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Draft Soda Mountain Solar Project Restoration and Revegetation Plan for Temporary Impact Areas, San Bernardino County, California

JANUARY 2025

PREPARED FOR Soda Mountain Solar, LLC

PREPARED BY

SWCA Environmental Consultants

DRAFT SODA MOUNTAIN SOLAR PROJECT RESTORATION AND REVEGETATION PLAN FOR TEMPORARY IMPACT AREAS, SAN BERNARDINO COUNTY, CALIFORNIA

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1 INTRODUCTION

This Restoration and Revegetation Plan (Plan) for Temporary Impact Areas was prepared by SWCA Environmental Consultants (SWCA) in support of the proposed Soda Mountain Solar Project (project). Soda Mountain Solar, LLC (applicant), proposes to construct, operate, and maintain a utility-scale solar photovoltaic (PV) electrical generating and storage facility and associated infrastructure to generate and deliver renewable electricity to the statewide electricity transmission grid. The proposal also includes future decommissioning, which is anticipated to occur after 30 years of operation.

The purpose of this Plan is to guide restoration of areas temporarily disturbed by construction activities. The plan includes specifications for appropriate species for seed mixes, soils, equipment, and plant salvage and location methodology. The *Vegetation Resources Management Plan for Soda Mountain Solar Project* was developed in 2013 by C.S. Ecological Surveys and Assessments. This Plan incorporates the methodology from the previous plan and provides additional information and methodology based on the current project layout, site conditions, and mitigation measures.

In the Mojave Desert, it is generally accepted that the most effective restoration efforts benefit from impact mitigation immediately after disturbance ends. This Plan also includes the methodology for salvage and translocation of cactus that may be impacted in temporary impact areas, and other species, as appropriate. The Plan conforms to the procedures and guidelines of San Bernardino County and the BLM.

Separate Integrated Weed Management Plan (IWMP) and Vegetation and Soil Salvage Plan (VSSP) plans will be developed for this project. The guidance provided in the IWMP and VSSP will be used in conjunction with this Plan.

1.1 Project Location

The project is located entirely on federally owned land managed by the BLM. The approximate 2,670-acre project area is located approximately 7 miles southwest of the community of Baker in unincorporated San Bernardino County, California, approximately 50 miles northeast of Barstow (Figure 1). The project area is located in portions of Sections 1 and 11–14, Township 12 North, Range 7 East; Sections 25 and 36, Township 13 North, Range 7 East; Sections 6, 7, 8, and 18, Township 13 North, Range 8 East, San Bernardino Meridian, California. The project would occupy area in the alluvial valley dividing the northern and southern portions of the Soda Mountains in the Mojave Desert.

Primary access to the project area is from a northbound exit off Interstate 15 (I-15). The project area is bounded directly to the east by the Mojave National Preserve (administered by the National Park Service) and the Rasor Off-Highway Vehicle (OHV) recreation area (administered by BLM) at the southeast corner. I-15, the former Arrowhead Trail Highway, runs along the western boundary of the project area, with Rasor Road Services Shell Oil gas station located off I-15 southwest of the project area, along the access road to the project area (Figure 2). Two high-voltage electrical transmission lines are west of I-15. They include a 115-kilovolt (kV) sub-transmission line owned by Southern California Edison and the Marketplace-Adelanto 500-kV transmission line is owned by the Los Angeles Department of Water and Power (LADWP). Approximately six storm drain culverts cross under I-15 adjacent to the project area.



Figure 1. Project vicinity map.



Figure 2. Project study area.

1.2 Project Background

Soda Mountain Solar, LLC, filed a right-of-way (ROW) grant application with the Bureau of Land Management (BLM) to construct, operate, maintain, and decommission the project (Case File Number CACA-049584) on December 14, 2007. The BLM considered the effects of granting the ROW as required by the National Environmental Policy Act (NEPA). The ROW grant triggered the need for a land use plan amendment (LUPA) to identify the site in the California Desert Conservation Area (CDCA) Plan of 1980 (CDCA Plan) as a suitable site for the solar project. The CDCA Plan Amendment also required analysis of potential impacts under NEPA.

As part of the original project proposal, Soda Mountain Solar, LLC, applied for groundwater well permits with the County of San Bernardino (County) on August 2, 2012. The groundwater well permit applications triggered the need for environmental analysis under the California Environmental Quality Act (CEQA). The BLM and the County jointly prepared a proposed amendment to the CDCA Plan and Environmental Impact Statement (EIS)/Environmental Impact Report (EIR) under NEPA and CEQA.

The BLM also submitted a Biological Assessment (BA) to the U.S. Fish and Wildlife Service (USFWS) on December 10, 2013, as part of a request for formal consultation pursuant to Section 7 of the federal Endangered Species Act. The BA provided an analysis of the project's potential impacts to two Endangered Species Act–listed species: Mohave tui chub (*Siphateles bicolor mohavensis*) and desert tortoise (*Gopherus agassizii*). The USFWS provided the BLM with a draft Biological Opinion (BO) on October 23, 2015, and issued a final BO on January 13, 2016. The USFWS concurred with the BLM's determination that the project may affect, but is not likely to adversely affect, the Mohave tui chub. The BO also indicated that the project would not jeopardize the continued existence of the desert tortoise. The USFWS estimated that a maximum of 10 large and 68 small desert tortoises could occur in the area. The BO authorized incidental take of desert tortoise up to this level and listed minimization measures and measures to offset adverse effects on the desert tortoise to be implemented.

The BLM and the County published the CDCA Plan Amendment and Final EIS/EIR document on June 12, 2015. The BLM issued a Record of Decision (ROD) to approve the agency-preferred alternative/selected alternative to the CDCA in March 2016. Compared with the original project analyzed in the EIS/EIR, the approved project as described in the ROD removed the North Solar Array, reduced ground disturbance by approximately 500 acres, reduced impacts to visual resources, and included future efforts to restore bighorn sheep (*Ovis canadensis nelsoni*) connectivity.

After publication of the CDCA Plan Amendment and Final EIS/EIR Soda Mountain Solar, LLC, also filed revised groundwater well permit applications with the County on May 12, 2016. The County held a hearing on adoption of the EIR and approval of the groundwater permits on August 23, 2016. Despite the project receiving a ROD from the BLM, and recommendation from the County planning staff to approve the project, the County Board of Supervisors declined to certify the EIR.

The applicant is pursuing completion of project review pursuant to CEQA based on a revised project. This report covers the project as currently proposed, and is intended to support environmental review under CEQA. The revised project is comparable to that approved in the ROD; solar arrays are only planned for installation south of I-15, and the boundary of the project south of I-15 matches the approved project in the ROD.

1.3 Summary of Project Components

The applicant proposes to construct, operate, maintain, and decommission a proposed 300-megawatt (MW) PV solar facility located on approximately 2,670 acres. The approximate disturbance acreage for the project would be up to 2,645.4 acres. The project components are as follows:

- 1. The solar plant site (i.e., all facilities that create a footprint in and around the field of solar panels, including the solar field consisting of solar power arrays identified as the East Array and South Arrays 1, 2, and 3), operation and maintenance buildings and structures, stormwater infrastructure, and related infrastructure and improvements.
- 2. A substation and switchyard for interconnection to the existing transmission system.
- 3. Approximately 300 MW of battery energy storage system (BESS) across 18 acres.

The project would operate 24 hours per day year-round and would generate electricity during daylight hours when the sun is shining. The project would generate and deliver solar-generated power to the regional electrical grid through an interconnection with the existing Marketplace-Adelanto 500-kV transmission line operated by LADWP.

1.4 Estimated Disturbance

Most of the temporary disturbance areas will be within the solar arrays, in areas where existing vegetation will be trimmed to allow access for construction equipment. Additional temporary disturbance will be associated with infrastructure such as buried electrical connector routes, berms, roadways, and construction laydown areas. The current estimated limit of disturbance (permanent and temporary) for the project is approximately 2,645.4 acres. However, the total temporary disturbance acreage will be determined following design finalization.

2 EXISTING CONDITIONS

The project area is composed of rural desert land and is almost entirely undeveloped. Rasor Road, an unimproved BLM public access road, runs from the southwest corner of the site and forks to the north and east-southeast within the project area. One section of the road continues from west to east through the project to the Rasor Road OHV area, and the other fork runs north through the project area. Elevations within the project area fall between approximately 1,200 and 1,600 feet above mean sea level (amsl). The project is immediately surrounded by the Soda Mountains, with I-15 directly west; the southern portion of the project area is bounded by Rasor Road, including a gas station, and the Rasor OHV area (see Figure 1).

The project would occupy the alluvial valley dividing the northern and southern portions of the Soda Mountains in the Mojave Desert. The project is located in the Mojave Desert Air Basin and within a sub-basin of the Soda Lake Valley Groundwater Basin.

2.1 Vegetation Communities

Vegetation communities and land cover types were mapped through desktop review and field verification. The vegetation community mapping was conducted by SWCA biologists Ryan Myers, Paris Krause, Lauren Strong, Minerva Lara, Luis Aguilar, Tamara Kramer, and Chennie Castanon during the focused rare plant survey between April 10 and May 2, 2023.Vegetation communities within the study area were classified using *A Manual of California Vegetation Online* (CNPS 2024a). Sensitive vegetation communities are defined by CDFW as those "communities that are of limited distribution statewide or within a county or region and are often vulnerable to environmental effects of Projects" (CDFW 2018). Vegetation communities with a State Rank of 1, 2, or 3 are considered sensitive by CDFW. Also, SWCA biologists surveyed for Desert Renewable Energy Conservation Plan (DRECP) Special Vegetation Features which include yucca clones, creosote rings, saguaro cactus, Joshua tree woodland, microphyll woodland, and crucifixion thorn stands (BLM 2016).

Five vegetation communities were identified on-site: Rigid Spineflower – Hairy Desert Sunflower (*Chorizanthe rigida – Geraea canescens* Desert Pavement Sparsely Vegetated Alliance), California Joint Fir – Longleaf Joint-fir Scrub (*Ephedra californica – Ephedra trifurca* Shrubland Alliance), Cheesebush – Sweetbush Scrub (*Ambrosia salsola – Bebbia juncea* Shrubland Alliance), Creosote Bush Scrub (*Larrea tridentata* Shrubland Alliance), and Creosote Bush – White Bursage Scrub (*Larrea tridentata – Ambrosia salsola* Shrubland Alliance) (Table 2; Figures 3–6). Maintained dirt roads and other disturbed areas were mapped as Developed/Disturbed landcover type. No sensitive alliance-level vegetation communities were mapped on-site. However, two sensitive associations were identified on-site: Rigid Spineflower – Hairy Desert Sunflower (*Chorizanthe rigida – Geraea canescens* Desert Pavement Association) and California Joint Fir – Longleaf Joint-fir Scrub (*Ephedra californica – Ephedra trifurca* Shrubland Alliance). Neither of these associations mapped on-site have a state rank rarity (see Table 1). No DRECP Special Vegetation Features were observed. Representative photographs of each vegetation community can be found in Appendix A.

Vegetation Community	Global Rank*	State Rank [†]	Acres within the Study Area
Creosote Bush – White Bursage Scrub Larrea tridentata – Ambrosia dumosa Shrubland Alliance	G5	S5	2,459
Creosote Bush Scrub Larrea tridentata Shrubland Alliance	G5	S5	145
Rigid Spineflower – Hairy Desert Sunflower Chorizanthe rigida – Geraea canescens Desert Pavement Sparsely Vegetated Alliance, (Chorizanthe rigida – Geraea canescens Desert Pavement Association)	G4	S4 (Sensitive Association)	32
Cheesebush – Sweetbush Scrub Ambrosia salsola – Bebbia juncea Shrubland Alliance	G4	S4	8.2
California Joint Fir – Longleaf Joint-fir Ephedra californica – Ephedra trifurca Shrubland Alliance, (Ephedra californica – Ambrosia salsola Association)	G5	S4 (Sensitive Association)	1.2
Developed/Disturbed	N/A	N/A	25
Total	N/A	N/A	2,670

Table 1. Vegetation Communities and Land Cover Types

*Global Rank (NatureServe 2024):

G4 = Over 100 viable occurrences worldwide/statewide and/or more than 32,000 acres

G5 = Demonstrably secure because of its worldwide/statewide abundance

[†]State Rank (NatureServe 2024):

S4 = Over 100 viable occurrences worldwide/statewide and/or more than 32,000 acres

S5 = Demonstrably secure because of its worldwide/statewide abundance



Figure 3. Overview of project components, vegetation communities, and plant locations.



Figure 4. Focused view of project components, vegetation communities, and plant locations (1 of 3).



Figure 5. Focused view of project components, vegetation communities, and plant locations (2 of 3).



Figure 6. Focused view of project components, vegetation communities, and plant locations (3 of 3).

2.2 Special-Status Plant Species

A desktop-based review was conducted to identify potential habitat and presence of special-status plant species in the study area (SWCA 2024). The desktop review incorporated record searches from the California Natural Diversity Database (CNDDB), California Native Plant Society (CNPS), and Calflora (CDFW 2024a; CNPS 2024b; Calflora 2024). Following the desktop review, a focused pedestrian survey for special-status plants with potential to occur in the study area was conducted using methodology from the *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (CDFW 2018). The survey was conducted concurrently with the vegetation mapping on April 10 and May 2, 2023.

The spring 2023 weather conditions were ideal for plant growth due to the substantial rainfall in winter to spring 2022 to 2023. All plant taxa identified during the spring rare plant survey can be found in Appendix B. The survey confirmed the presence of one rare plant species, Utah vine milkweed (*Funastrum utahense*, California Rare Plant Rank [CRPR] 4.2). One additional muilla (*Muilla* spp.) species was observed during this survey (see Figures 3, 4, and 6). The characteristics of the plant did not match any known species of muilla and is potentially a newly discovered species. The species is currently being described and evaluated at the University of California, Riverside and is therefore currently considered a new taxon under research. Thus, in the absence of lawful regulatory review, only assumptions can be made regarding the species' rarity, and potential to ultimately be listed as a special-status species. All other special-status plant species, their habitats, and their potential for occurrence based on the findings of the field survey.

Species	Status*	Life Form and Habitat Description [†]	Blooming Period	Habitat Suitability
Alkali marsh aster (Almutaster pauciflorus)	CRPR 2B.2	Perennial herb. Occurs in alkaline meadows and seeps. Elevational range: 239 to 800 m amsl.	June-October	Absent. Suitable habitat is not present in the study area. The species was not observed during the spring 2023 surveys.
Small-flowered androstephium (<i>Androstephium</i> <i>breviflorum</i>)	CRPR 2B.2	Perennial bulbiferous herb. Occurs in desert dunes and sandy to rocky soil in Mojavean desert scrub. Elevational range: 219 to 800 m amsl.	March–April	Absent. Some aeolian sand habitat is present in the southern portion of the study area. The species was not observed during the spring 2023 surveys. The nearest CNDDB record of this species is 4 miles southwest of the study area.
Borrego milkvetch (Astragalus lentiginosus var. borreganus)	CRPR 4.3	Annual herb. Occurs in sandy soils within Mojavean desert scrub and Sonoran desert scrub. Elevational range: 30 to 895 m amsl.	February–May	Absent. Suitable habitat is present in the study area. No milkvetch (<i>Astragalus</i> sp.) species were found during the spring 2023 surveys. The nearest recent record is 3 miles to the west of the study area.
Black grama (<i>Bouteloua eriopoda</i>)	CRPR 4.2	Perennial stoloniferous herb. Occurs in Joshua tree woodland and pinyon-juniper woodland. Elevational range: 900 to 1,900 m amsl.	May–August	Absent. Suitable habitat is not present in the study area. The species was not observed during the spring 2023 surveys.

Table 2. Potential for Special-Status Plants to Occur based on Desktop Review and SurveyResults within the Study Area

Species	Status*	Life Form and Habitat Description [†]	Blooming Period	Habitat Suitability
Emory's crucifixion thorn (<i>Castela emoryi</i>)	CRPR 2B.2	Perennial deciduous shrub. Occurs in gravelly soils within Mojavean desert scrub, washes, playas, and Sonoran desert scrub. Elevational range: 90 to 725 m amsl.	(April) June–July (September– October)	Absent. There is suitable habitat in gravelly washes throughout the study area. The species was not observed on-site during the April 2023 surveys. Species is a distinct perennial shrub and is identifiable outside of the blooming period. The nearest CNDDB record is located 1 mile northeast of the proposed gen-tie route (within 1,000 feet of the study area), originally documented during the botanical surveys in 2009 and 2012.
Harwood's eriastrum (<i>Eriastrum harwoodii</i>)	CRPR 1B.2, BLMS	Annual herb. Occurs in desert dunes. Elevational range: 124 to 914 m amsl.	March–June	Absent. Marginally suitable aeolian sand habitat is located in the southern portion of the study area. The species was not observed on- site during the April 2023 surveys. The nearest CNDDB occurrence is located 6 miles southeast of the study area.
Muilla (<i>Muilla</i> sp.)	Not Applicable	Perennial bulbiferous herb	Likely March-April (May)	Present. Five individuals were observed in sandy soil with volcanic cobble with creosote bush and white bursage.
Utah vine milkweed (Funastrum utahense)	CRPR 4.2	Perennial herb. Occurs in gravelly (sometimes) and occasionally sandy soils within Mojavean desert scrub and Sonoran desert scrub. Elevational range: 100 to 1,435 m amsl.	(March) April–June (September– October)	Present. Several individuals were found in and adjacent to the study area along the margins of ephemeral washes.
Wright's jaffueliobryum moss (<i>Jaffueliobryum wrightii</i>)	CRPR 2B.3	Moss. Occurs in dry openings, rock crevices, and carbonate substrates within alpine dwarf scrub, Mojavean desert scrub, and pinyon-juniper woodland. Elevational range: 160 to 2,500 m amsl.	Not Applicable	Absent. Suitable habitat is not present within the study area. The nearest records are 3 miles from the study area.
Ribbed cryptantha (<i>Johnstonella costata</i>)	CRPR 4.3	Annual herb. Occurs in sandy soils within desert dunes, Mojavean desert scrub, and Sonoran desert scrub. Elevational range: 28 m below mean sea level (bmsl) to 500 m amsl.	February–May	Absent. Suitable habitat is present throughout the study area. The species was not observed during the spring 2023 surveys. The nearest record is 4.5 miles west of the study area.
Winged cryptantha (Johnstonella holoptera)	CRPR 4.3	Annual herb. Occurs in gravelly to rocky soils, washes, slopes, ridges Mojavean desert scrub, and Sonoran desert scrub. Elevational range: 100 to 1,690 m amsl.	March–April	Absent. Suitable habitat is present throughout the study area. The species was not observed during the spring 2023 surveys. The nearest record is 7 miles northeast of the study area.
Cooper's rush (<i>Juncus cooperi</i>)	CRPR 4.3	Perennial herb. Occurs in meadows and seeps. Elevational range: 100 m bmsl to 1,769 m amsl.	April–May (August)	Absent. Suitable habitat is not present in the study area. The species was not observed during the spring 2023 surveys.

Species	Status*	Life Form and Habitat Description [†]	Blooming Period	Habitat Suitability
Desert winged rockcress (Sibara deserti)	CRPR 4.3	Annual herb. Occurs in washes, steep hillsides, dry flats, scree, calcareous rubble, rocky bluffs, and exposed crevices in Mojavean desert scrub. Elevational range: 344 to 1,300 m amsl.	March–April	Absent. Suitable habitat is present in the study area. The species was not observed during the spring 2023 surveys. The nearest record is 7 miles northeast of the study area.

*Ranks for the species included in this list are sourced from CNDDB (CDFW 2024a). Impacts to plants with CRPR 1 and 2 must be considered pursuant to CEQA and are treated as sensitive.

CRPR Ranking:

1B: Rare, threatened, or endangered in California and elsewhere.

2B: Rare, threatened, or endangered in California, but more common elsewhere.

4: Watch List Plants of limited distribution.

0.2: Fairly threatened in California.

0.3: Not very threatened in California

BLMS: Bureau of Land Management sensitive.

⁺Habitat descriptions are adapted from the CNPS Rare Plant Inventory Ecology and Life History notes, and consist of the general and microhabitat descriptions of the corresponding element (CNPS 2024b).

2.2.1 California Desert Native Plants

The CDFW California Desert Native Plants Act (CDNPA) protects certain native desert plant species from being unlawfully harvested on private and public lands. It also includes information on legal harvesting and transplanting CDNPA-regulated species. Native desert plants that are declared to be rare, threatened, or endangered species by federal or state law are not included under the provisions of the CDNPA. (CDFW 2024b). Seven CDNPA-regulated plant species were documented in the study area, including: silver cholla (*Cylindropuntia echinocarpa*), branched pencil cholla (*Cylindropuntia ramossiima*), cottontop cactus (*Echinocactus polycephalus*), common fishhook cactus (*Mammillaria tetrancistra*), beavertail cactus (*Opuntia basilaris* var. *basilaris*), desert holly (*Atriplex hymenelytra*), and blue paloverde (*Parkinsonia florida*).

3 APPLICABLE APPLICANT-PROPOSED MEASURES AND MITIGATION MEASURES

The following section lists the applicable applicant-proposed measures (APMs) and mitigation measures (MMs) related to temporary disturbance and revegetation.

3.1 Applicant-Proposed Measures

The applicant identified and committed to implementing the following APMs as part of the project to avoid or substantially lessen potentially significant impacts to biological resources, to the extent feasible. The APMs originated in the ROD issued by BLM in 2016 and have been updated to match the current project description and regulations. The APMs, where applicable, are discussed in the impact analysis section below. The measures pertaining to vegetation and special-status plants include the following:

3.1.1 Vegetation

• **APM BIO-1:** The site shall be revegetated after decommissioning according to the Final Closure Plan described in MM BIO-24 and prepared in conformance with BLM requirements at the time of decommissioning.

- **APM BIO 2:** The applicant shall prepare and implement a Vegetation Resources Management Plan that contains the following components:
 - a. Vegetation Salvage Plans that discuss the methods that will be used to transplant cacti present within the proposed disturbance areas. Salvage and transplant methods used will be approved by CDFW. In addition, the Vegetation Salvage Plans will also include methods that will be used to transplant special-status plant species that occur within proposed disturbance areas.
 - b. Restoration Plans discussing the methods that will be used to restore any of the five native plant community types (Creosote Bush-White Bursage Scrub, Cheesebush Cheesebush Scrub, Creosote Bush Scrub, and California Joint Fir Longleaf Joint-fir Scrub) present within the project area that may be temporarily disturbed by construction activities. The applicant will obtain CDFW approval for any seed mixtures used for restoration.
 - c. Vegetation Salvage and Restoration Plans that will specify success criteria and performance standards. The applicant will be responsible for implementing the Vegetation Salvage and Restoration Plan according to CDFW requirements.
- **APM BIO-3:** Herbicides shall not be applied systemically over the entire project area. Herbicides shall be applied in focused treatments in areas where invasive weed infestations have been identified, such as where there is a clump or monotypic stand of invasive weeds. Herbicides shall not be applied within 100 feet of a special-status plant.
- **APM BIO-4:** Only a State of California and federally certified contractor (i.e., Qualified Applicator), who is also approved by CDFW, and holds and maintains a Qualified Applicator License from California Department of Pesticide Regulation, shall be permitted to perform herbicide applications. Herbicides shall be applied in accordance with applicable laws, regulations, and permit stipulations. All herbicide applications must follow U.S. Environmental Protection Agency label instructions.
- **APM BIO-5:** Herbicides shall not be applied during rain events, within 48 hours of a forecasted rain event with a 50% or greater chance of precipitation, or when wind velocity exceeds 10 miles per hour (mph) (for liquids) and 15 mph for granular herbicides.
- **APM BIO-6:** The applicant shall implement an IWMP to control weed infestations and the spread of noxious weeds in the study area.
- **APM BIO-7:** After project construction, areas of temporary disturbance shall be closed and the restoration measures in the Vegetation Resource Management Plan shall be implemented.
- **APM BIO-8:** Foundations shall be removed to a minimum of 3 feet below surrounding grade during decommissioning and covered with soil to allow adequate root penetration for native plants. Petroleum product leaks and chemical releases shall be remediated prior to completion of decommissioning.
- **APM BIO-9:** Decommissioning methods shall minimize new site disturbance and removal of native vegetation.

3.1.2 Special-Status Plants

• **APM BIO-10:** All special-status and rare plant (CRPR 1, 2, 3, and 4) occurrences within the project area will be documented during preconstruction surveys. The applicant will also provide a 100-foot buffer area surrounding each avoided occurrence in which no construction activities will

take place, if feasible. If avoidance is not feasible, the applicant shall provide on-site mitigation (e.g., vegetation salvage) for impacts to special-status and rare plants.

• **APM BIO-11:** Before construction of a given phase begins, the applicant shall stake and flag the construction area boundaries, including the construction areas for the solar arrays and associated infrastructure; construction laydown, parking, and work areas; and the boundaries of all temporary and permanent access roads. A CDFW-approved biologist shall then survey all areas of proposed ground disturbance for rare or special-status plant species and cacti during the appropriate period (blooming or otherwise identifiable) for those species having the potential to occur in the construction areas. All rare or special-status plant species and cacti observed shall be flagged for transplantation.

3.2 Mitigation Measures

The APMs listed in Section 3.1 are considered part of the project. However, where other impacts are identified that are not addressed by these APMs, or where the APMs do not reduce impacts to less-thansignificant levels, the EIR identifies and recommends the additional MMs below to avoid and substantially lessen significant effects to the extent feasible. The MMs below only include measures applicable to this plan. MMs or portions of MMs applicable to the IWMP and VSSP are not included here.

- **MM BIO-4: Special-Status Plant Species and Cacti Impact Avoidance and Minimization.** This measure will provide guidance on how project personnel can avoid unintended impacts to special-status plants on the project area (e.g., Utah vine milkweed) and provide for the salvage of protected cacti prior to construction. This measure includes the following requirements:
 - The applicant shall establish Environmentally Sensitive Areas (ESAs) around Utah vine milkweed that have been identified on the project area and/or may be identified in project disturbance areas during site preparation. A minimum 100-foot exclusion area shall be established around the plants, which shall be clearly identified and maintained throughout construction to ensure that avoided plants are not inadvertently harmed. ESAs shall be clearly delineated in the field with temporary construction fencing and signs prohibiting movement of the fencing or sediment controls under penalty of work stoppages or compensatory mitigation.
 - Herbicide and Soil Stabilizer Drift Control Measures. Special-status plant occurrences within 100 feet of the project disturbance area, including Utah vine milkweed, shall be protected from herbicide and soil stabilizer drift. The IWMP includes measures to avoid chemical drift or residual toxicity to special-status plants consistent with guidelines such as those provided by the Nature Conservancy's Global Invasive Species Team (Hillmer and Liedtke 2003), the U.S. Environmental Protection Agency, and the Pesticide Action Network Database.
- **MM BIO-5: Biological Monitoring.** Biological Monitor(s) shall be employed to assist the Designated Biologist in conducting preconstruction surveys and monitoring ground disturbance, grading, construction, decommissioning, and restoration activities. Additionally, biological monitoring shall be performed during any ground disturbance or grading activities that occur during operation and maintenance. The Biological Monitor(s) shall have sufficient education and field experience to understand resident wildlife species biology; have experience conducting desert tortoise, burrowing owl, kit fox, and badger field monitoring; and be able to identify these species and their sign (including active burrows). The Designated Biologist shall submit a resume, at least three references, and contact information for each prospective Biological Monitor

to CDFW and USFWS for approval. To avoid and minimize effects on biological resources, the Biological Monitor(s) shall assist the Designated Biologist with the following:

- 1. Be present during construction activities that take place in suitable habitat for desert tortoise, burrowing owl, kit fox, badger, or other protected species to prevent or minimize harm or injury to these species.
- 2. Activities of the Biological Monitor(s) include, but are not limited to, ensuring compliance with all avoidance and minimization measures; monitoring for desert tortoise, burrowing owl, kit fox, badger, and other protected species; halting construction activity in the area if an individual is found; and checking the staking/flagging of all disturbance areas to be sure that they are intact and that all construction activities are being kept within the staked/flagged limits. If a desert tortoise, burrowing owl, kit fox, badger, or other protected species is found within a work area, the Biological Monitor(s) shall immediately notify the Designated Biologist, who shall determine measures to be taken to ensure that the individual is not harmed.
- 3. Inspect the study area for any special-status wildlife species.
- 4. Ensure that potential habitats within the construction zone are not occupied by specialstatus species (e.g., potential burrows or nests are inspected).
- 5. In the event of the discovery of a non-listed, special-status ground-dwelling animal, recover and relocate the animal to adjacent suitable habitat at least 200 feet from the limits of construction activities.
- 6. At the end of each workday, inspect all potential wildlife pitfalls (e.g., trenches, bores, other excavations) for wildlife and remove wildlife as necessary. If the potential pitfalls will not be immediately backfilled following inspection, the Biological Monitor(s) will ensure that the construction crew slopes the ends of the excavation (3:1 slope), provides wildlife escape ramps, or completely and securely covers the excavation to prevent wildlife entry.
- 7. Inspect the site to ensure trash and food-related waste is placed in closed-lid containers and that workers do not feed wildlife. Also inspect the work area each day to ensure that no microtrash (e.g., bolts, screws, etc.) is left behind.
- **MM BIO-7: Designated Biologist.** The applicant shall assign at least one Designated Biologist to the project. The applicant shall submit the resume of the proposed Designated Biologist(s), with at least three references and contact information, to the BLM Authorized Officer for approval in consultation with CDFW and USFWS.

The Designated Biologist must meet the following minimum qualifications:

- 1. Have a bachelor's degree in biological sciences, zoology, botany, ecology, or a closely related field;
- 2. Have 3 years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society;
- 3. Have at least 1 year of field experience with biological resources found in or near the study area;
- 4. Meet the current USFWS Authorized Biologist qualifications criteria, demonstrate familiarity with protocols and guidelines for the desert tortoise, and be approved by the USFWS;

5. Possess a California Endangered Species Act (CESA) Memorandum of Understanding pursuant to Section 2081(a) for desert tortoise.

In lieu of the above requirements, the resume shall demonstrate to the satisfaction of the BLM Authorized Officer, in consultation with CDFW and USFWS, that the proposed Designated Biologist or alternate has the appropriate training and background to effectively implement the MMs.

• MM BIO-7: Compliance Monitoring by the Designated Biologist. Prior to ground-disturbing activities, an individual shall be designated and approved by CDFW as a Designated Biologist (i.e., field contact representative). Designated Biologist qualifications are presented below.

The Designated Biologist shall be employed for the period during which ongoing construction and postconstruction monitoring and reporting by an approved biologist is required. Each successive Designated Biologist shall be approved by CDFW. The Designated Biologist shall have the authority to ensure compliance with all measures set forth in the BO and CESA Section 2081 take authorization and with all MMs included herein, and shall be the primary agency contact for the implementation of these measures. The Designated Biologist shall have the authority and responsibility to halt any project activities that are in violation of the terms of the BO, Section 2081 take authorization, or project MMs. A list of responsibilities of the Designated Biologist is summarized below.

To avoid and minimize effects to biological resources, the Designated Biologist shall:

- 1. Notify CDFW and USFWS at least 14 calendar days before initiation of grounddisturbing activities.
- 2. Immediately notify the CDFW in writing if the applicant/owner does not comply with any of the MMs or terms of the BO and/or the Section 2081 take authorization including, but not limited to, any actual or anticipated failure to implement such measures within the periods specified.
- 3. Ensure performance of daily compliance inspections during ongoing construction as clearing, grubbing, and grading are completed, and submit a monthly compliance report to CDFW until construction is complete.
- **MM BIO-23: Vegetation Best Management Practices (BMPs).** The applicant shall undertake the following measures to manage the construction site and related facilities in a manner to avoid or minimize impacts to vegetation resources:
 - <u>Revegetation of Temporarily Disturbed Areas</u>. The applicant shall prepare and implement a Temporary Disturbance Revegetation Plan to restore all areas subject to temporary disturbance to pre-project grade and conditions. The plan shall be submitted to the BLM and CDFW for review and approval at least 30 days prior to the start of grounddisturbing activities. Temporarily disturbed areas within the project area include, but are not limited to, all proposed locations for linear facilities, temporary lay-down areas not converted to part of the solar field, and construction equipment staging areas. The Temporary Disturbance Revegetation Plan shall include a description of topsoil salvage and seeding techniques and a monitoring and reporting plan, and plan to achieve the following performance standards by the end of monitoring year 2:
 - a. At least 80% of the species observed within the temporarily disturbed areas shall be native species that naturally occur in desert scrub habitats; and

b. Relative cover and density of plant species within the temporarily disturbed areas shall equal at least 60% relative to pre-disturbance conditions.

4 **RESTORATION ACTIONS**

The following sections includes the restoration actions from the 2013 *Vegetation Resources Management Plan for the Soda Mountain Solar Project* (C.S. Ecological Surveys and Assessments 2013). The restoration actions have been updated to reflect the current project design and current site conditions.

4.1 **Preconstruction Actions**

Preconstruction restoration activities will prepare the temporary use disturbance areas prior to construction, thus minimizing impacts.

4.1.1 Preconstruction Surveys

Prior to any ground-disturbing activities, such as grading or vegetation clearance, all temporary impact work sites will be surveyed by qualified biologists for rare and/or special-status biological resources in compliance with applicable project APMs and MMs. Special-status plants and cacti subject to temporary impact will be photographed, flagged, and their locations recorded using hand-held GPS units. A 100-foot buffer will be implemented for plants outside of disturbance areas, these plants will not be salvaged. Plants within temporary disturbance areas will be salvaged from the site and replanted in the same area (if feasible) once disturbance has been completed Avoidance buffers will also be established for salvaged plants at the transplant sites during construction.

Preconstruction surveys will be conducted before any ground-disturbing activities begin in temporary impact areas. If off-road vehicle access to the project site is needed prior to the completion of these surveys, such as for survey staking or soil testing, a biological monitor will accompany the vehicle to ensure that no rare or special-status biological resources are impacted.

Surveys for rare and special-status plants may only be conducted during the appropriate blooming season. The following survey schedule is recommended for the preconstruction surveys:

- Cacti: Surveys can be conducted year-round. Surveys will be conducted in disturbance areas.
- Utah milkweed vine and other rare or special-status plants: Surveys should be conducted during the spring (March–April) in areas where there are known occurrences or potential for occurrence.

4.2 Temporary Impact Restoration and Revegetation

The temporary disturbance sites will be revegetated to stabilize soils; maximize the likelihood of vegetation recovery over time; and minimize soil erosion, dust generation, and weed invasion. The applicant will contract a qualified Restoration Ecologist to evaluate and prescribe specific restoration measures at each work site. The Restoration Ecologist will coordinate with the project Designated Biologist and with the applicant to ensure that the prescriptions are implemented as written.

4.2.1 Site Preparation

Site preparation measures before reclamation work will be determined on a case-by-case basis, considering the advantages and disadvantages of different soil treatments and site preparation methods.

The goal will be to restore natural contours, protect the site from erosion (due to wind or water), and maximize the potential for vegetation recovery. Temporary disturbances will typically result from activities such as rock removal, micrograding, isolated cut-and-fill operations, scarifying work areas (blading without substantial soil movement), trimming woody vegetation, crushing vegetation in place, or driving over the work area. These activities will lead to soil compaction and may degrade or eliminate native vegetation.

Soil decompaction may increase vulnerability to weeds, erosion, and dust, and could further damage any surviving rootstocks. The Restoration Ecologist will assess soil compaction and recommend either no treatment, limited treatment using hand tools (depending on specific circumstances), or light harrowing. In areas where soil decompaction occurs, the surface will be covered with native mulch or chipped native vegetation to control dust and erosion, and may be seeded with native plants, as appropriate.

In cases where construction activities alter natural channel morphology or runoff patterns, the Restoration Ecologist will prescribe recontouring, soil compaction, placement of native rock, or application of local native mulch, including native rock or chipped vegetation. Efforts will focus on using on-site materials to reduce the risk of introducing invasive species. A site-specific approach will be employed, which may involve soil contouring, the construction of berms stabilized with native rock and mulch, and placement of local rock to enhance surface roughness. This approach will aim to recreate the natural microtopography of the site, minimizing impacts to native vegetation and wildlife. If necessary, off-site materials such as certified weed-free straw bales, straw wattles, or other erosion control materials may be used temporarily to address erosion. Where possible, mulch for erosion control will be sourced from native vegetation cleared from the site itself.

4.2.2 Seed Collection

Seed-collection activities will be conducted within the ROW grant and within 10 miles of the boundaries of the project area prior to the commencement of construction activities by a qualified seed company or other approved method. Standard seed-collection protocol will be followed. Sites for seed collection will be determined in advance and may need coordination with BLM. All seed collected will be from the appropriate Mojave seed-transfer zone. BLM may approve collection from greater distances from appropriate collection sites. Only mature seeds will be collected. Quantity (individual seed count or pounds) of seeds required will be based on the number of sensitive-listed plants being impacted and/or details of the approved seed mix and estimated acres of temporary disturbance for the project. If it is determined that seed collected, cleaned, tested for pure live seed (PLS), certified weed free, and stored by the contractor until they are ready for use, unless other arrangements approved by the BLM are made. Seeds will be stored dry in containers that will be labeled with exact location, date of collection, and collector. Containers must be stored in a rodent- and insect-proof location.

The desert scrub seed mix recommended in the *Vegetation Resources Management Plan for the Soda Mountain Solar Project* (C.S. Ecological Surveys and Assessments 2013) will be used for the project (Table 3). The seed mix consists of primarily or exclusively early successional species. This seed mix will be evaluated and revised in coordination with the BLM, as needed prior to restoration implementation, as the BLM will be responsible for approving final seed mixes and seed sources. The following BMPs will be applied during seeding:

• Seeding will include pelletizing, imprinting, or hydroseeding. Seeding methods will be selected in conjunction with the BLM based on current BMPs, time of year, new research developments, and recommendations from the contractor selected to implement restoration.

- Total seeding rate will be no less than 20 pounds per acre. Specific proportions will be based upon seed availability and recommendations of the Restoration Ecologist. The final seeding rate will be determined in coordination with BLM and based on final species selection and project specifications.
- The seed mix will be determined based on the dominant species found on-site during preconstruction surveys. The seed mix composition, rate, and origin must be approved by the BLM prior to application. Seeds must be from the same provisional seed-transfer zones (or empirical seed-transfer zones, if available) as the project. Seed procured must come with origin information, including applicable permits if the seed originated on public lands. Seed must be tagged appropriately, tested for PLS, and be certified weed free.
- No seed will be collected from designated Wilderness Areas or the Mojave National Preserve.
- Any seed collection on public lands will be done only under authorization from BLM.
- No more than 40% of seeding plants in any collection area will be harvested and no more than 10% of mature seed on any single plant will be harvested (excluding plants within project disturbance areas).
- Access to collection areas will be via open, designated routes, or on foot; there will be no crosscounty vehicle travel.
- Collectors will record and track seed lots, including collection date, collection location, elevation, dominant species at location, stand conditions, test data, bulk weight, and net weight (as PLS).
- Depending on seed availability, other native species occurring on the site or nearby at similar exposure and elevation may be selected to replace those below. Seed collection from plants to be removed or mowed for project construction will be unrestricted.

No re-seeding will be needed in areas where construction disturbance is limited to mowing or "drive and crush" unless these areas show inadequate natural recovery (e.g., re-sprouting rootstocks) or excessive soil compaction that may inhibit seed germination.

Common Name	Scientific Name	Habitat	Plant Type
Big galleta	Hilaria rigida	Creosote scrub	Perennial grasslike herb
Brittlebush	Encelia farinosa	Wash	Shrub
Burrobrush	Ambrosia salsola	Wash	Shrub
Button brittlebush	Encelia frutescens	Wash	Shrub
Allscale saltbush	Atriplex polycarpa	Creosote scrub	Shrub
Desert holly	Atriplex hymenelytra	Creosote scrub	Perennial
Desert trumpet	Eriogonum inflatum	Creosote scrub	Perennial herb
Distant phacelia	Phacelia distans	Creosote scrub	Annual herb
Esteve's pincushion	Chaenactis stevioides	Creosote scrub	Annual herb
Fluff grass	Dasyochloa pulchella	Creosote scrub	Perennial grasslike herb
Hairy desert sunflower	Geraea canescens	Creosote scrub	Annual herb
Needle grama	Bouteloua aristidoides var. aristidoides	Creosote scrub	Annual grasslike herb
Panamint cryptantha	Johnstonella angustifolia	Creosote scrub	Annual herb

Table 3. Seed Mix

Common Name	Scientific Name	Habitat	Plant Type
Sixweeks grama	Bouteloua barbata var. barbata	Creosote scrub	Annual grasslike herb
Sixweeks threeawn	Aristida adscensionis	Creosote scrub	Annual grasslike herb
Desert dandelion	Malacothrix glabrata	Creosote scrub	Annual herb
Sweetbush	Bebbia juncea var. aspera	Wash	Shrub
Threadleaf snakeweed	Gutierrezia microcephala	Creosote scrub	Shrub (stem succulent)
White bursage	Ambrosia dumosa	Creosote scrub	Shrub

Source: C.S. Ecological Surveys and Assessments (2013)

4.2.3 Seeding Schedule

Seeding will be performed after all decompaction has been completed and salvaged topsoils have been replaced. Seeding will be completed in late summer or early fall, to ensure that seed is in place prior to the onset of seasonal rain in late fall or early winter. Later seeding is likely to result in failed germination due to inadequate moisture availability.

Due to the arid climate and variable rainfall, germination and establishment success of seeded plants is not predictable. Supplemental activities (such as seeding) may occur, on a case-by-case basis, to improve chances of meeting target vegetation density within the recovery monitoring timeline. Re-seeding will be scheduled to minimize potential seed loss to granivorous birds and small mammals and maximize exposure to seasonal rainfall.

4.2.4 Revegetation Site Maintenance

Revegetation sites will not receive supplemental irrigation. These sites will be regularly monitored for weed presence and abundance, with weed control measures implemented as necessary, in accordance with the IWMP. Additional maintenance activities, including erosion control, soil stabilization, or other measures, will be carried out as needed based on the monitoring results.

4.3 Success Criteria

If the following success criteria have not been met within 3 years of project construction, the project owner will be responsible for implementing remediation measures, as needed. Following remediation work, the site will be subject to the success criteria and monitoring period as required for the initial revegetation or restoration.

- 1. At temporarily disturbed areas treated by vegetation trimming, drive and crush, or similar disturbance, at least 80% of the species observed within the area will be native species that naturally occur in local desert scrub habitats.
- 2. At temporarily disturbed areas treated by grading or scarification, which have resulted in loss of native soils and rootstocks, at least 60% of the species observed within the area will be native species that naturally occur in local desert scrub habitats.
- 3. Cover and density of nonnative plant species within the temporarily disturbed areas will be no more than twice their cover and density in comparable adjacent lands that have not been disturbed by the project.
- 4. Soil stability and potential for erosion or dust source will be comparable to adjacent lands that have not been disturbed by the project.

5 MONITORING, RESTORATION, AND REPORTING

Following implementation of restoration measures, each temporarily disturbed site will be monitored annually to evaluate success, in terms of the success criteria listed in Section 4.3. Monitoring will continue for a period of no fewer than 2 years or until the defined success criteria are achieved. Remediation activities (such as additional planting, removal of nonnative invasive species, or erosion control) will be taken during this 2-year period to ensure the success of the restoration effort, if necessary. If mitigation fails to meet the established performance criteria after the 2-year maintenance and monitoring period, monitoring and remedial activities will extend beyond the 2-year period until the criteria are met.

If a fire or flood damages a restoration site within the 2-year monitoring period, the applicant will be responsible for a one-time replacement. If a second fire or flood occurs, no replanting will be required, unless the damage is caused by the applicant's activities (as determined by BLM or other firefighting agency investigation).

Throughout the construction, operation and maintenance (O&M), and decommissioning phases, and for a minimum of 3 years following completion of decommissioning, the Designated Biologist and Restoration Ecologist will be responsible for providing annual Vegetation Management Progress Reports (VMPRs) to BLM for review and approval. After 3 years, VRPRs will be submitted every 3 to 5 years during project operation. Each VMPR will include the following:

- Brief summary of project construction, O&M, or decommissioning status, with a list of all temporarily disturbed sites treated or monitored during the preceding year.
- Summary of restoration or revegetation progress and results since previous report, including a map of all reclamation or restoration activity since previous report.
- Seed inventory accounting of materials acquired or used since previous report, and materials needed for the coming 5-year period.
- Summary of monitoring results and completion status for all sites.
- Recommendations as applicable for remedial work such as re-seeding, erosion control, weed control, or other maintenance activity.
- Representative site photographs.
- Notation of any other pertinent concerns (e.g., vehicle trespass).

6 ROLES AND RESPONSIBILITIES

The applicant is responsible for planning, implementation, maintenance, performance monitoring, and the reporting requirements of this Plan. The applicant will be supported by a qualified Restoration Ecologist and Designated Biologist. The roles and responsibilities of this team are outlined in detail below.

6.1 Restoration Ecologist

A qualified Restoration Ecologist will provide ecological guidance and restoration oversight. The Restoration Ecologist will be designated by the applicant and approved by BLM and CDFW. The restoration ecologist will be experienced with habitat restoration projects in in the Mojave Desert, maintenance and monitoring methods, and have knowledge of project flora. The Restoration Ecologist will be responsible for the following site-specific restoration activities and for supporting the Designated Biologist in managing and implementing this Plan, as follows:

- Review all temporary disturbance sites to evaluate soil compaction, vegetation condition, susceptibility to erosion, weed invasion, or as dust sources, and specify site-specific treatments such as erosion control, soil treatment, decompaction, mulch application, or reseeding for each site
- Estimate overall project seed requirements; update estimates as needed; and coordinate with the Designated Biologist, restoration contractor, and the applicant to obtain and maintain seed inventory
- Oversee and manage site treatments, including soils, erosion control, reseeding, and other requirements
- Oversee monitoring and evaluate success at each restoration or revegetation site
- Plan and direct follow-up remedial work as needed to meet success criteria
- Prepare and submit annual reports to the applicant and resource agencies in coordination with the Designated Biologist

6.2 Designated Biologist

The Designated Biologist will be designated by the applicant and approved by the BLM and CDFW, will be responsible for managing and implementing this Plan, as follows:

- Ensure that no off-road vehicle access occurs on the site until preconstruction surveys and special-status plant salvage, desert tortoise clearance, and other special-status species clearance or exclusion, have been completed.
- Ensure that no off-road vehicle access occurs off-site for plant salvage or seed collection or other project-related activities, except as specifically authorized by BLM.
- Schedule all pre-construction clearance surveys for all project components, to include seasonal surveys for all special-status plants and animal species in the areas where they have been previously documented.
- Ensure that each person assigned to survey, salvage, transplantation, collect seed, reseed, monitor, or any other aspect of this Plan is qualified for each task.
- For rare or special-status plant locations to be avoided by adjusting work area, the Designated Biologist will designate and mark a buffer area surrounding the location and will be responsible for monitoring the site throughout the construction phase of the project.
- Review the qualifications and recommendations of the contracted Restoration Ecologist, and support the coordination among the Restoration Ecologist, resource agencies, and the applicant.
- Review plans and recommendations made by the Restoration Ecologist.
- Review and approve plant materials, erosion control materials, and other materials to ensure they are certified weed-free certification.
- Communicate with the applicant and resource agencies regarding restoration and revegetation activities.

- Coordinate restoration activities with other project activities including construction and maintenance work as well as mitigation and compliance requirements such as implementing the IWMP.
- Conduct annual O&M-phase inspections to identify accumulated dead vegetation, wildlife attractants, barren soils, or other areas susceptible to erosion or likely dust sources; coordinate with Restoration Ecologist to implement site treatment as needed.
- Prepare and submit monitoring reports to the applicant and resource agencies.

7 LITERATURE CITED

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APPENDIX A

Site Photographs



Photograph A-1. Utah vine milkweed observed on April 19, 2023. This individual was found in the northern portion of the project site, west of I-15.



Photograph A-2. Creosote Bush – White Bursage Scrub in the northwestern portion of the project site, April 25, 2023; view facing southwest.



Photograph A-3. Creosote Bush Scrub in the southeastern corner of the project site, April 20, 2023; view facing northeast.



Photograph A-4. Example of desert pavement consisting of Rigid Spineflower – Hairy Desert Sunflower (*Chorizanthe rigida* – *Geraea canescens* Desert Pavement Association) in the western portion of the project site, April 18, 2023; view facing east.



Photograph A-5. Cheesebush – Sweetbush Scrub in the northeastern portion of the project site, April 13, 2023; view facing west.



Photograph A-6. California Joint fir – Longleaf Joint-fir (*Ephedra californica – Ambrosia salsola* Association) in the southeast corner of the project site, April 20, 2023; view facing north.



Photograph A-7. Example of eolian sands where tighter transects were conducted, south end of project site.

APPENDIX B

Floral Compendium

Scientific Name	Common Name	Life Form
	GYMNOSPERMS (DICOTS)	
Ephedraceae (Ephedra Family)		
Ephedra californica	California joint fir	shrub
	ANGIOSPERMS (DICOTS)	
Aizoaceae (Iceplant Family)		
Mesembryanthemum nodiflorum*	small-flowered iceplant	annual herb
Amaranthaceae (Pigweed Family)		
Tidestromia suffruticosa var. oblongifolia	honeysweet	annual herb
Apocynaceae (Dogbane Family)		
Asclepias erosa	desert milkweed	perennial herb
Asclepias subulata	rush milkweed	perennial herb
Funastrum hirtellum	hairy milkweed	perennial herb
Funastrum utahense (CRPR 4.2)*	Utah vine milkweed	perennial herb
Asteraceae (Aster Family)		
Ambrosia acanthicarpa	annual bursage	annual herb
Ambrosia dumosa	white bursage	shrub
Ambrosia salsola	burrobrush	shrub
Baccharis brachyphylla	short-leaved baccharis	shrub
Bebbia juncea	sweetbush shrub	shrub
Brickellia incana	woolly brickellia	shrub
Chaenactis carphoclinia var. carphoclinia	pebble pincushion	annual herb
Chaenactis fremontii	Fremont pincushion	annual herb
Chaenactis steviodies	desert pincushion	annual herb
Encelia farinosa	brittlebush	shrub
Encelia frutescens	rayless encelia	shrub
Eriophyllum wallacei	Wallace's woolly daisy	annual herb
Geraea canescens	hairy desert sunflower	annual herb
Lasthenia gracilis	needle goldfields	annual herb
Logfia depressa	dwarf cottonrose	annual herb
Malacothrix coulteri	snake's head	annual herb
Malacothrix glabrata	desert dandelion	annual herb
Monoptilon bellioides	Mojave Desert star	annual herb
Pectis papposa	manybristle chinchweed	annual herb
Perityle emoryi	Emory's rock daisy	annual herb
Peucephyllum schottii	Schott's pygmycedar	shrub
Porophyllum gracile	odora	perennial herb
Prenanthella exigua	bright white	annual herb
Rafinesquia neomexicana	desert chicory	annual herb
Senecio mohavensis	Mojave ragwort	annual herb
Stephanomeria pauciflora	wire lettuce	perennial herb

Scientific Name	Common Name	Life Form
Stylocline micropoides	desert nest straw	annual herb
Boraginaceae (Borage Family)		
Amsinckia tessellata var. tessellata	devil's lettuce	annual herb
Cryptantha barbigera var. barbigera	bearded cryptantha	annual herb
Cryptantha dumetorum	bush loving cryptantha	annual herb
Cryptantha maritima	Guadalupe cryptantha	annual herb
Cryptantha nevadensis	Nevada cryptantha	annual herb
Cryptantha pterocarya var. pterocarya	wingnut cryptantha	annual herb
Eremocarya micrantha var. micrantha	desert red-root	annual herb
Johnstonella angustifolia	narrow-leaved johnstonella	annual herb
Pectocarya heterocarpa	chuckwalla pectocarya	annual herb
Pectocarya platycarpa	broad fruited combseed	annual herb
Pectocarya recurvata	curvenut combseed	annual herb
Brassicaceae (Mustard Family)		
Brassica tournefortii*	Saharan mustard	annual herb
Caulanthus lasiophyllus	California mustard	annual herb
Lepidium lasiocarpum	shaggyfruit pepperweed	annual herb
Sisymbrium irio*	London rocket	annual herb
Thysanocarpus curvipes	common fringe pod	annual herb
Cactaceae (Cactus Family)		
Cylindropuntia echinocarpa	silver cholla	stem succulent
Cylindropuntia ramosissima	branched pencil cholla	stem succulent
Echinocactus polycephalus	cottontop cactus	stem succulent
Mammillaria tetrancistra	common fishhook cactus	stem succulent
Opuntia basilaris var. basilaris	beavertail cactus	stem succulent
Campanulaceae (Bellflower Family)		
Nemacladus orientalis	eastern glandular nemacladus	annual herb
Nemacladus tenuis var. aliformis	desert namacladus	annual herb
Caryophyllaceae (Carnation Family)		
Spergularia sp.	spurrey	annual herb
Chenopodiaceae (Goosefoot Family)		
Atriplex hymenelytra	desert holly	shrub
Atriplex polycarpa	allscale saltbush	shrub
Salsola tragus	prickly Russian thistle	annual herb
Convolvulaceae (Morning Glory Family)		
Cuscuta denticulata	desert dodder	annual herb, vine
Cucurbitaceae (Cucumber Family)		
Cucurbita palmata	coyote melon	annual or perennial herb

Scientific Name	Common Name	Life Form
Euphorbiaceae (Euphorbias Family)		
Euphorbia micromera	Sonoran sandmata	annual herb
Euphorbia polycarpa	smallseed sandmat	perennial herb
Fabaceae (Bean Family)		
Acmispon strigosus	strigose lotus	annual herb
Lupinus shockleyi	purple desert lupine	annual herb
Dalea mollissima	silky dalea	perennial herb
Lupinus arizonicus	Arizona lupine	annual herb
Parkinsonia florida	blue paloverde	tree
Senna armata	desert senna	shrub
Geraniaceae (Storksbill Family)		
Erodium cicutarium*	coastal heron's bill	annual herb
Erodium texanum	desert heron's bill	annual herb
Hydrophyllaceae (Waterleaf Family)		
Eucrypta micrantha	desert eucrypta	annual herb
Phacelia crenulata	notch-leaved phacelia	annual herb
Phacelia distans	distant phacelia	annual herb
Phacelia neglecta	alkali phacelia	annual herb
Krameriaceae (Ratany Family)		
Krameria erecta	little leaved ratany	shrub
Lamiaceae (Mint Family)		
Salvia columbariae	chia sage	annual herb
Loasaceae (Blazingstar Family)		
Mentzelia albicaulis	white stemmed blazing star	annual herb
Mentzelia involucrata	sand blazing star	annual herb
Mentzelia obscura	pacific blazing star	annual herb
Petalonyx thurberi ssp. thurberi	Thurber's sandpaper plant	perennial herb
Malvaceae (Mallow Family)		
Eremalche rotundifolia	desert fivespot	annual herb
Namaceae (Nama Family)		
Nama pusilla	small Leaf Nama	perennial herb
Nyctaginaceae (Four o'clock Family)		
Allionia incarnata	trailing windmills	perennial herb
Mirabilis laevis var. retorsa	wishbone bush	perennial herb
Onagraceae (Evening Primrose Family)		
Chylismia brevipes	yellow cups	annual or perennial herb
Chylismia claviformis	clavate fruited primrose	annual or perennial herb
Eremothera boothii ssp. condensata	clustered booth's desert primrose	annual herb
Eremothera boothii ssp. decorticans	shredding evening primrose	annual herb
Eremothera boothii ssp. desertorum	Booth's desert primrose	annual herb

Scientific Name	Common Name	Life Form		
Orobanchaceae (Broomrape Family)				
Aphyllon cooperi	burroweed strangler	Perennial herb		
Papaveraceae (Poppy Family)				
Eschscholzia glyptosperma	desert gold poppy	annual herb		
Eschscholzia minutiflora	pygmy poppy	annual herb		
Phrymaceae (Lopseed Family)				
Diplacus bigelovii	Bigelow's monkeyflower	annual herb		
Plantaginaceae (Plantain Family)				
Antirrhinum filipes	tangled snapdragon	annual herb		
Plantago ovata	desert plantain	annual herb		
Polemoniaceae (Phlox Family)				
Aliciella latifolia var. latifolia	broad-leaved aliciella	annual herb		
Gilia scopulorum	rock gilia	annual herb		
Gilia sp.	gilia	annual herb		
Gilia stellata	star gilia	annual herb		
Langloisia setosissima ssp. punctata	Great Basin langloisia	annual herb		
Linanthus demissus	Desert linanthus	annual herb		
Linanthus filiformis	yellow gilia	annual herb		
Linanthus jonesii	Jones' linanthus	annual herb		
Loeseliastrum matthewsii	desert calico	annual herb		
Loeseliastrum schottii	Schott gilia	annual herb		
Polygonaceae (Buckwheat Family)				
Chorizanthe brevicornu var. brevicornu	brittle spineflower	annual herb		
Chorizanthe corrugate	wrinkled spineflower	annual herb		
Chorizanthe rigida	Devil's spineflower	annual herb		
Eriogonum inflatum	desert trumpet	perennial herb		
Eriogonum sp.	annual buckwheat	annual herb		
Eriogonum trichopes	little desert buckwheat	annual herb		
Resedaceae (Reseda Family)				
Oligomeris linifolia	leaved cambess	annual herb		
Solanaceae (Nightshade Family)				
Nicotiana obtusifolia	desert tobacco	perennial herb		
Physalis crassifolia	thick-leaved ground-cherry	annual or perennial herb		
Tamaricaceae (Tamarisk Family)				
Tamarix aphylla*	Athel tamarisk	tree		
<i>Tamarix</i> sp.*	tamarisk	tree		
Zygophyllaceae (Caltrop Family)				
Larrea tridentata	creosote bush	shrub		
Tribulis terrestris*	puncturevine	annual herb		

Scientific Name	Common Name	Life Form
	ANGIOSPERMS (MONOCOTS)	
Agavaceae (Agave Family)		
Hesperocallis undulata	desert lily	perennial herb
Poaceae (Grass Family)		
Aristida adscensionis	three awn	annual grass
Bromus madritensis ssp. rubens*	red brome	annual grass
Festuca octoflora	sixweeks grass	annual grass
Hilaria rigida	big galleta	perennial grass
Hordeum murinum*	foxtail barley	annual grass
Schismus arabicus*	Mediterranean grass	annual grass
Schismus barbatus*	common Mediterranean grass	annual grass
Themidaceae (Brodiaea Family)		
Muilla sp.	muilla	perennial herb

Note: *non-native species