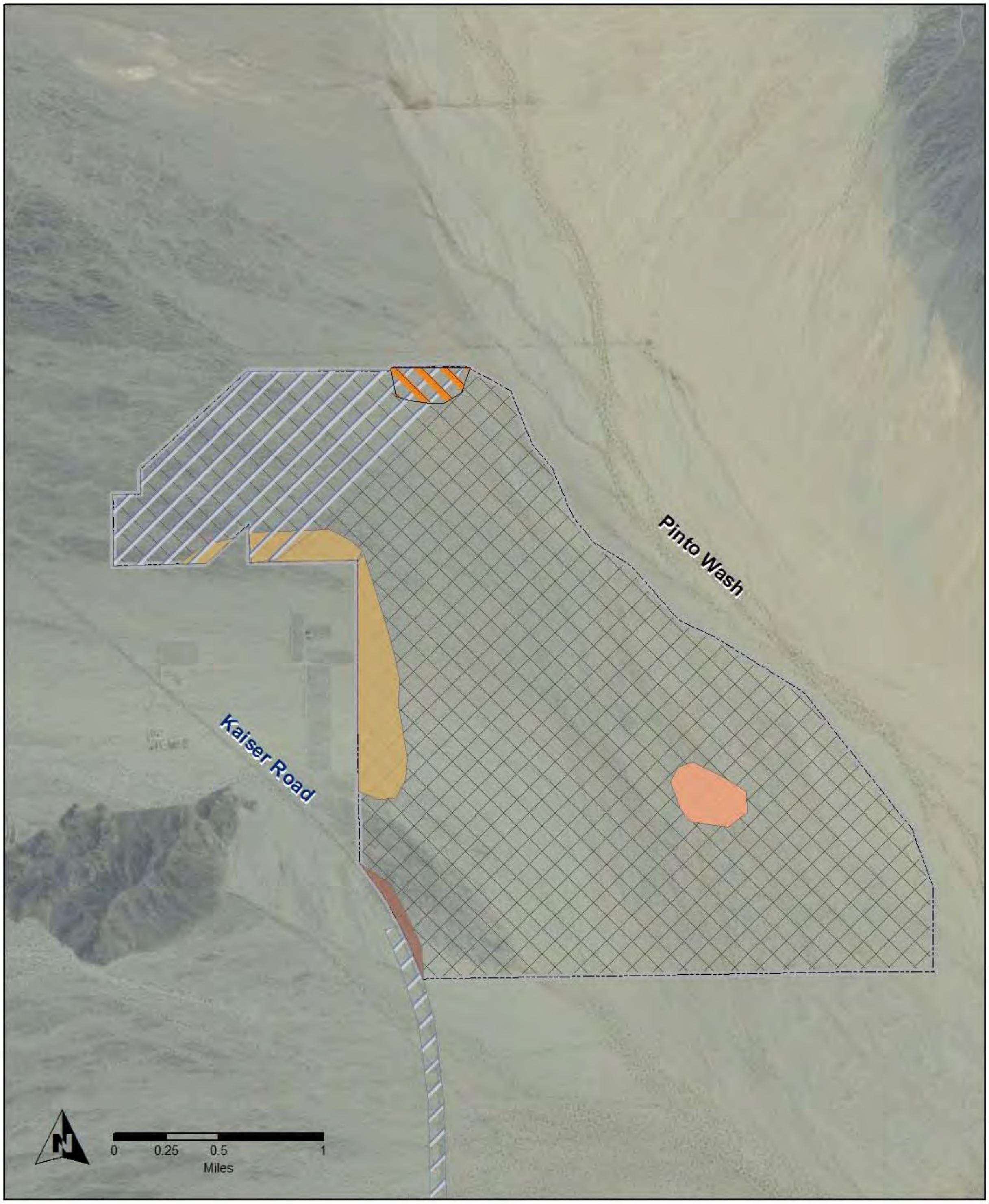
Spread could occur from the soil disturbance that comes with clearing and grubbing of vegetation and from plants with dried seed pods tumbling in the wind. Seeds can also be transported to the project site on vehicle tires and potentially on workers' footwear and clothing. This species is already widespread throughout the Chuckwalla Valley and other desert regions of southern California and increases in its spread may be into areas already supporting this species. However, the spread of Bermuda grass can be reduced by controlling it along roads, which provide corridors for rapid invasion into new habitats.

3. **Cape marigold** (*Dimorphotheca sinuata*) is an annual herb known to invade many arid habitats in southern California. This species is often cultivated in gardens and now is found as an invasive species in areas under 1,000 feet elevation. Cal-IPC considers this plant limited in invasive potential,

   Risk: Cape marigold has no rating for likelihood or consequence of spread. The vast majority of seeds from this species fall at the base of the plant as the seeds of this species do not have features that facilitate wind dispersal. However, wind levels in the Chuckwalla valley can reach extremely high levels and could facilitate dispersal of this species if these high winds occur at the same time as seeds dispersal of this species.

4. **Prickly lettuce** (*Lactuca serriola*) grows in disturbed areas. Cal-IPC evaluated this but did not include in their Invasive Plant Inventory. Although it is not listed by Cal-IPC, it is a non-native species that has become naturalized in the wild (Cal Flora 2010).

   Risk: Prickly lettuce is rated low for the likelihood of spread and low for the consequence of spread. It is highly likely that this species could invade adjacent wildlands because its seeds are windborne. Although prickly lettuce is not listed as a weed of concern on any of the lists used for this Project, BLM considers it a species that should be treated and removed from the Project site so that it does not spread into the adjacent wildlands.



Solar Farm
Lactuca serriola
Schismus arabicus
Schismus barbatus and Brassica tournefortii
Vulpia bromoides
Dimorphotheca sinuata
Salsola tragus

DESERT SUNLIGHT
SOLAR FARM PROJECT
DESERT SUNLIGHT HOLDINGS, LLC

Figure 3
Weed Distribution
Sunlight Components
Solar Farm

Schismus barbatus and Brassica tournefortii

Solar Farm

Vulpia bromoides

Schismus arabicus

DESERT SUNLIGHT
SOLAR FARM PROJECT
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Figure 4
Weed Distribution
Sunlight Components
Gen-Tie Line

5. **Mediterranean grasses** (*Schismus barbatus; S. arabicus*) are annual grasses found in both central and southern California particularly in disturbed areas and deserts. They contribute to the conversion of the desert shrubland into annual grassland by carrying fire across open areas, where they ignite and kill shrubs. Cal-IPC considers this plant to have limited invasive potential.

   Risk: Mediterranean grasses are rated high for likelihood of spread and moderate for consequence of spread. Spread could occur due to soil disturbance and vegetation cutting that may disperse seeds, as well as from vehicle tires and footwear. *Schismus barbatus* is already widespread throughout the Chuckwalla Valley and other desert regions of southern California and increases in its spread would likely be into areas already supporting this species. *Schismus arabicus* is currently found only in one isolated area of the Solar Farm Site (Figure 3) and is not widespread throughout other Project components.

6. **Six weeks fescue** (*Vulpia bromoides*) is an annual grass that grows in many areas of California and has replaced native perennial grasses in many areas of the state. Cal-IPC considers this plant limited in invasive potential. This species may hybridize with the native six weeks fescue (*Vulpia octoflora* var. *octoflora*) also found on the Solar Farm Site. The spread of this species and other annual grasses in the California deserts is a likely contributor to increased fire potential.

   Risk: Six weeks fescue has no rating for likelihood or consequence of spread. The non-native six weeks fescue does not spread quickly in native habitats but may spread more quickly in disturbed areas, such as those potentially created by Project activities.

2.2.2 Red Bluff Substation and Related Components

Four non-native weed species are known to occur in the areas that would be occupied by Red Bluff Substation and related components (Proposed Action of substation A and Gen-Tie A-1). These species are identified below on Table 3 and depicted on Figure 5. Except foxtail barley, the species in Table 3 are included on BLM's National List of Invasive Weed Species of Concern (BLM 2008).

Table 3. Weeds Found on the SCE Project Components and Their Cal-IPC score

Common Name ***Scientific Name***	**Impact**	**Invasiveness**	**Distribution**	**Documented Level**
Sahara mustard *Brassica tournefortii*	A High	A High	B Moderate	2.3
Red brome *Bromus madritensis* ssp. *rubens*	A High	B Moderate	A High	3.0
Foxtail barley *Hordeum murinum*	B Moderate	B Moderate	B Moderate	2.8
Mediterranean grass *Schismus barbatus*	B Moderate	C Limited	A High	2.3

1. **Sahara mustard** (*Brassica tournefortii*) risk factors are discussed in Section 2.2.1.
2. **Red Brome** (*Bromus madritensis* ssp. *rubens*) is found throughout California and invades disturbed areas as well as native habitat. Cal-IPC considers this plant highly invasive. It is a cool-season annual grass, emerging in early winter following rainfall and remaining largely quiescent until early spring when rainfall and higher temperatures stimulate growth and flowering. Plants continue to flower until water stress kills them, typically in mid-may (Bossard et al. 2000). Red brome is spreading rapidly in

desert shrub lands, pinyon pine-juniper communities, three-needle pine woodlands, and coastal scrub, where it increases fire frequency and converts habitat to annual grasslands.

Risk: Red brome is rated high for likelihood of spread and moderate for consequence of spread. Spread could occur due to soil disturbance and clearing and grubbing of vegetation that may disperse seeds, as well as from vehicle tires and workers' footwear and clothing. This species is already widespread throughout the Chuckwalla Valley and other desert regions of southern California and increases in its spread would likely be into areas already supporting this species. It becomes extremely competitive with other grasses and displaces native species. Red brome can produce large amount of biomass that increase the amount and continuity of fine fuels. The lack of a soil seed bank provides one avenue of control for this species (Global Invasive Database 2010). Removal methods include hand-pulling (not practical over large expanses) and herbicide treatment.

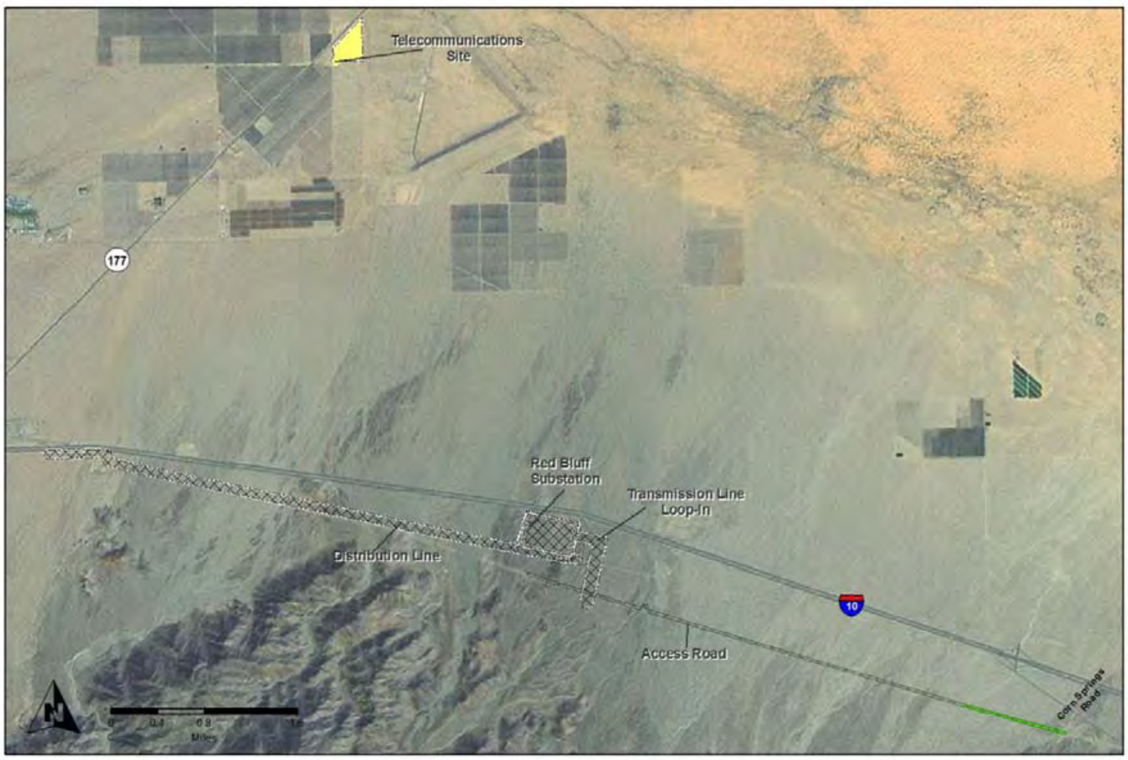

Figure 5
Weed Distribution SCE Components

3. **Foxtail barley** (*Hordeum murinum*) is an annual grass that grows in many areas of California and has contributed to the replacement of native perennial grasses in many areas of the state. Cal-IPC considers this plant to have moderate invasive potential. The spread of this species and other annual grasses in the California deserts is a likely contributor to increased fire potential where they occur in high densities.

Risk: foxtail barley has a moderate rating for likelihood and consequence of spread. This species can disperse with wind or because it attaches to clothing or animal fur, and may also be found in hay bales.

4. **Mediterranean grass** (*Schismus barbatus*) risk factors are discussed in Section 2.2.1.

2.2.3 Other Weed Species Found in Nearby Areas

Three additional non-native weed species are known to occur in nearby areas. These species are identified below in Table 4 and are discussed here because they are known from the Project region and have the potential to colonize Project components. Bermuda grass and athel are included on BLM's National List of Invasive Weed Species of Concern (BLM 2008).

Table 4. Other Weeds Found and Their Cal-IPC score

Common Name *Scientific Name*	**Impact**	**Invasiveness**	**Distribution**	**Documented Level**
Bermuda grass *Cynodon dactylon*	B Moderate	B Moderate	B Moderate	3.3
Russian thistle *Salsola tragus*	C Limited	B Moderate	B Moderate	2.8
Athel *Tamarix aphylla*	C Moderate	B Moderate	B Moderate	3.5

1. **Bermuda grass** (*Cynodon dactylon*) is a creeping perennial grass that, in native habitats, can out-compete native species, especially in riparian areas. Cal-IPC considers this plant moderately invasive. **Risk:** Bermuda grass is rated low for likelihood of spread and low for consequence of spread. Under the desert conditions present at the Project site and associated transmission line corridors, the rating for consequence of spread for Bermuda grass is low (Cal-IPC 2006). Bermuda grass is adapted to survive both extended dry periods and flooding conditions (Global Invasive Database 2010).

2. **Russian thistle** (*Salsola tragus*) tends to be associated with disturbed and cultivated areas, such as road edges and abandoned agricultural fields. This species was found along Gen-Tie alternative A-2 in areas of abandoned agriculture. This plant can crowd and shade out native species but can also act as a temporary nursery plant for later stage species colonizing disturbed areas. Cal-IPC considers this plant to have moderate invasive potential.

   Risk: Russian thistle is moderate for likelihood of spread and low for consequence of spread. Seeds of this species are dispersed by wind but this plant does not colonize areas for extended periods of time. Russian thistle may increase the risk of fire in areas where it is present.

3. **Athel** (*Tamarix aphylla*) tends to be associated with riparian habitats and is less invasive than other tamarisk species**.** Cal-IPC considers this plant to have limited invasive potential.

   Risk: Athel was only present on the A-2 Gen Tie Line alternative and is rated moderate for likelihood of spread in the areas of the A-2 Gen-Tie Line alternative, and low for consequence of spread.

3.0 Roles and Responsibilities

The Applicant and SCE will each appoint an Environmental Compliance Manager and Designated Biologist who will be responsible for the implementation of weed control (Section 4.0) and management and long-term monitoring and reporting (Section 5.0). If at any time a change is proposed to the Environmental Compliance Manager and/or Designated Biologist, the Applicant and SCE will obtain concurrence with the experience of new personnel from BLM, USFWS, and CDFG.

3.1 Environmental Compliance Manager

The Environmental Compliance Manager (ECM) will be independently or jointly assigned by the Applicant and SCE for their components of the Project. The ECM will be responsible for facilitating the implementation of all environmental management components of the project, including avoidance, minimization and mitigation measures for air quality, water quality and streambed permits, and other biological permits. The name, contact info, and qualifications of the ECM(s) will be listed in the Project's *Final Biological Resources Mitigation, Implementation, and Monitoring Plan*.

The ECM will have specific experience in the implementation of similar environmental compliance programs. The ECM will complete an extensive training program with the Project's Designated Biologist(s) and work closely together to ensure compliance with all environmental avoidance, minimization, and mitigation measures for the Project.

3.2 Designated Biologist

The Designated Biologist (DB) will be independently or jointly assigned by the Applicant and SCE for their components of the Project. The DB will be responsible for facilitating the implementation of avoidance, minimization and mitigation measures for streambed permits and other biological permits.

The name, contact info, and qualifications of the DB(s) will be listed in the Project's *Final Biological Resources Mitigation, Implementation, and Monitoring Plan* and their resume(s) will have been previously confirmed by BLM, USFWS, and CDFG as appropriate individuals for this position.

The DB will have specific experience in the implementation of similar environmental compliance programs. The DB will complete an extensive training program with the Project's ECM(s) and work closely together to ensure compliance with all biological avoidance, minimization, and mitigation measures for the Project. In addition, the DB will hold a Bachelor's or higher degree in Biological Sciences, Zoological Sciences, or a related field and will have at least five years of field experience in California desert habitats.

4.0 Weed Control

Weed management areas will include the Solar Farm Site and Gen-Tie Line. Project activities that could spread or introduce weeds include:

- Soil disturbance during construction will provide areas for the introduction of invasive species adapted to disturbance.
- Areas where soil is de-compacted post-construction will also be areas of potential for weed invasion and establishment.

Other areas that are paved, graveled, or covered with a dust suppressant are not likely to provide substrates suitable to vegetation growth.

Preventative measures discussed here apply to both the Applicant and SCE and are the Best Management Practices that will be employed by the Project in order to avoid and minimize the spread of weeds. Measures to minimize the introduction of new weed species and the spread of existing weed populations by Project personnel and equipment will be used on any areas that may support weed populations. Project development may increase the density of existing weed species in areas of soil disturbance. Because Sahara mustard and red brome (only on the proposed SCE access road) occur within the Project area, the control and suppression of these species will be planned and implemented to keep their populations from spreading or increasing in numbers.

Control measures will be essential to prevent the spread of identified weed species within the Project area. BLM Manual Section 9015 (BLM 1992) states that projects with weeds that have at least one moderate or high risk rating should develop preventative management measures. This will apply to Sahara mustard and red brome. Mediterranean grass, while receiving a high rating, is a dominant and widespread annual throughout the Mojave and Colorado Deserts and is unlikely to be controlled easily; however, control methods will be used to prevent the spread of this species from project components into the adjacent wildlands whenever possible.

4.1 Preventative Measures

Preventative measures to be implemented by the Applicant and SCE to prevent the spread of weed seeds and vegetative reproductive structures (such as rhizomes) and inhibit their germination include the following. All of these measures apply throughout the construction and operations and maintenance (O&M) phases of the project except the first, which is specific to the construction phase.

Limiting disturbance areas during construction to the minimum needed to perform work

Soil management will consist of limiting ground disturbance to the minimum necessary for construction activities and using dust suppressants to minimize the spread of seeds with fugitive dust. Disturbed vegetation and topsoil will be re-deposited at or near the area from which they are removed to eliminate the transport of soil-borne weed seeds, roots, or rhizomes. Dust suppressants (e.g. water and/or palliative) will be minimized on the site as much as possible, but will be used during construction to minimize the spread of airborne weed seeds, especially during very windy days.

Providing training to all project personnel on limiting weed spread and colonization

Weed management will be part of mandatory site training for all construction personnel and will be included in initial Environmental Awareness training briefings. Training will include weed identification and threat impacts including impacts to local agriculture, vegetation communities, wildlife, and creating fire potential. Training will also cover the importance of preventing the spread of weeds.

Limiting entrance and exit to defined routes

All vehicles and personnel entering and exiting the site will do so via defined routes of travel and established gates.

Maintaining and using vehicle wash and inspection stations

To prevent the spread of weed species into new habitats, and prior to entering the Project work areas, construction equipment will be cleaned of dirt and mud that could contain weed seeds, roots, or rhizomes. All equipment will be inspected to ensure it is free of any dirt or mud that could contain weed seeds; the tires, and undercarriage of each vehicle will be carefully washed, with special attention being paid to axles, frame, cross members, motor mounts, underneath steps, running boards, and front bumper/brush guard assemblies. Other construction vehicles (e.g. pick-up trucks) that will be frequently entering and exiting the site will be inspected and washed on an as-needed basis.

An off-site washing station will be used. This wash station will contain all waste water and debris; the water may be filtered for reuse. High-pressure water or air will be used to clean equipment and the water and debris contained and filtered for reuse it possible. The cleaning site will be situated away from any sensitive biological resources.

Additionally, the treads of workers footwear will also be inspected and washed prior to entering the project area. If footwear is not worn off-site, it will not be required to be re-washed until after being worn off the Project site.

Closely monitoring the types of materials brought onsite to minimize the potential for weed introduction

Any use of hay or straw bales on the Project site will be limited to certified weed-free material. Other products such as gravel, mulch, and soil may also carry weeds and these products, too, will be certified weed-free. If needed, mulch will be made from the local, on-site native vegetation cleared from the Project area. Soil will not be imported onto the Project site from off-site sources.

4.2 Containment and Control Measures

These methods will be implemented if Project monitoring (Section 4.0) indicates weeds are spreading. Personnel responsible for weed control will be trained in the proper and safe use of all equipment and chemicals used for weed control and comply with applicable county standards for herbicide treatment and disposal.

Mechanical Removal and Herbicides

The Project will use the most appropriate removal method for the species being treated including mechanical removal methods and the use of herbicides (during appropriate weather conditions only). During suppression or eradication activities, care will be taken to prevent herbicide drift and weed seed dispersal to reduce the affect of these activities on native plant species and adjacent wildlands.

Herbicides used will be limited to those approved by the BLM. Currently, only glyphosate compounds such as RoundUp™, a post-emergent herbicide, are recommended by the Desert District of the BLM (Anthony Chavez, personal communication, 2010). Post-emergent herbicides are applied to growing plants. Timing of herbicide application is critical and should be applied before the plants bolt, flower and set seed.

All herbicide treatments shall conform to the Herbicide Treatment Standard Operating Procedures included as Appendix B of BLM's Final Vegetation Treatments Using Herbicides Programmatic Environmental Impact Statement (2007), available at: http://www.blm.gov/wo/st/en/prog/more/veg eis.html.

Woody Vegetation

The only documented woody invasive weed species encountered during surveys was athel and it was found in very low numbers on the A-2 alternative Gen-Tie Line. If this species is found on any Project components during construction, operations and maintenance, or decommissioning then the athel will be removed by cutting the trees and applying Garlon™ Ultra Herbicide to the stump immediately after cutting. Garlon™ is approved for use on athel by the BLM. All cut material generated during athel clearance will be removed from the site by truck. This material will be covered with a tarp or other material that will keep athel cuttings or seed from being spread by truck movement.

5.0 Long-Term Monitoring and Reporting

BLM Manual Section 9015 (BLM 1992) states that projects with existing weeds that have at least a moderate risk rating should be monitored for at least five consecutive years, including the potential for follow-up weed control. These measures will apply to the full Project area. The purpose of long-term monitoring will be to determine if weed populations identified during baseline surveys have increased in density or spread as a result of the Project or if new weeds are present that were not previously detected.

5.1 Long-Term Monitoring

5.1.1 Pre-Construction to 5-years Post-Construction

Establishing Monitoring Plots

Baseline weed conditions will be re-assessed in the pre-construction phase of the Project using a full census technique (full coverage survey) that allows for detection and quantification of all weed species on each project component. This will update these 2010 baseline weed conditions on all project components and establish acreages of these species immediately prior to construction.

Plots will be established for long-term monitoring of weeds. Each plot will be 20 meters by 100 meters (2,000 square meters or 0.2 hectare) in size. Plots will be placed within all areas where weeds were identified during the pre-construction surveys with an interval of one plot per 100 acres of weed coverage (with the exception of weeds that are widespread throughout the Project and would be covered in all other plots). In addition, a random sampling of 10 plots will be established within the Project site, the 30 meter buffer area, and in similar habitats within two miles of the Project boundaries (as controls). Plots outside the project boundaries and buffer areas will be assessed for pre-construction baseline weed conditions.

SCE will place two such plots across the access road west of the area now supporting red brome to monitor the potential spread of this species.

Plot surveys will be full coverage with all native plant and weed species identified, tallied, and mapped within the plot.

Monitoring

Plot surveys will take place at all plots annually during construction, and annually for five years following the completion of construction, between March 1 and May 1 and after annual germination for that year. All results will be mapped in Geographic Information Systems (GIS) to show progression of weed status over time at the Project area.

Weed Control

Eradication of certain existing weed species is not possible due to their current prevalence in the region (i.e., Mediterranean grass, Sahara mustard, red brome). However, the Applicant and SCE are committed to ensuring that their activities do not worsen existing regional conditions. Control methods (Section 4.2) will be implemented both proactively when weeds are sighted incidental to normal daily activities onsite and when measureable weed increases (greater than 5% of baseline) are identified by long-term monitoring. This will include even small patches of unusually high density (e.g., concentrations in swales) that are growing as a result of Project activities.

5.1.2 5-Years Post-Construction to Project Decommissioning

At the end of the five year post-construction monitoring period, weed monitoring and necessary remedial weed treatment will be conducted throughout the life of the project to ensure that the project does not foster the introduction of new weed species or the spread of existing species into adjacent wildlands.

If Project components meet success criteria at the time of five year post-construction, plots will then be checked on a rotating basis where each plot is visited no less than once every five years. If Project Components do not meet success criteria the time of five year post-construction, plots will then be checked every two years until success criteria are met. Weed control will be the same as identified above for the first phase of weed control procedures.

In addition, during this phase of the Project, general management and monitoring of the Project area will be conducted by site personnel incidental to their daily activities on the Project site, during both the germinating and early growing season (November through April) to identify and eliminate new weed individuals prior to seed set. Throughout construction and long-term monitoring, personnel will be trained to identify the difference between weeds and native species.

5.1.3 Success Standards

Weed assessment and control will be an ongoing annual event on the Project site and all project components for the life of the Project, but the success of the post-construction monitoring plan will be determined by BLM after completion of the five years of post-construction monitoring.

Success criteria will be defined as having no increase in a weed species or in overall weed cover in any part of the Project over the life of the project. Thus, some areas may be considered successful at the end of the initial five-year monitoring period while other components may need additional weed control and monitoring for the life of the Project. Assessments of success on all Project components would be made annually for the life of the Project. Continued monitoring and control, with modified techniques as necessary, will be implemented through an adaptive management process if the plan is not demonstrating success after the initial five-year monitoring period.

5.1.4 Adaptive Management

Adaptive management may be employed whenever either new weeds are identified on project components or weeds previously identified show rates of spread that do not meet success criteria. Weeds not identified by field survey or previously reported for the area could colonize the site or site facilities, both during construction as well as during operation and maintenance. The Project's ECM or DB will be required to update the potential noxious and invasive weed list during the operations and maintenance phase of the project and provide monitoring and management appropriate to any new species in coordination with the BLM. At any point during the reporting process adaptive management measures may be developed to ensure successful weed treatment measures. Adaptive management will be reported by the Project's ECM or DB along with proposed management solutions that will be discussed with the BLM.

5.2 Reporting

Monitoring reports are required by the site owner and/or operator to evaluate monitoring results to determine if success standards are being met; and if not, to determine what adaptive control measures should be implemented and the rationale for the use of these measures and evaluation of the success of these measures.

5.2.1 Construction Reporting

Daily monitoring records will be kept by biological monitors that will include information relevant to invasive weeds. These results will be compiled weekly and monthly, and will be included in the annual reports as discussed below.

5.2.2 Annual Reports

Annual weed monitoring results will be presented in a report prepared following each of these surveys. These annual reports will include the following:

- Summaries of construction monitoring during the years of construction.
- Survey findings on location, type, spatial extent, and density of weeds. These data will include mapping and photographs, as well as textual and tabular data content to fully describe conditions on the Project site.
- Management efforts implemented, including date, location, type of treatment, and results within the Weed Management Areas.
- Ongoing evaluation of success of prevention and control measures.
- Additional control measures implemented and rationale for implementation.
- Any adaptive management techniques used during the reporting period.

Copies of these reports will be kept on file at the site and a copy of each annual report will be sent to the BLM for review and comment.

5.2.3 Five-Year Post-Construction Monitoring Report

After the initial five-year post-construction monitoring has been achieved, a comprehensive monitoring report will be produced to describe the outcome of weed management on the Project for this five-year period (using the same information provided in annual monitoring reports). This report will be submitted to the BLM for review who will evaluate the results and success of the program and determine if any additional monitoring or control measures are necessary.

5.2.4 Reporting Five-Years Post-Construction to Project Decommissioning

Because the weed monitoring program will continue for the life of the project, the Applicant will continue to submit summary reports to the BLM on the results of the program at five-year intervals (after all plots have been surveyed in a particular round of surveys), beginning the fifth year after submittal of the Five-Year Post-Construction Monitoring Report. This report schedule will continue until project decommissioning.

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Attachment 1

RISK ASSESSMENT FACTORS AND RATING RISK ASSESSMENT FACTORS

BLM MANUAL 9015

RISK ASSESSMENT FACTORS AND RATING

RISK ASSESSMENT

Factor 1 – Likelihood of Noxious Weed Species Spreading to Project Area

None
Noxious weed species not located within or adjacent to the project area. Project activity is not likely to result in the establishment of noxious weed species in the project area.

Low
Noxious weed species present in areas adjacent to but not within the project area. Project activities can be implemented and prevent the spread of noxious weeds into the project area.

Moderate
Noxious weed species located immediately adjacent to or within the project area. Project activities are likely to result in some areas becoming infested with noxious weed species even when preventative management actions are followed. Control measures are essential to prevent the spread of noxious weeds within the project area.

High
Heavy infestations of noxious weeds are located within or immediately adjacent to the project area. Project activities, even with preventative management actions are likely to results in the establishment and spread of noxious weeds on disturbed sites throughout much of the project area.

Factor 2 – Consequence of Noxious Weed Establishment in Project Area

Low to Nonexistent (1)
None. No cumulative effects expected.

Moderate (5)
Possible adverse effects on site and possible expansion of infestation within project area. Cumulative effects on native plant community are likely but limited.

High (10)
Obvious adverse effects within the project area and probable expansion of noxious weed infestations to areas outside the project area. Adverse cumulative effects on native plant community are probable.

RISK RATING

Step 1 – Identify level of likelihood and consequence of adverse effects and assign values according to the following:

None – 0
Low – 1
Moderate – 5

High – 10

Step 2 - Multiply level of likelihood times consequence.
Step 3 - Use the value resulting in Step 2 to determine Risk Rating and Action as follows:

Value/Risk Rating/Action

0 (None)
Proceed as planned.

1-10 (Low)
Proceed as planned. Initiate control treatment on noxious weed populations that get established in the area.

25 (Moderate)
Develop preventative management measures for the proposed project to reduce the risk of introduction or spread of noxious weeds into the area. Preventative management measures should include modifying the project to include seeding the area to occupy disturbed sites with desirable species. Monitor area for at least 3 consecutive years and provide for control of newly established populations of noxious weeds and follow-up treatment for previously treated infestations.

50-100 (High)
Project must be modified to reduce risk level through preventative management measures including seeding with desirable species to occupy disturbed sites and controlling existing infestations of noxious Weeds prior to project activity. Project must provide at least 5 consecutive years of monitoring. Projects must also provide for control of newly established populations of noxious weeds and follow-up treatment for previously treated infestations.

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Fall Plant Survey

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December 2010

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Ironwood Consulting Inc.
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Subject: Fall 2010 Sensitive Plant Surveys for the Proposed Desert Sunlight Solar Farm Project

This letter report presents information gathered during fall 2010 sensitive plant surveys of the proposed Desert Sunlight Solar Farm (DSSF or Project) conducted during the month of November 2010. The purpose of the surveys was to supplement botanical surveys performed in the spring of 2010 in order to further determine plant species present on the DSSF, particularly special-status plant species known to bloom in the fall. The surveys were conducted to support the ongoing environmental impact assessment and permitting process for the Project.

Eleven plant species not seen during the spring 2010 vegetation surveys were found during the fall surveys. None of these species hold special status either at the Federal, State, or agency level. Surveys were conducted on the alternative solar farm layouts , gen-tie line alternatives Ai, A2 and B2, Red Bluff Substation Alternatives A and B, the telecommunications site, the transmission line loop-in, and the access road from the Red Bluff Substation A site to Corn Springs road approximately 6 miles east. The areas surveyed are shown in Figure 2.

The Solar Farm site is approximately six miles north of the rural community of Desert Center and four miles north of Lake Tamarisk, between the cities of Coachella (to the west) and Blythe (to the east) (Figure 1). The Project area contains existing transmission lines, telephone lines and pipelines, as well as dirt roads. Joshua Tree National Park is located to the north, east, and west of the area; at its closest point, the Solar Farm site is approximately 1.4 miles southwest of the national park boundary. The inactive Eagle Mountain Mine is located approximately one mile to the west of the Solar Farm site.

Methods

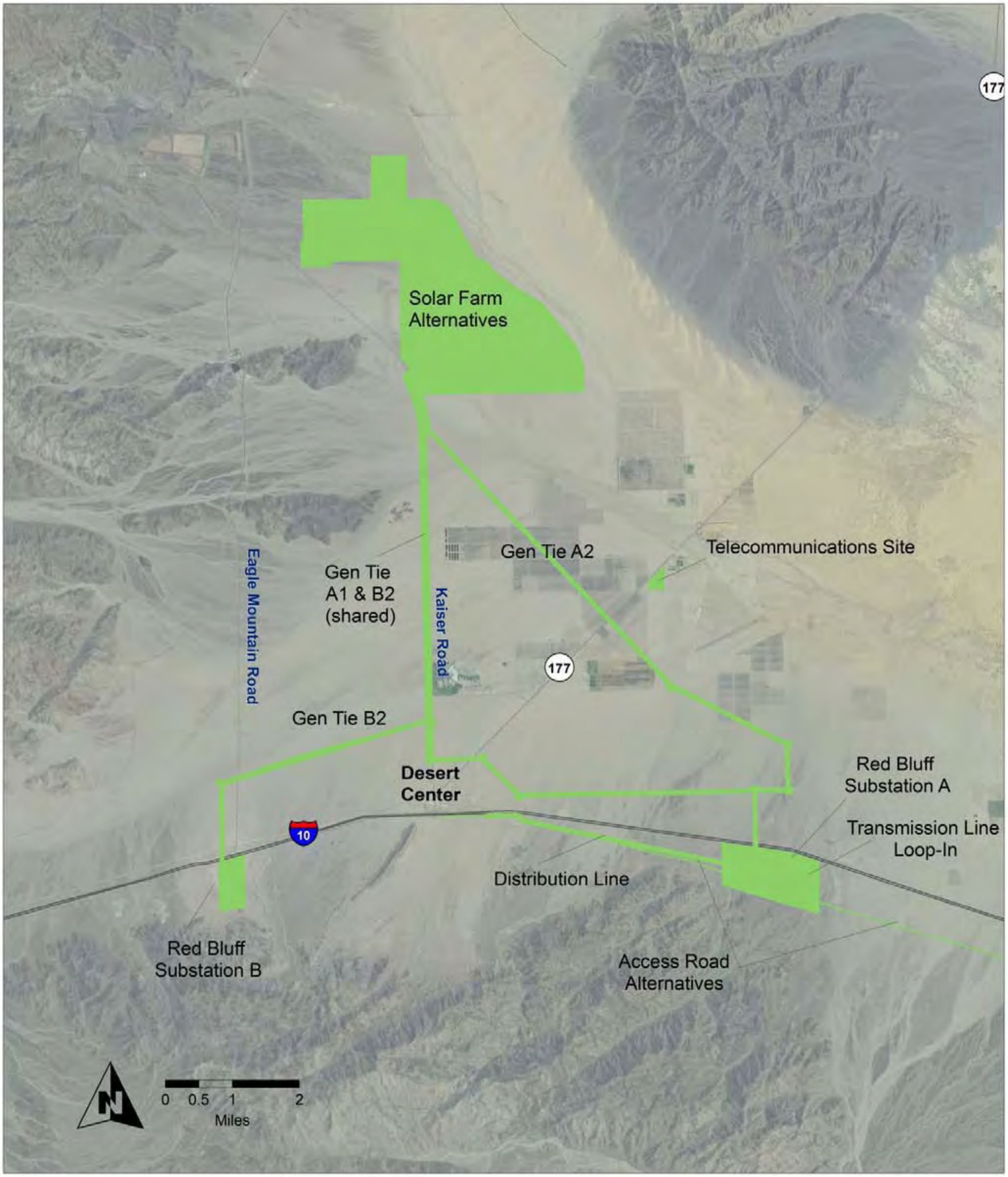
Fall 2010 special status plant surveys followed the *Survey Protocols Required for NEPA/ESA Compliance for BLM Sensitive Plant Species* (BLM 2009) and are an addendum to the vegetation surveys performed in spring 2010, which followed the BLM protocols and the *Protocols for Surveying and Evaluating Impacts to Sensitive Native Plant Populations and Natural Communities* (CDFG 2009). Spring 2010 surveys are discussed in further detail in the Project's Biological Resources Technical Report (BRTR; Ironwood Consulting 2010).

0 45 90 180
Miles

DESERT SUNLIGHT
SOLAR FARM PROJECT
FIRST SOLAR DEVELOPMENT, INC.

Figure 1
Regional Location

Prepared by Ironwood Consulting, Inc. - May 2010



Botanical Survey Area - Fall 2010

DESERT SUNLIGHT
SOLAR FARM PROJECT
FIRST SOLAR DEVELOPMENT, INC.

Figure 2
Survey Area
Botanical Surveys
Fall 2010

For assessment purposes in this report, a special status species has been defined as a plant that meets the following criteria:

- Species designated as either rare, threatened, or endangered by CDFG or the USFWS, and protected under either the California or Federal Endangered Species Acts;
- Candidate species being considered or proposed for listing under these same Acts;
- Species addressed in the Northern and Eastern Colorado Coordinated Management Plan and Final Environmental Impact Statement (NECO; BLM/CDFG 2002);
- Species Listed by the California Native Plant Society (CNPS) Lists 1, 2, 3, and 4 (which correspond to the CDFG's California Rare Plant Ranks); or
- Species considered endangered, threatened, or rare pursuant to California Environmental Quality Act (CEQA) Guidelines, Section 15380 (which also include CNPS Lists 1 and 2).
- Species listed as rare under the California Native Plant Protection Act (Fish and Game Code § 1900 et seq.).

Prior to conducting the fall site surveys, a literature search was performed in order to identify fall-blooming special status plant species with potential to occur within the Project area. The literature search included a review of the following:

- NECO;
- Biological Opinion (BO) for NECO (USFWS 2005);
- California Natural Diversity Data Base (CNDDB; CDFG 2010), (USGS Quads Victory Pass, East of Victory Pass, Desert Center, Corn Springs, and Sidewinder Well);
- California Native Plant Society's Electronic Inventory (CNPS 2010), (USGS Quads Victory Pass, East of Victory Pass, Desert Center, Corn Springs, and Sidewinder Well);
- Environmental documents prepared for the Palen and Genesis Solar Projects.

The list of special-status plant species historically known to occur in these quadrangles according to the CNDDB and the CNPSEI is shown in Appendix 2.

The surveys were conducted November 8 through November 12, 2010, by surveyors with experience in conducting plant surveys in the Colorado Desert and at the Project site (Botanists Kent Hughes and Tim Thomas, Brian Sandstrom, Lehong Chow, and Corey Mitchell who are experienced in Mojave/Sonora desert flora and participated in the spring plant surveys on the project site) using the intuitive controlled technique in which no formal transects are followed and efforts are concentrated in areas more likely to support plant species. Because the literature search did not identify any fall-blooming special-status plant species historically known to occur in the area, no reference populations were visited.

All plant species encountered were identified to species level whenever possible and voucher specimens were collected.

Results

Two native vegetation communities occur within the Project components: Sonoran Creosote Bush Scrub [Holland 1986; analogous in part to a *Larrea Tridentata* Shrubland Alliance (Sawyer and Keeler-Wolf 2010] and Desert Dry Wash Woodland [Holland 1986; analogous in part to a *Psorothamnus spinosus* Alliance (Sawyer and Keeler-Wolf 2010)]. Areas of disturbed, developed, and agricultural land also occur within the Project components.

The spring 2010 vegetation surveys followed above-average winter rainfall for the region. Over 190 plant species were detected during the spring surveys. A full plant list for the Project components is found in Appendix A. This list indicates whether each species was encountered during the spring surveys, fall surveys, or both. The indication of spring encountered species also found in the fall shows only those species that were blooming at the time of the fall surveys.

No federally or state-listed (threatened or endangered) plant species were found within the Project components during the spring surveys, although six otherwise sensitive (CNPS listing status and NECO-covered) plant species were found:

1. Crucifixion thorn (*Castela emoryi*)(CNPS List 2.3, NECO)
2. Las Animas colubrine or snakebush (*Colubrina californica*)(CNPS List 2.3, NECO)
3. Foxtail cactus (*Coryptantha alversonii*)(CNPS List 4.3, NECO)
4. California ditaxis (*Ditaxis serrata* var. *californica*)(CNPS 3.2 NECO)
5. Slender-spined althorn or crown-of-thorns (*Koeberlinia spinosa* ssp. *tenuispina*)(CNPS List 2.2, NECO)
6. Desert unicorn plant (*Proboscidea althaeifolia*)(CNPS List 4.3, NECO)

The fall 2010 vegetation surveys followed a series of rain storms in the area between four and six weeks prior to the surveys. No previously undiscovered sensitive plant species were found during these surveys. Eleven plant species not observed during spring surveys of the Project components were discovered during the fall surveys:

- fringed amaranth (*Amaranthus fimbriatus*)
- woolly bursage (*Ambrosia eriocentra*)
- fivewing spiderling (*Boerhavia intermedia)*
- slender spiderling (*Boerhavia triquetra)*
- Wright's boerhavia (*Boerhavia wrightii)*
- needle gramma (*Bouteloua aristidoides)*
- six-weeks gramma (*Bouteloua barbata)*
- Sonoran sand mat (*Chamaesyce micromera)*
- desert twin bugs (*Dicoria canescens)*
- warty caltrop (*Kallstroemia parviflora)*
- many bristle cinchweed (*Pectis papposa)*

Discussion and Recommendations

Plant surveys have been completed of all Project components during both the spring and fall blooming periods. These surveys are considered to provide sufficient information to complete the Project's environmental impact assessment and permitting process. No additional special status plant species were found in the fall survey, and the Project's potential impacts to special status plant species are therefore unchanged from those discussed in the Project's Draft Environmental Impact Statement, which was based on results of previous surveys, including those competed in Spring 2010.

Prior to Project construction, a Project biologist will survey areas of proposed ground disturbance for special status plant species and cacti during the appropriate blooming period for those species having potential to occur in the construction areas. Special status plant species and cacti observed will be flagged for transplantation, which will be implemented following procedures to be outlined in the Project's *Vegetation Salvage Plan*.

Sincerely,

Kent Hughes, Botanist
424 Elder Drive
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Appendix A

Plant List from Desert Sunlight Surveys

Scientific Name	Common Name	N SITE	S SITE	East Access Road	A1	A2	B2	Telecom Site	SUB A	SUB B
Abronia villosa	sand verbena	S	S		S	S		S		
Acacia greggii	catclaw acacia	S		S	S	S	S			S
Achyronychia cooperi	frost mat	S	S	S	S	S	S	S		
Allionia incarnata	windmills			S	S		S		SF	F
Amaranthus fimbriatus	fringed amaranth	F	F							F
Ambrosia dumosa	burro bush	SF	S	S	S	S	S	S	SF	SF
Ambrosia eriocentra	woolly bursage									
Ambrosia ilicifolia	holly-leaf ambrosia			S	S					
Amsinckia tessellatta	fiddleneck	S	S	S	S	S	S		S	S
Antirrhinum filipes	twining snapdragon	S	S	S	S	S	S		S	S
Argemone munita	prickly poppy									
Aristida adscensionis	six-weeks three awn	F								F
Aristida purpurea	three awn	S					S			S
Asclepias erosa	desert milkweed	S	S				S	S		
Asclepias subulata	rush milkweed	SF	S	S		F	S			SF
Atrichoseris platyphylla	gravel ghost			S		S	S			
Atriplex polycarpa	cattle spinach					S				
Bebbia juncea	sweetbush	SF	S	S	SF	S	S		SF	SF
Boerhavia intermedia	fivewing spiderling	F	F							F
Boerhavia triquetra	slender spiderling	F	F							
Boerhavia wrightii	Wright's boerhavia	F	F							F
Bouteloua aristidoides	needle gramma									F
Bouteloua barbata	six-weeks gramma									
Brandegea bigelovii	brandegea	S	S	S	S	S	S		S	F
Brassica tournefortii	Saharan mustard	S	S	S	S	S	S	S	S	S
Bromus madritensis rubens	red brome			S						
Calycoseris wrightii	white-tack stem	S	S	S	S	S	S	S	S	S
Calyptridium monandrum	pussy-toes		S							
Camissonia boothii	Booth's primrose	S	S	S	S	S	S	S		S
Camissonia brevipes	golden evening primrose	S	S	S	S	S	S	S	S	S

S = observed during spring surveys
F = observed during fall surveys
SF = observed during spring and fall surveys

red = non-native species
bold = sensitivespecies

Scientific Name	Common Name	N SITE	S SITE	East Access Road	A1	A2	B2	Telecom Site	SUB A	SUB B
Camissonia californica	California suncup		S	S	S		S			
Camissonia chamaenerioides	longfruit suncup	S								
Camissonia claviformis	brown-eyed evening primrose	S	S	S	S	S	S	S		S
Camissonia pallida	pale suncup	S	S							
Camissonia refracta	narrow-leafed suncup			S	S	S	S			S
Castela emoryi	**crucifixion thorn**		**S**			**S**	**S**			
Cercidium floridium	palo verde	S	S	S	S	SF	S	S	S	S
Chaenactis carpoclinia	pebble pincushion	S	S	S	S	S	S		S	S
Chaenactis fremontii	desert pincushion	S	S	S	S	S	S		S	S
Chaenactis stevioides	Steve’s dustymaiden	S	S	S	S	S	S	S		
Chamaesyce setiloba	Yuma sandmat	SF		S			S			F
Chamaesyce micromera	Sonoran sand mat									
Chamaesyce polycarpa	smallseed sandmat	SF	S	S	SF	SF	S		SF	SF
Chenopodium murale	pigweed		S	S	S	S	S			
Chenopodium sp.	pigweed					S				
Chorizanthe brevicornu	brittle spineflower	S	S	S	S	S	S		S	S
Chorizanthe corrugata	wrinkled spineflower	S	S	S	S	S				
Chorizanthe rigida	spiny-herb	S	S	S	S	S	S		S	S
Colubrina californica	**las animas colubrina**			**S**						
Coryphantha alversonii	**foxtail cactus**	**S**								
Crassula cornata	sand pygmyweed	S								
Croton californicus	California croton		S			SF				
Cryptantha angustifolia	narrow leaved forget-me-not	S	S	S	S	S	S	S		S
Cryptantha barbigera	bearded forget-me-not	S	S	S	S	S	S			S
Cryptantha dumetorum	bushloving cryptantha	S	S	S	S	S	S	S		S
Cryptantha maritima	white haired forget-me-not	S	S	S	S	S	S	S	S	S
Cryptantha nevadensis	Nevada forget-me-not	S	S	S	S	S	S			S
Cryptantha pterocarya	wing nut forget-me-not	S	S	S	S	S	S			S
Cryptantha sp.	forget–me-not		S	S	S	S	S			
Cucurbita palmata	coyote melon	S								

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Scientific Name	Common Name	N SITE	S SITE	East Access Road	A1	A2	B2	Telecom Site	SUB A	SUB B
Cuscuta denticulata	dodder		S	S	S	S	S			S
Cynanchum utahense	Utah cynanchum	S	S							
Cynodon dactylon	Bermuda grass						S			
Dalea mollissima	silky dalea	S	S	S	S	S	S		S	S
Datura discolor	desert thornapple	SF	S		S	SF				
Datura wrightii	jimson weed			S		SF	S			
Descurainia pinnata	tansy mustard			S		S	S			S
Dicoria canescens	desert twin bugs									
Dimorphotheca sinuata	cape marigold	S								
Ditaxis californica	**California ditaxis**			**S**	**S**		**S**			**S**
Ditaxis lanceolata	narrow-leaf ditaxis	S	S	S	SF	S	S		SF	
Ditaxis neomexicana	common ditaxis	SF	S	S	S	S	S		S	SF
Dithyrea californica	spectacle pod	S	S	S	S	S	S			
Echinocactus polycephalus	cottontop	S	S		S					
Echinocereus engelmannii	hedgehog cactus			S	S		S			S
Emmenanthe penduliflora	whispering bells						S			
Encelia farinosa	brittlebush	S	S	S	S	S	S	S	S	S
Encelia frutescens	rayless encelia	SF	S	S		SF	S			
Ephedra nevadensis	Mormon tea									S
Eremalche exilis	white mallow		S					S		
Eremalche rotundifolia	desert five-spot	S	S	S	S	S	S	S		S
Eriogonum deflexum	skeleton weed			S						F
Eriogonum inflatum	desert trumpet	SF	S	S	S		S			SF
Eriogonum sp.	buckwheat		S	S	S	S	S			S
Eriogonum thomasii	Thomas’ buckwheat	S	S	S	S	S			S	
Eriogonum reniforme	kidney-leaf buckwheat	S	S	S	S	S	S			
Erioneuron pulchellum	fluff grass				S		S			SF
Eriophyllum wallacei	Wallace's woolly daisy		S			S	S			
Erodium cicutarium	cranes bill	S	S	S		S	S	S		S
Erodium tesanum	Texas filaree	S	S	S	S	S	S	S	S	S

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Scientific Name	Common Name	N SITE	S SITE	East Access Road	A1	A2	B2	Telecom Site	SUB A	SUB B
Eschscholzia minutiflora	small-flowered desert poppy	S	S	S	S	S	S		S	S
Eschscholzia sp.	poppy			S	S	S	S		S	
Eucrypta chrysanthemifolia	common eucrypta			S			S			
Eucrypta micrantha	desert eucrypta	S	S	S	S	S	S			S
Fagonia laevis	California fagonia	SF	S	S	S	S	S		S	SF
Fagonia pachyacantha	sticky fagonia		S	S			S			
Ferocactus cylandraceus	barrel cactus	S	S	S			S			
Filago depressa	dwarf cottonrose	S	S			S				S
Fouquieria splendens	ocotillo	S	S	S	S	S	S			S
Geraea canescens	desert sunflower	S	S	S	S	S	S	S	S	S
Gilia brecciarum	small gilia						S			
Gilia sp.	gilia			S					S	
Gilia latifolia	broad leaved gilia	S	S	S	S	S	S		S	
Gilia stellata	star gilia	S	S	S	S	S	S		S	S
Guillenia lasiophylla	mustard	S	S	S	S	S	S			S
Hesperocallis undulata	desert lily	S	S	S	S	S	S	S		
Hibuscus denudatus	desert hibiscus	S	S	S	SF	S	S		S	F
Hordeum marinum	foxtail barley							S		
Hymenoclea salsola	cheesebush	S	S	S	S	S	S	S	S	S
Hyptis emoryii	desert lavender	SF	S	S	SF	S	S		S	SF
Isomeris arborea	bladderpod									SF
Justicia californica	chuparosa			S	S	S	S		SF	F
Kallstroemia parviflora	warty caltrop	F								
Krameria erecta	littleleaf rhatany		S	S			S		S	
Krameria grayi	white rhatany	SF	S	S	S	S	S		S	SF
Koeberlinia tenuispina	**Slender-spined allthorn, crown-of-thorns**		**S**							
Lactura serriola	prickly lettuce		S							
Larrea tridentata	creosote bush	SF	S	S	S	SF	S	S	S	SF
Lepidium fremontii	desert alyssum				S		S			
Lepidium lasicocarpum	peppergrass	S	S	S	S	S	S	S	S	S

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Scientific Name	Common Name	N SITE	S SITE	East Access Road	A1	A2	B2	Telecom Site	SUB A	SUB B
Linanthus jonesii	Jones' linanthus	S	S	S		S				
Loeseliastrum matthewsii	desert calico	S	S	S		S	S			
Lotus strigosus	stiff hair lotus	SF	S	S	S	S	S	S	S	S
Lupinus arizonicus	Arizona lupine	S	S	S	S	S	S	S	S	S
Lycium andersonii	Anderson's wolfberry	S	S	S	S	S	S		S	S
Lycium pallidum	pallid box thorn						S			
Malacothrix glabrata	desert dandelion	S	S	S	S	S	S	S	S	S
Mammalaria sp	nipple cactus	S		S	S		S		S	
Mammalaria tetrancistra	fishhook cactus	S	S			S				S
Marina parryi	Parry's false prairie clover	SF	S	S		S	S		S	
Mentzelia albicaulis	white-stemmed stickleaf	S	S	S	S	S	S			
Mentzelia involucrata	sand blazing star	S	S	S	S	S	S		S	S
Mimulis bigelovii	Bigelow's monkeyflower			S	S	S	S			S
Mirabilis bigelovii	wishbone plant	SF	S	S	S	S	S		S	SF
Mohavea confertiflora	ghost flower	S		S		S	S			
Monoptilon bellioides	desert star	S	S	S	S	S	S		S	S
Nama demissum	purple mat	S	S	S	S	S	S			S
Nama pusillum	small-leaf nama	S		S	S	S	S		S	
Nemacladus rubescens	desert threadplant	S	S	S		S				
Nerium oleander	oleander			S			S			
Nicotiana obtusifolla	coyote tobacco			S		SF	S			F
Oenothera deltoides	dune evening primrose							S		
Oligomeris linifolia	lineleaf whitepuff	S	S	S	S	S				S
Olneya tesota	ironwood	S	S	S	S	S	S	S	S	S
Opuntia sp.				S						
Opuntia basilaris basilaris	beavertail cactus	S	S	S	S	S				
Opuntia echinocarpa	golden cholla	S	S	S	S	S	S		S	S
Opuntia ramosissima	pencil cholla	S	S	S	S	S	S		S	S
Orobanche cooperi	broomrape									
Palafoxia arida	Spanish needles	SF	S	S	SF	SF	S	S		SF

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SF = observed during spring and fall surveys

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bold = sensitivespecies

Scientific Name	Common Name	N SITE	S SITE	East Access Road	A1	A2	B2	Telecom Site	SUB A	SUB B
Parietaria hespera	western paritory			S						
Pectis papposa	many bristle cinchweed	F	F							F
Pectocarya heterocarpa	chuckwalla pectocarya	S	S	S	S	S				
Pectocarya penicillata	winged pectocarya	S			S		S			S
Pectocarya peninsularis	Baja pectocarya	S			S		S			
Pectocarya platycarpa	broad-nutted combbur	S	S	S	S	S	S	S		
Pectocarya recurvata	broad-nut combseed	S	S	S	S	S	S	S	S	S
Pectocarya sp.	combseed			S						
Perityle emoryi	Emory's rocket daisy	S	S	S	S	S	S		S	S
Petalonyx thurberi	sandpaper plant	S								
Peucephyllum schottii	pygmy-cedar	S								S
Phacelia crenulata	notch-leaf phacelia	S	S	S	S	S	S	S	S	S
Phacelia distans	lace leaf phacelia	S	S	S	S	S	S		S	S
Phacelia neglecta	alkali phacelia	S	S	S	S	S	S		S	
Phoradendron californicum	desert mistletoe		S	S	S	S	S			
Physalis crassifolia	thick leaved ground cherry			S			S			S
Plagiobothrys sp.	popcorn flower			S			S			
Plantago ovata	woolly plantain	S	S	S	S	S	S	S	S	S
Pleuraphis rigida	big galleta grass	SF	S	S	S	SF	S	S	S	SF
Porophyllum gracile	odora			S	S	S	S			
Proboscidea altheaefolia	**unicorn plant**				**S**	**S**	**S**			
Prosopis glandulosa	honey mesquite			S						
Psathyrotes ramosissima	velvet turtleback	SF	SF	S	SF	SF	S			SF
Psorothamnus emoryi	dye plant	S	S	S	S	SF	S	S		
Psorothamnus schotti	Schott's indigobush	S	S	S	S	S	S			S
Psorothamnus spinosus	smoke tree	S	S	S	S	S	S			
Pulchea sericea	arrow plant						S			
Rafinesquia neomexicana	desert chicory	S	S	S	S	S	S		S	S
Salazaria mexicana	paper-bag bush		S							SF
Salsola tragus	Russian thistle, tumbleweed					S				

S = observed during spring surveys
F = observed during fall surveys
SF = observed during spring and fall surveys

red = non-native species
bold = sensitivespecies

Scientific Name	Common Name	N SITE	S SITE	East Access Road	A1	A2	B2	Telecom Site	SUB A	SUB B
Salvia columbariae	chia	S	S	S	S	S	S		S	S
Sarcostemma cynanchoides	climbing milkweed	SF	S	S	S		S			S
Sarcostemma hirtellum	trailing townula		S							
Schismus arabicus	Mediterranean grass	S	S		S					
Schismus barbatus	Mediterranean grass	S	S	S	S	S	S	S	S	S
Senecio mohavensis	Mojave groundsel	S	S	S		S	S		S	S
Senna armata	spiny senna						S			S
Simmondsia chinensis	jojoba			S	S	S	S			S
Sisymbrium irio	London rocket			S	S					
Sphaeralcea angustifolia	copper globe mallow			S						
Sphaeralcea ambigua	globe mallow			S	S	S	S		S	S
Stephanomeria pauciflora	wire lettuce	SF	S	S	S	S	S			SF
Streptanthella longirostris	long beaked twist flower		S	S	S	S	S			
Stillingia linearifolia	linear leaved stillingia		S							
Stillingia spinulosa	annual stillingia	S	S			S		S		
Tamarix aphylla	athel					S				
Thysanocarpus curvipes	fringepod		S	S	S					
Tiquilia plicata	tequilia			S	S	S		S		
Tidestromia oblongifolia	Arizona honeysweet		SF				S			
Trichoptilium incisum	yellowhead	S		S	S	S			S	
Trixis californica	American threefold	S	S							S
Vulpia bromoides	six weeks fescue	S		S	S	S				S
Vulpia octoflora var. octoflora	six weeks fescue	S								

S = observed during spring surveys
F = observed during fall surveys
SF = observed during spring and fall surveys

red = non-native species
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Appendix 2

Results of CNDDB and CNPSEI Searches

California Department of Fish and Game
Natural Diversity Database
Selected Elements by Scientific Name - Portrait
Desert Sunlight: Victory Pass, East of Victory Pass, Desert Center, Corn Spring, and Sidewinder Well USGS Quads.

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
1	***Abronia villosa var. aurita*** chaparral sand-verbena	PDNYC010P1			G5T3T4	S2.1	1B.1
2	***Astragalus insularis var. harwoodii*** Harwood's milk-vetch	PDFAB0F491			G5T3	S2.2?	2.2
3	***Ayenia compacta*** California ayenia	PDSTE01020			G4	S3.3	2.3
4	***Castela emoryi*** Emory's crucifixion-thorn	PDSIM03030			G3	S2.2	2.3
5	***Colubrina californica*** Las Animas colubrina	PDRHA05030			G4	S2S3.3	2.3
6	***Coryphantha alversonii*** Alverson's foxtail cactus	PDCAC0X060			G3	S3.2	4.3
7	***Ditaxis claryana*** glandular ditaxis	PDEUP080L0			G4G5	S1	2.2
8	***Ditaxis serrata var. californica*** California ditaxis	PDEUP08050			G5T2T3	S2	3.2
9	***Eriastrum harwoodii*** Harwood's eriastrum	PDPLM030B1			G2	S2	1B.2
10	***Koeberlinia spinosa ssp. tenuispina*** slender-spined all-thorn	PDCPP05012			G4T4	S2.2	2.2
11	***Matelea parvifolia*** spear-leaf matelea	PDASC0A0J0			G5?	S2.2	2.3
12	***Mentzelia puberula*** Darlington's blazing star	PDLOA031F0			G4	S2	2.2
13	***Salvia greatae*** Orocopia sage	PDLAM1S0P0			G2	S2	1B.3
14	***Selaginella eremophila*** desert spike-moss	PPSEL010G0			G4	S2.2?	2.2
15	***Senna covesii*** Coves' cassia	PDFAB491X0			G5?	S2.2	2.2
16	***Wislizenia refracta ssp. palmeri*** Palmer's jackass clover	PDCPP09015			G5T2T4	S2?	2.2