

APPENDIX E-5
SPECIAL STATUS PLANT SPECIES SURVEY REPORT

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Administrative Draft Special-Status Plant Species Survey Report

Daggett Solar Power Facility

San Bernardino County, California

June 4, 2018



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Acronyms and Abbreviations

amsl	above mean sea level
Applicant	Daggett Solar Power 1, LLC
CDFW	California Department of Fish and Wildlife
CNPS	California Native Plant Society
CRPR	California Rare Plant Rank
project	Daggett Solar Power Facility
U.S.	United States
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

1 Introduction and Project Description

Daggett Solar Power 1, LLC, a subsidiary of NRG Renew LLC (Applicant), is proposing to develop the Daggett Solar Power Facility in San Bernardino County, east of Daggett (Figure 1). The Daggett Solar Power Facility Project (project) consists of constructing and operating a utility-scale, solar photovoltaic, electricity generation and energy storage facility that would produce up to 650 megawatts of power and include up to 450 megawatts of battery storage capacity on approximately 3,500 acres of land (Figure 2 and Figure 3). The project would utilize existing electrical transmission infrastructure adjacent to the existing Coolwater Generating Station, a recently retired natural gas-fired power plant, to deliver renewable energy to the electric grid.

This Rare Plant Survey Report is intended to communicate the Applicant's results for focused surveys for special-status plant species that have a potential to occur within the project site, as identified in the Biological Resources Technical Report (HDR 2017) and the Biological Resources Survey Plan (HDR 2018). The surveys were conducted in support of the Applicant's compliance with the California Environmental Quality Act and other state and federal regulations.

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2 Project Site Description

The project site is located east of Barstow and Daggett, south of Interstate 15 and the Mojave River, north of Interstate 40, and adjacent to Barstow-Daggett Airport (Figure 1). The project area is situated within Township 9 North and within Ranges 1 East and 2 East. This involves Sections 13, 23, and 24 in Range 1 East; Sections 7, 8, 15-19, 21, and 23 in Range 2 East.

The project site is flat and generally bounded by Daggett approximately 0.5 mile to the west; the Mojave River, Yermo, and Interstate 15 to the north; Barstow-Daggett Airport, Route 66, and Interstate 40 to the south; and Newberry Springs and Mojave Valley to the east.

The project site is shown on four United States (U.S.) Geological Survey (USGS) 7.5-minute topographic quadrangles in California: Yermo, Minneola, Harvard Hill, and Newberry Springs. The site is located approximately within the latitudes of 34.83° and 34.90° and within the longitudes of -116.70° and -116.88° (34° 52' 0" N/116° 48' 0" W). Figure 1 shows the project location. Figure 2 depicts the project site on topographic mapping. Figure 3 depicts the project site on aerial photography. Figure 4 depicts soil mapping for the project site. Figure 5 depicts vegetation mapping for the project site.

Figure 1. Project Location

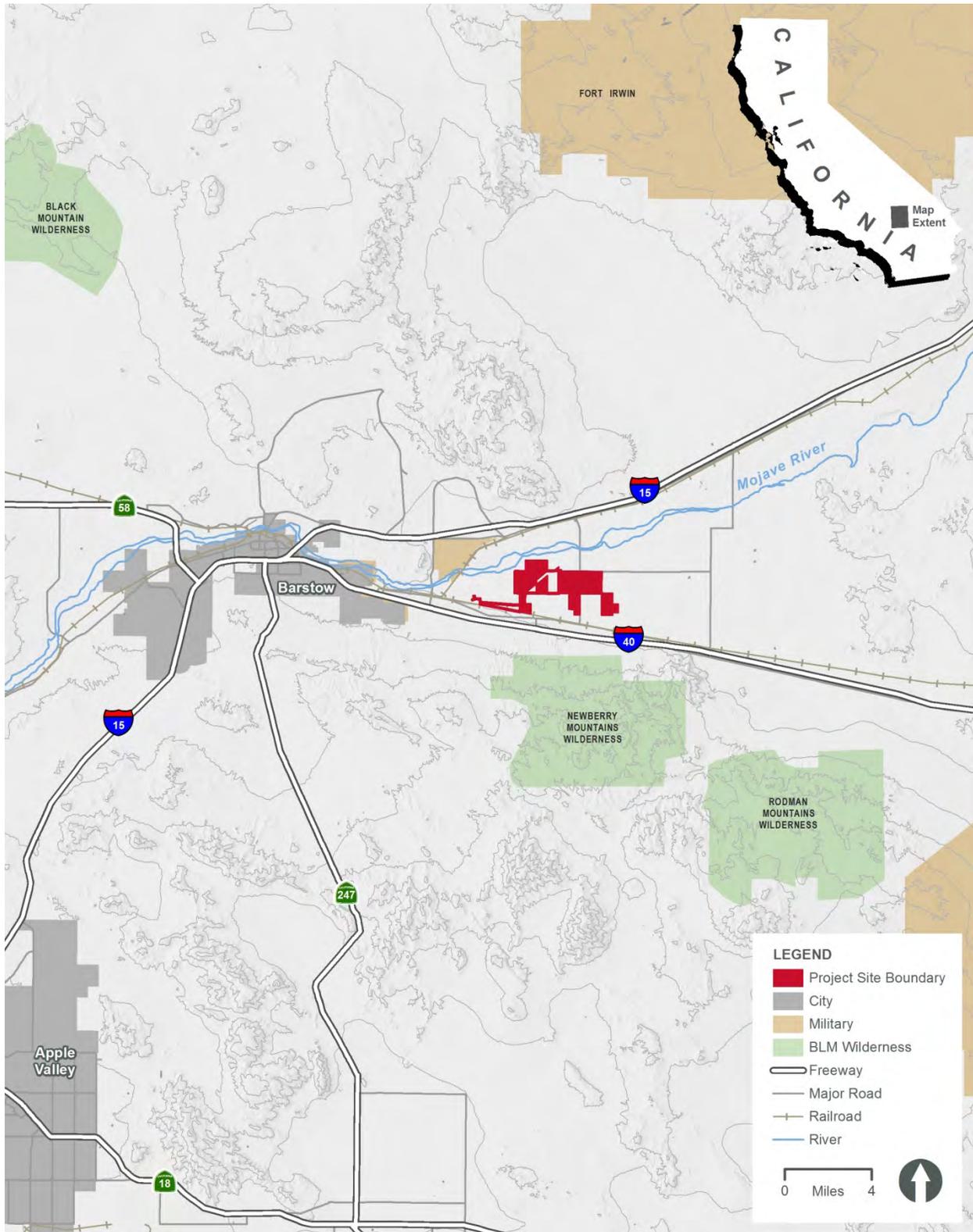


Figure 2. Project Site on United States Geological Survey Quadrangles

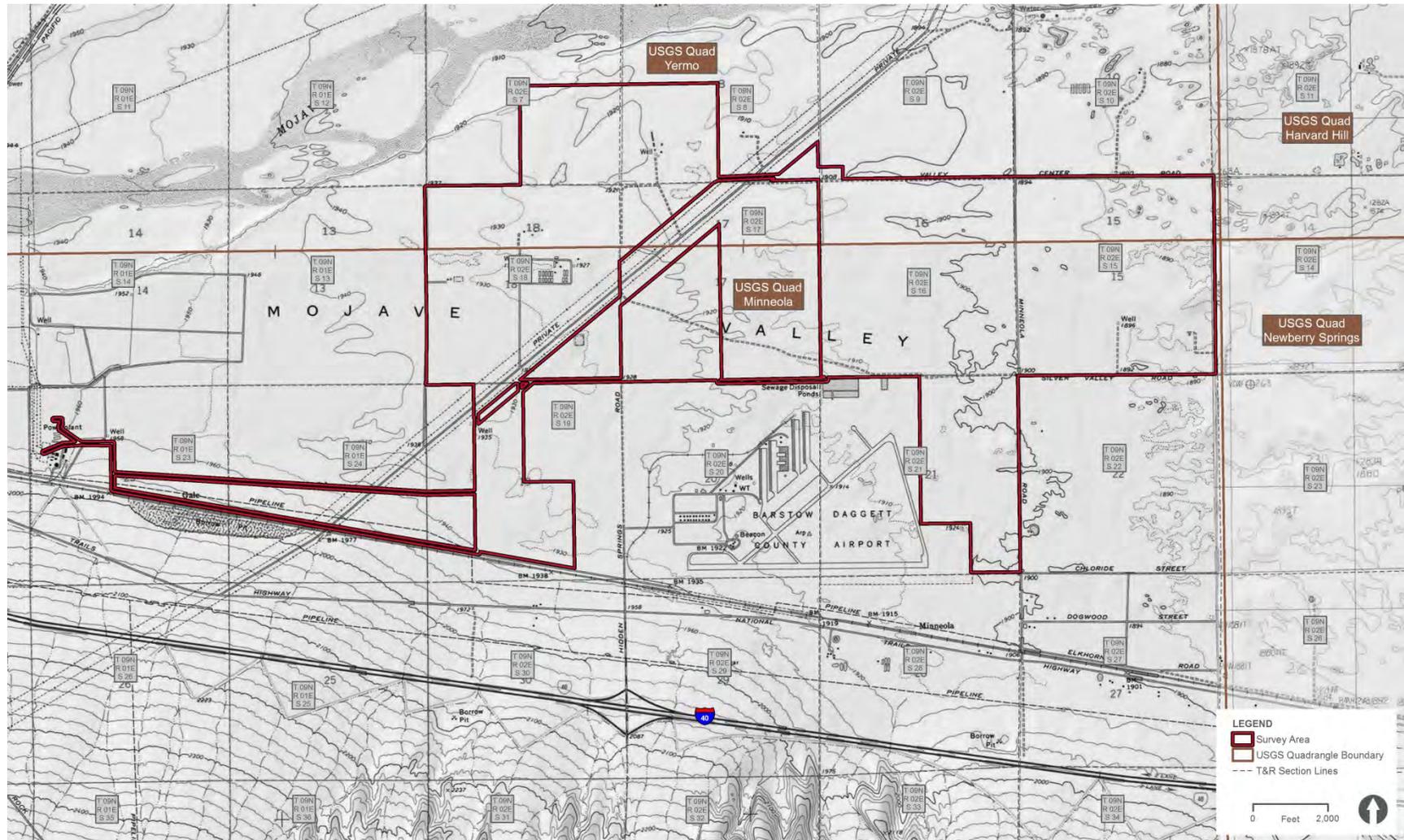


Figure 3. Project Site Aerial Imagery

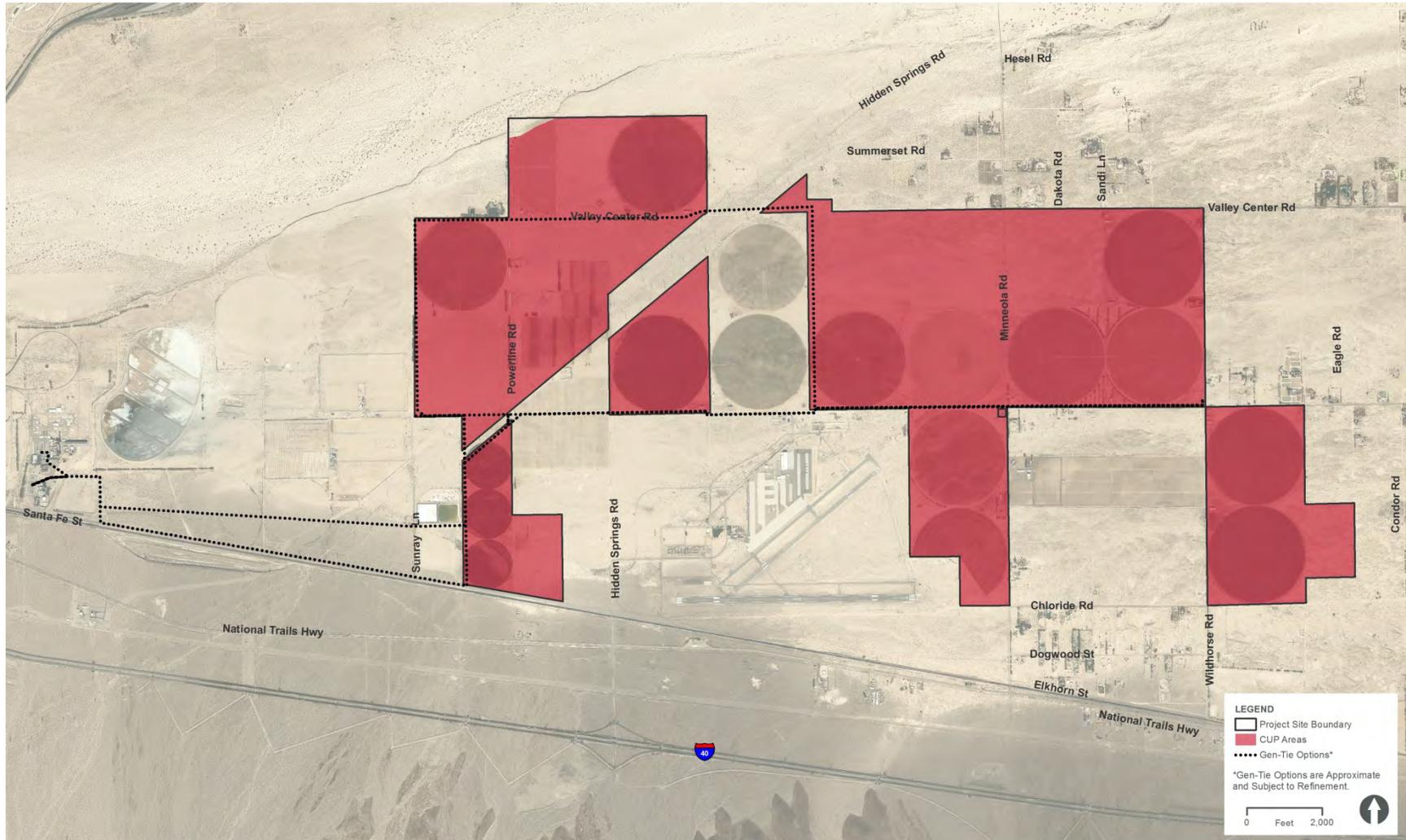


Figure 4. Soils within the Project Area

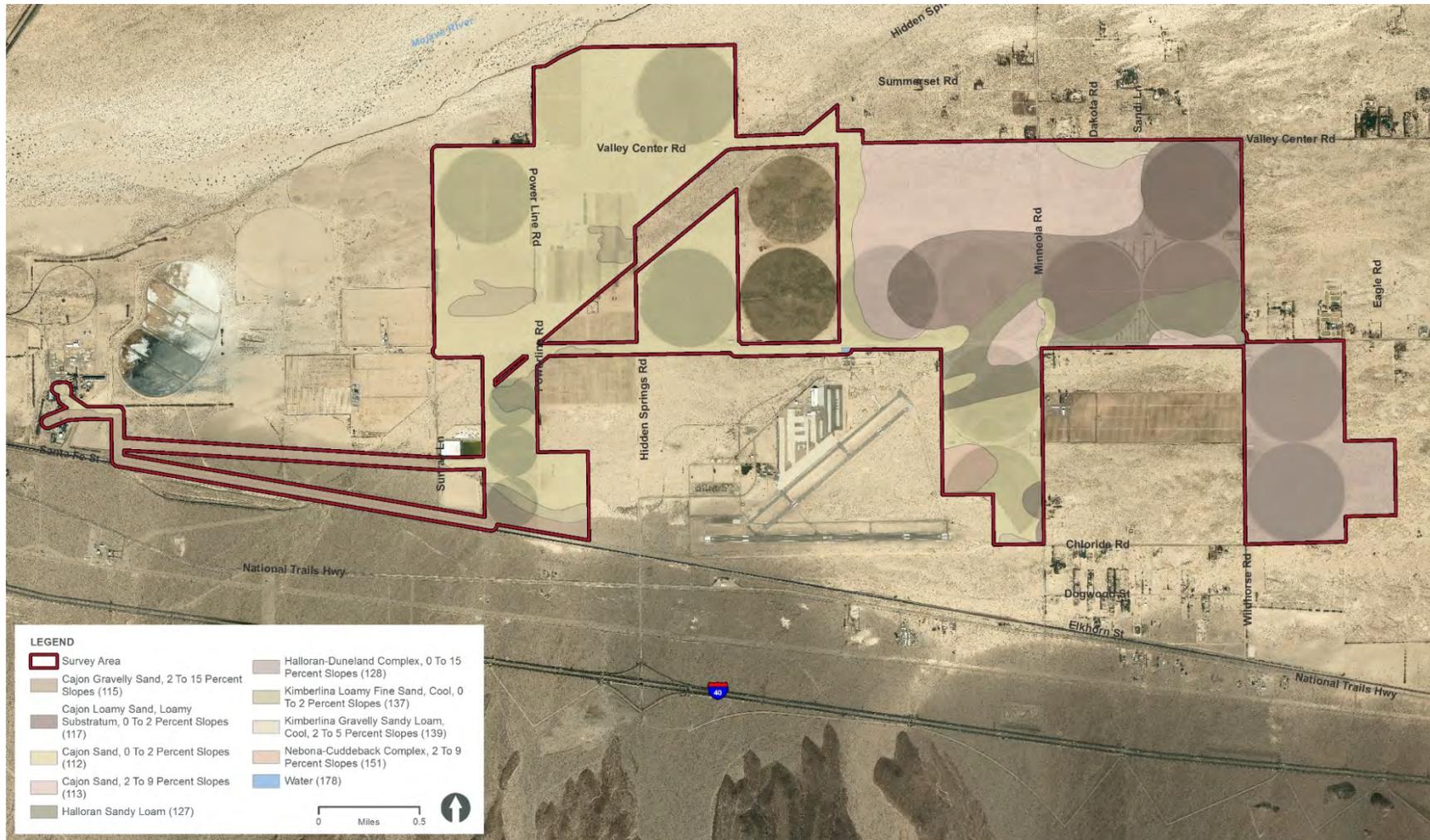
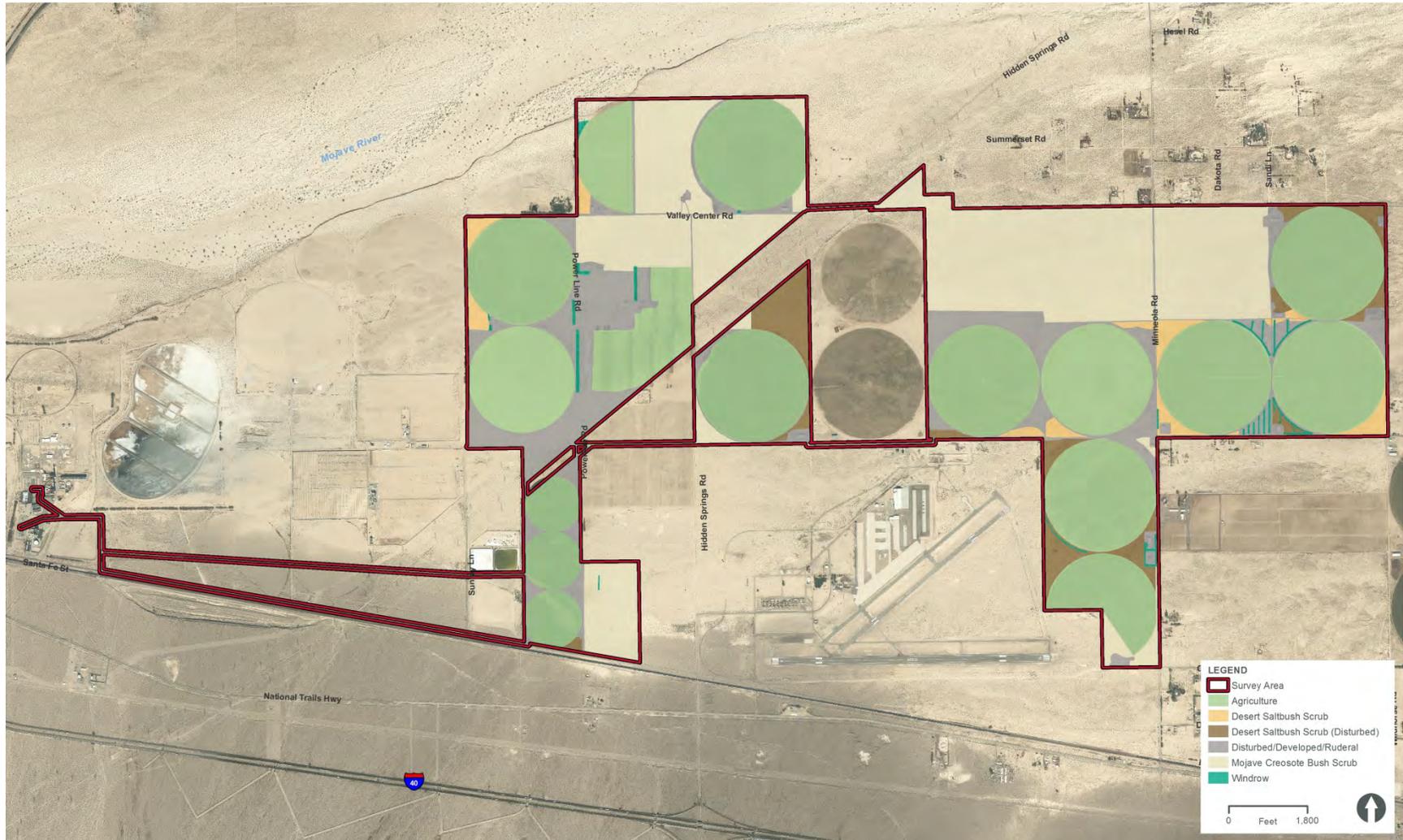


Figure 5. Vegetation Communities within the Project Area



2.1 Topography and Rainfall

The project area is at elevations between approximately 1,870 feet above mean sea level (amsl) on the southeastern boundary of the project area to 1,970 feet amsl on the western boundary (Figure 2). The project area has a gentle slope from south to north, toward the Mojave River, which is immediately north of the project area.

The Daggett Airport receives an average of 4.1 inches of precipitation per year, of which the majority (3.97 inches) occurs between July and April. During the 2017-2018 rainfall year thus far to date (07/01/2017 through 5/17/2018), Daggett received 1.53 inches of rain (39 percent of the average rainfall for the site) (U.S. Climate Data 2018).

2.2 Geology

The site is situated within the Mojave Desert Geomorphic Province in Southern California. Geologic structures within this province trend mostly northwest, in contrast to the prevailing east to west trend in the neighboring Transverse Ranges Geomorphic Province to the west. The Mojave Desert Province extends into lower California, and is bounded by the Garlock Fault to the north, the San Andreas Fault to the west and Nevada and Arizona borders to the east. Surficial geologic units in the site consist mainly of Alluvium deposits in the western portion of the site and Dune sands in the eastern portion of the site of Recent Quaternary Age (Terracon Consultants, Inc. 2017). The presence of creosote hummocks and eolian sand dunes along with the absence of fluvial transport, deposition or out-of-channel flow indicators within the jurisdictional study area suggest that the site lies on an old inactive floodplain terrace (Brady and Vyverberg 2014).

2.3 Soils

Soils within much of the jurisdictional study area have been disturbed as a result of agricultural, residential, and industrial uses. Soils in the project area were mapped using the Natural Resources Conservation Service Web Soil Survey and depicted in Figure 4 (United States Department of Agriculture Natural Resources Conservation Service 2017). The proposed project encompasses water and the following five different soil series:

- **Cajon Series** - This series consists of very deep, somewhat excessively drained soils that are formed in sandy alluvium from dominantly granitic rocks. These soils range from strongly alkaline to strongly saline-alkali. Runoff is negligible to low with rapid permeability. Cajon soils are formed on recent fans, fan skirts and aprons, and river terraces from 200 to 4,300 feet amsl on 0 to 15 percent slopes.
- **Halloran Series** - This series consists of deep, moderately well drained soils that formed in mixed alluvium. These soils range from mildly to moderately alkaline. Runoff is slow with moderately slow permeability. Halloran soils are formed on old alluvial terraces and depressional areas that have been overblown with irregularly spaced hummocks and small dunes, which occupy 15 to 35 percent of the area and are mapped in some areas as a complex with Dune land. This complex occurs from 1,800 to 1,850 feet amsl on 0 to 2 percent slopes.

- **Kimberlina Series** - This series consists of very deep, well drained soils formed in mixed alluvium from dominantly igneous and/or sedimentary rocks. These soils are moderately alkaline. Runoff is medium with moderately rapid and moderate permeability. Kimberlina soils are formed from recent alluvial fans and flood plains from 1,800 to 4,100 feet amsl in the Mojave Desert on 0 to 9 percent slopes.
- **Nebona-cuddeback Series** - The Nebona series consists of shallow, well drained soils formed in mixed alluvium. These soils are mildly to moderately alkaline. Runoff is medium to rapid with moderately rapid permeability. Nebona soils are formed from old gravelly desert pavement covered terraces derived from nonmarine mixed alluvium from 2,200 to 3,000 feet amsl on 2 to 9 percent slopes.

The Cuddeback series consists of well drained soils formed in alluvium from mixed sources. These soils are mildly to moderately alkaline. Runoff is medium to rapid with moderately slow permeability. Cuddleback soils are formed from old terraces and alluvial fans from 2,200 to 3,000 feet amsl on 2 to 9 percent slopes.

- **Riverwash Series** - This series consists of generally rapid runoff that typically consists of sandy or gravelly cobble and boulder deposits. Soils of this series occurring on alluvial fans are considered hydric.

2.4 Hydrology

The project area is located within the Lower Mojave Hydrologic Sub-Area (USGS Hydrologic Sub-Area Code 628.50) of the Mojave Watershed (USGS 8-digit Hydrologic Unit Code 18090208). The sub-area is approximately 317.5 square miles and drains to the Mojave River. The site is located within the Mojave River Groundwater Basin, an approximately 1,400-square-mile area that extends from the San Bernardino and the San Gabriel mountains in the south, Harper and Coyote lakes in the north, Antelope Valley to the west, and Daggett to the east. The primary source of groundwater recharge in the Mojave River groundwater basin is intermittent streamflow in the Mojave River, which typically occurs January through March and from sporadic releases of imported water from the California State Water Project (USGS 2018).

2.4.1 Local Drainage

The only obvious, large surface drainage feature in or adjacent to the jurisdictional study area is the Mojave River. To the south of that drainage, where project facilities would be located, there are no obvious or defined drainage features, and the area has only very localized surface runoff. It appears that rainfall in that area quickly percolates into the soil.

Flooding

The project area is not located within the Federal Emergency Management Agency 100-or 500-year flood zones (Federal Emergency Management Agency 2016).



Groundwater

Based on a monitoring well located within the Barstow-Daggett Airport, identified by the California Department of Water Resources, recent groundwater levels are approximately 143 to 150 feet below ground surface (Terracon Consultants, Inc. 2017).

2.5 Vegetation Communities

The project area supports six vegetation communities or other land cover types including Creosote Bush Scrub, Desert Saltbush Scrub, Disturbed Saltbush Scrub, Agriculture, Tamarisk Windrows and Disturbed/Developed/Ruderal, which are described in detail in the Daggett Solar Biological Resources Technical Report (HDR 2017) and depicted on Figure 5. Of these communities and land cover types, only Creosote Bush Scrub and Desert Saltbush Scrub provide suitable habitat for special-status plant species. The disturbed portions of these two communities do not contain suitable substrates for special-status plants and were not surveyed. Table 1 summarizes the acreages of vegetation communities that were surveyed within the current configuration of the project area and gen-tie alternatives. Descriptions of the communities that were surveyed are provided below.

Creosote Bush Scrub (*Larrea tridentata* Shrubland Alliance)

Within the Creosote Bush Scrub community (*Larrea tridentata* Shrubland Alliance), creosote bush is dominant or co-dominant in the shrub canopy with several sub-dominant desert shrub species, such as white bursage (*Ambrosia dumosa*), common burrobrush (*Ambrosia salsola*), various saltbush (*Atriplex*) species, and California jointfir (*Ephedra californica*).

Table 1. Vegetation Communities in the Special-Status Plant Species Survey Area

(acres)

Plant Community	Solar Field	Gen-Tie
Creosote Bush Scrub (<i>Larrea tridentata</i> Shrubland Alliance)	798.1	33.7
Desert Saltbush Scrub (<i>Atriplex polycarpa</i> Shrubland Alliance)	58.1	2.1
Total	856.2	35.8

In the project area, the Creosote Bush Scrub community is found primarily on undeveloped lands in the western and northern portions of the project area (Figure 4 and Figure 5), and creosote bush is largely dominant. Some small areas of this community consist of an equal mix of creosote bush and allscale saltbush (*Atriplex polycarpa*). Other plants observed in this community include silver cholla (*Cylindropuntia echinoocarpa*), diamond cholla (*Cylindropuntia ramosissima*), common Mediterranean grass (*Schismus barbatus*), bristly fiddleneck (*Amsinckia tessellata*), white bursage, burrobrush, and California jointfir. Representative photographs of Creosote Bush Scrub within the project area are included in Appendix A, Photographs 1 and 2. A list of all plant species identified during 2018 rare plant surveys is provided in Appendix B.

Desert Saltbush Scrub (*Atriplex polycarpa* Alliance)

Allscale is dominant in the shrub canopy within the Desert Saltbush Scrub community (*Atriplex polycarpa* Shrubland Alliance), with sub-dominant species, such as creosote bush, burrobrush, slenderleaf saltbush (*Atriplex canescens* var. *linearis*), and common Mediterranean grass.

This community occurs primarily on sandy soils in the eastern portion of the project area (Figure 4 and Figure 5), and the dominant shrub is allscale with creosote bush and white bursage as sub-dominants. Other plants observed in this community include common Mediterranean grass, slenderleaf saltbush, silver cholla, and bristly fiddleneck. Annuals were, for the most part, not identifiable because of the lack of sufficient rainfall. Representative photographs of Desert Saltbush Scrub within the project area are included in Appendix A, Photographs 3 and 4.

3 2018 Special-Status Plant Species Survey Methods

3.1 Survey Area

The survey area for rare plants included all creosote bush scrub and desert salt bush scrub depicted on Figure 5.

3.2 Literature and Record Search

Prior to conducting focused special-status plant species surveys, HDR conducted the following to identify special-status plant species that could occur within or near the project area:

- HDR searched applicable databases maintained by the California Department of Fish and Wildlife (CDFW) (CDFW 2017), U.S. Fish and Wildlife Service (USFWS) (USFWS 2017), and the California Native Plant Society (CNPS) (CNPS 2017) to identify special-status plant species that are known to occur within 5 miles of the project area.
- HDR consulted CDFW and USFWS staff to identify species under their jurisdiction that could occur in the region.
- HDR acquired information on the habitat requirements of special-status plants from CNPS (CNPS 2017) and Calflora (Calflora 2017).

Based on database searches, HDR identified 13 special-status plant species with the potential to occur in the vicinity of the project area (Table 2). Of these, seven plants are not expected to occur within the project area because of a lack of suitable habitat or because the project area is well outside of the known elevations where the plants have been documented. Details of the database search are contained in the survey report (HDR 2017).

3.3 Reference Sites

No recently recorded, accessible reference sites for the target species were identified in the project vicinity during the records search. Therefore, reference surveys were not feasible.

3.4 Focused Surveys

Based on information acquired during the literature review, 2017 field surveys, and discussions with staff from CDFW and USFWS, HDR biologists Shelly Austin (CDFW Plant Voucher Collecting Permit No. 2081(a)-15-109-V), Sarah Barrera, Allegra Engleson, Tracy Goyak, Ronell Santos, and McKenna Smith conducted focused surveys from April 9 to 12 and April 23 to 25, 2018, for the following special-status plant species to determine their distribution and abundance within the project area:

- Mojave monkeyflower (*Diplacus [Mimulus] mohavensis*)

- Barstow woolly sunflower (*Eriophyllum mohavense*)
- Darlington's blazing star (*Mentzelia puberula*)
- Beaver Dam breadroot (*Pediomelum castoreum*)
- White-margined beardtongue (*Penstemon albomarginatus*)
- Parish's phacelia (*Phacelia parishii*)

A complete list of special-status botanical species evaluated for potential to occur within the project site is included as Appendix C.

The target species all flower between March and May or June (Table 2). None of the six plants are state- or federally-listed as threatened or endangered, but they are included in the CNPS Inventory of Rare and Endangered Plants as California Rare Plant Rank¹ List 1B.1 (white-margined beardtongue and Parish's phacelia), 1B.2 (Mojave monkeyflower, Barstow woolly sunflower, and Beaver Dam breadroot), or 2B.2 (Darlington's blazing star) species. Suitable habitat for these species on the project site includes Creosote Bush Scrub and Desert Saltbush Scrub. These communities occupy 856.2 acres in the solar field and 35.8 acres along the gen-tie lines within the rare plant study area (project area plus a 50-foot buffer (Table 1).

The 2018 focused surveys were conducted during the peak flowering period for these species. Biologists conducting separate surveys for special-status animals (burrowing owls, raptors, and desert tortoise) for the project in March and early April tracked plant growth to help determine special-status plant species survey timing.

HDR conducted focused plant surveys in Creosote Bush Scrub and Desert Saltbush Scrub communities within the rare plant study area in accordance with standard protocols described in the CNPS Botanical Survey Guidelines (CNPS 1983) and the CDFW Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Natural Communities (CDFW 2009). These surveys were conducted by walking transects spaced approximately 30 feet apart in all areas with suitable habitat within the rare plant study area for the solar array, related infrastructure, and gen-tie line routes (Figure 2 and Figure 3). This transect spacing enabled a 100 percent visualization of the survey area. Areas mapped as Creosote Bush Scrub – Disturbed and Desert Saltbush Scrub – Disturbed were examined and determined to not have suitable substrates for special-status plant species and were, therefore, not surveyed. Agricultural areas, tamarisk thickets, ruderal habitat, disturbed habitat, and developed areas do not provide suitable habitat for special-status plant species and were not surveyed.

Surveys were floristic in nature—all plant species encountered during the surveys were identified to species as feasible based on the phenology of plants at the time of survey. Plant nomenclature follows The Jepson Manual 2nd Edition (Baldwin et al. 2012) and Jepson Flora Project (2018). The Calflora online database (Calflora 2017) was also used to assist with plant identification.

¹ 1B Plants Rare, Threatened, or Endangered in California and elsewhere; 2B Plants Rare, Threatened, or Endangered in California, but more common elsewhere. 0.1-Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat). 0.2-Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)



Table 2. Special-Status Plant Species with Potential to Occur in Project Area

Species	Status	General Habitat Requirements	Potential for Occurrence	Observed During Focused Surveys?
Diplacus [Mimulus] mohavensis Mojave monkeyflower	Federal: - California Rare Plant Rank (CRPR): 1B.2	<ul style="list-style-type: none"> • Annual herb • Occurs in granitic soils on gravelly banks of washes, in sandy openings between creosote bushes, and on rocky slopes above washes, in Joshua tree woodland or Mojavean desert scrub from 1,968 to 3,937 feet amsl • Known only from around Barstow in the Mojave Desert of San Bernardino County • Flowers April through June 	Low. Suitable habitat but Site is at the margin of species' known elevation range.	No
Eriophyllum mohavense Barstow woolly sunflower	Federal: - CRPR: 1B.2	<ul style="list-style-type: none"> • Annual herb • Occurs in silty or sandy areas in chenopod scrub, creosote bush scrub, and playas at 1,600 to 3,200 feet amsl • Historically occurred within 30 miles of Barstow in the Mojave Desert • Known only from Kern, Los Angeles, and San Bernardino counties • Flowers March through May 	Low. Suitable habitat, but site is located approximately 2 miles east of known, documented occurrences. Not enough data is available on this species to rule it out from the site.	No
Mentzelia puberula Darlington's blazing star	Federal: - CRPR: 2B.2	<ul style="list-style-type: none"> • Perennial herb • Sandy or rocky areas in Mojavean desert scrub or Sonoran desert scrub from 300 to 4,200 feet amsl • Known from Imperial, Riverside and San Bernardino counties • Flowers March through May 	Moderate. Suitable habitat occurs in native vegetation communities within project area.	No
<i>Pediomelum castoreum</i> Beaver Dam breadroot	Federal: - CRPR: 1B.2	<ul style="list-style-type: none"> • Perennial herb • Occurs in sandy soils, washes, and roadcuts in Joshua tree woodland and Mojavean desert scrub from 2,000 to 5,000 feet amsl • In California, known only from San Bernardino County • Also occurs in Arizona and Nevada • Flowers April through May 	Moderate. Site supports suitable Desert Saltbush Scrub and Creosote Bush Scrub habitat. Elevation of known populations is higher than project area.	No

Table 2. Special-Status Plant Species with Potential to Occur in Project Area

Species	Status	General Habitat Requirements	Potential for Occurrence	Observed During Focused Surveys?
<i>Penstemon albomarginatus</i> white-margined beardtongue	Federal: - CRPR: 1B.1	<ul style="list-style-type: none"> • Perennial herb • Occurs in stabilized desert dunes and sandy soils in Mojavean desert scrub from 2,100 to 3,495 amsl • Flowers March through May (June) 	Low. Elevation of known populations are higher than project area.	No
<i>Phacelia parishii</i> Parish's phacelia	Federal: - CRPR: 1B.1	<ul style="list-style-type: none"> • Annual herb • Occurs in clay or alkaline soils in Mojavean desert scrub and playas from 1,770 to 3,940 amsl • In California, known only from San Bernardino County • Also occurs in Nevada and Arizona • Flowers April through May (June through July) 	Moderate. Site supports suitable soils in Desert Saltbush Scrub habitat within project area.	No



4 2018 Special-Status Plant Species Survey Results

No special-status plant species were observed during focused plant surveys conducted in April 2018. Table 3 shows the average rainfall at the Barstow-Daggett Airport, located adjacent to the project site, and the 2017-2018 season, which experienced about 36-percent of the average rainfall for the area. The growth of desert annuals is highly dependent on the timing and duration of rainfall. Typically, late fall rains are needed for germination, followed by approximately 0.5 to 1 inch of rain each month to sustain the plants (Arizona-Sonora Desert Museum 2018).

Table 3. Rainfall in the Project Vicinity by Rainfall Season

Month	Average Rainfall (in)	2017-2018 Rainfall (in)
July	0.47	0.03
August	0.28	0.01
September	0.20	0.18
October	0.20	0.00
November	0.35	0.00
December	0.55	0.00
January	0.59	0.40
February	0.67	0.01
March	0.51	0.62
April	0.16	0.00
May	0.04	0.28
June	0.08	--
Total	4.10	1.53

Source: U.S. Climate Data 2018

During the 2016-2017 rainfall year, which was considered a productive year for desert blooms, there were late fall rains in October and November 2016, followed by a substantial amount of rain in January and February 2017. By contrast, there were modest summer rains in July through September 2017, with no rainfall from October through December during the critical germination period for desert annuals. The project area had only received slightly over half the normal precipitation in 2018 by the time surveys were conducted (less than 0.5 inch in January, none in February, over 0.5 inch in March, none in April). That, combined with high temperatures in early April, resulted in minimal flowering this spring. Very few annual species were observed flowering during 2018 surveys – Fremont pincushion (*Chaenactis fremontii*), desert dandelion (*Malacothrix glabrata*), Spanish-needle (*Palafoxia arida* var. *arida*), desert chicory (*Rafinesquia neomexicana*), and bristly fiddleneck. HDR observed dead stalks of many different types of plants, likely remnants from last year's blooms. Some of these were identifiable to genus (see Appendix B for floral compendium).

5 References

- Arizona-Sonora Desert Museum. 2018. Predicting Desert Wildflower Blooms - The science behind the spectacle. Available: http://www.desertmuseum.org/programs/flw_predicting.php. Accessed January 2018.
- Brady, R. H., and K. Vyverberg. 2014. *Methods to describe and delineate episodic stream processes on arid landscapes for permitting utility-scale solar power plants*. CEC-500-2014-013. Prepared for California Energy Commission.
- B.G. Baldwin, D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken. 2012. *The Jepson Manual: Vascular Plants of California*. 2nd edition, thoroughly revised and expanded. University of California Press, Berkeley, CA.
- Calflora. 2017. Information on California plants for education, research and conservation, based on data contributed by the Consortium of Calif. Herbaria and dozens of other public and private institutions and individuals. Berkeley, California: The Calflora Database (a non-profit organization). Available: <http://www.calflora.org/>. Accessed August/September 2017.
- California Department of Fish and Wildlife (CDFW). 2009. Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Natural Communities.
- _____. 2017. RareFind 5 – California Natural Diversity Database Online Search. <http://www.dfg.ca.gov/biogeodata/cnddb/mapsanddata.asp>. Data accessed on August 1, 2017.
- California Native Plant Society (CNPS), Rare Plant Program. 1983, revised 2001. Botanical Survey Guidelines. Sacramento, Calif.
- _____. 2017. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). [Website http://www.rareplants.cnps.org](http://www.rareplants.cnps.org). Accessed August 1, 2017.
- Federal Emergency Management Agency. 2017. National Flood Hazard Layer GIS Dataset. Available online at: <https://fema.maps.arcgis.com/home/item.html?id=cbe088e7c8704464aa0fc34eb99e7f30>
- HDR. 2017. Draft Biological Resources Technical Report: Daggett Solar Power Project. Prepared for Daggett Solar Power 1, LLC, a subsidiary of NRG Renew, LLC.
- _____. 2018. Draft Biological Resources Survey Plan: Daggett Solar Power Project. Prepared for Daggett Solar Power 1, LLC, a subsidiary of NRG Renew, LLC.
- Jepson Flora Project (eds.) 2018. Jepson eFlora, <http://ucjeps.berkeley.edu/eflora/> Accessed April 2018.
- Terracon Consultants, Inc. 2017. Preliminary Geologic Engineering Report for the Coolwater Solar Project.

U.S. Climate Data. 2018. Climate – Daggett, California. Climate data for Daggett-Barstow Airport. Longitude: -116.786, Latitude: 34.8536. Average weather Daggett, CA - 92365 - 1981-2010 normals. Accessed online at: <https://www.usclimatedata.com/climate/daggett/california/united-states/usca0277>

United States Department of Agriculture Natural Resources Conservation Service. 2017. Web Soil Survey. Available online at <http://websoilsurvey.nrcs.usda.gov/>. Accessed 2017 and 2018.

United States Geological Survey (USGS). 2018. *National Hydrography Dataset website*. Last revised: December 11. <https://nhd.usgs.gov/index.html>. Accessed 2017 and 2018.

U.S. Fish and Wildlife Service (USFWS). 2017. Information for Planning and Conservation. Website: <https://ecos.fws.gov/ipac/>. Accessed August 1, 2017.



Appendix A. Site Photographs

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Photograph 1. Creosote Bush Scrub in the eastern portion of the project area. View looking north.



Photograph 2. Creosote Bush Scrub in the eastern portion of the project area. View looking south.



Photograph 3. Desert Saltbush Scrub in eastern portion of project area. View looking north.



Photograph 4. Desert Saltbush Scrub in central portion of project area. View looking south.





Appendix B. Floral Compendium

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Observed Botanical Species

Scientific Name		Common Name
PINOPHYTA	GYMNOSPERMS	
Ephedraceae		Ephedra Family
<i>Ephedra californica</i>		California jointfir
MAGNOLIOPHYTA: MAGNOLIOPSIDA		DICOT FLOWERING PLANTS
Amaranthaceae		Amaranth Family
<i>Amaranthus albus*</i>		Prostrate pigweed
Agavaceae		Agave Family
<i>Hesperocallis undulata</i> (remnants from 2017)		<i>Desert lily</i>
Anacardiaceae		Sumac or Cashew Family
<i>Pistacia chinensis</i>		Pistachio
Asteraceae		Sunflower Family
<i>Agoseris grandiflora*</i>		Large flowered dandelion
<i>Ambrosia acanthicarpa</i>		Annual bur-sage
<i>Ambrosia artemisiifolia*</i>		Common ragweed
<i>Ambrosia dumosa</i>		White bur-sage
<i>Ambrosia salsola</i>		Common burrobrush
<i>Baileya pleniradiata</i>		Woolly desert marigold
<i>Chaenactis fremontii</i>		Fremont pincushion
<i>Dittrichia graveolens*</i>		Stinkwort
<i>Encelia farinosa</i>		Brittlebush
<i>Ericameria cf. paniculata</i>		Black-banded rabbitbrush
<i>Malacothrix glabrata</i>		Desert dandelion
<i>Palafoxia arida</i> var. <i>arida</i>		Spanish-needle
<i>Rafinesquia neomexicana</i>		Desert chicory
<i>Stephanomeria pauciflora</i>		Wire-lettuce
Boraginaceae		Borage Family
<i>Amsinckia menziesii</i>		Menzies' fiddleneck
<i>Amsinckia cf. tessellata</i>		Bristly fiddleneck
<i>Cryptantha cf. angustifolia</i>		Narrow-leaved cryptantha
<i>Heliotropium curassavicum</i> var. <i>oculatum</i>		Alkali heliotrope
<i>Plagiobothrys</i> sp.		Popcornflower
<i>Tiquilia</i> sp. (not flowering, likely <i>nuttallii</i>)		Nuttall's coldenia
Brassicaceae		Mustard Family
<i>Brassica tournefortii*</i>		Sahara mustard
<i>Lepidium c.f. lasiocarpum</i> ssp. <i>lasiocarpum</i>		Shaggyfruit pepperweed
<i>Sisymbrium irio*</i>		London rocket
Cactaceae		Cactus Family
<i>Cylindropuntia echinocarpa</i>		Silver cholla
<i>Cylindropuntia ramosissima</i>		Diamond cholla

Chenopodiaceae

Atriplex canescens var. *linearis*
Atriplex confertifolia
Atriplex elegans var. *fasciculata*
Atriplex polycarpa
Chenopodium desiccatum
Grayia spinosa
*Medicago sativa**
*Salsola tragus**
Suaeda nigra

Convolvulaceae

*Convolvulus arvensis**

Euphorbiaceae

Euphorbia cf. *polycarpa*

Fabaceae

Prosopis sp. (not flowering, likely *glandulosa* var. *torreyana*)

Geraniaceae

*Erodium cicutarium**

Loasaceae

Petalonyx thurberi ssp. *thurberi*

Myrtaceae

Eucalyptus sp. *

Onagraceae

Chylismia sp. (remnant from 2017)

Orobanchaceae

Aphyllon cf. *cooperi* (dried out, ID based on range and habitat)

Polemoniaceae

Loeseliastrum matthewsii

Polygonaceae

Chorizanthe sp.
Chorizanthe rigida
Eriogonum gracillimum
Eriogonum cf. *brachypodum*
Eriogonum cf. *maculatum*
Eriogonum fasciculatum

Tamaricaceae

*Tamarix aphylla**
*Tamarix ramosissima**

Zygophyllaceae

Larrea tridentata

Saltbush Family

Slenderleaf saltbush
Spiny saltbush
Mecca orach
Allscale saltbush
Aridland goosefoot
Hop-sage
Alfalfa
Russian thistle
Bush seepweed

Morning Glory Family

Field bindweed

Spurge Family

Smallseed sandmat

Pea Family

Honey mesquite

Geranium Family

Red-stem filaree

Loasa Family

Thurber's sandpaper plant

Myrtle Family

Eucalyptus

Evening-Primrose Family

Primrose

Broomrape Family

Burroweed strangler

Phlox Family

Desert calico

Buckwheat Family

Spineflower
Rigid spineflower
Rose-and-white wild buckwheat
Parry's wild buckwheat
Spotted wild buckwheat
California buckwheat

Tamarisk Family

Athel
Saltcedar

Caltrop Family

Creosote bush

MAGNOLIOPHYTA: LILIOPSIDA

Agavaceae

Hesperocallis undulata (remnant from 2017)

Poaceae

Avena sp.*

Bromus madritensis ssp. *rubens**

*Bromus tectorum**

*Cynodon dactylon**

Hordeum murinum ssp. *leporinum**

*Schismus barbatus**

Stipa cf. *speciosa*

MONOCOT FLOWERING PLANTS

Agave Family

Desert lily

Grass Family

Oat

Red brome

Cheatgrass

Bermuda grass

Hare barley

Common Mediterranean grass

Desert needlegrass

cf. indicates the plant was identified to genus, but was not identifiable to species because of the lack of necessary plant parts to key out to species (e.g., flowers or fruits). However, based on other characteristics, site location, and the habitat the plant was found in, a likely species is indicated after the cf.

sp. indicates the plant was identified to genus, but was not identifiable to species and there are at least two possibilities for the species based on site location and habitat the plant was found in.

Remnant from 2017 was indicated for plants that were dried out and were likely dead plants from the spring 2017 blooms.

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Appendix C. Special-Status Botanical Species Evaluated For Potential to Occur within the Project Site

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Appendix C. Special-Status Botanical Species Evaluated for Potential to Occur within the Project site

Species	Status	General Habitat Requirements	Potential for Occurrence
Plants			
<i>Castela emoryi</i> Emory's crucifixion-thorn	Federal: - CNPS: 2B.2	<ul style="list-style-type: none"> • Non-saline dry lakes and less frequently along washes (especially among basalt flows) or similar non-saline seasonally wet sites where water accumulates, at 280 to 2,530 feet elevation in desert scrub • Occurs rarely if at all on upper alluvial slopes or rocky slopes • In California, known only from Imperial, Riverside, and San Bernardino counties • Also occurs in Arizona and Mexico (Sonora) 	Not Expected. No dry lakes, washes, or other seasonally wet sites in project area.
<i>Cymopterus multinervatus</i> Purple-nerve cymopterus	Federal: - CNPS: 2B.2	<ul style="list-style-type: none"> • Sandy or gravelly areas in Mojavean desert scrub or pinyon and juniper woodlands at 2,600 to 5,900 feet in elevation • Known in the Inyo and San Bernardino counties 	Not Expected. Site is outside of species' known elevation range.
<i>Diplacus mohavensis</i> Mojave monkeyflower	Federal: - CNPS: 1B.2	<ul style="list-style-type: none"> • Granitic soils on gravelly banks of washes, in sandy openings between creosote bushes, soils and rocky slopes above washes in Mojave desert scrub or Joshua tree woodland at 2,000 to 4,000 feet elevation • Known only from around Barstow in the Mojave Desert of San Bernardino County 	Low, suitable habitat but Site is at the margin of species' known elevation range.
<i>Eriophyllum Mohanvense</i> Barstow woolly sunflower	Federal: - CNPS: 1B.2	<ul style="list-style-type: none"> • Silty or sandy areas in chenopod scrub, creosote bush scrub, and playas at 1,600 to 3,200 feet elevation • Historically occurred within 30 miles of the City of Barstow on the Mojave Desert. Known only from Kern, Los Angeles, and San Bernardino counties 	Low. Suitable habitat, but site is located approximately 2 miles east of known, documented occurrences. Not enough data is available on this species to rule it out from the site.
<i>Menodora spinescens</i> <i>var. mohavensis</i> Mojave menodora	Federal: - CNPS: 1B.2	<ul style="list-style-type: none"> • Rocky desert hillsides, canyons, andesite gravel at 2,200 to 7,500 feet elevation • Known only from Inyo and San Bernardino counties, California 	Not Expected. No suitable habitat in project area to support this species. Site is outside of species' elevation range.

Appendix C. Special-Status Botanical Species Evaluated for Potential to Occur within the Project site

Species	Status	General Habitat Requirements	Potential for Occurrence
<i>Mentzelia puberula</i> Darlington's blazing star	Federal: - CNPS: 2B.2	<ul style="list-style-type: none"> Sandy or rocky areas in Mojavean desert scrub or Sonoran desert scrub at (300 to 4,200 feet in elevation Known in the Imperial, Riverside and San Bernardino counties 	Moderate. Suitable habitat occurs in native vegetation communities within project area.
<i>Mentzelia tridentata</i> Creamy blazing star	Federal: - CNPS: 1B.3	<ul style="list-style-type: none"> Mojavean desert scrub at 2,300 to 3,800 feet elevation in Imperial, Inyo, Kern, Riverside, San Bernardino, and San Diego counties 	Not Expected. Site is outside of species' elevation range.
<i>Mondardella boydii</i> Boyd's monardella	Federal: - CNPS: 1B.2	<ul style="list-style-type: none"> Usually in alluvial soils and cracks of bedrock in washes on canyon bottoms and rocky slopes. Mojavean desert scrub, pinyon and juniper woodland, and riparian scrubs (desert) areas at 4,600 to 5,400 feet in elevation 	Not Expected. Site is outside of species' elevation range.
<i>Muhlenbergia appressa</i> Appressed muhly	Federal: - CNPS: 2B.2	<ul style="list-style-type: none"> Open canyon bottoms and rocky slopes at 65 to 5,300 feet elevation Known in California from Los Angeles (islands), San Bernardino, and San Diego counties. Also occurs in Arizona and Mexico 	Not Expected. No suitable habitat in project area to support this species.
<i>Pediomelum castoreum</i> Beaver Dam breadroot	Federal: - CNPS: 1B.2	<ul style="list-style-type: none"> Sandy soils, washes, and roadcuts in Joshua tree woodland and Mojave Desert scrub at 2,000 to 5,000 feet elevation In California, known only from San Bernardino County. Also occurs in Arizona and Nevada 	Moderate. Site supports suitable habitat in desert saltbush scrub and creosote bush scrub habitats.
<i>Penstemon albomarginatus</i> white-margined beardtongue	Federal: - CRPR: 1B.1	<ul style="list-style-type: none"> Perennial herb Occurs in stabilized desert dunes and sandy soils in Mojavean desert scrub from 2,100 to 3,495 amsl. Flowers March-May (June). 	Low. Elevation of known populations are higher than project area.
<i>Phacelia parishii</i> Parish's phacelia	Federal: - CNPS: 1B.1	<ul style="list-style-type: none"> Clay or alkaline soils in Mojave Desert scrub and playas at 1,770 to 3,940 feet In California, known only from San Bernardino County. Also occurs in Nevada and Arizona 	Moderate. Site supports suitable soils in <i>Atriplex</i> -dominated habitats within project area.
<i>Wislizenia refracta</i> ssp. <i>refracta</i> Jackass-clover	Federal: - CNPS: 2B.2	<ul style="list-style-type: none"> Desert dunes, Mojavean desert scrub, Sonoran desert scrub, and playas at 2,000 to 2,600 feet Known in the Riverside and San Bernardino counties 	Not Expected. Site is outside of species' elevation range.