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CH2MHILL

January 31, 2012

427930.DI.DR

Mike Monasmith
Project Manager
Systems Assessment & Facility Siting Division
California Energy Commission
1516 Ninth Street, MS-15
Sacramento, CA 95814

Subject: Data Response, Set 1B-3
Hidden Hills Solar Electric Generating System (11-AFC-2)

Dear Mr. Monasmith:

On behalf of Hidden Hills Solar I, LLC; and Hidden Hills Solar II, LLC, please find attached electronic copies of Data Response, Set 1B-3, which provides the following documents:

- Attachment DR52-1, Technical Memorandum: HHSEGS Site Aerial Golden Eagle Nest Survey, Fall 2011
- Attachment DR63-2, Technical Report: Spring 2011 Offsite Surveys for Special-status Plants
- Attachment DR63-3, Technical Report: Late-Season 2010 and 2011 Surveys for Special-status Plants

Hard copies will be sent out tomorrow. Please call me if you have any questions.

Sincerely,

CH2M HILL

John L. Carrier, J.D.
Program Manager

Encl.

c: POS List
Project file

Data Response 1B-3

Hidden Hills

Solar Electric Generating System

(11-AFC-2)

Application for Certification

Hidden Hills Solar I, LLC; and Hidden Hills Solar II, LLC

January 31, 2012

With Technical Assistance from

CH2MHILL®

IS061411043744SAC

Hidden Hills Solar Electric Generating System (HHSEGS)

(11-AFC-2)

Data Response, Set 1B-3
(Response to Data Request 63)

Submitted to the

California Energy Commission

Submitted by

Hidden Hills Solar I, LLC; and Hidden Hills Solar II, LLC

January 31, 2012

With Assistance from

CH2MHILL
2485 Natomas Park Drive
Suite 600
Sacramento, CA 95833

Contents

Attachments

Introduction

Attached is Hidden Hills Solar I, LLC, and Hidden Hills Solar II, LLC (collectively, "Applicant") supplemental response to the California Energy Commission (CEC) Staff's data request 63 for the Hidden Hills Solar Electric Generating System (HHSEGS) Project (11-AFC-2). The CEC Staff served this data request on November 4, 2011. The Attachments, submitted in response to the data request, are numbered to match the data request number.

Biological Resources (52 and 63)

GOLDEN EAGLE

BACKGROUND: Due to recent changes in the U.S. Fish and Wildlife Service's (USFWS) survey protocols and management of golden eagle, staff needs additional information on the occurrence of golden eagle nests within the project area. The applicant's golden eagle surveys provided in Appendix 5.2D of the AFC did not completely follow the most recent survey protocol for this species, *Interim Golden Eagle Inventory and Monitoring Protocols and other Recommendations* (Pagel et al 2010). Staff contacted USFWS Migratory Bird Program staff (Heather Beeler) on September 6, 2011, and learned that helicopter surveys were highly recommended for this project and if there were conflicts with bighorn sheep lambing season, helicopter surveys could be flown prior to the lambing season to ensure all potential eagle nests are located. Staff also learned that upon completion of the helicopter survey, ground surveys could be conducted for the identified nest locations. Heather Beeler also indicated the applicant's golden eagle surveys included in Appendix 5.2D suffice as a preliminary, reconnaissance-level survey effort but are not thorough enough to draw any conclusions about eagle use of the project area during the breeding season or throughout the year. At staff's request, the applicant contacted Heather Beeler on September 7, 2011, to clarify aerial and ground survey needs and appropriate survey timing for golden eagles for this project.

Based on consultation with resource agencies, previous Energy Commission siting cases for large solar thermal projects in the Mojave Desert have considered a cumulative impact radius of 140 miles from the project site to golden eagle territories, since the local golden eagle population is defined as eagles that occur within the average natal dispersal distance of the nests under consideration (Pagel et al 2010). Heather Beeler also indicated that observational points are suggested for golden eagle migration data in which observers watch for golden eagle activity from fixed locations for a minimum of two hours to assess occurrence and habitat use of the project area by golden eagles; observational points are also useful to assess general raptor habitat use in the project area.

The following data requests are based on the preliminary agency conversations and guidance included in Records of Conversations provided by the applicant during Data Adequacy review (California Department Fish and Game (CDFG), Jeff Villepique; Sacramento USFWS, Heather Beeler; Ventura USFWS, Ashleigh Blackford; Nevada Department of Wildlife, Brad Hardenbrook)).

DATA REQUEST

52. Once the agencies have approved the study proposal and the fall 2011 helicopter survey(s) has been completed, please provide staff a fall 2011 helicopter survey report that will include the "minimum data collected at known golden eagle territories" identified in Pagel et al 2010 (See Section IX, Documentation and Accepted Notation). Once winter/spring 2012 ground surveys have been completed, please provide staff a complete Golden Eagle Study Report.

Response: The fall 2011 aerial survey report for Golden Eagle nesting sites for the HHSEGS Site and surrounding 10-mile radius is provided as Attachment DR52-1 (Technical Memorandum: HHSEGS Site Aerial Golden Eagle Nest Survey, Fall 2011).

SPECIAL-STATUS PLANT SPECIES

BACKGROUND: Eight special-status plant species have been found on-site, some in very large numbers and densities throughout the project site; seven of these plants are identified by the California Native Plant Society as List 2 species and one is a List 1B species, Pahrump Valley buckwheat. An additional plant species, Nye milk-vetch (Astragalus nyensis), was previously not known to occur in California, was also found on-site. In addition to focused botanical surveys performed on-site, the applicant also performed off-site plant surveys in areas near Pahrump, Chicago, and Stewart valleys in California and Nevada although those results have not been provided to staff, to date. The applicant stated in Data Adequacy Supplement A (Response 7, page 15) that no significant impacts would occur to special-status plant species since avoidance measures would be implemented and that no further mitigation would be required, but did not identify which impact avoidance and minimization measures would be implemented.

In Data Adequacy Supplement B (Response B7, page 12), the applicant claimed impacts to special-status plant species would not be significant but includes a "general discussion of impact avoidance and minimization measures." The applicant also claims that the primary impact avoidance measure to special-status plant species is the project's use of taller solar power towers, which reduces the project's impact footprint (Response B5, page 7). Staff believes that since an adequate impact analysis of special-status plant species has not been provided by the applicant, in both a site-specific and regional context, it is premature to assume that impacts would not be significant. Staff needs all the field survey information in order to perform an analysis of the project's impacts to special-status plants and to determine if impacts may be significant and if additional mitigation is necessary.

DATA REQUEST

63. As indicated in the AFC, please provide staff a survey report including maps for fall 2010 botanical surveys for off-site botanical surveys performed near Pahrump, Nevada, Chicago, and Stewart valleys in California and Nevada.

Response: As described in our data response filed December 5, 2011, three botany reports were referenced in the AFC: (1) onsite spring, (2) offsite spring and (3) onsite fall. On December 30, 2011 the Applicant filed Attachment DR63-1—the Spring 2011 Botanical Resource Survey technical report (the onsite spring report) and stated that the offsite report would be filed in January 2012. Included herein are technical reports for the Spring 2011 Offsite Surveys for Special-status Plants (offsite spring report) and the Late-Season 2010 and 2011 Surveys for Special-status Plants (onsite fall report). These reports are provided as Attachments DR63-2 and DR63-3, respectively.

Attachments

ATTACHMENT DR52-1

TECHNICAL MEMORANDUM CH2MHILL®

Hidden Hills SEGS Site Aerial Golden Eagle Nest Survey, Fall 2011

PREPARED FOR: Hidden Hills Solar I, LLC, and Hidden Hills Solar II, LLC

PREPARED BY: William (BJ) Lukins

COPIES:

DATE: January 27, 2012

PROJECT NUMBER: 420246.AP.FS.EA

Introduction

Hidden Hills Solar I, LLC; and Hidden Hills Solar II, LLC (collectively, the "Applicant") are wholly owned subsidiaries of BrightSource Energy, Inc. The Hidden Hills Solar Electric Generating System (HHSEGS) will be located on privately owned land in Inyo County, California, adjacent to the Nevada border. It will comprise two solar fields and associated facilities: the northern solar plant (Solar Plant 1) and the southern solar plant (Solar Plant 2). Each solar plant will generate 270 megawatts (MW) gross (250 MW net), for a total net output of 500 MW. Each of these LLC entities will own its respective plant individually, and together they will own the shared facilities located in an onsite common area as tenants in common.

HHSEGS is located in Inyo County, California, west of Las Vegas, Nevada, and approximately 18 miles south of the town of Pahrump, Nevada. It is located along the California-Nevada border on privately owned land, with the solar facility being situated within California (Figure 1, all figures are at the end of the document). The proposed HHSEGS project is located on privately held lands that will be leased. Lands within a 10-mile radius of the proposed HHSEGS include those administered by the Bureau of Land Management (BLM),[1] state administered lands, private lands and unclassified lands (Figure 2).

HHSEGS will connect to a proposed transmission and gas line in Nevada, which is part of Valley Electric Association's BLM SF299 application. Development of the transmission and gas lines that will service HHSEGS are proposed on primarily BLM-administered lands and some privately held lands within Nevada, and are being reviewed as part of the NEPA process. Valley Electric Association is the applicant for the BLM SF299 for the linear corridor. A separate eagle survey report of the area surrounding the linear corridors (and the HHSEGS site, which is a connected action) will be submitted for incorporation into the NEPA analysis being prepared for the linear corridor environmental impact statement (EIS). Hence, the study area of this report focuses solely on the HHSEGS plant site and a 10-mile radius surrounding it.

Aerial surveys for golden eagles (*Aquila chrysaetos*) within a 10-mile radius of the project site (i.e., the study area) were conducted by a qualified aerial raptor survey biologist between October 3 to 7, and November 9 to 11, 2011. Surveys were conducted to verify agency-provided nest locations, to record previously undocumented nest locations, collect nest attribute data, and to attempt to identify nests that were likely occupied in 2011 based on sign (or lack of sign) observed at nest locations. This report summarizes the results of aerial surveys conducted over the 10-mile radius around the site.

Because portions of the proposed project are within desert bighorn sheep lambing areas, the California Department of Fish and Game (CDFG) imposed restrictions on aerial surveys. The raptor nesting period

[1] The BLM land in California is administered by the Barstow Field Office in Barstow, California; whereas, the BLM land in Nevada is administered by the Southern Nevada District, in Las Vegas, Nevada.

coincides with the lambing period (December to June and weaning at 6 months); therefore, surveys were conducted outside of the nesting season to avoid impacts to bighorn sheep lambs. In fall 2011, based on consultation with CDFG, Nevada Department of Wildlife (NDOW), BLM, and U.S. Fish and Wildlife Service (USFWS), (Barangan, 2011; Klinger, 2011; LaPre, 2011; Beeler, 2011) CH2MHill developed a Golden Eagle Study Plan for the HHSEGS project (Attachment DR51-1, Data Response Set 1B), which proposed a survey strategy acceptable to the agencies. It was determined that aerial nest inventories conducted after lambing restrictions were lifted would provide some indication as to which nests were likely occupied in 2011, based on sign at the nest (heavy whitewash, recent prey remains, feathers, egg fragments, or dead chicks). The collection of this information contributes to an overall understanding of nest distribution and potential nest occupancy for the 2011 nesting season. Nest location information will be useful in planning additional nest surveys during the nesting season as required by the Golden Eagle Study Plan.

Study Area

The study area consists of a 10-mile radius around the HHSEGS project site (Figure 3), about 266,800 acres. HHSEGS is situated entirely in California on private lands; however, because of the site's location on the California-Nevada border, the study area extends into Nevada. Habitats within the survey area ranged from mixed Mojave Desert Scrub on the valley floors, alluvial fan complexes or bajadas, dry lake bed and badlands. Two wilderness areas are located within 10 miles of the HHSEGS facility: the Nopah Range Wilderness to the west and the Pahrump Valley Wilderness to the south (Figure 1), both in California.

Elevation on the site ranges from approximately 2,585 to 2,685 feet. Peaks over 6,300 feet exist within the buffer in the Nopah Range to the west, and elevations over 4,000 feet exist in the Pahrump Valley (Kingston Range) to the south. These mountains and the foothills below them provide suitable nesting habitat for golden eagle and are adjacent to open desert scrub that can be used as foraging habitat for the species.

The lowland desert scrub within the buffer has been found in previous surveys to be occupied by cottontails, jackrabbits, antelope ground squirrel, desert whiptail, and patch-nosed snake, while the cliffs and slopes of the ranges contained chuckwallas, collared-lizards, rock squirrels, mule deer, and big horned sheep. Many of these species provide an appropriate prey base for golden eagles.

Regulatory Context

Federal

At the federal level, all raptors are protected by the Migratory Bird Treaty Act (MBTA) (16 United States Code [U.S.C.] 703-712). Additional federal protection is afforded to bald (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) under the Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668-668d) by prohibiting—except under certain specified conditions—the taking, possession, and commerce of such birds. Threatened and endangered species, if present, are also protected by the federal Endangered Species Act (7 U.S.C. 136, 16 U.S.C. 1531 et seq.) that protects threatened and endangered species and the habitats on which they depend.

California

At the state level, nesting and wintering golden eagles are fully protected California Species-of-Special Concern (SSC) and are subject to a higher level of protection than other SSC species (California Department of Fish and Game [CDFG], 2010). Specifically, as stated in Fish and Game Code §3511, fully protected SSC "may not be taken or possessed at any time. No provision of this code or any other law shall be construed to authorize the issuance of permits or licenses to take any fully protected" species.

Methodology

Aerial surveys conducted within the study area followed guidance provided in the USFWS Interim Golden Eagle Inventory and Monitoring Protocols (USFWS, 2010). Surveys were conducted outside of the nesting season due to lambing restrictions that prevented completion of aerial surveys during this timeframe.

Raptor nest inventory surveys of the study area were conducted October 3 to 7, and November 9 to 11, 2011 via aerial surveys over approximately 266,800 acres contained within the 10-mile radius surrounding HHSEGS, to document nest locations of golden eagles and to document nest locations of all other raptor species (Figure 3). In addition to surveying known nest locations[2], observations of new or previously unrecorded nest locations were documented and nest attribute data was recorded. All documented nests were assigned a CH2M HILL Nest Identification (ID) number, and nest locations provided by the BLM were assigned a BLM Nest ID number. Nest locations were recorded using Trimble Geo XT handheld global positioning system (GPS) unit running TerraSync 2.4 mobile application geographic information system software. All spatial analyses were performed and cartographic products were created using ArcGIS 10.0. Helistream Helicopter Services, LLC was contracted to provide air support for the CH2M HILL biologist conducting aerial surveys. A Robinson 66 helicopter was used to conduct surveys. The study area included the project site with a 10-mile radius around the solar facility boundary. Map grids, each measuring approximately 5 miles by 4 miles, were established and overlaid on the survey map to assist in tracking aerial survey efforts (Figure 3).

Transects between 0.25 and 0.5 mile apart were flown across each map grid with greater focus in areas of suitable golden eagle nesting habitat and structure (rock outcrops, cliffs, large trees, and transmission line towers). When a nest was located, the helicopter pilot was instructed to hover at a safe distance from the nest, putting the biologist at eye level with the nest when possible. This methodology also helped to minimize impacts to the nest by keeping the downdraft of the rotor from washing over the nest. The biologist recorded nest attributes including species, nest type, nest status, nest condition, nest height, substrate, substrate height, nest aspect, and GPS accuracy. Two photographs were taken at each nest location when possible, including a landscape photograph showing the substrate in which the nest was located and a close-up photograph of the nest (nest photographs are provided in Appendix A, on the accompanying CD).

Terminology

Nest type is used to describe the size and material used for nesting (see Table 1, located at the end of the document). The term is somewhat subjective and will vary between observers. Defining the nest type allows nest use and trends to be monitored over time. Small stick nests are typically bowl shapes with circumferences of roughly 8 to 10 inches, made up of small sticks, grasses, mud, and other material. Small stick nests are typical of nests used by accipiter species, including sharp-shinned and coopers hawk. Medium stick nests are typically bowl shapes 10 to 20 inches in diameter and are typical of nests used by buteo species, including red-tailed hawk. Large stick nests tend to be flat or deep, constructed using large sticks or roots from trees, sagebrush, or other scrub species, intertwined with soil or other medium to form a bowl or platform. Large stick nests are the type typically used by golden eagles.

Because eagles nest on a variety of substrates (cliff ledges, rock out crops, tree tops, utility structures, and occasionally the ground), and because some nests are maintained over many generations, eagle nests can become very large over time. Nests built into the crack of a cliff ledge typically get very tall or deep.

[2] California BLM provided the Applicant with location data for four golden eagle nests, of which three were located within the study area However, one of the three could not be located.

Scrapes are not constructed nests, but rather shallow depressions used for egg laying found on the ground or on cliff ledges. Scrapes used by ground-nesting raptor species can be hard to detect; those that are found on cliff ledges can be identified by the presence of heavy whitewash and are typically used by species such as prairie falcons or great horned owls. In some instances, the scrape will be lined with grass, mud, or even small sticks.

Although the determination of nest condition can be subjective and may vary between observers, it provides a general sense of when a nest or nest site may have last been used. Nests in poor to fair condition are typically in disrepair, sloughing, or sagging heavily and require some level of effort to rebuild to be suitable for successful nesting. Nests in good to excellent condition are those that are observed to have been well maintained, have a defined bowl shape, are not sagging or sloughing, and appear to be suitable for nesting. Nests recorded as remnant or gone are those that have deteriorated to the point that there is little nesting material remaining on the substrate or the nest is observed on the ground below its former location.

When previous nest location data is provided, such as that received from the BLM, efforts to locate and collect attribute data are exercised. Nests documented as “did not locate” (DNL) were those that the biologist was unable to locate during inventory surveys. It is possible that nest coordinates were not accurate, the nest had deteriorated beyond detection, or the observer was simply unable to detect the nest. Nests documented as previously undocumented (PU) were those nests that were not provided to the Applicant by the BLM or NDOW and assumed to be previously undocumented. These nests were recorded, assigned a CH2M HILL nest ID number, and associated attribute data collected by CH2M HILL biologist during aerial surveys.

Nesting status associated with golden eagles should be handled independently of other raptor species due to the fact that golden eagles typically have a high incidence of non-laying territorial pairs and floaters (Kochert et al., 2002). The terms occupied and unoccupied are used to describe nesting status within the survey year. Status within a given year cannot change from occupied to unoccupied if nesting status changes, rather the end of year status is documented to reflect occupancy changes such as occupied-failed or occupied-productive.

Evidence that a territory is occupied can be based on the observation of two birds that appear to be paired or one or more adults engaged in territorial defense, nest affinity, or other reproductive-related activity (Steenhof and Newton, 2007). Because aerial surveys for this project were conducted outside of the nesting season, inferences to nesting status are only assumptions based on sign observed at the nest by the qualified biologist. These assumptions provide an understanding of which territories appear to have been occupied in 2011 and those that will require closer scrutiny during follow-up surveys pursuant to the Golden Eagle Study Plan. It should also be noted that species other than golden eagle may use golden eagle nests not currently used by eagles, leaving similar sign such as whitewash.

A similar definition of eagle territory is included in the Draft Eagle Conservation Plan Guidance (USFWS January 2011), which defines eagle territory as an area that contains, or historically contained, one or more nests within the home range of a mated pair of eagles. Home range is defined as the area traveled by an eagle in its normal activities of food gathering, mating, and caring for young. Breeding home range is the home range during the breeding season, and the non-breeding home range is the home range outside the breeding season. (USFWS January 2011).

Local area population is defined as the population within the average natal dispersal distance of the nest or nests under consideration (43 miles for bald eagles, 140 miles for golden eagles). Effects to the local area population are considered in the evaluation of the direct, indirect, and cumulative effects of take, and the mitigation for such a take, under eagle take permits (USFWS, 2010).

Nests documented as unknown raptor species are defined as any stick nest that did not have an occupant associated with it at the time of survey. Many times nests will become abandoned or are

historic and are not used. An unknown number of stick nests are likely used by common raven (*Corvus corax*) and nesting species may not have been detected as such during aerial surveys based on nesting chronology timeframes. Unknown raptor nests are documented to populate a nest database and to ensure that future surveys will include these locations.

Results

During aerial surveys, 25 raptor nest locations were documented within the study area (see Table 1 and Figure 3). Of these 25 nests, 19 were recorded as golden eagle and 6 recorded as "unknown raptor" nest. All 19 of the identified golden eagle nests lacked signs of use in 2011, were in poor to remnant condition, or may be alternate nest locations. Two of the BLM-provided golden eagle nest locations within the study area were located during aerial surveys (CA-IN-26-GE-A and CA-IN-27-GE-A), and included in the 19 nests found. The third nest (CA-IN-25-GE-A) was not found during multiple attempts and, therefore, was not included as one of the nest locations. None of the 19 potential golden eagle nests observed within the 10-mile study area of the HHSEGS in 2011 were occupied.

The six nests documented as unknown raptor are stick nests that could not be identified to species. Many of the unknown raptor nests are likely used by red-tailed hawk (*Buteo jamaicensis*), or common raven (*Corvus corax)*. Based on sign observed, none of the unknown raptor nests were occupied in 2011 (Table 1 and Figure 3).

Opportunistic Sightings

During aerial surveys, opportunistic wildlife sightings were recorded whenever possible. Figure 4 identifies the approximate location of the sitings. In some cases it was not possible to record numbers of individuals and to differentiate sex or age class. Locations were recorded as a GPS coordinate or noted in a field book. The documentation of these sightings is used as a subjective indication of wildlife diversity at the time of survey.

Eleven desert bighorn sheep (*Ovis canadensis nelsoni*), were observed in California at three locations in the mountains about 7 to 10 miles to the west and southwest of the HHSEGS site (Figure 4). One group of nine individuals was observed on several occasions. It was comprised of one adult male, one sub-adult male and the remainder juveniles or females. Three red-tailed hawks, two juveniles in flight, and one adult perched, were also sighted. One golden eagle sighting was recorded, a juvenile was observed soaring between 300 and 600 feet above ground level near Emigrant Pass (Figure 4). One coyote (*Canis latrans*) was observed wandering on the proposed HHSEGS site.

Discussion

Accurately defining which raptor species constructed a nest is challenging without direct observation of the construction. Determining which species use a nest in any given year is also challenging without direct observation of the female incubating eggs, nestlings, fledglings or other defining evidence. Because nest inventories were conducted several months after nesting season, direct evidence as to which species may have occupied any given nest was limited. Nests documented as golden eagle were done so based on defining characteristics and years of experience in conducting nest inventories.

Aerial searches were conducted to verify three golden eagle nest locations provided to the Applicant by the California BLM (CA-IN-25-GE-A, CA-IN-26-GE-A, and CA-IN-27-GE-A). Two of the three nest locations were located (Table 1 and Figure 3). The distance between CH2M HILL nest ID 7 and CA-IN-26-GE-A was approximately 730 feet and the distance between CH2M HILL Nest ID 16 and CA-IN-27-GE-A was approximately 885 feet. Because our locations were recorded from the helicopter rather than from the ground creating some level of spatial error we are confident that documented locations represent those provided by the BLM, since there were no other nests detected in the immediate vicinity. After searching on three different days, no nest was observed in the vicinity of CA-IN-25-GE-A, an area with

steep canyon walls and ridgelines. The biologist also looked to the ground searching for nest debris below suitable nest ledges and outcrops to identify if a nest had fallen from its previous nest ledge—none was detected.

Prairie falcon are primarily scrape nesters, nesting on protected cliff ledges in shallow depressions or scrapes. They sometimes will use abandoned raptor or raven nest, but do not build their own nests. In areas where prairie falcon are found to be nesting there is usually heavy whitewash observed and the actual scrape can be difficult to identify without observing the female on the eggs. However, because it can be difficult to accurately identify a scrape in areas of heavy whitewash, prairie falcon nesting scrapes were not documented.

References

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TABLE 1
Raptor Nest Locations and Nesting Status

Nest ID (CH2)	Nest ID CA-BLM-NDOW	Map Unit	Species	Nest Type	Occupancy 2011	Nest Condition	Nest Height (ft)	Nest Substrate	Substrate Height (ft)	Nest Aspect	GPS Accuracy	Photo Number (Appendix A)		State	Section	Township	Range	QQ	USGS Quadrant Map
												Landscape	Closeup						
1	PU	048	Golden Eagle	Large Stick Flat	Unoccupied	Poor	100	Cliff	200	SE	GPS Aerial	2443	2444	CA	14	22N	08E	NENW	Nopah Peak
2	PU	048	Golden Eagle	Medium Stick	Unoccupied	Excellent	200	Cliff	400	NW	GPS Aerial	2445	2446	CA	14	22N	08E	SWNW	Nopah Peak
3	PU	048	Golden Eagle	Large Stick Flat	Unoccupied	Good	200	Cliff	400	SW	GPS Aerial	2447	2450	CA	14	22N	08E	SWNW	Nopah Peak
4	PU	048	Golden Eagle	Large Stick Flat	Unoccupied	Good	160	Cliff	300	SW	GPS Aerial	2451	2454	CA	14	22N	08E	NWSW	Nopah Peak
5	PU	048	Golden Eagle	Large Stick Flat	Unoccupied	Good	165	Cliff	300	SW	GPS Aerial	2455	2456	CA	14	22N	08E	NWSW	Nopah Peak
6	PU	058	Golden Eagle	Large Stick Flat	Unoccupied	Fair	30	Cliff	90	SW	GPS Aerial	2457	2458	CA	06	21N	09E	NWSW	North of Tecopa Pass
7	CA-IN-26-GE-A	048	Golden Eagle	Large Stick Deep	Unoccupied	Fair	100	Cliff	200	NW	GPS Aerial	2459	2460	CA	31	21.5N	09E	NWNE	North of Tecopa Pass
8	PU	048	Golden Eagle	Large Stick Flat	Unoccupied	Fair	55	Rock Cavity	100	NE	GPS Aerial	2475	2476	CA	24	22N	08E	SENE	North of Tecopa Pass
9	PU	048	Golden Eagle	Large Stick Deep	Unoccupied	Fair	40	Rock Cavity	125	W	GPS Aerial	2479	2481	CA	13	22N	08E	SWSE	Nopah Peak
11	PU	058	Golden Eagle	Large Stick Flat	Unoccupied	Good	40	Cliff	100	SE	GPS Aerial	2239	2240	CA	17	21N	09E	SESE	North of Tecopa Pass
12	PU	059	Golden Eagle	Large Stick Flat	Unoccupied	Excellent	110	Cliff	135	NW	GPS Aerial	2241	2143	CA	17	21N	09E	SENE	North of Tecopa Pass
13	PU	060	Golden Eagle	Large Stick Flat	Unoccupied	Poor	100	Cliff	135	NW	GPS Aerial	2244	2245	CA	17	21N	09E	SENE	North of Tecopa Pass
14	PU	061	Golden Eagle	Large Stick Flat	Unoccupied	Excellent	65	Cliff	85	N	GPS Aerial	2253	2255	CA	17	21N	09E	SENE	North of Tecopa Pass
16	CA-IN-27-GE-A	058	Golden Eagle	Large Stick Deep	Unoccupied	Excellent	55	Cliff	135	SE	GPS Aerial	2259	2260	CA	06	21N	09E	SESE	North of Tecopa Pass
29	PU	076	Golden Eagle	Large Stick Flat	Unoccupied	Excellent	20	Rock Cavity	30	S	GPS Aerial	2287	2288	CA	04	20N	11E	NESE	Blackwater Mine
30	PU	089	Golden Eagle	Large Stick Deep	Unoccupied	Good	30	Cliff	70	SW	GPS Aerial	2290	2291	CA	02	20N	10E	SESE	Blackwater Mine
88	PU	039	Golden Eagle	Large Stick Flat	Unoccupied	Good	85	Cliff	165	SE	GPS Aerial	2436	2437	CA	35	23N	08E	NWSE	Nopah Peak
90	PU	073	Golden Eagle	Large Stick Deep	Unoccupied	Excellent	25	Cliff	110	SW	GPS Aerial	2660	2661	CA	30	21.5N	09E	SENE	North of Tecopa Pass
91	PU	073	Golden Eagle	Large Stick Flat	Unoccupied	Good	20	Cliff	65	SE	GPS Ground	2658	2659	CA	25	21.5N	08E	SESE	North of Tecopa Pass
26	PU	077	Unknown Raptor	Medium Stick	Unoccupied	Good	35	Rock Cavity	65	E	GPS Aerial	2280	2281	NV	06	24S	56E	SWNW	Green Monster Mine
28	PU	076	Unknown Raptor	Medium Stick	Unoccupied	Excellent	15	Rock Cavity	180	NW	GPS Aerial	2284	2286	CA	34	20.5N	11E	SENW	Blackwater Mine
10	PU	059	Unknown Raptor	Medium Stick	Unoccupied	Good	100	Cliff	250	SE	GPS Aerial	2237	2238	CA	16	21N	09E	NESW	North of Tecopa Pass
15	PU	058	Unknown Raptor	Medium Stick	Unoccupied	Poor	95	Cliff	350	NW	GPS Aerial	2256	2258	CA	06	21N	09E	SESE	North of Tecopa Pass
87	PU	039	Unknown Raptor	Medium Stick	Unoccupied	Good	45	Cliff	70	NW	GPS Aerial	2434	2435	CA	26	23N	08E	SWSE	Nopah Peak
89	PU	049	Unknown Raptor	Medium Stick	Unoccupied	Excellent	65	Cliff	110	NE	GPS Ground	2663	2664	CA	27	21.5N	09E	NESW	Calvada Springs
DNL	CA-IN-25-GE-A	048	Golden Eagle	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	CA	09	19N	21E	SWNE	North of Tecopa Pass

NOTES:
PU: Previously undocumented nest location observed during aerial surveys in 2011
Unoccupied: Lack of sign at nest that indicates no nesting attempt was made in 2011 nesting season
DNL: BLM provided nest location that biologist did not locate
N/A: Data not available in 2011

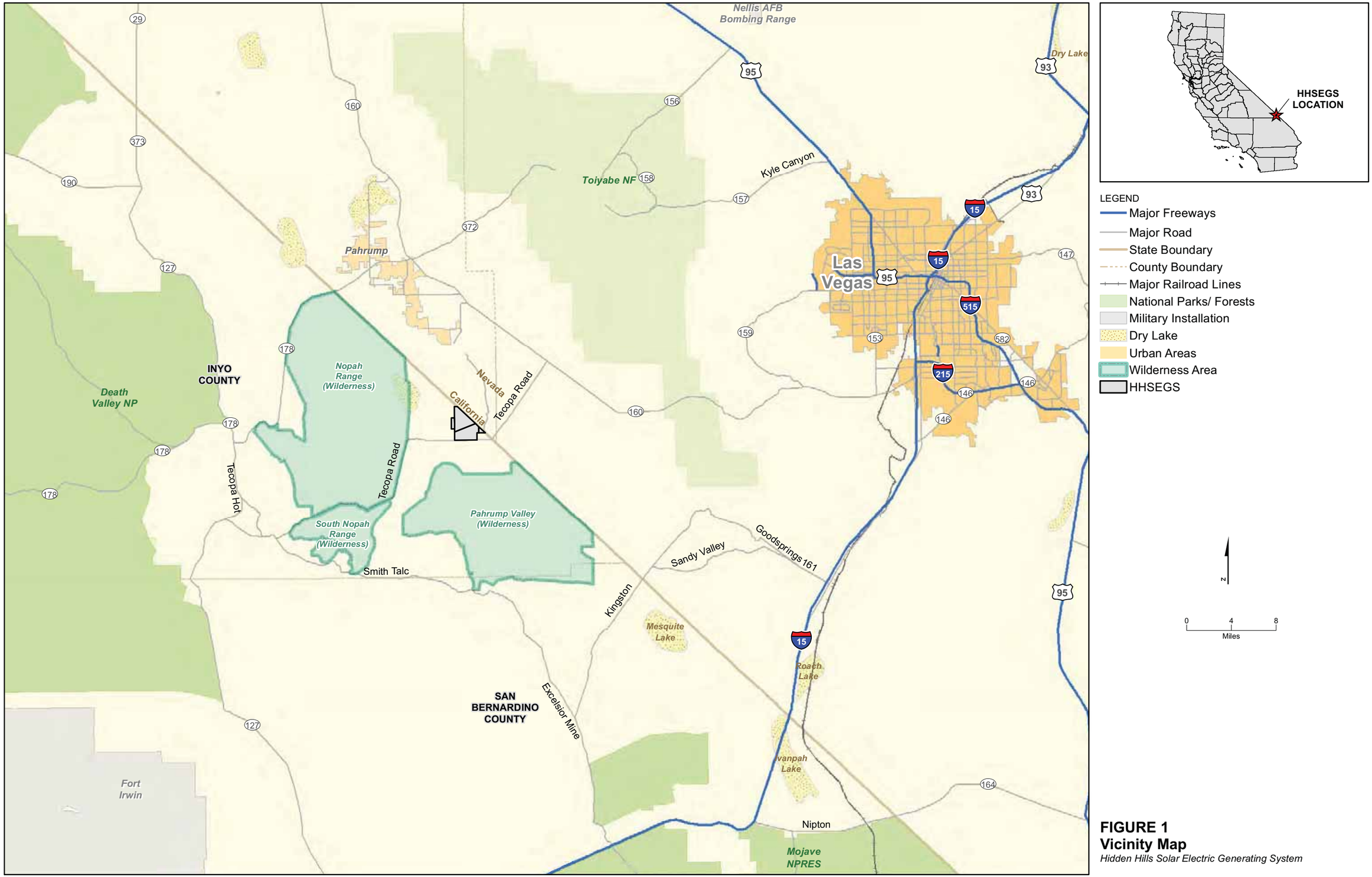


FIGURE 1
Vicinity Map
Hidden Hills Solar Electric Generating System

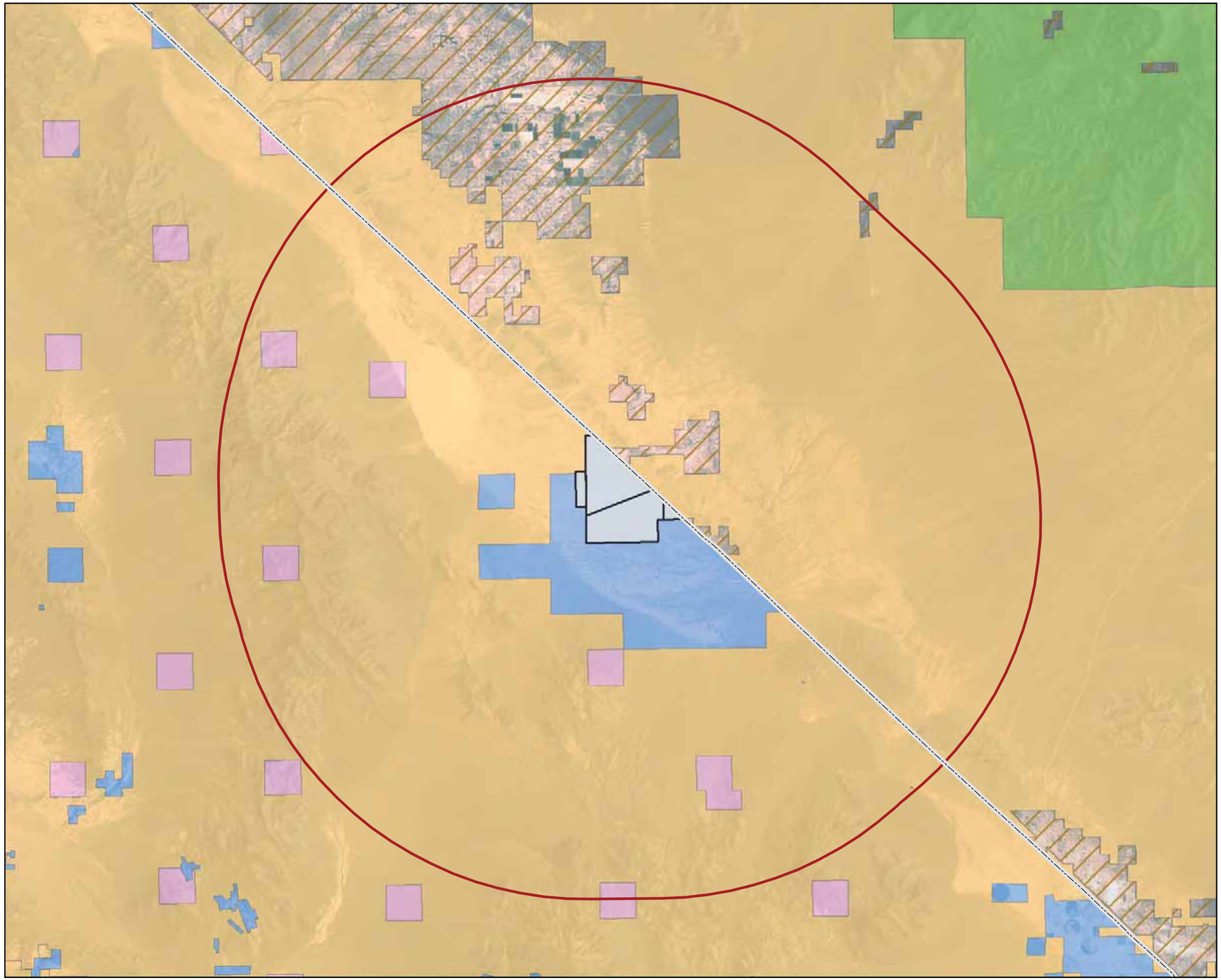
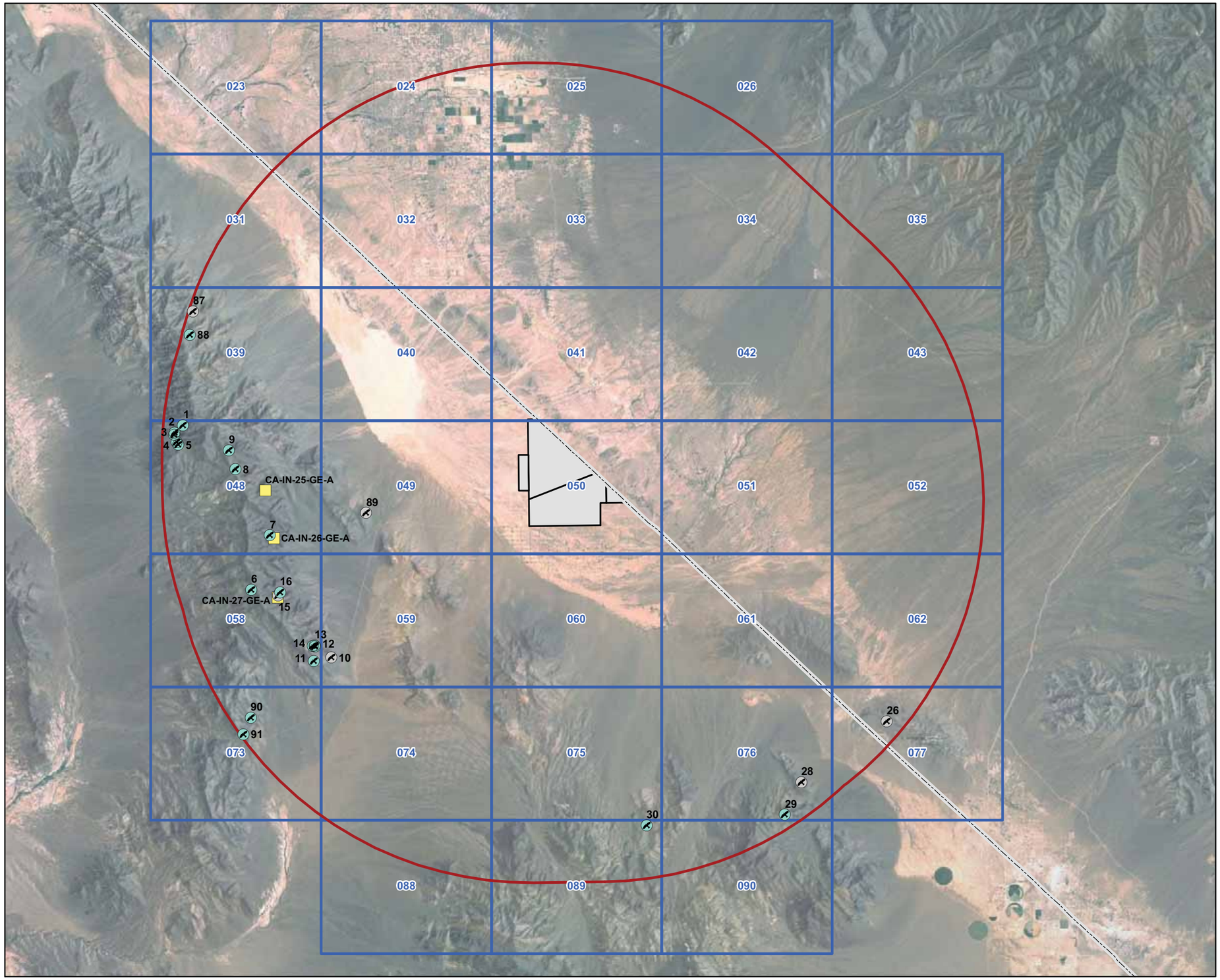


FIGURE 2
Land Ownership
Hidden Hills Solar Electric Generating System



LEGEND

CH2MHILL Nest ID

- Golden Eagle - Unoccupied 2011
- Unknown Raptor (Raven/Red-tailed hawk)

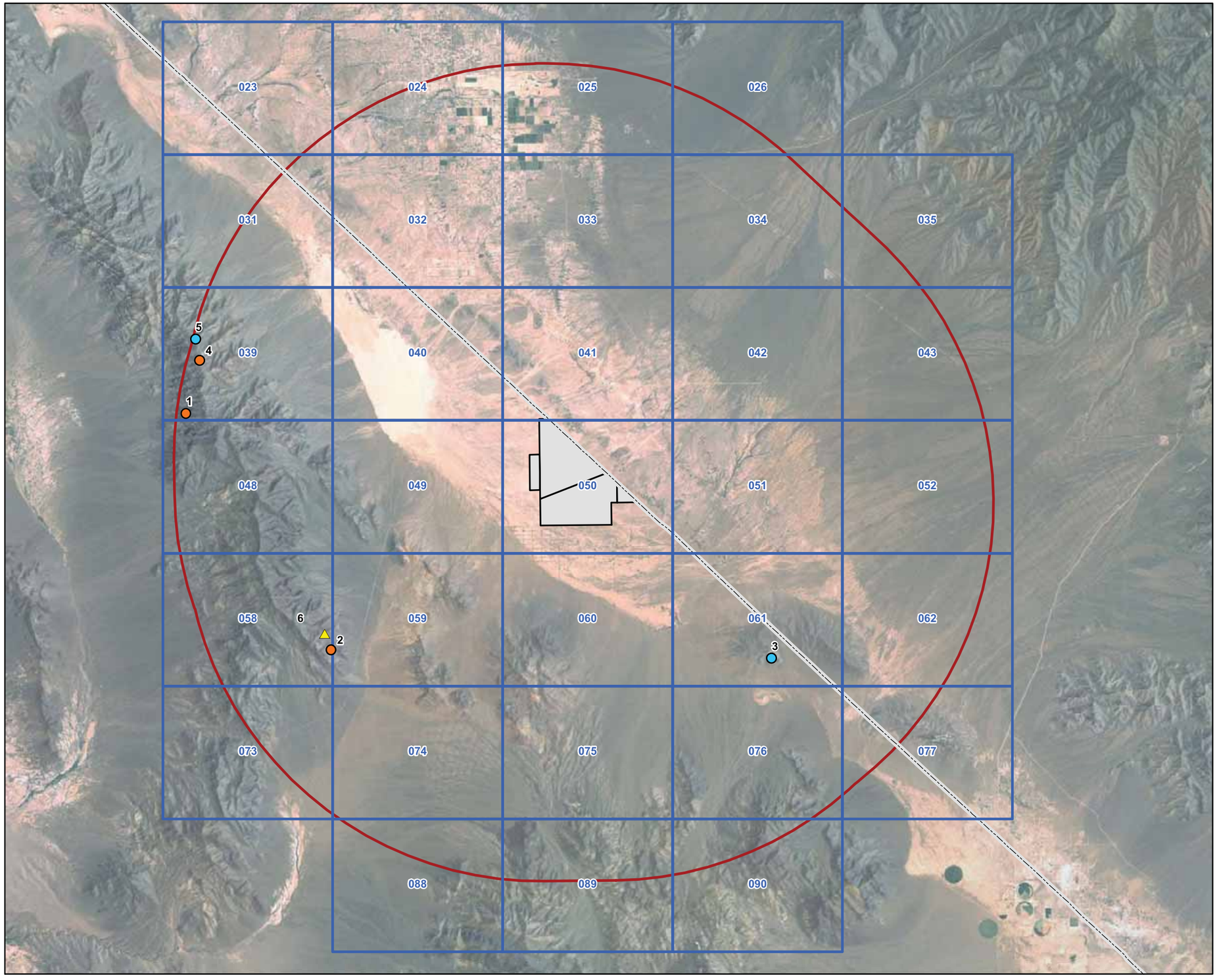
BLM in CA

- golden eagle - BLM Database
- HHSEGS
- Survey Area
- Solar Fac - 10mi

N

0 1.4 2.8
Miles

FIGURE 3
Raptor Nests within 10 miles of HHSEGS
Hidden Hills Solar Electric Generating System



LEGEND

Opportunistic Sighting

- big horn sheep
- red-tailed hawk
- Golden eagle
- Substation
- Proposed Transmission Line
- Kern River Gasline
- HHSEGS
- Aerial Survey Grid

Table 2. Opportunistic Sightings

CH2MHILL ID	Sighting	Activity	Class	Number Observed	UTM NAD83	
					Easting	Northing
1	Big horn sheep	--	n/a	9	581593.33	3986438.21
2	Big horn sheep	--	Adult	1	588162.94	3975742.53
3	Red-tailed hawk	Flying	Juvenile	2	608086.75	3975360.97
4	Big horn sheep	Walking	n/a	1	582202.14	3988850.74
5	Red-tailed hawk	Perched	Adult	1	582023.36	3989813.59
6	Golden eagle	Soaring	Juvenile	1	587854.92	3976488.82

N

0 1.4 2.8

Miles

FIGURE 4
Opportunistic Sightings
Hidden Hills Solar Electric Generating System

Appendix A
Nest Photos

(on attached CD-ROM)

Attachment DR63-2

Technical Report: Spring 2011 Offsite Surveys for Special-Status Plants for the Hidden Hills Solar Electric Generating System

Prepared for

Hidden Hills Solar I, LLC, and Hidden Hills Solar II, LLC

January 2012

Prepared by

CH2MHILL®

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Executive Summary

The objective of the 2011 offsite survey was to find and document new localities of special-status plant species in the vicinity of the Hidden Hills Solar Electric Generating System (HHSEGS) project area. The HHSEGS will be located on approximately 3,277 acres of privately owned land in Inyo County, California, adjacent to the Nevada border and north of Tecopa Road. The project site is approximately 18 miles south of Pahrump, Nevada, and approximately 45 miles west of Las Vegas, Nevada.

Offsite surveys were conducted in California and Nevada in April and May 2011. Surveys were conducted in Pahrump Valley, Stewart Valley, the Ash Meadows area, Chicago Valley and California Valley. These areas are referred to collectively in this report as "*offsite areas*." The offsite surveys for special-status plants were not comprehensive in scope and they therefore do not qualify as protocol-level surveys. However, large geographic areas were sampled, and by focusing on habitat likely to be suitable for special-status plant species, many new localities of special-status plants were found.

The offsite field surveys were conducted on April 20, 22, and 25, and May 1-8, 2011, using roughly 60 person-days. Surveyors who completed the offsite surveys also performed surveys of the spring 2011 HHSEGS site and portions of the linear corridor in Nevada.

Eighteen special-status plant species were found during offsite surveys conducted in support of the HHSEGS project. The complete list includes:

- Nevada onion (*Allium nevadense*)
- Pink funnel-lily (*Androstephium breviflorum*) – (also found at HHSEGS)
- Nye milkvetch (*Astragalus nyensis*) - (also found at HHSEGS)
- Preuss' milkvetch (*Astragalus preussii* var. *preussii*) - (also found at HHSEGS)
- Gravel milkvetch (*Astragalus sabulonum*) - (also found at HHSEGS)
- Tidestrom's milkvetch (*Astragalus tidestromii*) - (also found at HHSEGS)
- Pahrump silverscale (*Atriplex argentea* var. *longitrichoma*)
- Wheeler's skeletonweed (*Chaetadelpha wheeleri*) - (also found at HHSEGS)
- Purplenerve springparsley (*Cymopterus multinervatus*) - (also found at HHSEGS)
- Utah vine milkweed (*Cynanchum [=Funastrum] utahense*)
- Pahrump Valley buckwheat (*Eriogonum bifurcatum*) - (also found at HHSEGS)
- Reveal's buckwheat (*Eriogonum contiguum*)
- Wing-seed blazing star (*Mentzelia pterosperma*)
- Spine-noded milkvetch (*Peteria thompsoniae*)
- Parish's phacelia (*Phacelia parishii*)
- Goodding's phacelia (*Phacelia pulchella* ssp. *gooddingii*) - (also found at HHSEGS)
- Johnson's bee-hive cactus (*Sclerocactus johnsonii*)
- Desert wing-fruit (*Selinocarpus nevadensis*) - (also found at HHSEGS)

Nye milkvetch was identified in California for the first time during surveys conducted in spring 2011 for the HHSEGS project (CNDDB 2011). Nye milkvetch was assigned conservation status in January 2012 (CNDDB 2012).

Other plants of consideration mapped during offsite surveys include: Torrey's jointfir (*Ephedra torreyana*) and gray wire-lettuce (*Stephanomeria cinerea*). Torrey's jointfir was first documented in California during surveys in spring 2011 for the HHSEGS project. In January 2012, Torrey's jointfir was proposed for conservation status and this species is currently under review. Gray wire-lettuce is recognized in the Flora of Nevada (Kartesz, 1988). Currently, in California, this species has been lumped with the subspecies *parishii* of a more widespread *Stephanomeria* species, few-flowered wire-lettuce (*Stephanomeria pauciflora*). However, plants of gray wire-lettuce observed during offsite surveys were

noted to be morphologically distinct and their characteristics are currently being assessed by experts (Sanders pers. comm.).

In addition to the offsite surveys, reconnaissance-level surveys of the 1-mile buffer surrounding the HHSEGS site were performed in spring 2011. Appendix C provides results of the 1-mile buffer surveys. Late-season protocol-level surveys for special-status plants were conducted within the HHSEGS solar fields and common area in October 2010, and within the 250-foot buffer and the 180-acre temporary construction laydown and parking area in October 2011. A protocol-level survey of the transmission line/gas line (i.e., linear) corridor was completed in spring of 2011. Results of the late-season and linear corridor surveys are addressed in separate reports.

Contents

Appendixes

Tables

SECTION 1

Introduction

The objective of the 2011 offsite survey was to find and document new localities of special-status plant species[1] in the vicinity of the HHSEGS project area. Offsite surveys were conducted in California and Nevada in April and May 2011. Surveys were conducted in Pahrump Valley, Stewart Valley, the Ash Meadows area, Chicago Valley and California Valley. These areas are referred to in this report as "*offsite areas*." Figures showing the location of areas included in offsite surveys are provided in Appendix A.

Section 1 of this report describes the purpose of the offsite surveys and gives a brief overview of the environmental setting. Section 2 describes the methods of the offsite surveys. Section 3 describes the results of the offsite surveys by geographic region. Section 4 provides species accounts for all of the special-status plant species detected during offsite surveys. Section 5 includes species accounts for other plant species of consideration. References are listed in Section 6. Tables are included in Appendix B. During spring 2011, reconnaissance-level surveys of the 1-mile buffer were also performed. Appendix C contains a description of the HHSEGS 1-mile buffer reconnaissance-level survey, a map of vegetation and special-status plants identified in the 1-mile buffer, and a list of all vascular plant species observed within the 1-mile buffer. Appendix D contains a list of all vascular plant species observed during offsite surveys. Appendix E contains photographs of special-status plants and offsite survey areas.

1.1 Objectives of the Offsite Survey

The principal objective of the 2011 offsite survey was to find and document additional localities for the special-status plant species that were found within the Hidden Hills SEGS site or the site buffer during protocol-level surveys conducted in October 2010, October 2011, and April 2011. A secondary objective was to find and document new localities of additional species of special-status plants that are known from only a few localities in California.

Survey areas were selected on the basis of their likelihood to contain suitable habitat for special-status plants, and secondarily, on their accessibility. The Pahrump Valley and Stewart Valley contain large areas of suitable habitat and have good road access, so many locations in these valleys were surveyed. Bureau of Land Management (BLM) wilderness areas contain large acreages of suitable habitat but are less accessible by road, so less time was spent there. Watersheds west of the Pahrump Valley-Stewart Valley watershed, including Chicago and California Valleys, were examined because they contain potentially suitable habitat for special-status plant species, and locating such species in these watersheds would substantially enlarge their known ranges.

1.2 Environmental Setting

The offsite survey area is located in the northeastern Mojave Desert, and has climatic conditions typical of that region. The climate is arid with extreme fluctuations in daily and seasonal temperatures. Average annual precipitation is less than 5 inches. More information on climatic conditions in the offsite survey area can be obtained from the Western Regional Climate Center (WRCC 2011).

The offsite survey region includes portions of southeastern Inyo County, California, and southwestern Nye County, Nevada (Figures 1 through 7, Appendix A). Valleys where surveys were conducted include: Pahrump Valley, Stewart Valley, the Ash Meadows area in the Amargosa Valley, Chicago Valley and California Valley. Pahrump Valley, Stewart Valley and the Ash Meadows area occupy the California-Nevada borderlands in the vicinity of the town of Pahrump, Nevada. The lowest parts of Pahrump Valley

[1] The term "special-status" species is not limited in scope to describe threatened, endangered or candidate species under the federal ESA or CESA. Instead, the term "special-status" is a more expansive term, employed by many agencies as described herein.

and Stewart Valley contain dry lakes. The Ash Meadows area has extensive desert marshes and other wetlands. Soils in all these areas include gravelly to sandy gray to brown soils, and pale-colored silty soils.

Several mountain ranges border the valleys where surveys were conducted. To the south of the southern Pahrump Valley lies the Kingston Range. West of the Pahrump Valley is the Nopah Range. West of the Stewart Valley is the Resting Springs Range, and to the east, High Peak. Chicago Valley lies between the Nopah and Resting Springs ranges. California Valley is south of the southern end of the Nopah Range. Ash Meadows occupies a portion of the southern Amargosa Valley, with the Devil's Hole Hills to the east.

1.3 Previous Botanical Surveys in the Survey Region

Plant collection records indicate that, prior to 2011, few botanical explorations had been made in the portion of the survey region that is in Inyo County, California. Collection records for Nevada are not available online. In the portion of the Pahrump Valley that lies in California, the Consortium of California Herbaria (Consortium) lists only 67 collections prior to 2010 (Jepson Online Interchange 2011). Most of these collections were made by Dr. Carl B. Wolf, on May 15, 1941, including the first specimen of the special-status plant, Pahrump Valley buckwheat (*Eriogonum bifurcatum*). On June 12, 2010, James Andre collected eight specimens in the vicinity of Tecopa Road[2] (ibid.). For Stewart Valley, the Consortium lists a total of only 10 specimens collected prior to surveys conducted for this project, most notably a specimen of Pahrump silverscale (*Atriplex argentea* var. *longitrichoma*) (ibid.). For Chicago Valley, the Consortium lists only 21 specimens collected prior to 2011 (ibid.). These low numbers of specimens indicate that few botanists had visited the offsite survey area, and that the flora of this region was relatively unknown prior to 2011 surveys conducted offsite in support of the HHSEGS project.

[2] Also referred to as Old Spanish Trail Highway.

SECTION 2

Methods

This section describes the methods of the spring 2011 offsite surveys. The location of areas included in offsite surveys is shown in Figures 1 through 7, Appendix A. Methods used by the botanical team to locate, identify, and map special-status plants in the offsite survey areas are described in Sections 2.1 through 2.3. In addition to the spring 2011 offsite survey, a few locations of special-status plants were identified offsite in October 2010 during a reference site review and general site reconnaissance conducted during late-season 2010 surveys of the HHSEGS site. Special-status plants identified in October 2010 that are outside the HHSEGS site boundary are also addressed in this report. Special-status plants identified within the HHSEGS site boundary during late-season surveys are described in a separate late-season report.

Vegetation within a 1-mile buffer of the HHSEGS was mapped in spring 2011 during a reconnaissance-level survey of the one-mile buffer. Special-status plants observed during the reconnaissance-level survey were noted but not mapped. Methods used during the one-mile buffer survey are described in Appendix C.

2.1 Pre-field Preparations

Pre-field preparations for the offsite surveys were minimal because the offsite survey team was the same one that completed the spring 2011 surveys of the HHSEGS site and portions of the linear corridor. The survey team members already were familiar with the special-status plant species with potential to occur in the offsite survey area. The lists of potentially occurring special-status plant species that had been compiled for the HHSEGS site survey and the linear corridor survey were reviewed prior to and during the offsite surveys. These lists are included in the reports for those surveys (CH2M HILL 2011; 2012). U.S. Geological Survey (USGS) 7.5-minute topographic maps and Google Earth imagery were studied to locate potentially suitable habitat and access roads.

2.2 Field Survey Methods

The spring 2011 offsite survey included the documentation of a few additional reference sites, and a reconnaissance-level, selective approach to field survey coverage of the offsite survey area. All localities of special-status plant species that were detected were mapped as point data. Non-native invasive plant species were recorded in field notes, but were not mapped. Native and naturally occurring (not planted) cacti and yucca species observed during the surveys were included on the species list. A plant species list was compiled with separate sub-lists for each geographic region visited. Although all plant species observed were identified and recorded, these sub-lists are not complete lists for the geographic region because they are based on short survey visits to selected small sites.

2.2.1 Reference Site Documentation

No reference site visits were conducted specifically for the spring 2011 offsite survey. Instead, when a special-status plant species not previously found during HHSEGS site and linear surveys was first encountered during offsite surveys, the locality was documented and used as a reference site. This means that the team members observed the plant in its natural habitat, and noted its characteristic features, to assist with identifying it elsewhere. The special-status plant species that were first encountered during offsite surveys, and whose first-detected locations were used as reference sites, include: Pahrump silverscale (*Atriplex argentea* var. *longitrichoma*), Reveal's buckwheat (*Eriogonum contiguum*), spine-noded milkvetch (*Peteria thompsoniae*), and Parish's phacelia (*Phacelia parishii*). Details of these reference site visits are provided in the site and other HHSEGS botany reports.

2.2.2 Offsite Special-status Plant Field Survey Methods

A selective, reconnaissance-level approach was used for the 2011 offsite survey for special-status plants. For each offsite survey region, survey areas were selected based on habitat type and the presence of access roads. Surveys were conducted by driving existing roads, and stopping to survey local sites within the larger survey area. Survey sites were spaced at regular intervals or were selected on an *ad hoc* basis when a plant species of interest was spotted from the vehicle. At each localized survey site, the crew members spread out on foot in different directions to observe as much of the landscape as possible within a short time. The time spent at each localized site ranged from about 20 to 45 minutes, depending on the terrain, habitat types and number of special-status plant localities found.

Each special-status plant locality was mapped as a point using a Trimble GeoXT or GeoXH Global Positioning System (GPS) unit. Abundance and habitat data for each locality were recorded on the GPS units, using the same project-specific data dictionary used for the HHSEGS site and linear surveys. Backup data were recorded on paper data sheets. Recorded data included: scientific name, number of individuals, phenology (vegetative, flowering, in fruit), substrate type, vegetation type, and associated species. Data sheets were collected and reviewed daily by the field supervisor. Representative photographs were taken of special-status plant species and their habitats.

2.3 Global Positioning System/Geographic Information System Data Collection and Analysis, and Quality Assurance

Data collected in the field were recorded using Trimble GeoXH or GeoXT GPS units. GPS units were equipped with background files for navigation, and data dictionaries for data collection. Garmin Oregon GPS units with topographic map background files and the Google Earth application for iPhone were used to assist with navigation. A project-specific data dictionary was used in the field to increase data recording efficiency and data quality. All data collected with GPS units were downloaded and backed up each night onto laptop computers, and emailed to the project's Geographic Information System (GIS) technician. GPS data were post-processed by the GIS technician and downloaded into a project GIS database. Data were mapped onto aerial photographic or U.S. Geological Survey (USGS) topographic base maps by the GIS technician. These draft figures were checked for accuracy by the field supervisor, using the backup data on the paper data sheets.

SECTION 3

Results

A total of 18 species of special-status plants and 2 other plant species of consideration were identified during the offsite surveys. Results of the offsite surveys are described in the following sections. Finds for each of the survey areas are presented by regional location: Section 3.1, Pahrump Valley; Section 3.2, Stewart Valley and the Ash Meadows area; and Section 3.3, Chicago Valley and California Valley. The location of special-status plants is depicted in Figures 1 through 7 (Appendix A). Table 3-1 lists the total number of special-status plant species and other species of consideration by state. Tables summarizing the numbers of special-status plant species, other species of consideration, and key findings observed within the Pahrump Valley, Stewart Valley and Ash Meadows Area, and the Chicago and California Valleys, are provided in Section 3.1, 3.2, and 3.3. Species accounts for the special-status plants are in Section 4. Species accounts for other plant species of consideration are in Section 5.

The offsite surveys were conducted at a reconnaissance-level. Areas of unsurveyed suitable special status plant habitat remain within the geographic regions shown on Figures 1-7 (Appendix A). It is likely that other localities of special-status plants are present within these unsurveyed areas that were not located or mapped due to the scope of these surveys.

TABLE 3-1
Total Number Of Individuals And Localities Observed in California and Nevada During Offsite Surveys In 2011

Common Name/Scientific Name	California		Nevada		Total (CA and NV)		Present at HHSEGS Site
	No. of Localities	No. of Individuals	No. of Localities	No. of Individuals	No. of Localities	No. of Individuals	
Special Status Plant Species							
Nevada onion *Allium nevadense*	1	9	0	0	1	9	No
Pink-funnel lily *Androstephium breviflorum*	14	216	0	0	14	216	Yes
Nye milkvetch *Astragalus nyensis*	42	1,160	4	62	46	1,222	Yes
Preuss' milkvetc *Astragalus preussii* var. *preussii*	5	13	1	1	6	14	Yes
Gravel milkvetch *Astragalus sabulonum*	1	20	0	0	1	20	Yes
Tidestrom's milkvetch *Astragalus tidestromii*	72	3,235	3	47	75	3,282	Yes
Pahrump silverscale *Atriplex argentea* var. *longitrichoma*	7	9,150	5	4,565	12	13,715	No
Wheeler's skeletonweed *Chaetadelpha wheeleri*	23	942	0	0	23	942	Yes
Purplenerve springparsley *Cymopterus multinervatus*	2	11	3	21	5	32	Yes
Utah vine milkweed *Cynanchum* (=Funastrum) *utahense*	1	1	0	0	1	1	No

TABLE 3-1
Total Number Of Individuals And Localities Observed in California and Nevada During Offsite Surveys In 2011

Common Name/Scientific Name	California		Nevada		Total (CA and NV)		Present at HHSEGS Site
	No. of Localities	No. of Individuals	No. of Localities	No. of Individuals	No. of Localities	No. of Individuals	
Pahrump Valley buckwheat *Eriogonum bifurcatum*	34	558,702	9	473,200	43	1,031,902	Yes
Reveal's buckwheat *Eriogonum contiguum*	18	418,424	16	618,646	34	1,037,070	No
Wing-seed blazing star *Mentzelia pterosperma*	5	50	2	71	7	121	No
Spine-noded milkvetch *Peteria thompsoniae*	3	43	0	0	3	43	No
Parish's phacelia *Phacelia parishii*	9	161,230	2	5,100	11	166,330	No
Goodding's phacelia *Phacelia pulchella* var. *gooddingii*	100	13,129	4	115	104	13,244	Yes
Johnson's bee-hive cactus *Sclerocactus johnsonii*	0	0	1	3	1	3	No
Desert wing-fruit *Selinocarpus nevadensis*	15	143	1	20	16	163	Yes
Other Plant Species of Consideration							
Torrey's jointfir *Ephedra torreyana*	13	234	0	0	13	234	No
Gray wire-lettuce *Stephanomeria cinerea*	2	25	2	16	4	41	No

Source: GANDA field surveys conducted for the HHSEGS project in 2010 and 2011.

3.1 Pahrump Valley

Offsite surveys were conducted within selected areas of the southern, central and northern portions of the Pahrump Valley, in California and Nevada (Figures 1 through 4, Appendix A). The botanists spent the most time within the Pahrump Valley located nearby the HHSEGS site. Additional unsurveyed suitable habitat for special-status plants and other plant species of consideration exists in the Pahrump Valley and it is possible that other localities of special-status plants occur beyond those identified during these reconnaissance-level surveys.

Within the southern, central and northern parts of the Pahrump Valley, 17 species of special-status plants and 2 other plant species of consideration were mapped during the offsite surveys (Figures 1 through 4, Appendix A). The special-status plants found in the Pahrump Valley include all of the special-status plant species that were found within the HHSEGS site and the 250-foot buffer during protocol-level surveys (CH2M HILL 2011). The number of localities and individuals of special-status plants found in the Pahrump Valley in California and Nevada during the offsite surveys is listed in Table 3-2

TABLE 3-2
Number of Special-Status Plants and Other Species of Consideration Found During Offsite Surveys Within the Pahrump Valley, California and Nevada

	Pahrump Valley						
	Southern		Central		Northern		Total No. of Individuals (Localities)
Common Name/Scientific Name	No. of Localities	No. of Individuals	No. of Localities	No. of Individuals	No. of Localities	No. of Individuals	
Special-Status Plant Species							
Nevada onion *Allium nevadense*	1	9	0	0	0	0	**9 (1)**
Pink-funnel lily (S) *Androstephium breviflorum*	12	213	0	0	0	0	**213 (12)**
Nye milkvetch (S) *Astragalus nyensis*	42	1,160	3	61	0	0	**1,221 (45)**
Preuss' milkvetch (S) *Astragalus preussii* var. *preussii*	5	13	1	1	0	0	**14 (6)**
Gravel milkvetch (S) *Astragalus sabulonum*	1	Estimated 20	0	0	0	0	**20 (1)**
Tidestrom's milkvetch (S) *Astragalus tidestromii*	68	3,202	4	62	0	0	**3,264 (72)**
Pahrump silverscale *Atriplex argentea* var. *longitrichoma*	0	0	2	3,100	2	1,500	**4,600 (4)**
Wheeler's skeletonweed (S) *Chaetadelpha wheeleri*	23	942	0	0	0	0	**942 (23)**
Purplenerve springparsley (S) *Cymopterus multinervatus*	0	0	5	32	0	0	**32 (5)**
Utah vine milkweed *Cynanchum (=Funastrum) utahense*	1	1	0	0	0	0	**1 (1)**
Pahrump Valley buckwheat (S) *Eriogonum bifurcatum*	25	1,902	8	508,000	1	50,000	**559,902 (34)**
Reveal's buckwheat *Eriogonum contiguum*	2	275	12	282,846	0	0	**283,121 (14)**
Wing-seed blazing star *Mentzelia pterosperma*	4	42	3	79	0	0	**121 (7)**
Spine-noded milkvetch *Peteria thompsoniae*	3	43	0	0	0	0	**43 (3)**
Parish's phacelia *Phacelia parishii*	0	0	2	250	0	0	**250 (2)**
Goodding's phacelia (S) *Phacelia pulchella* var. *gooddingii*	95	12,703	9	541	0	0	**13,375 (104)**
Desert wing-fruit (S) *Selinocarpus nevadensis*	15	143	1	20	0	0	**163 (16)**
Other Plant Species of Consideration							
Torrey's jointfir *Ephedra torreyana*	11	168	3	66	0	0	**234 (14)**
Gray wire-lettuce *Stephanomeria cinerea*	0	0	2	30	0	0	**30 (2)**

Notes:

S = species observed at the HHSEGS site

Source: GANDA field surveys conducted for the HHSEGS project in 2010 and 2011.

3.1.1 Southern Pahrump Valley

Two areas managed by BLM and five privately-owned lands were surveyed in the southern Pahrump Valley. The boundaries of these areas are shown on Figure 2 in Appendix A. These areas are referred to as: Private Land A, Private Land B, Private Land C, Private Land D, Calvada South, BLM 1 and BLM 2. The vegetation types and other features observed within the areas surveyed included shadscale scrub, Mojave Desert scrub, small washes, mesquite thickets, a low dune, and cleared areas. Fourteen species of special-status plants were mapped within the southern Pahrump Valley (Table 3-2). One plant species of consideration, Torrey's jointfir, was also identified. Information for each site surveyed in the southern Pahrump Valley such as size, elevation, description of the nearest access roads or physical landmarks, as well as the vegetation types, dominant plant species, special-status plants and weeds observed during the surveys is presented in Table 3-3. Individual sites are also described in more detail in the following sections.

TABLE 3-3
Southern Pahrump Valley - Summary of Key Finds

Location	Size (approx. acres)	Elevation (approx. feet)	Vegetation Types in Area Surveyed	Special-status Plant Species Observed	Other Plant Species of Consideration Observed	Noxious Weed Species Observed
Southern Pahrump Valley						
Private Land A	320	2,570	Shadscale scrub	Preuss' milkvetch Tidestrom's milkvetch Goodding's phacelia	None	Red brome African mustard Halogeton
Private Land B	640	2,535	Shadscale scrub	Pink funnel lily Wheeler's skeletonweed Gooding's phacelia	None	Red brome Cheatgrass African mustard Halogeton
Private Land C	640	2,590 – 2,790	Mojave Desert scrub	Nevada onion Nye milkvetch Tidestrom's milkvetch Reveal's buckwheat Spine-noded milkvetch Desert wing-fruit	None	Red brome African mustard
Private Land D	800	2,600 –2,690	Mojave Desert scrub Shadscale scrub	Pink funnel-lily Nye milkvetch Tidestrom's milkvetch Pahrump Valley buckwheat Desert wing-fruit	None	Red brome London rocket
Calvada South	4,800	2,640 – 2,830	Mojave Desert scrub Shadscale scrub Mesquite thicket Cleared land	Pink funnel-lily Nye milkvetch Gravel milkvetch Tidestrom's milkvetch Wheeler's skeletonweed Utah vine milkweed Pahrump Valley buckwheat Goodding's phacelia Desert wing-fruit	None	Red brome Cheatgrass Halogeton London rocket Tumble mustard African mustard Russian thistle

TABLE 3-3
Southern Pahrump Valley - Summary of Key Finds

Location	Size (approx. acres)	Elevation (approx. feet)	Vegetation Types in Area Surveyed	Special-status Plant Species Observed	Other Plant Species of Consideration Observed	Noxious Weed Species Observed
BLM Lands						
BLM 1	1,280	2,560	Shadscale scrub	Preuss' milkvetch Tidestrom's milkvetch Wheeler's skeletonweed Pahrump Valley buckwheat Wing-seed blazing star Goodding's phacelia	Torrey's jointfir	Red brome Cheatgrass Halogeton African mustard Russian thistle
BLM 2	200	2,700 – 2,840	Mojave Desert scrub Washes	Tidestrom's milkvetch Desert wing-fruit	None	Red brome

Source: GANDA field surveys conducted for the HHSEGS project in 2010 and 2011.

3.1.1.1 Private Lands

Private Land A. This 320-acre area is adjacent to the western boundary of the HHSEGS site between Avenues B and D (Figure 2, Appendix A). It is located within the Calvada Springs USGS quadrangle (T22N, R10 E, and NW and SW quarters of Section 20). The elevation of Private Land A is approximately 2,570 feet. A total of 8 person-hours were spent searching this area for special-status plants, using two, 2-person crews. The vegetation within Private Land A is shadscale scrub. Dominant plant species included shadscale (*Atriplex confertifolia*), box-thorn species (*Lycium spp*.), desert alyssum (*Lepidium fremontii*), and burro bush (*Ambrosia dumosa*). Three special-status plant species were identified within Private Land A: Preuss' milkvetch, Tidestrom's milkvetch, and Goodding's phacelia. Noxious weeds were noted in the field, but they were not the focus of the surveys, and weed locations were not mapped. The following noxious weeds were observed: red brome (*Bromus madritensis* ssp. *rubens*), African mustard (*Malcolmia africana*), and halogeton (*Halogeton glomeratus*).

Private Land B. Private Land B is approximately 640 acres and is located west of Private Land A (Figure 2, Appendix A). It is about 1 mile west of Carpenter Road, and 1 mile north of Tecopa Road. Private Land B is within the Calvada Springs 7.5-minute USGS quadrangle (T22 N, R10 E, NW and SW quarter-sections of Section 20). The elevation of Private Land B is approximately 2,535 feet.

Four sites within Private Land B were searched for special-status plants using two, 2-person crews, and the level of effort totaled approximately 10 person-hours. The vegetation within Private Land B is shadscale scrub, and it is dominated by shadscale, box-thorn species, desert alyssum, and burro bush. Three special-status plant species were identified within Private Land B: pink funnel-lily, Wheeler's skeletonweed, and Goodding's phacelia (Figure 2, Appendix A). Three noxious weeds were observed: red brome, cheatgrass (*Bromus tectorum*), African mustard, and halogeton.

Private Land C. This 640-acre site is located about 1.7 miles southwest of the HHSEGS site, 2 miles west of Rosie/Quartz Road, and immediately south of Tecopa Road (Figure 2, Appendix A). It is located at T21½N, R9E, Section 36 within the Calvada Springs USGS 7.5-minute quadrangle. The elevation ranges between approximately 2,590 to 2,790 feet. Five sites were searched by two, 2-person crews for a level of effort totaling 23 person-hours. The vegetation within Private Land C is Mojave Desert scrub. The dominant plants observed included: creosote bush (*Larrea tridentata*), burro bush, shadscale, rabbit-thorn (*Lycium pallidum*), desert alyssum, and Mediterranean grass (*Schismus* spp.). Six special-status plant species were observed: Nevada onion, Nye milkvetch, Tidestrom's milkvetch, Reveal's buckwheat, spine-noded milkvetch and desert wing-fruit. Two weed species, red brome and African mustard, were identified within this survey area.

Private Land D. This 800-acre area is approximately 1 mile south of Tecopa Road, east of Carpenter Road, and southwest of the HHSEGS site (Figure 2, Appendix A). It is located within the Calvada Springs USGS 7.5-minute quadrangle (T21N, R10E, Section 5, and the SW quarter-section of Section 4). The elevation of Private Land D ranges between 2,600 to 2,690 feet. Six sites within Private Land D were searched for special-status plants using two, 2-person crews, and the level of effort totaled approximately 16 person-hours. The vegetation within Private Land D is mainly Mojave Desert scrub. The dominant plants observed included: creosote bush, burro bush, shadscale, rabbit-thorn species, Nevada ephedra (*Ephedra nevadensis*), big galleta (*Pleuraphis rigida*), and Mediterranean grass. Small portions of the eastern edge of Private Land D support shadscale scrub vegetation that is dominated by shadscale and allscale (*Atriplex polycarpa*). Five special-status plants were observed: pink funnel-lily, Nye milkvetch, Tidestrom's milkvetch, Pahrump Valley buckwheat, and desert wing-fruit. Two weed species, red brome and London rocket (*Sisymbrium irio*), were identified.

Calvada South. The Calvada South survey area is approximately 4,800 acres. It is located south of Tecopa Road and east of Charleston View Road. This survey area is adjacent to the survey area designated as BLM 2 and the BLM Pahrump Valley Wilderness (Figure 2, Appendix A). It is located within the Calvada Springs USGS 7.5-minute quadrangle (T21N, R10E, Sections 1, 2, 10, 11 and 12, and T21N, R11E, Sections 5, 6 and 7 [Sections 5 and 6 are truncated by the state line]). The elevation ranges between 2,640 to 2,830 feet. Within the boundary of the Calvada South survey area, a total of 19 sites were searched for special-status plants by crews of between 3 to 5 persons, for a level of effort of 19 person-days. The vegetation types within Calvada South include Mojave Desert scrub and shadscale scrub. The dominant plants observed were creosote bush, burro bush, allscale (*Atriplex polycarpa*), rabbit-thorn species, pima ratany (*Krameria erecta*), Nevada ephedra, big galleta, and winter fat (*Kraschenninikovia lanata*). The shadscale scrub vegetation was dominated by shadscale and allscale. A few low dunes were identified that were covered with thickets of honey mesquite (*Prosopis glandulosa*). Washes within the area supported honey mesquite, catclaw acacia (*Acacia greggii*), desert baccharis (*Baccharis sergiloides*), blackstem rabbitbrush (*Chrysothamnus paniculatus*), and many species characteristic of uplands. Cleared lands were devoid of shrubs, with plant cover consisting of native annual forbs and Mediterranean grass (*Schismus arabicus*). Nine special-status plant species were observed: Pink funnel-lily, Nye milkvetch, gravel milkvetch, Tidestrom's milkvetch, Wheeler's skeletonweed, Utah vine milkweed, Pahrump Valley buckwheat, Goodding's phacelia, and desert wing-fruit. Seven species of noxious weeds were identified, including red brome, cheatgrass, halogeton, London rocket, tumble mustard (*Sisymbrium altissimum*), African mustard, and Russian thistle (*Salsola* spp.).

3.1.1.2 BLM Lands

Two areas managed by BLM were searched for special-status plants during offsite surveys in the southern Pahrump Valley. These areas are designated as BLM 1 and BLM 2 on Figure 2 (Appendix A). Results of the surveys are summarized below.

BLM 1. This 1,280-acre area is one to 2 miles south of Tecopa Road, between Private Land A and B, and west of the HHSEGS site (Figure 2, Appendix A). It is located within the Calvada Springs and Mound Spring USGS 7.5-minute quadrangles (T22N, R10E, portions of Sections 17, 18, and 19. BLM 1 is situated at an elevation of approximately 2,560 feet. Eight sites were searched for special-status plants by two, 2-person crews, for a total level of effort of 32 person-hours. The vegetation within BLM 1 is shadscale scrub vegetation that is dominated by shadscale, rabbit-thorn, winter fat, desert alyssum, and burro bush. Six special-status plant species were observed: Preuss' milkvetch, Tidestrom's milkvetch, Wheeler's skeletonweed, Pahrump Valley buckwheat, wing-seed blazing star, and Goodding's phacelia. Torrey's jointfir, a plant species of consideration, was identified. Five noxious weeds were observed: Red brome, cheatgrass, halogeton, African mustard, and Russian thistle.

BLM 2. BLM 2 is approximately 200 acres. It is located 3 miles south of Tecopa Road, east of Charleston View Road, and next to the northern edge of the BLM Pahrump Valley Wilderness (Figure 2, Appendix

A). BLM 2 is located within the Calvada Springs and Stump Spring USGS 7.5-minute quadrangles (T21N, R10E, northern edge of Section 15, and T21, R11E, northern edge of Section 18). The elevation of BLM 2 ranges from 2,700 to 2,840 feet. Three sites within the boundary of this survey area were searched by one 3-person crew, for a total level of effort of approximately 8 person-hours. This site supported Mojave Desert scrub vegetation that was dominated by creosote bush, burro bush, pima ratany, Mojave yucca (*Yucca schidigera*), rabbit-thorn, winter fat, and goldenhead (*Acamptopappus sphaerocephalus*). Large to small washes were present that contained species such as bladder sage (*Salazaria mexicana*), Mojave aster (*Xylorhiza tortifolia*), paper-daisy (*Psilostrophe cooperi*), and Virgin River brittlebush (*Encelia virginensis*). Two special-status plant species were observed: Tidestrom's milkvetch and desert wing-fruit. One weed species, red brome, was identified within this survey area.

3.1.2 Central and Northern Pahrump Valley

In the central and northern parts of the Pahrump Valley, areas selected for special-status plant surveys were mainly managed by BLM, but in some areas, the land ownership was uncertain (Figures 3 and 4, Appendix A). Survey sites in the central and northern Pahrump Valley are small and widely scattered. Therefore, this section collectively addresses all of these small survey sites within the boundary of the central and northern Pahrump Valley.

All survey sites were accessed using existing roads. The vegetation and other features observed in these areas included Mojave Desert scrub, shadscale scrub, shallow drainages with mesquite woodland, shoreline areas (Pahrump Dry Lake), and disturbed fields and roadsides. Eleven species of special-status plants and two plant species of consideration were mapped in the central and northern Pahrump Valley (Figures 3 and 4, Appendix A).

A summary of information for all of the sites, collectively, in the central and northern Pahrump Valley, such as location, vegetation types, dominant plant species, special-status plants, and weeds observed during the surveys is presented in Table 3-4.

TABLE 3-4
Central and Northern Pahrump Valley - Summary of Key Finds

Location	Size (approx. acres)	Elevation (approx. feet)	Vegetation Types in Area Surveyed	Special-status Plant Species Observed	Other Plant Species of Consideration Observed	Noxious Weed Species Observed
Central and Northern Pahrump Valley	3,000	2,410 – 2,525	Shadscale scrub Mojave Desert scrub	Preuss's milkvetch Nye milkvetch Tidestrom's milkvetch Pahrump silverscale Purplenerve springparsley Pahrump Valley buckwheat Reveal's buckwheat Wing-seed blazing star Parish's phacelia Goodding's phacelia Desert wing-fruit	Torrey's jointfir Gray wire-lettuce	Red brome London rocket Tamarisk

Source: GANDA field surveys conducted for the HHSEGS project in 2010 and 2011.

Collectively, a total of approximately 3,000 acres were surveyed within the central and northern Pahrump Valley. These survey areas are located west of the town of Pahrump, northwest of the HHSEGS site, and are located within California and Nevada (Figures 3 and 4, Appendix A). The central and northern survey areas are located within the Mound Spring and Nopah Peak USGS 7.5-minute quadrangles (T21S, R53E, parts of Sections 14, 23 and 27; and T23N, R9E, parts of Sections 17, 20, 21, 22, and 28). The elevation ranges from 2,410 to 2,525 feet within these survey areas.

Within the boundaries of the central and northern Pahrump Valley survey areas, 25 sites were searched for special-status plants. The distribution of special-status plants on Figures 3 and 4, Appendix A, roughly

shows the location of the sites surveyed. Fourteen sites were searched for special-status plants by two, 2-person crews, for 28 person-hours. Surveys were performed within another 9 sites by two, 2-person crews for a total of approximately 24 person-hours. Two additional sites were searched by one, 2-person crew, for a total of approximately 3 person-hours.

Vegetation types and other features within the northern and central Pahrump Valley survey areas included shadscale scrub, Mojave Desert scrub, and mesquite woodland. Also noted were shallow drainages with mesquite woodland, shoreline areas associated with Pahrump Dry Lake, and disturbed fields and roadsides. The shadscale scrub was dominated by shadscale, and this vegetation type also included species such as four-wing saltbush, broom snakeweed, prince's plume, desert holly (*Atriplex hymenelytra*), seepweed (*Suaeda moquinii*), desert mallow (*Sphaeralcea ambigua*), and burrobush. The Mojave Desert scrub was dominated by creosote bush, with burro bush, shadscale, rabbit-thorn species, Nevada ephedra (*Ephedra nevadensis*) and Mediterranean grass.

Eleven special-status plants were observed within these central and northern Pahrump Valley survey areas: Preuss' milkvetch, Tidestrom's milkvetch, Nye milkvetch, Pahrump silverscale, purplenerve springparsley, Pahrump Valley buckwheat, Reveal's buckwheat, wing-seed blazing star, Parish's phacelia, Goodding's phacelia, and desert wing-fruit (Figures 3 and 4, Appendix A). Torrey's jointfir and gray wire-lettuce, plant species of consideration, were also identified. Three noxious weeds were observed: red brome, London rocket, and tamarisk (*Tamarix ramosissima*).

3.2 Stewart Valley and the Ash Meadows Area

Offsite surveys in the Stewart Valley and the Ash Meadows area were more limited in scope compared to surveys of the Pahrump Valley, which is closer to the HHSEGS site. Surveys were conducted within approximately 1,200 acres in a few selected areas in the Stewart Valley, in California and Nevada, and to the north, in the Ash Meadows area of Nevada (Figure 5, Appendix A). In California, all of the survey sites were south of Highway 178, and just west of the Nevada border. In Nevada, survey sites were located along Highway 372, Ash Meadows Road, or Highway 190. The areas selected for surveys contain habitat suitable for special-status plants and were accessible by road.

Six species of special-status plants were identified in the Stewart Valley and the Ash Meadows area: Nye milkvetch, Pahrump silverscale, Pahrump Valley buckwheat, Reveal's buckwheat, Parish's phacelia, and Johnson's bee-hive cactus (Figure 5, Appendix A). One plant species of consideration, gray wire-lettuce, was also recorded in this area. Table 3-5 lists the number of individuals and localities recorded in the Stewart Valley and the Ash Meadows offsite survey area.

A summary of information for all of the sites, collectively, in the Stewart Valley and Ash Meadows Area, such as location, vegetation types, dominant plant species, special-status plants, and weeds observed during the surveys is presented in Table 3-6. Individual sites are also described in more detail in the following sections.

TABLE 3-5
Special-Status Plant Individuals and Localities Mapped During Offsite Surveys in 2011 In Stewart Valley and the Ash Meadows Area

	Stewart Valley		Ash Meadows Area		Total Number of Individuals (Localities)
Common Name/Scientific Name	No. of Localities	No. of Individuals	No. of Localities	No. of Individuals	
Special-Status Plant Species					
Nye milkvetch (S) *Astragalus nyensis*	1	1	0	0	1 (1)
Pahrump silverscale *Atriplex argentea* var. *longitrichoma*	4	8,065	0	0	8,065(4)
Pahrump Valley buckwheat (S) *Eriogonum bifurcatum*	5	270,200	0	0	270,200 (5)

TABLE 3-5
Special-Status Plant Individuals and Localities Mapped During Offsite Surveys in 2011 In Stewart Valley and the Ash Meadows Area

Common Name/Scientific Name	Stewart Valley		Ash Meadows Area		Total Number of Individuals (Localities)
	No. of Localities	No. of Individuals	No. of Localities	No. of Individuals	
Reveal's buckwheat *Eriogonum contiguum*	9	533,500	1	5,000	538,500 (10)
Parish's phacelia *Phacelia parishii*	2	5,100	0	0	5,100 (2)
Johnson's bee-hive cactus *Sclerocactus johnsonii*	1	3	0	0	3 (1)
Other Plant Species of Consideration					
Gray wire-lettuce *Stephanomeria cinerea*	1	1	0	0	1 (1)

Notes:

S = species observed within the HHSEGS Site.

Source: GANDA field surveys conducted for the HHSEGS project in 2010 and 2011

TABLE 3-6
Stewart Valley and the Ash Meadows - Summary of Key Finds

Location	Size (approx. acres)	Elevation (approx. feet)	Vegetation Types in Area Surveyed	Special-status Plant Species Observed	Other Plant Species of Consideration Observed	Noxious Weed Species Observed
Stewart Valley and Ash Meadows	1,200 (collectively)	2,465-2,555	Shadscale scrub Mojave Desert scrub Mesquite woodland	Nye milkvetch Pahrump silverscale Pahrump Valley buckwheat Reveal's buckwheat Parish's phacelia Johnson's bee-hive cactus	Gray wire-lettuce	Russian knapweed Red brome Cheatgrass Halogeton African mustard London rocket Russian thistle Tamarisk

Source: GANDA field surveys conducted for the HHSEGS project in 2010 and 2011

3.2.1 Description of Key Finds

The Stewart Valley and Ash Meadows survey area is roughly west and northwest of the town of Pahrump, and northwest of the HHSEGS site. It is located within the Stewart Valley, Sixmile Spring, and High Peak USGS 7.5-minute quadrangles (T24N, R8E, parts of Sections 8, 9, and 22; T20S, R52E, parts of Sections 7 and 8; T19S, R53E, part of Section 29). Sites ranged in elevation from 2,465 to 2,555 feet. Ten sites were searched for special-status plants. Six sites were searched by two, 2-person crews, for a level of effort of approximately 16 person-hours. Four additional sites were searched by two, 2-person crews for a total of approximately 8 person-hours.

The Stewart Valley and the Ash Meadows survey area supports shadscale scrub, Mojave Desert scrub, and mesquite woodland. The shadscale scrub was dominated by shadscale and seepweed, and contained four-wing saltbush, broom snakeweed, prince's plume, desert holly, desert mallow, and burrobush. The dominant plant species in the Mojave Desert scrub was creosote bush, and this habitat also supported burro bush, four-wing saltbush, rabbit-thorn species, Nevada ephedra, and desert allyssum. Mesquite woodland, dominated by honey mesquite, was observed along the margins of Stewart Dry Lake. Six species of special-status plants were identified: Nye milkvetch, Pahrump silverscale, Pahrump Valley buckwheat, Reveal's buckwheat, Parish's phacelia, and Johnson's bee-hive cactus (Figure 5, Appendix A). One plant species of consideration, gray wire-lettuce, was also recorded in

this area. Eight noxious weed species were observed: Russian knapweed (*Acroptilon repens*), red brome, cheatgrass, halogeton, African mustard, London rocket, Russian thistle and tamarisk.

3.3 Chicago and California Valleys

Offsite surveys in the Chicago Valley and California Valley areas were more limited in scope compared to surveys of the central and southern Pahrump Valley, closer to the HHSEGS site. Within the boundary of the survey areas shown on Figure 6, Appendix A, searches for special-status plants were performed within roughly 320 acres in Chicago Valley, and approximately 800 acres in California Valley. Both valleys are in Inyo County, California. Surveys in Chicago Valley were performed in the southeastern part of the valley. Surveys in California Valley were conducted in a few survey sites along Mesquite Valley Road, and one site along Tecopa Road.

The areas selected for surveys contain habitat suitable for special-status plants and were accessible by road. Within the Chicago and California valleys, seven species of special-status plants were detected. Table 3-7 contains a summary of the numbers of localities and numbers of individuals of special-status plants found during offsite surveys in these areas. Figures 6 and 7 (Appendix A) show the locations where special-status plants were found. Species accounts for all seven species of special-status plants are in Section 4.

TABLE 3-7
Special-status Plant Localities Mapped During Offsite Surveys in 2011 In Chicago Valley and California Valley.

	Chicago Valley		California Valley		
Common Name/Scientific Name	No. of Localities	No. of Individuals	No. of Localities	No. of Individuals	Total Number of Individuals (Localities)
Special-status Plant Species					
Pink funnel-lily (S) *Androstephium breviflorum*	0	0	2	3	3 (2)
Tidestrom's milkvetch (S) *Astragalus tidestromii*	0	0	3	18	18 (3)
Pahrump silverscale *Atriplex argentea* var. *longitrichoma*	3	850	1	200	1,050 (4)
Pahrump Valley buckwheat (S) *Eriogonum bifurcatum*	4	201,800	0	0	201,800 (4)
Reveal's buckwheat *Eriogonum contiguum*	6	210,029	5	5,420	215,449 (11)
Parish's phacelia *Phacelia parishii*	4	155,150	3	5,830	160,980 (7)
Other Plant Species of Consideration					
Gray wire-lettuce *Stephanomeria cinerea*	1	10	0	0	10 (1)

Notes:

S = species observed within the HHSEGS Site

Source: GANDA field surveys conducted for the HHSEGS project in 2010 and 2011

A summary of information for all of the sites, collectively, that are located within the Chicago and California Valley Survey Area, such as location, vegetation types, dominant plant species, special-status plants, and weeds observed during the surveys is presented in Table 3-8. Individual sites are also described in more detail in the following sections.

TABLE 3-8
Chicago and California Valleys - Summary of Key Finds

Location	Size (approx. acres)	Elevation (approx. feet)	Vegetation Types in Area Surveyed	Special-status Plant Species Observed	Other Plant Species of Consideration Observed	Noxious Weed Species Observed
Chicago Valley	320	2,120	Shadscale scrub Barren silty hills	Pahrump silverscale Pahrump Valley buckwheat Reveal's buckwheat Parish's phacelia	Gray wire-lettuce	Red brome
California Valley	800	2,280 – 2,560	Mojave Desert scrub Shadscale scrub Barren silty hills	Pink funnel-lily Pahrump silverscale Tidestrom's milkvetch Reveal's buckwheat Parish's phacelia	none	Red brome London rocket Russian thistle

Source: GANDA field surveys conducted for the HHSEGS project in 2010 and 2011.

3.3.1 Chicago Valley

Searches for special-status plants were performed within approximately 320 acres in the southern end of the Chicago Valley, between the Resting Springs Range and the Nopah Range, east of Highway 178. It is located within the Twelvemile Spring USGS 7.5-minute quadrangle (T22N, R7E, part of Section 13) (Figure 6, Appendix A). The Nopah Range Wilderness Area is to the east. The elevation of this survey area is about 2,120 feet. Four sites within Chicago Valley were searched for special-status plants using two, 2-person crews, and the level of effort totaled approximately 8 person-hours. The vegetation within this survey area is shadscale scrub dominated by shadscale and seepweed, and it also supported prince's plume. Low, barren hills with whitish, silty soil also were noted in these survey sites. Four special-status plants were observed in these survey sites: Pahrump silverscale, Pahrump Valley buckwheat, Reveal's buckwheat, and Parish's phacelia. One plant species of consideration, gray wire-lettuce, was noted. One noxious weed, red brome, was identified.

3.3.2 California Valley

Roughly 800 acres were searched for special-status plants within the California Valley and the southern tip of the Nopah Range. The boundary of the California Valley survey area is shown on Figure 7, Appendix A. The California Valley survey area is southwest of the HHSEGS site and is situated between three BLM wilderness areas: 1) South Nopah Range Wilderness, 2) the Nopah Range Wilderness, and 3) the Pahrump Valley Wilderness. This survey area is located within two USGS 7.5-minute quadrangle maps: north of Tecopa Pass and Tecopa Pass (T21N, R9E, part of Section S32; T20N, R9E). The elevation of the California Valley survey area is between 2,280 to 2,560 feet. Four sites within this area were searched by two, 2-person crews, for a total level of effort of 16 person-hours. One additional site was searched by one person for one hour.

Mojave Desert scrub and shadscale scrub were identified within this survey area. Mesquite thickets were observed near springs (but these areas were not surveyed), and barren, low hills with whitish, silty soil were also present. The Mojave Desert scrub was dominated by creosote bush and burro bush, and this vegetation type also supported species such as Mojave yucca, Nevada ephedra, pima ratany, goldenhead (*Acamptopappus sphaerocephalus*), boxthorn species, and allscale. The shadscale scrub was dominated by shadscale and seepweed, and also included prince's plume, cheesebush (*Hymenoclea salsola*), rabbit-thorn, and goldenbush (*Isocoma acradenia*). Five special-status plants were identified: pink funnel-lily, Pahrump silverscale, Tidestrom's milkvetch, Reveal's buckwheat, and Parish's phacelia. Three noxious weeds, red brome, London rocket, and Russian thistle were noted.

SECTION 4

Special-status Plant Species Accounts

This section includes species accounts for the special-status plant species that were found and mapped during offsite surveys conducted in support of the HHSEGS project. Table B-2 summarizes the conservation status for all of these species. Information on the distribution and abundance of these species within the offsite survey area is found in Section 3. Additionally, two species of consideration, Torrey's jointfir and gray wire-lettuce, were mapped during offsite surveys. Species accounts for these species are found in Section 5.

4.1 Nevada onion (*Allium nevadense*) – CRPR 2.3

Nevada onion is a small, pinkish-flowered, bulb-forming perennial (geophyte) in the Lily Family (*Liliaceae*). Distinctive features include the pale petals with a pink midvein, and the net-like markings on the bulb coat (outer layers of the bulb, like an onion's "skin") (Baldwin et al. 2002). In California, Nevada onion flowers from April to May (CNPS 2011). Line drawings of this species are found in Baldwin and others (2002) and Cronquist and others (1977). Photos can be viewed on the CalPhotos website, and in Appendix E.

Nevada onion grows in sandy to gravelly soils in Joshua tree woodland and pinyon-juniper woodland (Kartesz 1988). In California it has been documented from 4,265 to 5,580 feet (CNPS 2011).

In California, Nevada onion is known from the eastern Mojave Desert in San Bernardino and Inyo counties. It is also found in Nevada, Arizona, Utah, Colorado, Idaho and Oregon (USDA 2011). The California Natural Diversity Database (CNDDB) (2011a) lists 22 element occurrences (EOs[3]) for this species, of which 16 are recent and six are historic. The Consortium of California Herbaria (Consortium) (Jepson Online Interchange 2011) lists 25 records for Nevada onion, of which three are duplicates. All records are from San Bernardino County, except one from Inyo County.

During 2011 offsite surveys in support of the HHSEGS project, Nevada onion was found in the southern Pahrump Valley on private land (see Section 3). During protocol-level surveys for the HHSEGS project, Nevada onion was not found within the HHSEGS site, but was found within the linear corridor (CH2M HILL 2011, 2012). One locality of Nevada onion with 9 individuals was documented in California during offsite surveys in 2011 (Table 3-1). Nevada onion was not found in Nevada during offsite surveys in 2011.

Nevada onion is not state or federally listed. In California, it is designated California Rare Plant Rank[4] (CRPR) 2, meaning that it is considered "rare and endangered in California, and more common elsewhere" (CNPS 2011). The CNDDB classifies it as G4 S2, meaning that globally it is "apparently secure," and in California it is "imperiled" (CNDDB 2011b). It has no conservation status in Nevada, or in any other state where it occurs. Its conservation status is summarized in Table B-2.

[3] *Element Occurrence* (EO) is a term used by CNDDB to indicate a location where a special-status plant is found. An EO can consist of a single individual or a group of individuals, which may include sub-groups. Element occurrences are, by definition, separated from the nearest EO(s) by ¼ mile or more (NatureServe 2010, CNDDB 2011b). An EO is usually not equivalent to a biological population.

[4] In April 2011 CNPS changed the name of the CNPS List to "California Rare Plant Rank," The rank designations (1A, 1B, 2, 3, 4) and their definitions are identical to those formerly used in the CNPS List (CNPS 2011), and are determined through a consensus-based review process by experts.

4.2 Pink funnel-lily (*Androstephium breviflorum*) – CRPR 2.2

Pink funnel-lily is a bulb-forming perennial (geophyte) in the Lily Family (*Liliaceae*). The flowers are white to pale pink or pale violet. The erect stem is typically 12 inches or less in height, and bears an umbel of 3 to 12 flowers, each with 6 floral parts (Baldwin et al. 2002, Flora of North America [FNA] 2009). The leaves are up to 12 inches in length, very narrow, channeled, and appear before the flowering stalk. In California, pink funnel-lily flowers from March to April. The fruit is a 3-lobed capsule that splits open at maturity to reveal rows of large black seeds. Line drawings of this species are found in Baldwin and others (2002) and Cronquist and others (1977). Photos can be viewed on the CalPhotos website, and in Appendix E.

Pink funnel-lily grows in sandy soil, in open desert scrub in California (Baldwin et al. 2002). The CNDDB (2011a) describes its habitat in California as desert dunes, and on bajadas in Mojave Desert scrub, from about 700 to 4,800 feet.

In California, pink funnel-lily is known from the Mojave Desert in San Bernardino County and the northeastern Colorado Desert in Riverside County. It is also found in Nevada, Arizona, Utah, Wyoming, Colorado and New Mexico (USDA 2011, FNA 2009, Cronquist et al. 1977). The CNDDB (2011a) lists 87 element occurrences (EOs), from San Bernardino, Riverside, and possibly Inyo counties. Eight of these are historic, and 79 are recent, meaning seen within the last 20 years. The Consortium (Jepson On-line Interchange 2011) lists 18 specimens of pink funnel-lily, 17 from San Bernardino County and one from Riverside County. Locations found during surveys for the HHSEGS project are likely the first confirmed records for this species from Inyo County.

During 2011 offsite surveys conducted in support of the HHSEGS project, pink funnel-lily was found in several new offsite locations in the southern Pahrump Valley and in California Valley, in Inyo County, California. Section 3 includes details on these locations. In addition, during protocol-level surveys, pink funnel-lily was mapped within the HHSEGS site and the linear corridor (CH2M HILL 2011a, b). As shown in Table 3.1, a total of 14 localities of pink-funnel-lily with 216 individuals were documented in California during offsite surveys in 2011. Pink-funnel-lily was not observed in Nevada during offsite surveys in 2011.

Pink funnel-lily is not state or federally listed. In California, it is designated as CRPR 2, meaning that it is considered “rare and endangered in California, and more common elsewhere” (CNPS 2011). The CNDDB classifies it as G5 S1.3, meaning that globally it is “secure,” and in California it is “critically imperiled” (CNDDB 2011b). It has no conservation status in Nevada. Its conservation status is summarized in Table B-2.

4.3 Nye milkvetch (*Astragalus nyensis*) – CRPR 1B.1

Nye milkvetch is a small, white-flowered annual herb in the Pea Family (*Fabaceae*). The flowers have a blunt keel (type of petal) with a pink spot at the tip, which is one character of several that distinguishes this species of *Astragalus* from two others with similar pods: *A. nuttallianus* var. *imperfectus* and *A. acutirostris* (Kartesz 1988). Prior to surveys for the HHSEGS project, Nye milkvetch had not been documented from California, so information about this species is derived from Nevada sources and observations made during surveys for this project. The blooming time for Nye milkvetch in California and Nevada is April to May. Photos can be viewed on the CalPhotos website and in Appendix E.

In Nevada, Nye milkvetch grows in the foothills of desert mountains, on calcareous outwash fans and gravelly flats, sometimes in sandy soil, in Mojave Desert scrub (NNHP 2001). It has been recorded from 1,500 to 5,600 feet in Nevada. There are documented locations in Nye, Clark and Lincoln counties, Nevada (Kartesz 1988).

In California, the first state records for Nye milkvetch were made during protocol-level surveys conducted for this project, within the HHSEGS site (CH2M HILL 2011a). Nye milkvetch also was observed in several locations within the linear corridor (CH2M HILL 2012a).

During 2011 offsite surveys conducted in support of the HHSEGS project, Nye milkvetch was found in several additional new offsite locations in the Pahrump Valley, in California and Nevada. Locations with large numbers of individuals were found in California within 5 miles of the California-Nevada state line, north and south of the HHSEGS site. Details are provided in Section 3. As shown in Table 3.1, a total of 42 localities and 1,160 individuals were documented in California during offsite surveys in 2011. An additional 4 localities and 62 individuals were documented in Nevada during offsite surveys in 2011.

Nye milkvetch is not state or federally listed. Conservation status for Nye milkvetch in California was determined in January 2012 (CNDDB 2012). Nye milkvetch is a CRPR 1B.1 species (CNPS 2011). The CNDDB classifies it as G3 S1, meaning that globally it is "vulnerable," and in California it is "critically imperiled" (CNDDB 2012). In Nevada, Nye milkvetch previously had conservation status, but does not at present (NNPS 2010).

4.4 Preuss' Milkvetch (*Astragalus preussii* var. *preussii*) – CRPR 2.3

Preuss' milkvetch is a pink and white-flowered perennial herb in the Pea Family. Mature plants are bushy, about 1 foot tall, and give off a strong unpleasant odor found in *Astragalus* species that concentrate selenium (Barneby 1989). The pods are straight, single-chambered, and reddish at maturity (Baldwin et al. 2002). In California, Preuss' milkvetch flowers from April to June. Photos can be viewed on the CalPhotos website, and in Appendix E.

In California, Preuss' milkvetch grows in silty soil, in open sites within shadscale scrub or Mojave Desert scrub vegetation, between 2,460 and 2,560 feet in elevation (Baldwin et al. 2002, CNPS 2011).

Prior to surveys completed for the HHSEGS project, Preuss' milkvetch was known in California only from three locations, near Mesquite Lake and in Mesquite Valley in San Bernardino County, and northwest of Panamint Valley in Inyo County (Jepson Online Interchange 2011). The Consortium contains five collection records for this species (ibid.). The CNDDB includes four EOs, two recent and two historic (CNDDB 2011a). Preuss' milkvetch is also known from Nevada, Arizona and Utah (Barneby 1989, Kartesz 1988, CNPS 2011).

During offsite surveys conducted in support of the HHSEGS project, Preuss' milkvetch was found in several new offsite locations in the Pahrump Valley, in Inyo County, California. Details are provided in Section 3. Preuss' milkvetch also was mapped in the southeastern quarter of the HHSEGS site, and within the western section of the 250-foot site buffer (CH2M HILL 2011a). In addition, this species was found in several locations within the linear corridor (CH2M HILL 2011b). As shown in Table 3.1, a total of 5 localities and 13 individuals were documented in California during offsite surveys in 2011. One additional locality with a single plant was documented in Nevada during offsite surveys in 2011.

Preuss' milkvetch is not state or federally listed. In California, Preuss' milkvetch is designated as CRPR 2 (CNPS 2011). The CNDDB classifies it as G4T4 S1.2, meaning that globally both the species and the variety are "secure," and in California the variety *preussii* is "critically imperiled" (CNDDB 2011b). In Nevada, Preuss' milkvetch has no conservation status. Its conservation status is summarized in Table B-2.

4.5 Gravel Milkvetch (*Astragalus sabulonum*) – CRPR 2.2

Gravel milkvetch is a pink flowered annual in the Pea Family (*Fabaceae*). This species is distinguished from the other annual *Astragalus* species observed during offsite surveys by its pod characteristics, and by its pink flowers, which are darker colored and larger than those of *A. didymocarpus, A. nuttallianus* or *A. nyensis* (Barneby 1989, Baldwin et al. 2002). In California and Nevada, gravel milkvetch is most

commonly found in sandy sites, such as sand dunes, sandy flats, sandy washes, and sandy roadsides, but sometimes in soils with silt and clay, as well as sand (CNPS 2011). In California it blooms from February to June, and has been recorded from 200 to 3,050 feet in elevation (CNPS 2011). Line drawings of this species are in Baldwin and others (2002) and in Barneby (1989). Photographs of this species can be accessed through the CalPhotos website.

In California, prior to surveys for the HHSEGS project, gravel milkvetch was known from a few locations in the eastern Mojave and Sonoran deserts, in Imperial, Inyo, Riverside and San Diego counties (CNPS 2011, Jepson Online Interchange 2011). The Consortium has 28 collection records for this species (Jepson Online Interchange 2011). The only collection in the Consortium from the southern Pahrump Valley previous to the HHSEGS surveys is a 2010 collection by James Andre (ibid.). Gravel milkvetch also is found in Nevada, Arizona, New Mexico, Utah; and Sonora, Mexico (Barneby 1989, Kartesz 1988, CNPS 2011). As of October 2011 the CNDDB had identified 18 EOs, of which two are recent and 18 are historic. These EOs do not include localities from the HHSEGS surveys.

Gravel milkvetch did not obtain conservation status in California until October 2011. Therefore, this species was not systematically mapped during HHSEGS surveys conducted in spring 2011. However, gravel milkvetch was collected within the HHSEGS site in five locations, and in one offsite location, and was noted to occur within the linear corridor. For localities where collections were made, abundance and habitat information was recorded in field notes, and location data were recorded from personal GPS units. The mapped offsite collection was made within the private property known as Calvada South. One locality of gravel milkvetch with twenty individuals was documented in California (at the Calvada South property) during offsite surveys in 2011. Gravel milkvetch was not documented in Nevada during offsite surveys in 2011.

Gravel milkvetch is not state or federally listed. In October 2011 it was designated as CRPR 2, meaning that it is considered “rare and endangered in California, and more common elsewhere” (CNPS 2011). The CNDDB added gravel milkvetch to its central database on October 25, 2011, and ranks it G5 S2, meaning that globally the species is “secure,” and within California it is “imperiled” (CNDDB 2011b). Its conservation status in California and Nevada is summarized in Table B-2.

4.6 Tidestrom’s milkvetch (*Astragalus tidestromii*) – CRPR 2.2

Tidestrom’s milkvetch is a purple and white-flowered perennial herb in the Pea Family. Mature plants are grayish in color, hairy, and acaulescent (stemless). The pods are large (1 to 1.5 inches long), strongly curved into a half-circle or greater, stiff and leathery, with one seed chamber, and a raised suture on the outer side (Baldwin et al. 2002). In California and Nevada, Tidestrom’s milkvetch flowers from April to June. Photos can be viewed on the CalPhoto website, and in Appendix E.

In California and Nevada, Tidestrom’s milkvetch grows on calcareous substrates, including rocky limestone slopes, but can also be found in sandy washes, and in sandy-silty substrates in valley bottoms. It can be locally common on roadsides and also grows in unpaved, infrequently used roads. It is usually associated with Mojave Desert scrub vegetation in California, at 1,970 to 5,200 feet in elevation (Baldwin et al. 2002, CNPS 2011).

Tidestrom’s milkvetch superficially resembles the common Mojave Desert species, Layne’s milkvetch (*Astragalus layneae*), and has been confused with it. Tidestrom’s milkvetch differs from Layne’s milkvetch in the following characters:

Tidestrom's milkvetch	Layne's milkvetch
acaulescent (stemless)	stem well-developed
inflorescence 3-16-flowered	inflorescence 10-45-flowered
pod one-chambered	pod two-chambered
pod flattened	pod round in cross-section
pod with rib on suture on both sides	pod with groove on the outer side suture
hairs on plant and pod appressed	hairs on plant and pod spreading

Specimens in the UC Riverside herbarium labeled as *Astragalus layneae* were checked in April 2011 by Andrew Sanders, and many of them were found to be misidentified specimens of *Astragalus tidestromii*. It appears that Tidestrom's milkvetch is much more common on limestone substrates in the eastern Mojave Desert than previously known and, likely, much more common than Layne's milkvetch in that area. No individuals of Layne's milkvetch were found in the Pahrump Valley or in surrounding areas during surveys conducted for the HHSEGS project. Tidestrom's milkvetch was found to be widespread on calcareous substrates in these areas.

Prior to surveys completed for this project, Tidestrom's milkvetch was thought to be uncommon and limited in distribution in California. The Consortium lists only 17 specimens, mainly from the San Bernardino, Clark, Kingston, and Ivanpah mountains in San Bernardino County (Jepson Online Interchange 2011). Re-evaluated *Astragalus layneae* specimens at UC Riverside have approximately doubled the number of Tidestrom's milkvetch specimens listed in the Consortium, and surveys for the HHSEGS project have expanded its range in California. The CNDDB contains 15 EOs for this species, including 6 recent and 9 historic (CNDDB 2011a). Tidestrom's milkvetch is also known from the Spring Mountains and other locations in Nevada (Niles and Leary 2007, Kartesz 1988).

During 2011 offsite surveys conducted in support of the HHSEGS project, Tidestrom's milkvetch was found in several new offsite locations in California Valley in California, and in Stewart and Pahrump valleys in California and Nevada. Details are in Section 3. Tidestrom's milkvetch also was found during protocol-level surveys in many localities within the HHSEGS site and 250-foot buffer (CH2M HILL 2011a). In addition, this species was found in several locations within the linear corridor (CH2M HILL 2011b). As shown in Table 3.1, a total of 72 localities and 3,235 individuals were documented in California during offsite surveys in 2011. An additional 3 localities and 47 individuals were documented in Nevada during offsite surveys in 2011.

Tidestrom's milkvetch is not state or federally listed. In California, Tidestrom's milkvetch is designated as CRPR 2 (CNPS 2011). The CNDDB classifies it as G4G5 S2, meaning that globally it is "apparently secure to secure," and in California it is "critically imperiled" (CNDDB 2011b). In Nevada this species has no conservation status. Its conservation status is summarized in Table B-2.

4.7 Pahrump silverscale (*Atriplex argentea* var. *longitrichoma*) – CRPR 1B.1, BLM Sensitive

Pahrump silverscale is a low, mounded annual herb in the Saltbush Family (*Chenopodiaceae*). The branched stems and leaves are fleshy to succulent, and are covered with long, club-shaped trichomes (hairs) (FNA 2011). These distinctive hairs are the feature that distinguishes this variety from the other varieties of *Atriplex argentea*. The flowers are green and inconspicuous. In California and Nevada, Pahrump silverscale flowers from April to May (CNPS 2011). A photograph of this species can be viewed in Appendix E.

Pahrump silverscale grows in pale-colored, silty, alkaline soils in shadscale scrub and alkali sink scrub, from 2,295 to 2,625 feet (ibid.).

Prior to surveys conducted for the HHSEGS project, the known worldwide distribution of Pahrump silverscale was limited to portions of the northern Pahrump Valley and southern Stewart Valley, in Inyo County, California, and Nye County, Nevada (CNPS 2011). The Consortium includes three collections, two as *A. argentea* var. *longitrichoma*, and one as *A. longitrichoma* (Jepson Online Interchange 2011). The CNDDB lists two EOs, both historic, and both from Stewart Valley (CNDDB 2011a).

During 2011 offsite surveys conducted in support of the HHSEGS project, known locations of Pahrump silverscale in the Pahrump and Stewart valleys were confirmed to exist, and new locations consisting of many individuals were mapped in the Pahrump Valley in California and Nevada, and in Chicago and California valleys in California. The Chicago Valley and California Valley records are the first records for this species in California outside of the Pahrump Valley-Stewart Valley watershed area. These records extend the range of Pahrump silverscale approximately 20 miles south. More detail is provided in Section 3. During protocol-level surveys within the HHSEGS site and the linear corridor, no individuals of Pahrump silverscale were detected (CH2M HILL 2011a, b). As shown in Table 3.1, a total of 7 localities and 9,150 individuals were documented in California during offsite surveys in 2011. An additional 5 localities and 4,565 individuals were documented in Nevada during offsite surveys in 2011.

Pahrump silverscale is not state or federally listed. In California, it is designated CRPR 1B.1, meaning that it is considered "rare and endangered in California and elsewhere" (CNPS 2011). The CNDDB classifies Pahrump silverscale as G5T1T2 S1, meaning that globally the species is "secure," and the variety *longitrichoma* is "imperiled to critically imperiled;" and in California the variety *longitrichoma* is "critically imperiled" (CNDDB 2011b). Pahrump silverscale is a BLM Sensitive species in California (BLM 2010). It is tracked by the Nevada Natural Heritage Program (NNPH 2010). The Nevada Native Plant Society includes it on its "watch" list (NNPS 2010). Its conservation status is summarized in Table B-2.

4.8 Wheeler's skeletonweed (*Chaetadelpha wheeleri*) – CRPR 2.2

Wheeler's skeletonweed is a white-flowered perennial herb in the Sunflower Family (*Asteraceae*). The mature plants are about 1 foot tall, broom-like, with many bright green stems with very small leaves (Baldwin et al. 2002). In California and Nevada, this species flowers from April to September (CNPS 2011, Kartesz 1988). Line drawings of this species are found in Baldwin and others (2002) and Cronquist and others (1994). Photos can be viewed on the CalPhotos website, and in Appendix E.

Wheeler's skeletonweed grows in sandy to silty soil, in desert dunes, Mojave Desert scrub, and Great Basin scrub in California and Nevada, at elevations from 2,790 to 6,235 feet (CNPS 2011, Kartesz 1988).

Prior to surveys completed for this project, Wheeler's skeletonweed was known in California mainly from the Death Valley region (CNPS 2011), and the nearest known locality to the HHSEGS site was about 50 miles north, in dunes at the base of the Last Chance Range, east of Death Valley (Jepson Online Interchange 2011). Thus, localities found during surveys for this project have resulted in a 50-mile southern range extension for this species in California. The Consortium lists 38 specimen records for this species (Jepson Online Interchange 2011). The CNDDB lists ten EOs for Wheeler's skeletonweed (CNDDB 2011a). Wheeler's skeletonweed is also known from Nevada and Oregon (Cronquist et al. 1994, Kartesz 1988).

During 2011 offsite surveys conducted in support of the HHSEGS project, Wheeler's skeletonweed was found in several new locations in the Pahrump Valley in Inyo County, California, near the California-Nevada state line. Details are provided in Section 3. Wheeler's skeletonweed also was observed within the HHSEGS site, the 250-foot buffer, and in several locations within the linear corridor (CH2M HILL 2011a, b). As shown in Table 3.1, a total of 23 localities and 942 individuals were documented in California during offsite surveys in 2011. This species was not observed in Nevada during offsite surveys in 2011.

Wheeler's skeletonweed is not state or federally listed. In California, Wheeler's skeletonweed is designated CRPR 2 (CNPS 2011). The CNDDB classifies it as G4 S1S2, meaning that globally it is "apparently secure," and in California it is "imperiled to critically imperiled" (CNDDB 2011b). In Nevada this species has no conservation status. Its conservation status is summarized in Table B-2.

4.9 Purplenerve springparsley (*Cymopterus multinervatus*) – CRPR 2.2

Purplenerve springparsley is a purplish-flowered perennial herb in the Carrot Family (*Apiaceae*). The mature plants are stemless, low-growing, and gray-green, with leaves and flower stalks attached underground to the buried stem or taproot (Cronquist et al. 1997, Baldwin et al. 2002). The winged fruits with purple veins are distinctive (ibid.) In California and Nevada, this species flowers from February to May (CNPS 2011, Kartesz 1988). Line drawings are included in Cronquist and others (1997). Photos can be viewed on the CalPhotos website, and in Appendix E.

Purplenerve springparsley grows in sandy to gravelly soil, in Mojave Desert scrub and pinyon-juniper woodland in California and Nevada, at elevations of 2,500 to 9,000 feet (CNPS 2011, Kartesz 1988).

Prior to surveys completed for this project, purplenerve springparsley was known in California to be uncommon, but widely distributed from the Death Valley area south to the eastern Mojave Desert, and west to the edge of the San Bernardino Mountains (Jepson Online Interchange 2011). The nearest known locality to the HHSEGS site was about 25 miles south, in the vicinity of Clark Mountain (ibid), so localities mapped during the offsite surveys extend its range in California approximately 25 miles north. The CNDDB (2011a) includes 27 EOs for this species, of which 17 are recent and 10 are historic. The Consortium contains 15 collection records for purplenerve springparsley, 14 in San Bernardino County and one in Inyo County (Jepson Online Interchange 2011). This species is also known from Nevada, Arizona, Utah, New Mexico, Texas, and Baja California (Cronquist et al. 1997, CNPS 2011, Kartesz 1988).

During 2011 offsite surveys conducted in support of the HHSEGS project, purplenerve springparsley was found in several additional new offsite locations in the Pahrump Valley in Inyo County, California, and in Nye County, Nevada. Details are provided in Section 3. During protocol-level surveys, one individual of purplenerve springparsley was observed in the HHSEGS site (CH2M HILL 2011a). This species was not found within the linear corridor (CH2M HILL 2011b). As shown in Table 3.1, a total of 2 localities and 11 individuals were documented in California during offsite surveys in 2011. An additional 3 localities and 21 individuals were documented in Nevada during offsite surveys in 2011.

Purplenerve springparsley is not state or federally listed. In California, purplenerve springparsley is designated CRPR 2 (CNPS 2011). The CNDDB classifies it as G5?[5] S2, meaning that globally it is "likely secure, although there is some uncertainty", and in California it is "imperiled" (CNDDB 2011b). In Nevada this species has no conservation status. Its conservation status is summarized in Table B-2.

4.10 Utah vine milkweed (*Cynanchum [=Funastrum] utahense*) – CRPR 4.2

Utah vine milkweed is a yellow and red-flowered perennial herbaceous vine in the Milkweed Family (*Asclepiadaceae*). The plants have thread-like, usually dark green stems, and small red and yellow flowers clustered in umbellate heads about 1 inch wide (Baldwin et al. 2002). The fruit is a pod (follicle) about 2 inches long (Cronquist et al. 1984). These small vines grow up through and entwine themselves within woody shrubs. The blooming time in California is March to June. This species often blooms somewhat later than most species with which it co-occurs. Line drawings of Utah vine milkweed are

[5] The question mark in 5? means that there is some uncertainty as to whether this species is actually globally secure.

found in Baldwin and others (2002) and Cronquist and others (1984). Photos can be viewed through the CalPhotos website (www.calphotos.org) and in Appendix E.

The Jepson Desert Manual (Baldwin et al. 2002) describes the habitat of Utah vine milkweed as dry, sandy or gravelly areas below 3,000 feet elevation (CNPS 2011, CNDDB 2011a). Utah vine milkweed grows in Mojave Desert scrub and Sonoran Desert scrub at approximately 450 to 4500 feet elevation (ibid.)

Utah vine milkweed has been documented from many locations in the Mojave and Sonoran deserts in Imperial, Riverside, San Bernardino and San Diego counties (CNPS 2011). The Consortium contains 68 collection records for this species (Jepson Online Interchange 2011). The online version of the CNDDB, RareFind4, does not provide information on the number of EOs for this species due to its rank of CRPR 4.[6] Utah vine milkweed also is found in Nevada, Arizona and Utah (CNPS 2011).

During offsite surveys conducted in support of the HHSEGS project, Utah vine milkweed was found in one location in the southern Pahrump Valley (see Section 3). One individual in flowering condition was found. This locality may be the first documented observation of this species in Inyo County, and represents an extension of its known range in California approximately 30 miles northwest (Jepson Online Interchange 2011).

During protocol-level surveys of the HHSEGS site and linear corridor, Utah vine milkweed was not detected.

Utah vine milkweed is not state or federally listed. In California, this species is designated CRPR 4.2, meaning that it is "of limited distribution or infrequent throughout a broader area in California" (CNPS 2011). The CNDDB classifies it as G4 S3.2, meaning that globally it is "likely secure, considering locations outside California," and in California it is "vulnerable" (CNDDB 2011b). In Nevada this species has no conservation status. Its conservation status is summarized in Table B-2.

4.11 Pahrump Valley buckwheat (*Eriogonum bifurcatum*) – CRPR 1B.2, BLM Sensitive

Pahrump Valley buckwheat is an annual herb in the Buckwheat Family (*Polygonaceae*). Its distinctive features include involucres (structures surrounding a group of flowers) that are sessile (attached directly to the major branches) and upright; stout branches; and a strongly dichotomous (forked) branching pattern (Reveal 1971, 2010; Baldwin et al. 2002). Both living plants and skeletons are distinctive, and can be identified at a distance. Line drawings of Pahrump Valley buckwheat are included in Mozingo and Williams (1980) and Baldwin and others (2002). Photographs of this species can be viewed at the CalPhotos website, and in Appendix E.

The habitat for Pahrump Valley buckwheat in California has been described as sandy soil areas in chenopod scrub at 2,330 to 2,625 feet in elevation (CNPS 2011, CNDDB 2011a). In Nevada, the habitat is described as barren, saline, heavy clay or silty hardpan soils on and near dry playa margins, and on adjacent shore terraces and stabilized sand dunes, at 2,300 to 2,800 feet (Reveal 2010, NNHP 2001). Pahrump Valley buckwheat has been described as endemic to the Pahrump, Stewart, Mesquite and Sandy valleys, near the California-Nevada border (ibid.). It was noted by Beatley (1976) as common near the California-Nevada border west of the town of Pahrump.

Prior to studies conducted for the HHSEGS project, the most recent comprehensive account of Pahrump Valley buckwheat in Nevada is provided by the Nevada Natural Heritage Program's 2001 rare plant fact sheet for this species (NNHP 2001). Population census information from this fact sheet states that 18 occurrences are known for Pahrump Valley buckwheat in Nevada using a mapping separation of

[6] The CNDDB has Information on specific localities for CRPR 4 species in hard copy format that can be viewed at its office by appointment. This information is not available online due to funding constraints.

1.0 km (0.6 mile), or 47 occurrences if a separation of 0.16 km (0.1 mile) is used. This fact sheet also states that the total estimated number of individuals in Nevada is 1,109 or more, and the total estimated area occupied by this species is 651 or more hectares (1,609 or more acres) (ibid.). In California, the Consortium includes two records, which are duplicates of a single collection from the southern Pahrump Valley, collected in 1941 by Carl Wolf (Jepson Online Interchange 2011).

Offsite surveys in California and Nevada conducted in support of the HHSEGS project confirmed the existence of large populations of Pahrump Valley buckwheat in previously known locations, and discovered additional large populations in new locations. In California, populations with thousands of individuals, including some with at least 100,000 plants and some larger, were documented in Stewart Valley, northern and southern Pahrump Valley, and in Chicago Valley. The Chicago Valley locality, with at least 100,000 individuals, was newly discovered during offsite surveys. Chicago Valley is on the west side of the Nopah Range, so this location extends its range one watershed to the west (approximately 10 miles) from its previously known range in this area. In Nevada, populations with at least 100,000 plants, some larger, were documented in Stewart Valley, on the east side of Stewart Dry Lake; and in the northern Pahrump Valley, within and near the town of Pahrump and northeast of Pahrump Dry Lake.

During protocol-level surveys, Pahrump Valley buckwheat was found to be common (>15,000 individuals) within the HHSEGS site, where it was found mainly in the western half, in white to pale brown, silty soils, in shadscale scrub (CH2M HILL 2011a). In the linear corridor, in Nevada, one new locality of 5,000 or more individuals was found (CH2M HILL 2011b).

Pahrump Valley buckwheat is not state or federally listed. It is designated as CRPR 1B.2, indicating that it is “considered to be rare and endangered in California and elsewhere” (CNPS 2011). Until 2010, Pahrump Valley buckwheat was documented in California from only four CNDDB element occurrences (EOs #1-4). In 2010, CNPS changed the status of Pahrump Valley buckwheat from 1B.1 to 1B.2, and five new records for this species were added to CNDDB (EOs #5-9). These new records are from the Kingston Spring and Kingston Peak USGS 7.5-minute quadrangles (Thomas 2001, CNDDB 2011a) and, if accurate, they would represent a range expansion to the west in California for this species, compared with previous records (Reveal 2010). These newly added occurrences are based on data collected in 1997 from a project to map the vegetation of the central Mojave Desert (Thomas 2001). There do not appear to be voucher specimens from the locations represented by EOs #5-9, and those localities have not been checked in the field recently, so the current status of Pahrump Valley buckwheat in these locations is uncertain. As shown in Table 3.1, a total of 34 localities and 558,702 individuals were documented in California during offsite surveys in 2011. An additional 9 localities and 473,200 individuals were documented in Nevada during offsite surveys in 2011.

The CNDDB (2011b) ranking of Pahrump Valley buckwheat is G2 S2, meaning that on a global basis and within California it is considered “imperiled, at high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors.” The Nevada Natural Heritage Program also ranks it G2 S2 (NNHP 2010). Pahrump Valley buckwheat is a BLM sensitive species in California and Nevada. The conservation status of this species is summarized in Table B-2.

4.12 Reveal’s buckwheat (*Eriogonum contiguum*) – CRPR 2.3

Reveal’s buckwheat is an annual herb in the Buckwheat Family (*Polygonaceae*). Its distinctive features include a slightly inflated stem, many thread-like branches, involucres (structures surrounding a group of flowers) with five teeth, and stems and leaves with glands (Baldwin et al. 2002). Reveal’s buckwheat is similar to another annual wild buckwheat, little desert trumpet (*Eriogonum trichopes*), which is common in the HHSEGS survey region. Little desert trumpet can be distinguished from Reveal’s buckwheat by its four-toothed involucres and its non-glandular stems and leaves (ibid.). In addition, these two species

usually grow in different habitats. Line drawings of Reveal's buckwheat are included in Baldwin and others (2002). Photographs of this species can be viewed at the CalPhotos website, and in Appendix E.

The habitat for Reveal's buckwheat in California has been described as sandy soil areas in Mojave Desert scrub at 100 to 4,330 feet in elevation (CNPS 2011, CNDDB 2011a). In Nevada, the habitat is described as rocky hills and lower bajadas, in areas with saltbush species (*Atriplex* spp.), at 2,200 to 2,500 feet elevation (Reveal 2011, Kartesz 1988, Beatley 1976).

Reveal's buckwheat has been described as endemic to the Death Valley to Ash Meadows region, and the Stewart and Pahrump valleys (ibid.). The CNDDB (2011a) contains 20 EOs for this species, of which 11 are recent and nine are historic. The Consortium includes 14 collection records for Reveal's buckwheat, of which two are duplicates (Jepson Online Interchange 2011). All of these are from Inyo County.

During 2011 offsite surveys conducted in support of the HHSEGS project, large populations of Reveal's buckwheat were found in the Ash Meadows area, Stewart Valley, Pahrump Valley, Chicago Valley and California Valley. During protocol-level surveys of the HHSEGS site and linear corridor, Reveal's buckwheat was not detected. As shown in Table 3.1, a total of 18 localities and 418,424 individuals were documented in California during offsite surveys in 2011. An additional 16 localities and 618,646 individuals were documented in Nevada during offsite surveys in 2011.

Reveal's buckwheat is not state or federally listed. In California, this species is designated CRPR 2 (CNPS 2011). The CNDDB classifies it as G2 S2, meaning that globally and in California it is "imperiled" (CNDDB 2011b). The Nevada Native Plant Society (2010) includes Reveal's buckwheat on its "marginal" list of species. This list is defined as including species "with conservation status in other states whose ranges extend into Nevada." The conservation status of Reveal's buckwheat is summarized in Table B-2.

4.13 Wing-seed blazing star (*Mentzelia pterosperma*) – CRPR 2.2

Wing-seed blazing star is a yellow-flowered perennial herb in the Sandpaper-plant Family (*Loasaceae*). Its barrel-shaped fruits and winged seeds are distinctive features. In California and Nevada, it flowers from April to June (CNPS 2011, Kartesz 1988). Photos and observations indicate that the flowers are open mainly or entirely at night. In California, wing-seed blazing star is documented from Mojave Desert scrub, in gypsum-rich clay soils, at elevations from 3,450 to 4,000 feet (CNPS 2011, CNDDB 2011a, Jepson Online Interchange 2011). Photographs of this species, showing the flowers closed, can be accessed through the CalPhotos website and in Appendix E.

Prior to surveys for the HHSEGS project, wing-seed blazing star was known in California from only two areas, one in the vicinity of Valley Wells, west of Mountain Pass, and one on gypsum deposits near Clark Mountain (CNPS 2011, Jepson Online Interchange 2011). Both of these are in San Bernardino County, about 35 miles south of the southern Pahrump Valley. The CNDDB (2011a) contains four EOs for this species, of which three are recent and one is historic. The Consortium contains three collection records for this species (Jepson Online Interchange 2011). Records of this species from the HHSEGS 2011 offsite surveys are the first documented records for Inyo County, and are a range extension in California of about 35 miles to the north. Wing-seed blazing star also is found in southern Nevada (Kartesz 1988).

During 2011 offsite surveys conducted in support of the HHSEGS project, wing-seed blazing star was found in several locations in the Pahrump Valley, in California and Nevada (see Section 3). This species was not detected within the HHSEGS site or the linear corridor during protocol-level surveys conducted for this project. As shown in Table 3.1, a total of 5 localities and 50 individuals were documented in California during offsite surveys in 2011. An additional 2 localities and 71 individuals were documented in Nevada during offsite surveys in 2011.

Wing-seed blazing star is not state or federally listed. It is designated as CRPR 2.2, meaning that it is considered "rare and endangered in California, and more common elsewhere" (CNPS 2011). The CNDDB ranks it G4 S1.2, meaning that globally the species is "apparently secure," and within California it is "critically imperiled" (CNDDB 2011b). Wing-seed blazing star has no conservation status in Nevada. Its conservation status is summarized in Table B-2.

4.14 Spine-noded milkvetch (*Peteria thompsoniae*) – CRPR 2.3

Spine-noded milkvetch is a rhizomatous perennial with cream-colored flowers, in the Pea Family (*Fabaceae*). The golden-yellow spines located at the nodes (location on the stem where a leaf is attached) and multi-celled glandular hairs distinguish this species from all species in the genus *Astragalus*, which it otherwise resembles (Baldwin et al. 2002). In California and Nevada, spine-noded milkvetch has been found in dry washes, talus ridges and slopes, on clay or sandy flats in Mojave Desert scrub and pinyon-juniper woodland, at 3,200 to 5,800 feet in elevation (CNPS 2011, Kartesz 1988). Line drawings of this species are in Baldwin and others (2002) and in Barneby (1989). Photographs of this species can be accessed through the CalPhotos website, and in Appendix E.

In California, prior to surveys for the HHSEGS project, spine-noded milkvetch was known from just one location in California, along Mesquite Valley Road in California Valley, in Inyo County (CNPS 2011, Jepson Online Interchange 2011). The Consortium has one collection record for this species (Jepson Online Interchange 2011), and the CNDDB (2011a) contains one EO for this species. All of these records are based on the same collection. Spine-noded milkvetch also is found in southern Nevada (Barneby 1989, Kartesz 1988).

During the 2011 offsite surveys conducted in support of the HHSEGS project, spine-noded milkvetch was found in one location in the southern Pahrump Valley, in California. This species was not detected within the HHSEGS site or the linear corridor during protocol-level surveys conducted for this project. As shown in Table 3.1, a total of 3 localities and 43 individuals were documented in California during offsite surveys in 2011. Spine-noded milkvetch was not observed in Nevada during offsite surveys in 2011.

Spine-noded milkvetch is not state or federally listed. It is designated as CRPR 2, meaning that it is "considered rare and endangered in California, and more common elsewhere." The CNDDB ranks it G4 S1.3 meaning that globally the species is "apparently secure," and within California it is "critically imperiled, although there is some uncertainty" (CNDDB 2011b). Spine-noded milkvetch is included on the Nevada Native Plant Society's "marginal" list, which contains species that have conservation status in other states and are also found in Nevada (NNPS 2010). Its conservation status is summarized in Table B-2.

4.15 Parish's phacelia (*Phacelia parishii*) – CRPR 1B.1, BLM Sensitive

Parish's phacelia is a diminutive, slightly succulent annual herb with very small, light blue flowers, in the Waterleaf Family (*Hydrophyllaceae*). It is distinguished from Goodding's phacelia, and other annual *Phacelia* species of the desert, by its small size, leaf shape, small light-blue flowers, and seeds without cross-furrows (Baldwin et al. 2002). It flowers from April to July (Baldwin et al. 2002, Kartesz 1988). Line drawings of this species are found in Baldwin and others (2002) and Cronquist and others (1984). Photos can be viewed on the CalPhotos website, and in Appendix E.

In California and Nevada, the habitat of Parish's phacelia is moist to superficially dry, open, flat to hummocky, mostly barren, often salt-crusted, pale-colored silty-clay soils on valley bottom flats, lake deposits and playa edges, sometimes near seepage areas or on gypsum soils, from 1,770 to 5,920 feet in elevation (Baldwin et al. 2002, Kartesz 1988, NNHP 2001).

In California, prior to surveys for the HHSEGS project, Parish's phacelia was known only from San Bernardino County (CNDDB 2011a). In Nevada, 16 locations have been documented, with more than 37 million individuals (NNHP 2001). The Consortium has 16 collection records for this species, of which four are duplicates (Jepson Online Interchange 2011). Most of these are from Rabbit Springs and Coyote Dry Lake (ibid.). The CNDDB (2011a) contains four EOs for Parish's phacelia, of which two are recent and two are historic.

During offsite surveys conducted in support of the HHSEGS project, Parish's phacelia was documented for the first time in Inyo County, California, and a new location was documented in Nye County, Nevada. In Inyo County, large populations of Parish's phacelia were found in Pahrump, Chicago and California valleys. These findings constitute a range expansion in California to the northeast of about 60 miles. In Nye County, one large population was found in Stewart Valley on the eastern margin of Stewart Dry Lake. Parish's phacelia was not detected within the HHSEGS site or the linear corridor during protocol-level surveys conducted for this project. As shown in Table 3.1, a total of 9 localities and 161,230 individuals were documented in California during offsite surveys in 2011. An additional 2 localities and 5,100 individuals were documented in Nevada during offsite surveys in 2011.

Parish's phacelia is not state or federally listed. It is designated as CRPR 1B.1, meaning that it is considered "rare and endangered in California and elsewhere" (CNPS 2011). The CNDDB ranks it G2G3 S1.1, meaning that globally the species is "vulnerable to imperiled," and within California it is "critically imperiled" (CNDDB 2011b). Parish's phacelia is a BLM Sensitive species in California and Nevada. It is included on the Nevada Native Plant Society's "watch" list (NNPS 2010). The conservation status of Parish's phacelia is summarized in Table B-2.

4.16 Goodding's phacelia (*Phacelia pulchella* var. *gooddingii*) – CRPR 2.3

Goodding's phacelia is a small, purple-flowered annual herb in the Waterleaf Family (*Hydrophyllaceae*). Its distinctive features include flowers that are all purple, stamens that are included within the corolla (flower), and leaves that are longer than wide, and entirely to only slightly lobed (Baldwin et al. 2002). It flowers from April to July (ibid.). Line drawings of this species are found in Baldwin and others (2002). Photos can be viewed on the CalPhotos website, and in Appendix E.

In California, the habitat of Goodding's phacelia has been described as alkaline clay soils in Mojave Desert scrub, from 2,500 to 3,280 feet in elevation (CNPS 2011, CNDDB 2011a). In Nevada, it grows on gravelly slopes, valleys and flats, mostly on alkaline or gypsum alluvial clay soils, at 1,000 to 5,000 feet in elevation (Kartesz 1988).

Prior to 2010, Goodding's phacelia was known in California only from Mesquite Valley (Jepson Online Interchange 2011), and possibly from Salsberry Pass in the Amargosa Mountains, south of Death Valley. One specimen previously identified as this species from Clark Mountain has been re-examined by Andrew Sanders and is actually *Phacelia barnebyana* (ibid.). The Consortium contains five records for this species, from San Bernardino and Inyo counties (Jepson Online Interchange 2011). The CNDDB (2011a) lists six EOs for Goodding's phacelia, of which three are recent and three are historic. It is also known from Nevada, Arizona and Utah (Kartesz 1988).

During 2011 offsite surveys conducted in support of the HHSEGS project, Goodding's phacelia was found in several new locations in Inyo County, California, and Nye County, Nevada. Details are provided in Section 3. During protocol-level surveys, Goodding's phacelia was found to be widespread and common within the HHSEGS site and the linear corridor (CH2M HILL 2011a, b). As shown in Table 3.1, a total of 100 localities and 13,129 individuals were documented in California during offsite surveys in 2011. An additional 4 localities and 115 individuals were documented in Nevada during offsite surveys in 2011.

Goodding's phacelia is not state or federally listed. In California, this species is designated CRPR 2, meaning that it is considered "rare and endangered in California and more common elsewhere"

(CNPS 2011). The CNDDB (2011b) ranks it as G5T2T3 S1.3?, meaning that globally the species *Phacelia pulchella* is "secure," but the variety *gooddingii* is "vulnerable to imperiled," and in California the variety *gooddingii* is "critically imperiled, although there is some uncertainty." In Nevada Goodding's phacelia has no conservation status. The conservation status of this species is summarized in Table B-2.

4.17 Johnson's bee-hive cactus (*Sclerocactus johnsonii*) – CRPR 2.2

Johnson's bee-hive cactus is a small stem succulent with large pink flowers, in the Cactus Family (*Cactaceae*). This cactus is single-stemmed, and rarely more than 6 to 8 inches tall. The size, flower color, spines curved but not hooked and smooth seeds separate this cactus from other single-stemmed small cacti of the Mojave Desert (Baldwin et al. 2002). In California and Nevada, Johnson's bee-hive cactus flowers from May to June (ibid., Kartesz 1988). Line drawings of this cactus are found in Baldwin and others (2002). Photos can be viewed at the CalPhotos website.

In California, Johnson's bee-hive cactus grows in rocky to gravelly granitic substrates, in creosote bush scrub, from 1,640 to 3,940 feet in elevation (Baldwin et al. 2002). In Nevada, this species is found on hillsides in granitic soils, from 1,600 to 4,000 feet in elevation (Kartesz 1988).

In California, Johnson's bee-hive cactus is restricted to the eastern Mojave Desert, in Inyo and San Bernardino counties. The Consortium contains five distinct collections attributed to this taxon. It contains four collections under the name *Sclerocactus johnsonii*—the most recent collected in 1957—and three collections under the name *Echinomastus johnsonii* (the tentative new name for this cactus), of which two are duplicates of the collections listed under *Sclerocactus johnsonii* (Jepson Online Interchange 2011). Most species of cacti are infrequently collected. The CNDDB (2011a) lists 14 EOs for this species, of which 9 are recent and 5 are historic. In Nevada, according to Kartesz (1988), this species is known only from Clark County.

During the 2011 offsite surveys conducted in support of the HHSEGS project, Johnson's bee-hive cactus was found in one new location in Stewart Valley, Nye County, Nevada. Nevada collection records are generally not accessible online, so it is uncertain whether this is the first documented locality for this species in Nye County. More information is provided in Section 3. During protocol-level surveys, this species was not found within the HHSEGS site or the linear corridor (CH2M HILL 2011a, b). As shown in Table 3.1, this species was not observed in California during offsite surveys in 2011. One locality with three individuals was documented in Nevada during offsite surveys in 2011.

Johnson's bee-hive cactus is not state or federally listed. In California, this species is designated CRPR 2, meaning that it is "rare and endangered in California and more common elsewhere" (CNPS 2011). The CNDDB (2011b) ranks it G3G4 S2.2, meaning that globally it is "apparently secure to vulnerable," and in California it is "critically imperiled." In Nevada Johnson's bee-hive cactus is covered under laws that protect cactus and yucca species. The conservation status of this species is summarized in Table B-2.

4.18 Desert wing-fruit (*Selinocarpus nevadensis*) – CRPR 2.3

Desert wing-fruit is a white-flowered perennial herb in the Sand-verbena Family (*Nyctaginaceae*). The mature plants form low mounds a few inches tall. The leaves are oval and slightly succulent. The winged opalescent fruits are diagnostic (Baldwin et al. 2002). In California and Nevada, this species flowers from May to September (CNPS 2011). Line drawings of this species are found in Baldwin and others (2002). Photos can be viewed at the CalPhotos website, and in Appendix E.

Desert wing-fruit grows in sandy to gravelly soil, in Mojave Desert scrub and Joshua tree woodland, from 1,700 to 3,400 feet, in California and Nevada (CNPS 2011).

Prior to surveys completed for this project, desert wing-fruit was known in California from a single location in Mesquite Valley, near the California-Nevada border (CNPS 2011). The Consortium contains two records for this species, which are duplicates of the same collection (Jepson Online Interchange 2011). The CNDDB (2011a) lists one EO, which is from the same location as the Consortium record, and is historic. In Nevada, desert wing-fruit is known from Clark, Nye and Lincoln counties (Kartesz 1988). It also grows in Arizona and Utah (Baldwin et al. 2002).

During 2011 offsite surveys conducted in support of the HHSEGS project, desert wing-fruit was found in several new locations in Pahrump and Stewart valleys, in California and Nevada, near the state line (see Section 3). During protocol-level surveys, desert wing-fruit was found in the southwestern part of the HHSEGS site and in many locations within the linear corridor (CH2M HILL 2011a, b). As shown in Table 3.1, a total of 15 localities and 143 individuals were documented in California during offsite surveys in 2011. One additional locality with 20 individuals was documented in Nevada during offsite surveys in 2011.

Desert wing-fruit is not state or federally listed. In California, this species is designated CRPR 2, indicating that it is considered “rare and endangered in California but more common elsewhere” (CNPS 2011). The CNDDB (2011b) designates it G5 S1.3, meaning that globally it is “secure,” and in California it is “critically imperiled.” Desert wing-fruit is common in southern Nevada, and has no conservation status there. Its conservation status is summarized in Table B-2.

SECTION 5

Other Plant Species of Consideration

5.1 Torrey's jointfir (*Ephedra torreyana*) – Proposed CRPR 2.1, Conservation Status Pending

Torrey's jointfir is a much-branched, gray-green shrub in the Ephedra Family (*Ephedraceae*). This species is a gymnosperm, not a flowering plant, so there are no flowers. The reproductive structures are *strobili*, which are similar to small cones. Male and female strobili are borne on different individuals. Female strobili are composed of bracts and seeds. Mature female strobili are required to distinguish Torrey's jointfir from Death Valley jointfir (*Ephedra funerea*). Both of these can grow in the same area. In Torrey's jointfir, the bracts surrounding the seeds are in many pairs; and are membranous, translucent, and minutely toothed and wavy on the margins; and the mature seeds do not protrude beyond the outer edge of the bracts (Ickert-Bond and Rydin 2011, FNA 2011). In Death Valley jointfir, the bracts surrounding the seeds are in 5 to 6 pairs, are not membranous, are not toothed or wavy; and the mature seeds protrude about 0.2 inch beyond the outer edge of the bracts (ibid.). Photographs of Torrey's jointfir can be viewed on the CalPhotos website and in Appendix E.

The habitat of Torrey's jointfir is described as dry, rocky to sandy areas, from 1,500 to 6,500 feet in elevation (Cronquist et al. 1972, Kartesz 1988).

Prior to the one-mile buffer surveys conducted for the HHSEGS project, Torrey's jointfir had not been documented in California. The identification of a 1958 specimen from near Blythe as Torrey's jointfir was found to be erroneous (Jepson Online Interchange 2011). Torrey's jointfir is not included in *The Jepson Desert Manual* (Baldwin et al. 2002), the standard field identification manual for desert plants in California. Torrey's jointfir was identified in California during HHSEGS offsite surveys by Andrew Sanders, using characteristics described as diagnostic for this species (Ickert-Bond and Rydin 2011, Cronquist et al. 1972, Kartesz 1988). Voucher specimens were made (Jepson Online Interchange 2012). In Nevada, Torrey's jointfir is common in Nye, Lincoln and Clark counties (Kartesz 1988, Cronquist et al. 1972).

During the 2011 offsite surveys conducted in support of the HHSEGS project, Torrey's jointfir was observed in Mojave Desert scrub and shadscale scrub in Pahrump and Stewart valleys, in California and Nevada. This species was not detected during protocol-level surveys of the HHSEGS site (CH2M HILL 2011), but was mapped within the HHSEGS 1-mile buffer. As shown in Table 3.1, a total of 13 localities with 234 individuals were documented in California during offsite surveys in 2011.

Torrey's jointfir is not state or federally listed. Conservation status for Torrey's jointfir in California was proposed as a CRPR 2.1 species in January 2012, and final determination of its status rank is pending (CNPS 2012). Torrey's jointfir has no conservation status in Nevada (NNPS 2010).

5.2 Gray wire-lettuce (*Stephanomeria cinerea*) – No conservation status

Gray wire-lettuce (*Stephanomeria cinerea*) is a semi-woody, much-branched, low shrub with light pink flowers, in the Sunflower Family (*Asteraceae*). The plants are covered with short, light gray, wavy hairs (Abrams, 1960). Flowering occurs in June and July (ibid.). This species occurs from the Death Valley region of Inyo County, California, and in adjacent Nevada, south to Lancaster in Los Angeles County (ibid.). The gray wire-lettuce plants observed key to the *Stephanomeria cinerea* using the key in the Flora of Nevada and therefore this species is referred to by this name in this report (Kartesz, 1988). The type

locality[7] for gray wire-lettuce is Pahrump Valley, Nevada (Abrams, 1960). *Stephanomeria cinerea* is recognized as a distinct species in the Flora of Nevada that was formally described in 1922 by Blake, and this nomenclature was applied to the plants in the Pahrump Valley in California and Nevada (Kartesz, 1988, Abrams, 1960).

In California, recent treatments (Hickman, 1993; Baldwin et al., 2012; Jepson Online Interchange, 2011), have lumped *Stephanomeria cinerea* in with the subspecies *parishii* of a more widespread *Stephanomeria* species, few-flowered wire-lettuce (*Stephanomeria pauciflora*). However, plants of gray wire-lettuce observed during offsite surveys were noted to be morphologically distinct and their characteristics are currently being assessed by experts (Sanders pers. comm.).

The gray wire-lettuce plants observed during the offsite surveys also appeared to be ecologically separated from the more widespread few-flowered wire-lettuce (*Stephanomeria pauciflora* var. *pauciflora)*. *Stephanomeria pauciflora* was observed on the alluvial flats and slopes, while *S. cinerea* was observed in old lakebed soils (alkaline clays) of the valley bottom.

The gray wire-lettuce plants collected from the offsite survey area could be recognized taxonomically under two possible names: *Stephanomeria cinerea* or *Stephanomeria pauciflora* var. *parishii*. Regardless of the nomenclature used, the plants observed during offsite surveys are morphologically distinct from the more widespread *Stephanomeria pauciflora* var. *pauciflora,* and very few collections of this morphologically distinct *Stephanomeria* have been collected or documented.

During the 2011 offsite surveys conducted in support of the HHSEGS project, gray wire-lettuce was observed and mapped in the Pahrump Valley in California and Nevada, the Stewart Valley in Nevada, and the Chicago Valley in California. This species was not detected during protocol-level surveys of the HHSEGS site and proposed linear corridor (CH2M HILL 2011, 2012). As shown in Table 3.1, a total of 2 localities and 25 individuals were documented in California during offsite surveys in 2011. An additional 2 localities and 16 individuals were documented in Nevada during offsite surveys in 2011.

Gray wire-lettuce is not state or federally listed. It has no conservation status in California or Nevada.

[7] The *type locality* is the geographic location where the *type specimen* was collected. The *type specimen* is the herbarium specimen that has the features deemed typical of that species. It is chosen by the taxonomist who first named the species.

SECTION 6

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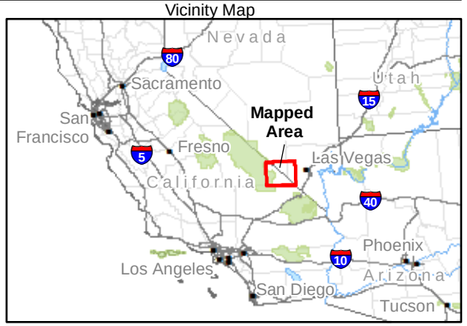
Appendix A
Figures

Vicinity Map



LEGEND

- HHSEGS 2011 Site Boundary
- Offsite Survey Area (2011)
- County Boundary*

*County boundary moved due to annexation, 2001

Data Source:
GANDA Botanical Survey, 2011

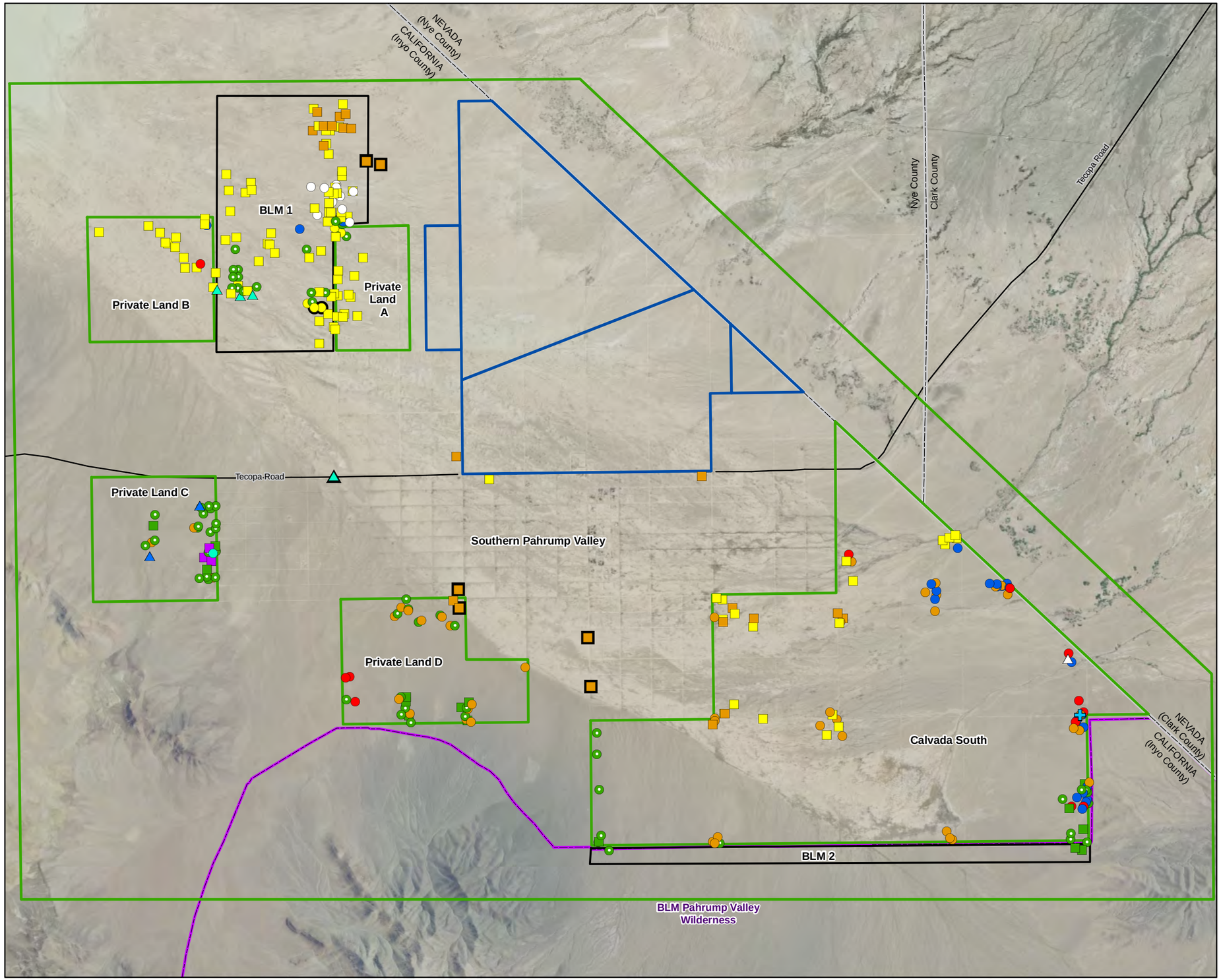
N

0 12,000 24,000
Feet

FIGURE 1
Overview of Offsite Survey Areas
Hidden Hills Solar Electric Generating System

SAC \\ZION\SACGIS\PROJ\SOLARPROJECTS\HIDDENHILLS\MAPFILES\2011_HIDDENHILLS\SPRING_SITE_BOTANY_REPORT\OFFSITE_REPORT\FIGURE1_OVERVIEW_OFFSITEAREAS.MXD SSCOPES 1/13/2012 11:22:27 AM

CH2MHILL



LEGEND

- *Androstephium breviflorum* (Pink funnel-lily)
- *Allium nevadense* (Nevada onion)
- *Astragalus nyensis* (Nye milkvetch)
- *Astragalus preussii* var. *preussii* (Preuss' milkvetch)
- *Astragalus sabulonum* (Gravel milkvetch)
- *Astragalus tidestromii* (Tidestrom's milkvetch)
- *Chaetadelpha wheeleri* (Wheeler's skeletonweed)
- *Cynanchum (=Funastrum) utahense* (Utah vine milkweed)
- *Eriogonum bifurcatum* (Pahrump Valley buckwheat)
- *Ephedra torreyana* (Torrey's jointfir)
- *Eriogonum contiguum* (Reveal's buckwheat)
- *Mentzelia pterosperma* (Wing-seed blazing-star)
- *Peteria thompsoniae* (Spine-noded milkvetch)
- *Phacelia pulchella* var. *gooddingii* (Goodding's phacelia)
- *Selinocarpus nevadensis* (Desert wing-fruit)

2010 Special-Status Plants*

- *Astragalus preussii* var. *preussii* (Preuss' milkvetch)
- *Eriogonum bifurcatum* (Pahrump Valley buckwheat)
- *Mentzelia pterosperma* (Wingseed blazing star)
- HHSEGS 2011 Site Boundary
- Offsite Survey Area (2011)
- County Boundary
- Wilderness Areas

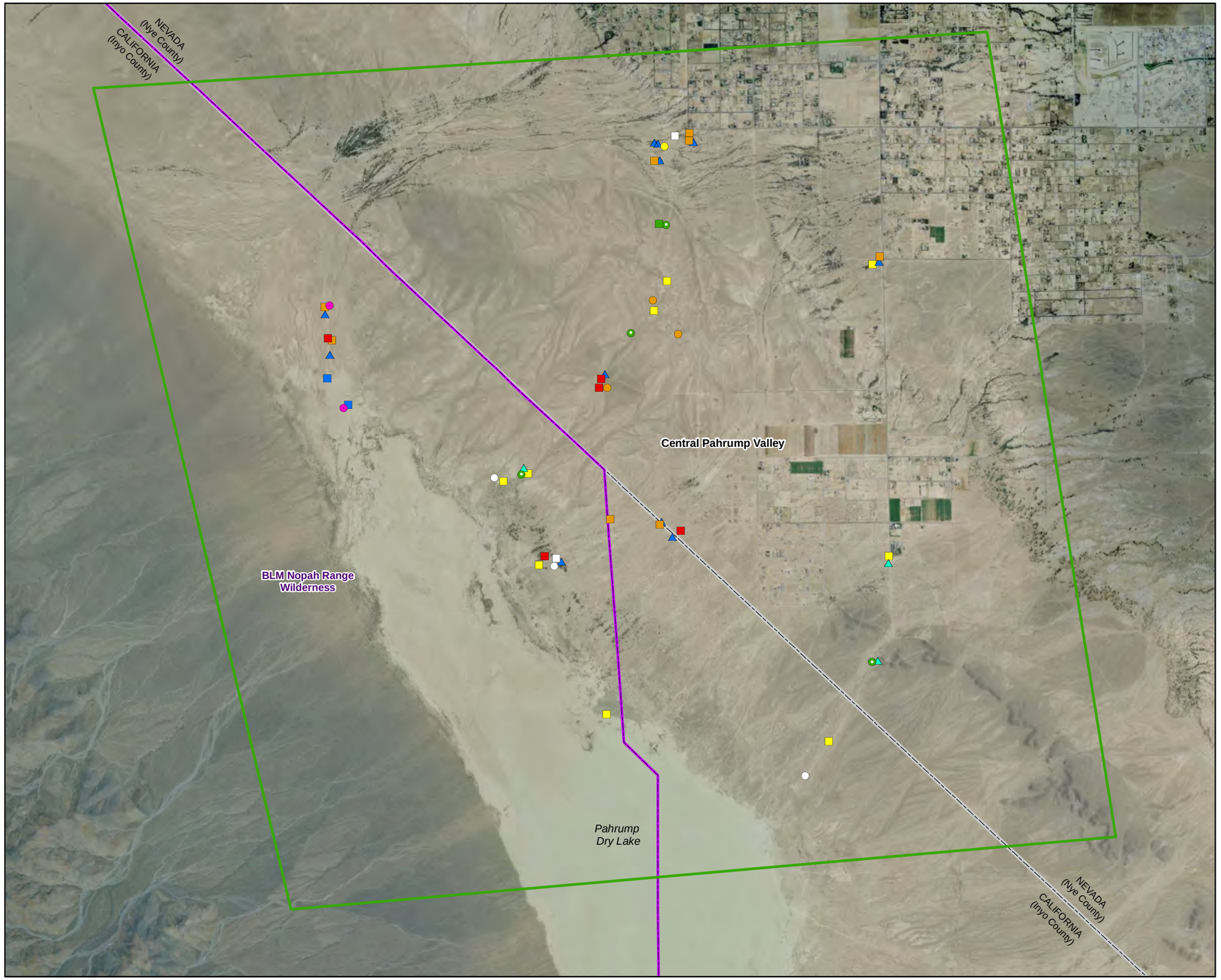
Data Source:
GANDA Botanical Survey, 2011

*Mapped during late-season reconnaissance-level survey of areas near HHSEGS

N

0 2,100 4,200
Feet

FIGURE 2
Offsite Survey Results
Southern Pahrump Valley
Hidden Hills Solar Electric Generating System



LEGEND

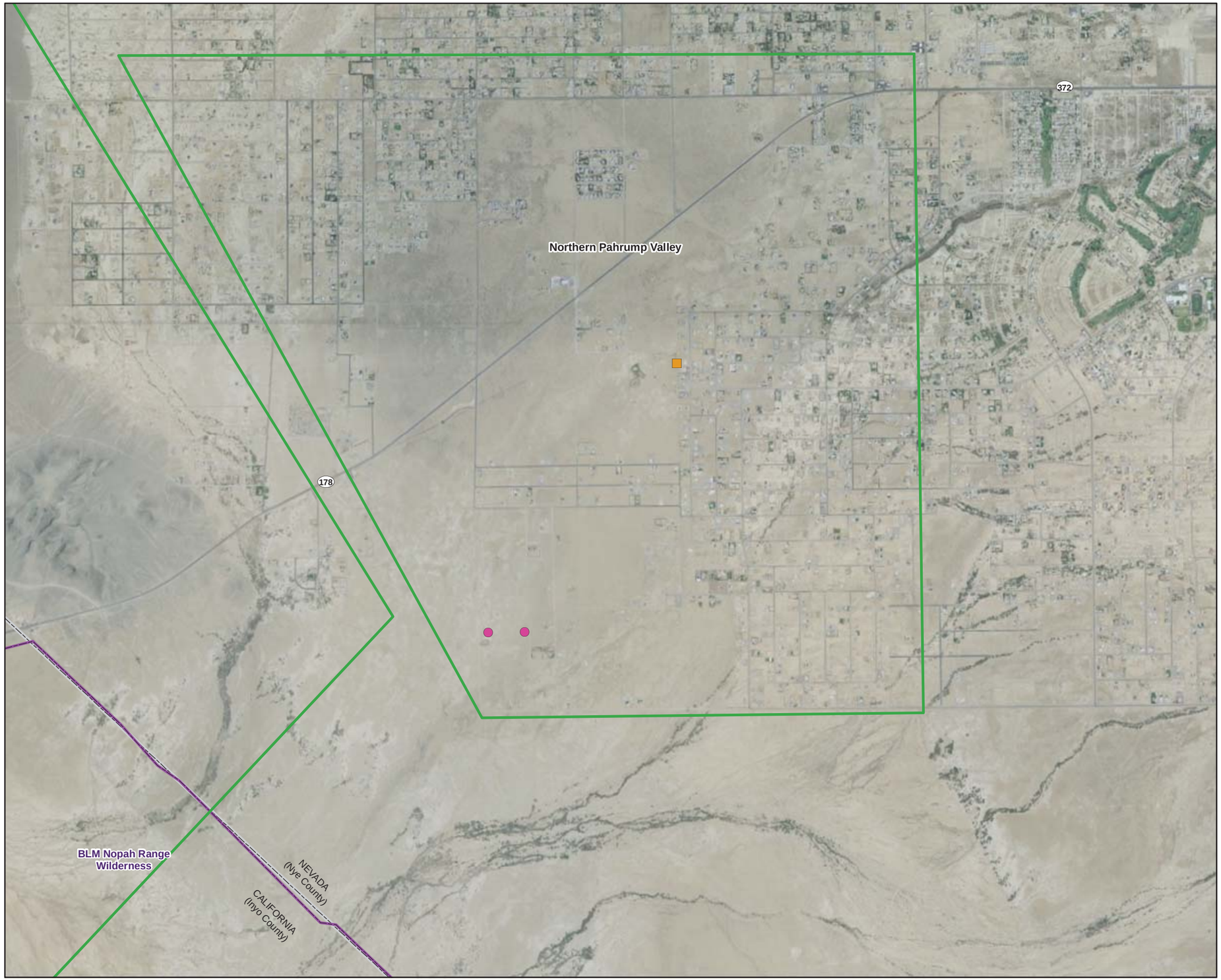
- *Astragalus nyensis* (Nye milkvetch)
- *Astragalus preussii* var. *preussii* (Preuss' milkvetch)
- *Astragalus tidestromii* (Tidestrom's milkvetch)
- *Atriplex argentea* var. *longitrichoma* (Pahrump Valley silverscale)
- *Cymopterus multinervatus* (Purplenerve springparsley)
- *Eriogonum bifurcatum* (Pahrump Valley buckwheat)
- *Ephedra torreyana* (Torrey's jointfir)
- *Eriogonum contiguum* (Reveal's buckwheat)
- *Mentzelia pterosperma* (Wing-seed blazing-star)
- *Phacelia parishii* (Parish's phacelia)
- *Phacelia pulchella* var. *gooddingii* (Goodding's phacelia)
- *Selinocarpus nevadensis* (Desert wing-fruit)
- *Stephanomeria cinerea* (Gray wirelettuce)
- Offsite Survey Area (2011)
- County Boundary
- Wilderness Areas

Data Source:
GANDA Botanical Survey, 2011

N

0 2,000 4,000
Feet

FIGURE 3
Offsite Survey Results
Central Pahrump Valley
Hidden Hills Solar Electric Generating System



LEGEND

- *Atriplex argentea* var. *longitrichoma* (Pahrump Valley silverscale)
- *Eriogonum bifurcatum* (Pahrump Valley buckwheat)
- OffSite Survey Area (2011)
- County Boundary
- Wilderness Areas

Data Source:
GANDA Botanical Survey, 2011

N

0 1,300 2,600
Feet

FIGURE 4
Offsite Survey Results
Northern Pahrump Valley
Hidden Hills Solar Electric Generating System

LEGEND

- *Astragalus nyensis* (Nye milkvetch)
- *Atriplex argentea* var. *longitrichoma* (Pahrump Valley silverscale)
- *Eriogonum bifurcatum* (Pahrump Valley buckwheat)
- *Eriogonum contiguum* (Reveal's buckwheat)
- *Phacelia parishii* (Parish's phacelia)
- *Sclerocactus johnsonii* (Johnson's bee-hive cactus))
- *Stephanomeria cinerea* (Gray wirelettuce)
- OffSite Survey Area (2011)
- County Boundary
- Wilderness Areas

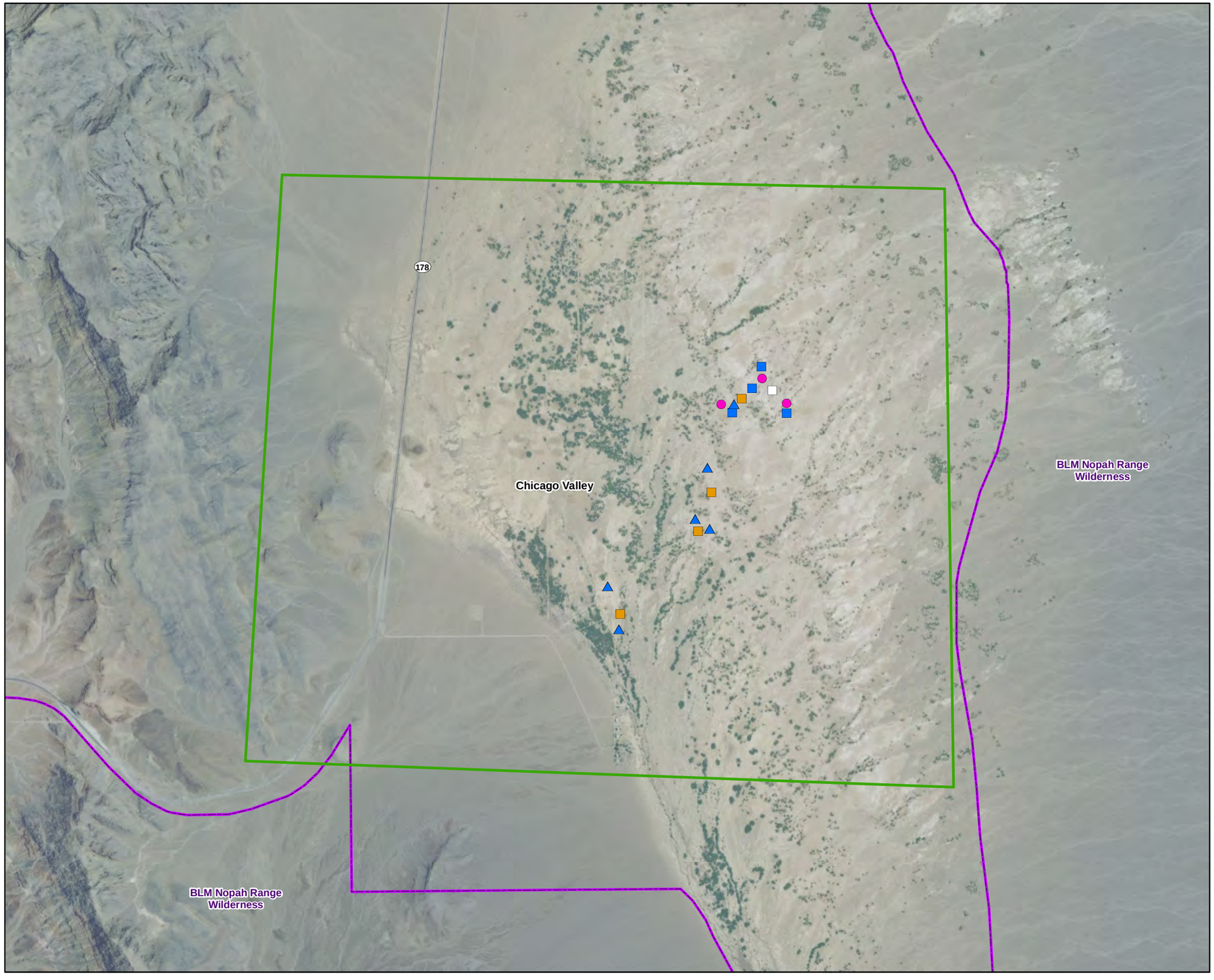
Data Source:
GANDA Botanical Survey, 2011

N

0 4,300 8,600
Feet

FIGURE 5
Offsite Survey Results
Stewart Valley and Ash Meadows Area
Hidden Hills Solar Electric Generating System

CH2MHILL



LEGEND

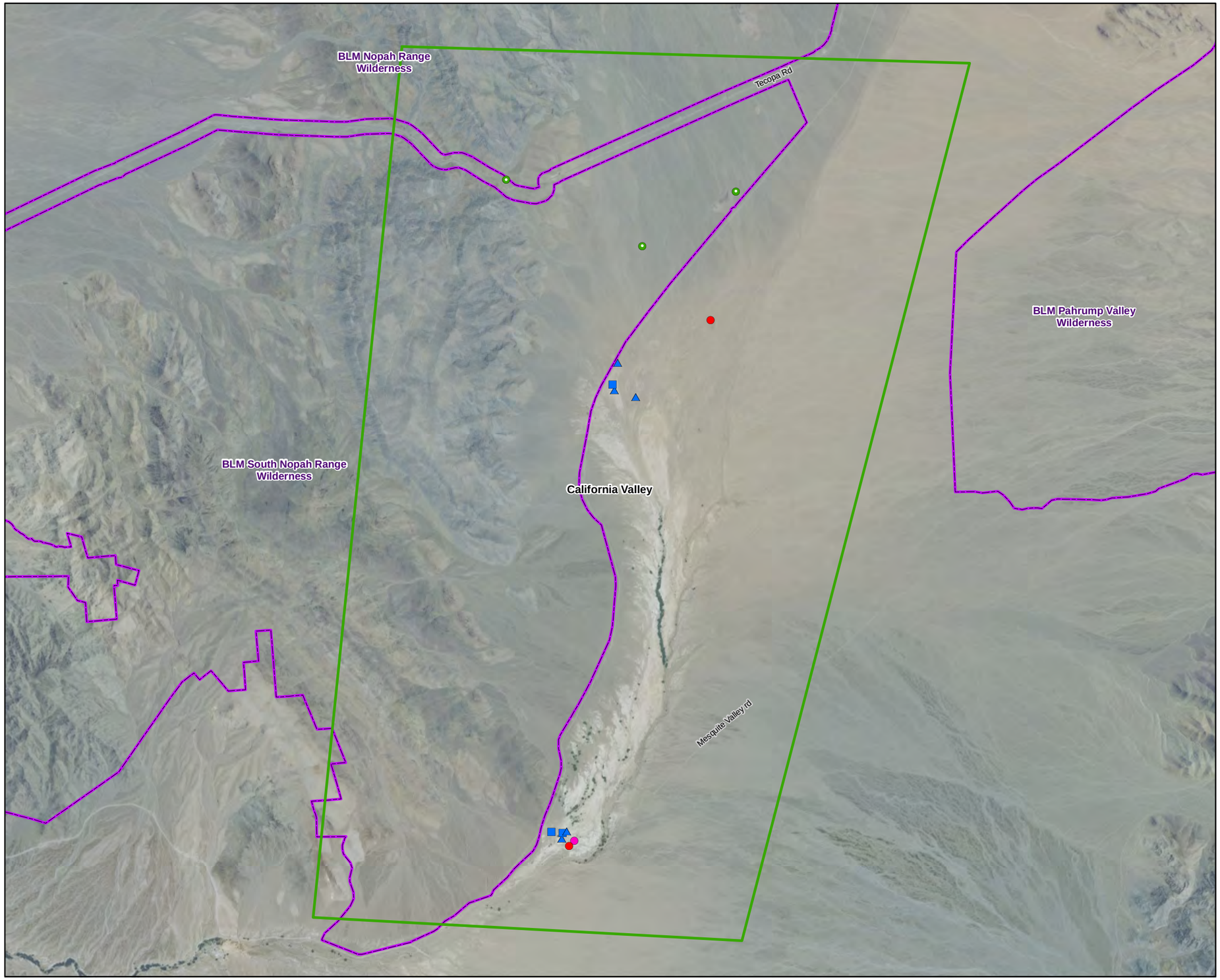
- *Atriplex argentea* var. *longitrichoma* (Pahrump Valley silverscale)
- *Eriogonum bifurcatum* (Pahrump Valley buckwheat)
- *Eriogonum contiguum* (Reveal's buckwheat)
- *Phacelia parishii* (Parish's phacelia)
- *Stephanomeria cinerea* (Gray wirelettuce)
- Offsite Survey Area (2011)
- Wilderness Areas

Data Source:
GANDA Botanical Survey, 2011

N

0 700 1,400
Feet

FIGURE 6
Offsite Survey Results
Chicago Valley
Hidden Hills Solar Electric Generating System



LEGEND

- *Androstephium breviflorum* (Pink funnel-lily)
- *Astragalus tidestromii* (Tidestrom's milkvetch)
- *Atriplex argentea* var. *longitrichoma* (Pahrump Valley silverscale)
- *Eriogonum contiguum* (Reveal's buckwheat)
- *Phacelia parishii* (Parish's phacelia)
- Offsite Survey Area (2011)
- Wilderness Areas

Data Source:
GANDA Botanical Survey, 2011

N

0 2,000 4,000
Feet

FIGURE 7
Offsite Survey Results
California Valley
Hidden Hills Solar Electric Generating System

Appendix B
Tables

TABLE B-1
Vegetation and Habitat Types Where Special-status Plant Species Were Observed During Offsite Surveys in 2011

Common Name/Scientific Name	Mojave Desert Scrub	Shadscale Scrub	Dry Lake	Wash
SPECIAL-STATUS PLANT SPECIES				
Nevada onion *Allium nevadense*	x			
Pink-funnel lily (S) *Androstephium breviflorum*	x			
Nye milkvetch (S) *Astragalus nyensis*	x			
Preuss' milkvetch (S) *Astragalus preussii* var. *preussii*	x	x		
Gravel milkvetch (S) *Astragalus sabulonum*	x			
Tidestrom's milkvetch (S) *Astragalus tidestromii*	x	x	x	
Pahrump silverscale *Atriplex argentea* var. *longitrichoma*		x	x	
Wheeler's skeletonweed (S) *Chaetadelpha wheeleri*	x			
Purplenerve springparsley (S) *Cymopterus multinervatus*	x			
Utah vine milkweed *Cynanchum (=Funastrum) utahense*	x			
Pahrump Valley buckwheat (S) *Eriogonum bifurcatum*	x	x	x	
Reveal's buckwheat *Eriogonum contiguum*		x	x	
Wing-seed blazing star *Mentzelia pterosperma*		x		
Spine-noded milkvetch *Peteria thompsoniae*	x			
Parish's phacelia *Phacelia parishii*		x	x	
Goodding's phacelia (S) *Phacelia pulchella* var. *gooddingii*	x	x	x	x
Johnson's bee-hive cactus *Sclerocactus johnsonii*	x			
Desert wing-fruit (S) *Selinocarpus nevadensis*	x			
OTHER PLANT SPECIES OF CONSIDERATION				
Torrey's jointfir *Ephedra torreyana*		x		
Gray wire-lettuce *Stephanomeria cinerea*		x		

Source: GANDA field surveys conducted for the HHSEGS project in 2010 and 2011.

Notes: (S) = species observed within the HHSEGS Site.

TABLE B-2
Conservation Status of Special-Status Plant Species Found Within the HHSEGS Offsite Survey Areas in 2011.

Common Name/ Scientific Name	Conservation Status in California					Presence and Conservation Status in Nevada
	Federal status	State status	BLM sensitive	CRPR	CNDDB	Nevada
Nevada onion *Allium nevadense*	-	-	-	2.3	G4 S2	Present; no conservation status
Pink funnel-lily *Androstephium breviflorum**	-	-	-	2.3	G5 S1.3	Present; no conservation status
Nye milkvetch *Astragalus nyensis*	-	-	Yes	1B.1	G3S1	Present; no conservation status
Preuss' milkvetch *Astragalus preussii* var. *preussii**	-	-	-	2.3	G4T4 S1.2	Present; no conservation status
Gravel milkvetch *Astragalus sabulonum**	-	-	-	2.2	G5 S2	Present; no conservation status
Tidestrom's milkvetch *Astragalus tidestromii**	-	-	-	2.2	G4G5 S2	Present; no conservation status
Pahrump silverscale *Atriplex argentea* var. *longitrichoma*	-	-	Yes	1B.1	G5T1T2 S1	NVNH track NNPS watch
Wheeler's skeletonweed *Chaetadelpha wheeleri**	-	-	-	2.2	G4 S1S2	Present; no conservation status
Purplenerve springparsley *Cymopterus multinervatus**	-	-	-	2.2	G5? S2	Present; no conservation status
Utah vine milkweed *Cynanchum (=Funastrum) utahense*	-	-	-	4.2	G4 S3.2	Present; no conservation status
Pahrump Valley buckwheat *Eriogonum bifurcatum**	-	-	Yes	1B.2	G2 S2	BLM sensitive; NNPS threatened
Reveal's buckwheat *Eriogonum contiguum*	-	-	-	2.3	G2 S2	NVNH track; NNPS marginal
Wing-seed blazing star *Mentzelia pterosperma*	-	-	-	2.2	G4 S1.2	Present; no conservation status
Spine-noded milkvetch *Peteria thompsoniae*	-	-	-	2.3	G4 S1.3?	NNPS marginal
Parish's phacelia *Phacelia parishii*	-	-	Yes	1B.1	G2G3 S1.1	BLM sensitive; NVNH sensitive; NNPS watch
Goodding's phacelia *Phacelia pulchella* ssp. *gooddingii**	-	-	-	2.3	G5T2T3 S1.3?	Present; no conservation status
Johnson's bee-hive cactus *Sclerocactus johnsonii*	-	-	-	2.2	G3G4 S2.2	Protected as cactus

TABLE B-2
Conservation Status of Special-Status Plant Species Found Within the HHSEGS Offsite Survey Areas in 2011.

Common Name/ Scientific Name	Conservation Status in California					Presence and Conservation Status in Nevada
	Federal status	State status	BLM sensitive	CRPR	CNDDB	Nevada
Desert wing-fruit *Selinocarpus nevadensis**	-	-	-	2.3	G5 S1.3	Present; no conservation status

Sources: CNDDB 2011b, BLM 2007, BLM 2010, BLM 2011, CNPS 2011, Nevada Native Plant Society (NNPS) 2010, Nevada Natural Heritage Program (NNHP) 2010, U.S. Dept. of Agriculture (USDA), Natural Resource Conservation Service, Plants Database (USDA 2011).

Notes:
***** = Found at the HHSEGS site

1. Status Codes:

USFWS Status
FE – Federally listed as Endangered
FT – Federally listed as Threatened
BLM Status
SS - Special status
CS - Sensitive in California
NS - Sensitive in Nevada

California State Status
SE – State listed as endangered
ST – State listed as threatened
SR – State listed as rare

Nevada State Status
CE = Critically endangered

California Rare Plant Rank (CRPR) Status
1A – Plants presumed extinct in California
1B – Plants rare, threatened, or endangered in California and elsewhere
2 – Plants rare, threatened, or endangered in California, but more common elsewhere
3 – Plants about which we need more information – a review list
4 – Plants of limited distribution – a watch list

CRPR threat code extensions:
.1 -- Seriously endangered in California.
.2 -- Fairly endangered in California.
.3 -- Not very endangered in California.
? -- Not determined.

2. Baja CA = Baja California, CO = Colorado, ID = Idaho, MX = Mexico, NM = New Mexico, OR = Oregon, TX = Texas, WY = Wyoming.

Appendix C
Survey of the HHSEGS 1-mile Buffer

APPENDIX C

Survey of the HHSEGS 1-mile Buffer

A survey of the 1-mile buffer of the HHSEGS site was completed in spring 2011. The 1-mile buffer extends from the boundary of the site out in all directions to a distance of one mile. Most of the 1-mile buffer is located in Inyo County, California, except east of the eastern site boundary, where it is located in Nye County, Nevada. The 1-mile buffer includes the 250-foot buffer; a short section of the linear corridor; and some additional private and BLM lands. The 250-foot buffer and the offsite linear corridor were surveyed at a protocol-level. Other areas of the 1-mile buffer were surveyed at a reconnaissance level. Information from protocol-level surveys of the 250-foot buffer and the short length of the linear corridor located within the 1-mile buffer is included here with the results of the reconnaissance-level survey of other portions of the 1-mile buffer. Surveys of the 1-mile buffer took place in September and October, 2010, and April and May, 2011.

The 1-mile buffer was accessed from existing unpaved roads in a variety of locations north and south of Tecopa Road[8], and by walking to additional areas from the roads.

Vegetation

Natural vegetation observed within the 1-mile buffer includes the following types: Mojave Desert scrub, shadscale scrub, and mesquite thicket (Figure 3-1, Appendix A in the HHSEGS site report). In addition, the buffer contains ruderal vegetation, and areas around rural residences that have been landscaped. All of these types, except the mesquite thicket and landscaped areas, are described in Section 3.1 of the HHSEGS site report. The mesquite thicket and landscaped areas are described below.

A plant list of all the plant species observed during the 1-mile buffer surveys is included at the end of this appendix in Table C-1.

Mesquite Thicket

Mesquite thickets cover a line of low vegetated sand dunes that occur within the eastern part of the 1-mile buffer, in Nevada. Mesquite thicket vegetation within the 1-mile buffer consists of low-growing, dense, spreading stands of the deciduous shrub, honey mesquite (*Prosopis glandulosa*). Many of the honey mesquite shrubs are heavily infested with the parasitic plant, desert mistletoe (*Phoradendron californicum*). Between the thickets of mesquite is a dense cover of the introduced annual grass, Mediterranean grass. Native annuals are present in very low diversity and abundance. These include: wing-nut cryptantha (*Cryptantha pterocarya*), Ives' phacelia (*Phacelia ivesiana*), and narrow-leaved cryptantha (*Cryptantha angustifolia*). Red brome was the only noxious weed observed in this vegetation type. No special-status plants were observed within this vegetation type within the 1-mile buffer.

Mesquite thickets on dunes are comparable to the vegetation type referred to as mesquite scrub in California (Barbour et al. 2007, Sawyer et al. 2009). In comparison, mesquite bosque, as described by Holland (1986), is a true woodland type that consists of large, dense stands of honey mesquite found along streams, in washes, alkali sinks, or outwash plains with substantial near-surface groundwater supplies. The stands of mesquite bosque nearest to the 1-mile buffer are about 10 miles east, near Tecopa, California, in several side canyons of the Amargosa River drainage (Barbour et al. 2007, Sawyer et al. 2009).

[8] Also referred to as Old Spanish Trail Highway

Landscaped Areas

Part of the rural residential area called Calvada Springs[9] lies within the 1-mile buffer, south of Tecopa Road. Landscaped areas surround some of the residences. Landscape plantings consist mainly of drought-resistant cacti, yuccas, perennial grasses, and trees. The planted trees include non-native athel (*Tamarix aphylla*) and tamarisk. Tamarisk is classified as a noxious weed by Cal-IPC (2006) and CDFA (2011). See Section 4 of the HHSEGS site report for additional information on tamarisk. The non-native perennial grass, giant reed (*Arundo donax*), has been planted for screening. Giant reed is designated by Cal-IPC (2006, 2009) as an invasive weed with a rating of "high" for ecological impacts, especially in riparian areas. However, in the southern Pahrump Valley, lack of water prevents this species from spreading outside of areas that are intensively irrigated. Several species of cacti and yucca that are not native to the vicinity of Calvada Springs are planted at a few residences.

Non-native Invasive Plants

Non-native invasive plants were noted during the reconnaissance-level survey of the 1-mile buffer. However, they were not systematically mapped. The species of weeds that were identified, and their abundance, were similar to conditions observed within the HHSEGS site. All 11 species of weeds observed within the site and the 250-foot buffer also are present within the 1-mile buffer. These include: Russian knapweed, red brome, cheatgrass, purple mustard, field bindweed, halogeton, African mustard, Russian thistle, tumble mustard, London rocket, and tamarisk. More information on these species is available in Section 4 of the HHSEGS site report.

Special-status Plant Species and Other Plants of Consideration

Special-status plant species observed during the reconnaissance-level survey of the 1-mile buffer were recorded in field notes, but were not systematically mapped. Some special-status plant locations within the 1-mile buffer were mapped during surveys of the 250-foot buffer, the linear corridor, and in other localities, but these covered only small parts of the 1-mile buffer. The 1-mile buffer was examined in several additional locations, where special-status plants were not mapped. A protocol-level survey of the 1-mile buffer was not required (CEC 2008). The results of the survey give a reasonably accurate assessment of which special-status plant species occur within the 1-mile buffer, but are not as complete as would be obtained from a protocol-level survey.

The ten special-status plant species observed within the 1-mile buffer include the following:

- Pink funnel-lily (*Androstephium breviflorum*)
- Nye milkvetch (*Astragalus nyensis*)
- Gravel milkvetch (*Astragalus sabulonum*)
- Preuss' milkvetch (*Astragalus preussii* var. *preussii*)
- Tidestrom's milkvetch (*Astragalus tidestromii*)
- Wheeler's skeletonweed (*Chaetadelpha wheeleri*)
- Pahrump Valley buckwheat (*Eriogonum bifurcatum*)
- Wing-seed blazing star (*Mentzelia pterosperma*)
- Goodding's phacelia (*Phacelia pulchella* var. *gooddingii*)
- Desert wing-fruit (*Selinocarpus nevadensis*)

All of these except wing-seed blazing star also occur within the HHSEGS site (CH2M HILL 2011). The distribution within the 1-mile buffer of each species listed above is briefly discussed below in Table C-1.

[9] Also known as Charleston View.

Torrey's jointfir (*Ephedra torreyana*) (FNA 2011) was mapped in the northwest quarter of the 1-mile buffer, in Inyo County, California. These observations of Torrey's jointfir are the first documented records of this species in California. In Nevada, Torrey's jointfir is common in Nye, Lincoln and Clark counties (Kartesz 1988, Cronquist et al. 1972). A species account for Torrey's jointfir is included in Section 5 of this report.

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TABLE C-1
Plant Species Observed within the HHSEGS 1-mile Buffer in 2010 and 2011

Scientific Name	Common Name	1-mile Buffer	Life Form
GYMNOSPERMS			
Ephedraceae	**Ephedra Family**		
Ephedra funerea	Death Valley ephedra	x	shrub
Ephedra nevadensis	Nevada ephedra	x	shrub
Ephedra torreyana	Torrey's jointfir	x	shrub
FLOWERING PLANTS: DICOTS			
Apiaceae	**Carrot Family**		
Cymopterus multinervatus	purplenerve springparsley	x	perennial
Asclepiadaceae	**Milkweed Family**		
Asclepias erosa	desert milkweed	x	perennial
Asteraceae	**Sunflower Family**		
Acamptopappus shockleyi	Shockley's goldenhead	x	shrub
Acamptopappus sphaerocephalus var. sphaerocephalus	goldenhead	x	shrub
Adenophyllum cooperi	Cooper's dogweed	x	subshrub
Ambrosia dumosa	burrobush	x	shrub
Baccharis brachyphylla	short-leaf baccharis	x	shrub
Baccharis sergiloides	desert baccharis	x	shrub
Baileya multiradiata var. *multiradiata*	desert marigold	x	annual
Baileya pleniradiata	woolly desert marigold	x	annual
Calycoseris wrightii	white tackstem	x	annual
Chaenactis carphoclinia	pebble pincushion	x	annual
Chaenactis fremontii	desert pincushion	x	annual
Chaenactis macrantha	Mojave pincushion	x	annual
Chaenactis stevioides	desert pincushion	x	annual
Chaetadelpha wheeleri	Wheeler's skeletonweed	x	perennial
Chrysothamnus nauseosus	rubber rabbit-brush	x	shrub
Encelia virginensis	Virgin River encelia	x	shrub
Eriophyllum wallacei	Wallace's woolly daisy	x	annual
Glyptopleura marginata	carved seed	x	annual
Gutierrezia microcephala	broom snakeweed	x	shrub
Gutierrezia sarothrae	broom snakeweed	x	shrub
Helianthus annuus	common sunflower	x	annual
Hymenoclea salsola	cheesebush	x	shrub
Isocoma acradenia	goldenbush	x	shrub
*Lactuca serriola*NW*	prickly wild lettuce	x	annual
Malacothrix coulteri	snake's head	x	annual
Malacothrix glabrata	desert dandelion	x	annual
Monoptilon bellioides	desert star	x	annual
Pectis papposa	chinchweed	x	annual
Prenanthella exigua	brightwhite	x	annual
Psathyrotes annua	turtleback	x	annual
Psilostrophe cooperi	paper-daisy	x	subshrub

TABLE C-1
Plant Species Observed within the HHSEGS 1-mile Buffer in 2010 and 2011

Scientific Name	Common Name	1-mile Buffer	Life Form
Rafinesquia neomexicana	desert chicory	x	annual
Stephanomeria exigua	small wire-lettuce	x	annual
Stephanomeria pauciflora	wire-lettuce	x	perennial
Stylocline micropoides	desert nest-straw	x	annual
Tetradymia axillaris	cotton-thorn	x	shrub
Xylorhiza tortifolia	Mojave aster	x	perennial
Boraginaceae	**Borage Family**		
Amsinckia tessellata	fiddleneck	x	annual
Cryptantha angustifolia	narrow leaved cryptantha	x	annual
Cryptantha barbigera	bearded cryptantha	x	annual
Cryptantha circumscissa	cushion cryptantha	x	annual
Cryptantha micrantha ssp. *micrantha*	purple-rooted cryptantha	x	annual
Cryptantha nevadensis	Nevada cryptantha	x	annual
Cryptantha pterocarya	wingnut cryptantha	x	annual
Cryptantha recurvata	curved cryptantha	x	annual
Cryptantha virginensis	Virgin River cat's-eye	x	annual
Heliotropium curassavicum	heliotrope	x	perennial
Lappula redowskii var. *cupulata*	stickseed	x	annual
Pectocarya heterocarpa	chuckwalla combseed	x	annual
Pectocarya platycarpa	broadfruit combseed	x	annual
Pectocarya recurvata	curvenut combseed	x	annual
Plagiobothrys jonesii	Jones' popcorn flower	x	annual
Brassicaceae	**Mustard Family**		
Caulanthus cooperi	Cooper's jewelflower	x	annual
Descurainia pinnata ssp. *glabra*	tansy mustard	x	annual
*Descurainia sophia**	flix weed	x	annual
Guillenia lasiophylla	California mustard	x	annual
Lepidium flavum	yellow peppergrass	x	annual
Lepidium fremontii	desert alyssum	x	subshrub
Lepidium lasiocarpum var. *lasiocarpum*	modest peppergrass	x	annual
*Malcolmia africana*NW*	African mustard	x	annual
*Sisymbrium altissimum*NW*	tumble mustard	x	annual
*Sisymbrium irio*NW*	London rocket	x	annual
*Sisymbrium orientale**	Indian hedge mustard	x	annual or perennial
Stanleya pinnata var. *pinnata*	prince's-plume	x	subshrub
Streptanthella longirostris	longbeak streptanthella	x	annual
Cactaceae	**Cactus Family**		
Opuntia basilaris var. *basilaris*	beavertail cactus	x	stem succulent
Opuntia echinocarpa	silver cholla	x	stem succulent
Opuntia ramosissima	pencil cholla	x	stem succulent
Campanulaceae	**Bellflower Family**		
Nemacladus cf. glanduliferus	glandular threadstem	x	annual

TABLE C-1
Plant Species Observed within the HHSEGS 1-mile Buffer in 2010 and 2011

Scientific Name	Common Name	1-mile Buffer	Life Form
Chenopodiaceae	**Goosefoot Family**		
Atriplex canescens	four-wing saltbush	x	shrub
Atriplex confertifolia	shadscale	x	shrub
Atriplex polycarpa	allscale	x	shrub
Grayia spinosa	hop-sage	x	shrub
*Halogeton glomeratus*NW*	halogeton	x	annual
Krascheninnikovia lanata	winter fat	x	shrub
*Salsola spp.*NW*	Russian thistle	x	annual
Suaeda moquinii	seepweed	x	perennial
Convolvulaceae	**Morning Glory Family**		
*Convolvulus arvensis**NW	bindweed	x	perennial herb/vine
Cuscutaceae	**Dodder Family**		
Cuscuta cf. californica	California dodder	x	parasitic vine
Euphorbiaceae	**Spurge Family**		
Chamaesyce albomarginata	rattlesnake weed	x	perennial
Chamaesyce micromera	desert spurge	x	annual
Fabaceae	**Pea Family**		
Astragalus lentiginosus var. *fremontii*	freckled milk-vetch	x	perennial
Astragalus nuttallianus	Nuttall locoweed	x	annual
Astragalus nyensis	Nye milk-vetch	x	annual
Astragalus preussii var. *preussii*	Preuss' milk-vetch	x	perennial
Astragalus sabulonum	gravel milk-vetch	x	annual
Astragalus tidestromii	Tidestrom's milk-vetch	x	perennial
Hoffmannseggia glauca	hog potato	x	perennial
Prosopis glandulosa	honey mesquite	x	shrub
Psorothamnus arborescens var. *arborescens*	Mojave indigo bush	x	shrub
Senna armata	desert senna	x	shrub
Geraniaceae	**Geranium Family**		
*Erodium cicutarium*NW*	red-stemmed filaree	x	annual
Hydrophyllaceae	**Waterleaf Family**		
Nama demissum	purple mat	x	annual
Phacelia crenulata var. *ambigua*	purple phacelia	x	annual
Phacelia fremontii	Fremont's phacelia	x	annual
Phacelia ivesiana	Ives' phacelia	x	annual
Phacelia pulchella var. *gooddingii*	Goodding's phacelia	x	annual
Krameriaceae	**Rhatany Family**		
Krameria erecta	pima ratany	x	shrub
Lamiaceae	**Mint Family**		
Salazaria mexicana	Mexican bladder sage	x	shrub
Loasaceae	**Sandpaper-plant Family**		
Mentzelia cf. albicaulis	little blazing star	x	annual
Mentzelia pterosperma	wing-seed blazing star	x	perennial

TABLE C-1
Plant Species Observed within the HHSEGS 1-mile Buffer in 2010 and 2011

Scientific Name	Common Name	1-mile Buffer	Life Form
Malvaceae	**Mallow Family**		
Eremalche rotundifolia	desert five-spot	x	annual
Sphaeralcea ambigua	desert mallow	x	subshrub
Sphaeralcea emoryi	Emory's globemallow	x	subshrub
Nyctaginaceae	**Four-o'clock Family**		
Mirabilis bigelovii	wishbone bush	x	perennial
Oleaceae	**Olive Family**		
Menodora spinescens	spiny menodora	x	shrub
Fraxinus sp.*	ash	x	tree
Onagraceae	**Evening-primrose Family**		
Camissonia boothii	Booth's sun cup	x	annual
Camissonia brevipes	yellow cups	x	annual
Camissonia claviformis	brown-eyed evening-primrose	x	annual
Camissonia refracta	narrowleaf suncup	x	annual
Gaura coccinea	scarlet beeblossom	x	perennial
Oenothera primiveris	yellow evening-primrose	x	annual
Papaveraceae	**Poppy Family**		
Eschscholzia glyptosperma	desert golden poppy	x	annual
Plantaginaceae	**Plantain Family**		
Plantago ovata	woolly plantain	x	annual
Polemoniaceae	**Phlox Family**		
Aliciella hutchinsifolia	Marta Beckett's tutu	x	annual
Gilia sp.	gilia	x	annual
Gilia cana ssp. *speciformis*	showy gilia	x	annual
Gilia stellata	star gilia	x	annual
Ipomopsis polycladon	branching gilia	x	annual
Langloisia setosissima ssp. *setosissima*	lilac sunbonnet	x	annual
Linanthus jonesii	Jones' linanthus	x	annual
Loeseliastrum matthewsii	desert calico	x	annual
Loeseliastrum schottii	Schott's calico	x	annual
Polygonaceae	**Buckwheat Family**		
Chorizanthe brevicornu var. *brevicornu*	brittle spineflower	x	annual
Chorizanthe rigida	rigid spiny-herb	x	annual
Eriogonum bifurcatum	Pahrump Valley buckwheat	x	annual
Eriogonum brachypodum	glandular skeleton-weed	x	annual
Eriogonum inflatum var. *inflatum*	desert trumpet	x	perennial
Eriogonum nidularium	birdnest buckwheat	x	annual
Eriogonum trichopes	little desert trumpet	x	annual
Ranunculaceae	**Buttercup Family**		
Delphinium parishii var. *parishii*	desert larkspur	x	perennial
Scrophulariaceae	**Figwort Family**		
Antirrhinum filipes	tangled snapdragon	x	annual
Antirrhinum kingii	King's snapdragon	x	annual

TABLE C-1
Plant Species Observed within the HHSEGS 1-mile Buffer in 2010 and 2011

Scientific Name	Common Name	1-mile Buffer	Life Form
Castilleja angustifolia	desert paintbrush	x	perennial
Solanaceae	**Nightshade Family**		
Datura wrightii	devil's trumpet	x	perennial
Lycium andersonii	Anderson's box-thorn	x	shrub
Lycium cooperi	Cooper's box-thorn	x	shrub
Lycium pallidum var. *oligospermum*	rabbit-thorn	x	shrub
Tamaricaceae	**Tamarisk Family**		
*Tamarix ramosissima*NW*	tamarisk	x	tree
Viscaceae	**Mistletoe Family**		
Phoradendron californicum	desert mistletoe	x	parasitic herb
Zygophyllaceae	**Caltrop Family**		
Larrea tridentata	creosote bush	x	shrub
FLOWERING PLANTS: MONOCOTS			
Liliaceae	**Lily Family**		
Androstephium breviflorum	pink funnel-lily	x	perennial
Calochortus flexuosus	winding mariposa lily	x	perennial
Dichelostemma capitatum var. *pauciflora*	desert blue dicks	x	perennial
Poaceae	**Grass Family**		
Achnatherum hymenoides	Indian ricegrass	x	perennial
Achnatherum speciosum	desert needlegrass	x	perennial
Bromus madritensis ssp. *rubens*NW*	red brome	x	annual
*Bromus tectorum*NW*	cheat grass	x	annual
*Bromus trinii**	Chilean grass	x	perennial
*Cynodon dactylon*NW*	Bermuda grass	x	perennial
Elymus elymoides	squirreltail	x	perennial
Erioneuron pulchellum	fluff grass	x	perennial
Hordeum murinum ssp. *leporinum*NW*	foxtail barley	x	annual
Muhlenbergia porteri	Porter's muhly		perennial
Pleuraphis rigida	big galleta	x	perennial
*Schismus arabicus**	Mediterranean grass	x	annual
Sporobolus airoides	alkali sacaton	x	perennial
Vulpia octoflora	sixweeks fescue	x	Annual

Data collected by GANDA, 2011

TABLE C-2
Special-status plants and other plants of consideration found within the HHSEGS 1-mile buffer during 2010 and 2011 surveys.

Common Name *Scientific Name*	Conservation Status	Presence Within the HHSEGS 1-mile Buffer
Pink funnel-lily *Androstephium breviflorum*	CNDDB G5 S1.3 CRPR 2.3	Found in the 1-mi buffer west of the HHSEGS site in shadscale scrub, on private land; and east of the HHSEGS site in Mojave Desert scrub, on BLM land. Also mapped within the HHSEGS site (Section 5.1 of the HHSEGS site report).
Nye milkvetch *Astragalus nyensis*	CNDDB G3S1 CRPR 1B.1	Found in the 1-mi buffer west and south of the HHSEGS site in shadscale scrub and Mojave Desert scrub, on private and BLM lands; and east of the HHSEGS site in Mojave Desert scrub, on BLM land. First documented in CA in 2011 within the HHSEGS site during surveys for this project (Section 6.1 of the HHSEGS site report).
Preuss' milkvetch *Astragalus preussii* var. *preussii*	CNDDB G4T4 S1.2 CRPR 2.3	Found in the 1-mi buffer west of the HHSEGS site in shadscale scrub on private and BLM lands; and east of the HHSEGS site along roadsides and nearby, on BLM land. Also mapped within the HHSEGS site (Section 5.3 of the HHSEGS site report).
Gravel milkvetch *Astragalus sabulonum*	CNDDB G5 S2 CRPR 2.2	Found in the 1-mi buffer west of the HHSEGS site in shadscale scrub, on private and BLM land; and east of the HHSEGS site in Mojave Desert scrub, on BLM land. Also mapped within the HHSEGS site (Section 5.2 of the HHSEGS site report).
Tidestrom's milkvetch *Astragalus tidestromii*	CNDDB G4G5 S2 CRPR 2.2	Found in the 1-mi buffer west of the HHSEGS site in shadscale scrub, on private and BLM land; and east of the HHSEGS site in Mojave Desert scrub, on BLM land. Also mapped within the HHSEGS site (Section 5.4 of the HHSEGS site report).
Wheeler's skeletonweed *Chaetadelpha wheeleri*	CNDDB G4 S1S2 CRPR 2.2	Found in the 1-mi buffer west of the HHSEGS site in shadscale scrub, on private and BLM lands; east of the HHSEGS site in Mojave Desert scrub, on BLM land; and south of the HHSEGS site in a cleared area, on private land. Also mapped within the HHSEGS site (Section 5.5 of the HHSEGS site report).
Torrey's jointfir *Ephedra torreyana*	Other plant species of consideration (CDFG 2009)	Found in the 1-mi buffer west of the northwest corner of the HHSEGS site, in shadscale scrub, on BLM land; 10 localities with 168 individuals were mapped 0.7 to 0.6 mile west of the HHSEGS site. First documented in CA in 2011, within the HHSEGS 1-mi buffer, during surveys for this project.
Pahrump Valley buckwheat *Eriogonum bifurcatum*	CNDDB G2 S2 CRPR 1B.2 BLM Sensitive	Found in the 1-mi buffer west of the HHSEGS site, in shadscale scrub, on private and BLM lands; and south of the HHSEGS site, in shadscale scrub, in the vicinity of Charleston View Road. Also mapped within the HHSEGS site (Section 5.7 of the HHSEGS site report).
Wing-seed blazing star *Mentzelia pterosperma*	CNDDB G4 S1.2 CRPR 2.2	Found in the 1-mi buffer west and south of the HHSEGS site, on BLM land and on the roadside of Tecopa Road. Not detected within the HHSEGS site. A species account is included in Section 4 of this report.
Goodding's phacelia *Phacelia pulchella* var. *gooddingii*	CNDDB G5T2T3 S1.3? CRPR 2.3	Found in the 1-mi buffer, west, east, north and south of the HHSEGS site, in shadscale scrub and Mojave Desert scrub, on private and BLM lands. Also mapped within the HHSEGS site (Section 5.8 of the HHSEGS site report).
Desert wing-fruit *Selinocarpus nevadensis*	CNDDB G5 S1.3 CRPR 2.3	Found in the 1-mi buffer east of the HHSEGS site, in Mojave Desert scrub, on BLM land, in Nye County, Nevada. Also mapped within the HHSEGS site (Section 5.9 of the HHSEGS site report).

Source: GANDA field surveys conducted for the HHSEGS project in 2010 and 2011.

Appendix D
List of Plant Species Observed During 2011 Offsite Surveys

TABLE D-1
HHSEGS Project: List of Plant Species Observed During Offsite Surveys in California and Nevada in 2011

		Pahrump Valley			Other Areas			
Scientific Name	Common Name	Calvada South	Other Private Lands	BLM Lands	Stewart Valley and Ash Mdws	Cali-fornia Valley	Chicago Valley	Life Form
GYMNOSPERMS								
Ephedraceae	**Ephedra Family**							
Ephedra funerea	Death Valley jointfir	x	x	x	x	x		shrub
Ephedra nevadensis	Nevada ephedra	x	x	x		x		shrub
Ephedra torreyana	Torrey's jointfir			x	x			shrub
FLOWERING PLANTS: DICOTS								
Apiaceae	**Carrot Family**							
Cymopterus multinervatus	purplenerve springparsley			x				perennial
Asclepiadaceae	**Milkweed Family**							
Asclepias erosa	desert milkweed	x						perennial
Cynanchum (=Funastrum) utahense	Utah vine milkweed	x						perennial vine
Asteraceae	**Sunflower Family**							
Acamptopappus shockleyi	Shockley's goldenhead	x	x	x	x			shrub
Acamptopappus sphaerocephalus var. *sphaerocephalus*	goldenhead		x	x		x		shrub
*Acroptilon repens*NW*	Russian knapweed	x			x			annual
Adenophyllum cooperi	Cooper's dogweed	x	x					subshrub
Ambrosia dumosa	burrobush	x	x	x	x	x		shrub
Amphipappus fremontii	Fremont's chaff bush		x		x	x		shrub
Atrichoseris platyphylla	gravel ghost				x			annual
Baccharis brachyphylla	short-leaf baccharis	x						shrub
Baccharis sergiloides	desert baccharis	x						shrub
Baileya multiradiata var. *multiradiata*	desert marigold		x					annual
Baileya pleniradiata	woolly desert marigold	x	x			x		annual
Calycoseris parryi	yellow tackstem		x					annual
Calycoseris wrightii	white tackstem		x	x				annual
Chaenactis carphoclinia	pebble pincushion	x	x	x	x	x		annual
Chaenactis fremontii	desert pincushion	x	x			x		annual
Chaenactis macrantha	Mojave pincushion	x	x	x		x		annual
Chaenactis stevioides	desert pincushion	x	x	x	x			annual
Chaetadelpha wheeleri	Wheeler's dune broom	x	x	x				perennial
Chrysothamnus sp.	rabbitbrush sp.			x				shrub
Chysothamnus paniculatus	black-stem rabbitbrush	x						shrub
Encelia farinosa	brittlebush					x		shrub
Encelia frutescens	rayless encelia					x		shrub
Encelia virginensis	Virgin River brittlebush	x	x	x				shrub
Eriophyllum wallacei	Wallace's woolly daisy	x	x			x		annual
Eriophyllum pringlei	Pringle's woolly daisy	x						annual

TABLE D-1
HHSEGS Project: List of Plant Species Observed During Offsite Surveys in California and Nevada in 2011

		Pahrump Valley			Other Areas			
Scientific Name	Common Name	Calvada South	Other Private Lands	BLM Lands	Stewart Valley and Ash Mdws	Cali-fornia Valley	Chicago Valley	Life Form
Filago depressa	dwarf cottonrose		x					annual
Geraea canescens	desert sunflower							annual
Glyptopleura marginata	carved seed	x	x	x		x		annual
Gutierrezia microcephala	broom snakeweed			x				shrub
Gutierrezia sarothrae	broom snakeweed	x	x					shrub
Gutierrezia sp.	broom snakeweed			x				shrub
Helianthus annuus	common sunflower			x				annual
Hymenoclea salsola	cheesebush	x	x	x		x		shrub
Isocoma acradenia	goldenbush			x		x	x	shrub
*Lactuca serriola**	prickly wild lettuce			x				annual
Malacothrix coulteri	snake's head	x				x	x	annual
Malacothrix glabrata	desert dandelion	x	x	x		x		annual
Monoptilon bellioides	desert star	x	x		x	x		annual
Prenanthella exigua	brightwhite	x	x	x	x	x		annual
Psathyrotes annua	turtleback	x	x	x		x		annual
Psilostrophe cooperi	paper-daisy	x	x	x				subshrub
Rafinesquia neomexicana	desert chicory	x	x	x	x	x		annual
Stephanomeria cinerea	gray wire-lettuce			x	x		x	perennial
Stephanomeria exigua	small wire-lettuce	x	x			x		annual
Stephanomeria parryi	Parry's wire-lettuce		x					perennial
Stephanomeria pauciflora var. *pauciflora*	wire-lettuce	x	x	x	x	x		perennial
Stylocline micropoides	desert nest-straw	x	x			x		annual
Xylorhiza tortifolia	Mojave aster	x		x	x	x		perennial
Boraginaceae	**Borage Family**							
Amsinckia menziesii ssp. *menziesii (=retrorsa)*	fiddleneck	x						annual
Amsinckia tessellata	bristly fiddleneck	x	x	x	x	x	x	annual
Amsinckia sp.	fiddleneck			x				annual
Cryptantha angustifolia	narrow-leaved cryptantha	x	x		x	x		annual
Cryptantha circumscissa	cushion cryptantha	x	x					annual
Cryptantha decipiens	gravelbar cryptantha					x		
Cryptantha dumetorum	bush-loving cryptantha					x		annual
Cryptantha micrantha ssp. *micrantha*	purple-rooted cryptantha	x						annual
Cryptantha nevadensis	Nevada cryptantha	x	x	x	x	x		annual
Cryptantha pterocarya	wingnut cryptantha	x	x	x		x		annual
Cryptantha recurvata	curved cryptantha	x	x	x		x		annual
Cryptantha virginensis	Virgin River cat's-eye		x	x				annual
Lappula redowskii var. *cupulata*	stickseed	x	x	x		x		annual

TABLE D-1
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		Pahrump Valley			Other Areas			
Scientific Name	Common Name	Calvada South	Other Private Lands	BLM Lands	Stewart Valley and Ash Mdws	Cali-fornia Valley	Chicago Valley	Life Form
Pectocarya heterocarpa	chuckwalla combseed	x	x		x	x	x	annual
Pectocarya platycarpa	broadfruit combseed	x	x		x	x		annual
Pectocarya recurvata	curvenut combseed				x	x		annual
Brassicaceae	**Mustard Family**							
Caulanthus cooperi	Cooper's jewelflower	x	x	x				annual
*Chorispora tenella**	blue mustard	x	x					annual
Descurainia pinnata ssp. *glabra*	tansy mustard	x	x	x				annual
*Descurainia sophia**	flix weed	x	x					annual
Guillenia lasiophylla	California mustard	x	x	x	x	x	x	annual
Lepidium flavum	yellow peppergrass		x	x	x		x	annual
Lepidium fremontii	desert alyssum	x	x	x		x		subshrub
Lepidium lasiocarpum var. *lasiocarpum*	modest pepper grass	x	x	x	x	x		annual
*Lepidium perfoliatum**	Klamath pepper grass				x			annual
*Malcolmia africana*NW*	African mustard	x	x	x	x			annual
*Sisymbrium altissimum*NW*	tumble mustard	x						annual
*Sisymbrium irio*NW*	London rocket	x	x	x		x		annual
*Sisymbrium orientale**	Indian hedge mustard		x					annual or perennial
Stanleya pinnata var. *pinnata*	prince's-plume	x	x	x		x	x	subshrub
Streptanthella longirostris	longbeak streptanthella	x				x		annual
Cactaceae	**Cactus Family**							
Echinocactus polycephalus	clustered barrel cactus	x	x		x	x		stem succulent
Echinocereus engelmannii	hedgehog cactus	x						stem succulent
Ferocactus cylindraceus var. *lecontei*	Leconte's barrel cactus					x		stem succulent
Opuntia basilaris var. *basilaris*	beavertail cactus	x	x		x	x		stem succulent
Opuntia echinocarpa	silver cholla	x	x		x	x		stem succulent
Opuntia ramosissima	pencil cholla	x	x			x		stem succulent
Sclerocactus johnsonii	Johnson's bee-hive cactus				x			stem succulent
Campanulaceae	**Bellflower Family**							
Nemacladus cf. glanduliferus	glandular threadstem		x	x		x		annual
Nemacladus rubescens	red threadstem	x						annual
Nemacladus sp.	threadstem					x		annual
Chenopodiaceae	**Goosefoot Family**							

TABLE D-1
HHSEGS Project: List of Plant Species Observed During Offsite Surveys in California and Nevada in 2011

		Pahrump Valley			Other Areas			
Scientific Name	Common Name	Calvada South	Other Private Lands	BLM Lands	Stewart Valley and Ash Mdws	Cali-fornia Valley	Chicago Valley	Life Form
Atriplex argentea var. *longitrichoma*	Pahrump Valley silverscale			x	x	x	x	annual
Atriplex canescens	four-wing saltbush	x		x	x	x		shrub
Atriplex confertifolia	shadscale	x	x	x	x	x	x	shrub
Atriplex hymenelytra	desert holly			x	x			shrub
Atriplex phyllostegia	leafcover saltweed			x	x	x	x	annual
Atriplex polycarpa	allscale	x	x	x		x		shrub
Atriplex lentiformis ssp. *torreyi*	Torrey's saltbush				x			shrub
Chenopodium incanum	mealy goosefoot	x						annual
Grayia spinosa	hop-sage	x	x			x		shrub
*Halogeton glomeratus*NW*	halogeton	x	x	x	x			annual
Kraschenninikovia lanata	winter fat	x	x	x		x		shrub
Monolepis nuttalliana	Nuttall's poverty weed			x	x	x	x	annual
Salsola spp.*NW*	Russian thistle	x		x	x	x		annual
Suaeda moquinii	seepweed			x	x	x	x	perennial
Cuscutaceae	**Dodder Family**							
Cuscuta cf. californica	California dodder	x	x	x	x	x		parasitic vine
Cuscuta sp.	dodder				x	x		parasitic vine
Euphorbiaceae	**Spurge Family**							
Chamaesyce albomarginata	rattlesnake weed	x	x	x	x			perennial
Fabaceae	**Pea Family**							
Acacia greggii	catclaw acacia	x						shrub, small tree
Astragalus didymocarpus var. *dispermus*	notch leaved locoweed					x		annual
Astragalus lentiginosus var. *fremontii*	freckled milkvetch	x	x	x		x		perennial
Astragalus nuttallianus	Nuttall's locoweed		x					
Astragalus nyensis	Nye milkvetch	x	x	x	x			annual
Astragalus preussii var. *preussii*	Preuss' milkvetch		x	x				perennial
Astragalus sabulonum	gravel milkvetch	x						annual
Astragalus tidestromii	Tidestrom's milkvetch	x	x	x		x		perennial
Hoffmannseggia glauca	hog potato	x	x	x				perennial
Lupinus shockleyi	desert lupine		x			x		annual
Peteria thompsoniae	spine-noded milkvetch		x					perennial
Prosopis glandulosa	honey mesquite	x	x	x	x	x	x	shrub
Psorothamnus arborescens var. *minutifolius*	Mojave indigo bush	x		x				shrub
Senna armata	desert senna	x	x	x		x		shrub

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		Pahrump Valley			Other Areas			
Scientific Name	Common Name	Calvada South	Other Private Lands	BLM Lands	Stewart Valley and Ash Mdws	Cali-fornia Valley	Chicago Valley	Life Form
Geraniaceae	**Geranium Family**							
*Erodium cicutarium**	red-stemmed filaree	x	x	x	x	x		annual
Hydrophyllaceae	**Waterleaf Family**							
Eucrypta micrantha	small-flowered eucrypta					x		annual
Nama demissum	purple mat	x	x	x	x	x		annual
Nama pusillum	small-leaved nama		x			x		annual
Phacelia crenulata var. *ambigua*	purple phacelia	x	x	x		x		annual
Phacelia fremontii	Fremont's phacelia	x	x	x	x	x	x	annual
Phacelia ivesiana	Ives' phacelia	x						annual
Phacelia neglecta	alkali phacelia		x					annual
Phacelia parishii	Parish's phacelia			x	x	x	x	annual
Phacelia pulchella var. *gooddingii*	Goodding's phacelia	x	x	x				annual
Phacelia vallis-mortae	Death Valley phacelia	x	x	x				annual
Krameriaceae	**Rhatany Family**							
Krameria erecta	pima ratany	x	x	x	x	x		shrub
Lamiaceae	**Mint Family**							
Salazaria mexicana	Mexican bladder sage		x	x		x		shrub
Salvia columbariae	chia	x				x		annual
Lennoaceae	**Lennoa Family**							
Pholisma arenarium	scaly-stemmed sandplant					x		perennial (parasitic)
Loasaceae	**Sandpaper-plant Family**							
Mentzelia cf. albicaulis	little blazing star	x	x	x		x		annual
Mentzelia pterosperma	wing-seed blazing star			x				perennial
Mentzelia cf. reflexa	reflexed blazing star				x	x		annual
Mentzelia sp. (yellow)	blazing star	x		x	x			annual
Malvaceae	Mallow Family							
Eremalche rotundifolia	desert five-spot	x			x	x		annual
Malvella leprosa	alkali-mallow			x				perennial
Sphaeralcea ambigua	apricot mallow	x	x	x	x	x		subshrub
Sphaeralcea emoryi	Emory's globemallow	x		x			x	subshrub
Nyctaginaceae	**Four-o'clock Family**							
Mirabilis bigelovii	wishbone bush		x		x	x		perennial
Selinocarpus nevadensis	desert wing-fruit	x	x	x				perennial
Oleaceae	**Olive Family**							
Menodora spinescens	spiny menodora		x	x				shrub
Onagraceae	**Evening-primrose Family**							
Camissonia boothii	Booth's sun cup	x	x			x		annual
Camissonia brevipes	yellow cups	x	x	x	x	x	x	annual

TABLE D-1
HHSEGS Project: List of Plant Species Observed During Offsite Surveys in California and Nevada in 2011

		Pahrump Valley			Other Areas			
Scientific Name	Common Name	Calvada South	Other Private Lands	BLM Lands	Stewart Valley and Ash Mdws	Cali-fornia Valley	Chicago Valley	Life Form
Camissonia claviformis	brown-eyed evening-primrose	x	x			x		annual
Camissonia refracta	narrowleaf suncup	x						annual
Gaura coccinea	scarlet beeblossom	x						perennial
Oenothera primiveris	yellow evening-primrose	x	x			x		annual
Papaveraceae	**Poppy Family**							
Eschscholzia glyptosperma	desert golden poppy	x	x		x	x		annual
Plantaginaceae	**Plantain Family**							
Plantago ovata	woolly plantain	x	x	x	x	x		annual
Plantago patagonica	Patagonia plantain	x						annual
Polemoniaceae	**Phlox Family**							
Aliciella hutchinsifolia	Marta's Beckett's tutu	x	x			x		annual
Eriastrum diffusum	miniature eriastrum	x						annual
Eriastrum eremicum ssp. *eremicum*	desert woolly-star		x					annual
Eriastrum sparsiflorum	few-flowered eriastrum					x		
Gilia sp.	gilia	x						annual
Gilia cana ssp. *speciformis*	showy gilia	x	x	x	x	x		annual
Gilia latifolia	broad leaf gilia					x	x	annual
Gilia stellata	star gilia		x					annual
Ipomopsis polycladon	branching gilia	x	x	x		x		annual
Langloisia setosissima ssp. *punctata*	lilac sunbonnet	x		x		x		annual
Langloisia setosissima ssp. *setosissima*	bristly langloisia		x	x				annual
Linanthus aureus	golden linanthus	x	x					annual
Linanthus demissus	desert linanthus	x	x					annual
Loeseliastrum matthewsii	desert calico	x		x				annual
Loeseliastrum schottii	Schott's calico	x	x	x		x		annual
Polygonaceae	**Buckwheat Family**							
Chorizanthe brevicornu var. *brevicornu*	brittle spineflower	x	x		x	x		annual
Chorizanthe rigida	rigid spiny-herb	x	x	x	x	x		annual
Eriogonum bifurcatum	Pahrump Valley buckwheat	x	x	x	x		x	annual
Eriogonum brachypodum	glandular skeleton-weed		x	x	x			annual
Eriogonum contiguum	Reveal's buckwheat		x	x	x	x	x	annual
Eriogonum inflatum var. *inflatum*	desert trumpet	x	x		x	x		perennial
Eriogonum maculatum	angle-stemmed buckwheat		x					annual
Eriogonum nidularium	birdnest buckwheat	x	x					annual
Eriogonum reniforme	kidney leaf buckwheat	x	x					annual
Eriogonum trichopes	little desert trumpet	x	x	x	x	x		annual

TABLE D-1
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		Pahrump Valley			Other Areas			
Scientific Name	Common Name	Calvada South	Other Private Lands	BLM Lands	Stewart Valley and Ash Mdws	Cali-fornia Valley	Chicago Valley	Life Form
Oxytheca perfoliata	saucerplant		x					annual
*Polygonum argyrocoleon**	Persian knotweed			x				annual
Rumex hymenosepalus	canaigre dock	x				x		perennial
Ranunculaceae	**Buttercup Family**							
Delphinium parishii var. *parishii*	desert larkspur	x	x			x		perennial
Resedaceae	**Mignonette Family**							
Oligomeris linifolia	lineseed		x		x	x	x	annual
Rubiaceae	**Madder Family**							
Galium parishii	Parish's bedstraw					x		perennial
Scrophulariaceae	**Figwort Family**							
Antirrhinum filipes	tangled snapdragon					x		annual
Antirrhinum kingii	King's snapdragon		x					annual
Mimulus bigelovii	Bigelow's monkeyflower	x						annual
Solanaceae	**Nightshade Family**							
Lycium andersonii	Anderson's box-thorn	x	x	x	x	x	x	shrub
Lycium cooperi	Cooper's box-thorn		x	x		x		shrub
Lycium pallidum var. *oligospermum*	rabbit-thorn	x	x	x	x	x		shrub
Tamaricaceae	**Tamarisk Family**							
*Tamarix aphylla**	athel					x		tree
*Tamarix ramosissima**NW	tamarisk		x					tree
Viscaceae	**Mistletoe Family**							
Phoradendron californicum	desert mistletoe	x		x	x	x	x	parasite
Zygophyllaceae	**Caltrop Family**							
Larrea tridentata	creosote bush	x	x	x	x	x		shrub
FLOWERING PLANTS: MONOCOTS								
Liliaceae	**Lily Family**							
Allium nevadense	Nevada onion		x					perennial
Androstephium breviflorum	pink star-tulip	x	x			x		perennial
Calochortus flexuosus	winding mariposa lily		x					perennial
Yucca brevifolia	Joshua tree	x						tree-like
Yucca schidigera	Mojave yucca		x			x		shrub
Poaceae	**Grass Family**							
Achnatherum (=Stipa) hymenoides	Indian ricegrass	x	x	x		x		perennial
Achnatherum (=Stipa) speciosum	desert needlegrass		x	x				perennial
Aristida purpurea	purple three-awn					x		perennial
Bromus madritensis ssp. *rubens**NW	red brome	x	x	x	x	x	x	annual
*Bromus tectorum**NW	cheat grass	x	x	x	x			annual

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HHSEGS Project: List of Plant Species Observed During Offsite Surveys in California and Nevada in 2011

		Pahrump Valley			Other Areas			
Scientific Name	**Common Name**	**Calvada South**	**Other Private Lands**	**BLM Lands**	**Stewart Valley and Ash Mdws**	**Cali-fornia Valley**	**Chicago Valley**	**Life Form**
*Bromus trinii**	Chilean chess	x	x	x		x		annual
Distichlis spicata	saltgrass			x				perennial
Elymus elymoides	squirreltail		x	x				perennial
Hordeum murinum ssp. *leporinum**	foxtail barley			x	x		x	annual
*Phalaris minor**	Mediterranean canarygrass			x				annual
Pleuraphis rigida	big galleta	x	x					perennial
*Schismus arabicus**	Mediterranean grass	x	x	x	x	x	x	annual
*Triticum cf. aestivum**	common wheat		x					annual
Vulpia octoflora	sixweeks fescue	x						annual

Data collected by GANDA, 2011

Notes:
Scientific names from Baldwin and others (2002).
Common names from Baldwin and others (2002) and CalFlora (2011).
* = introduced species (not native to California)
NW = noxious weed acc. to California Dept. of Food and Agriculture or California Invasive Plant Council

Appendix E
Photographs

Southern Pahrump Valley, Private Land A, shadscale scrub, looking northeast to Charleston Peak. (Photo by Chloe Scott)

Southern Pahrump Valley, Private Land C, Mojave Desert scrub, looking west to hills south of the Nopah Range; habitat of Nevada onion, spine-noded milkvetch, Tidestrom's milkvetch and other special-status plants. (Photo by Chloe Scott)

Southern Pahrump Valley, Private Land D, Mojave Desert scrub, looking north toward Pahrump with Charleston Peak on the right; habitat of pink funnel-lily, Tidestrom's milkvetch, Nye milkvetch, desert wing-fruit. (Photo by Chloe Scott)

Southern Pahrump Valley, Private Land – Calvada South, Mojave Desert scrub, looking west toward the Nopah Range; habitat of Tidestrom's milkvetch, Wheeler's skeletonweed, desert wing-fruit.

Southern Pahrump Valley, BLM Pahrump Valley Wilderness, Mojave Desert scrub, looking south toward the Kingston Range.

Central Pahrump Valley, edge of Pahrump Dry Lake, patches of shadscale scrub, looking north toward Stewart Valley; habitat of Pahrump silverscale, Parish's phacelia. (Photo by Chloe Scott)

Central Pahrump Valley, shadscale scrub, looking east toward Charleston Peak. (Photo by Chloe Scott)

Stewart Valley, Inyo County, California, BLM Nopah Range Wilderness, looking west toward the Nopah Range; habitat of Pahrump silverscale, Pahrump Valley buckwheat, and Reveal's buckwheat.

Stewart Valley, Nye County, Nevada, edge of Stewart Dry Lake, looking west toward the Resting Springs Range; habitat of Pahrump silverscale, Pahrump Valley buckwheat, Parish's phacelia.

Stewart Valley, Nye County, Nevada, edge of Stewart Dry Lake, looking north; habitat of Parish's phacelia (small plants in foreground). (Photo by Bill Clark)

Chicago Valley, shadscale scrub and mesquite thickets, looking east toward the Nopah Range. (Photo by Bill Clark)

Chicago Valley, shadscale scrub (foreground) and mesquite thickets (middle ground), looking east toward the Nopah Range; shadscale scrub is habitat of Pahrump Valley buckwheat, Reveal's buckwheat.

California Valley, shadscale scrub and mostly barren ground, looking east toward Charleston Peak (trees in distance planted at developed spring); habitat of Pahrump silverscale, Parish's phacelia.

California Valley, shadscale scrub on hills of silty soil, looking east toward Charleston Peak. (Photo by Bill Clark)

Nevada onion (*Allium nevadense*) (Photo by Chloe Scott)

Pink funnel-lily (*Androstephium breviflorum*)

Pahrump silverscale (*Atriplex argentea* var. *longitrichoma*) (Photo by Bill Clark)

Nye milkvetch (*Astragalus nyensis*)

Preuss' milkvetch (*Astragalus preussii* var. *preussii*)

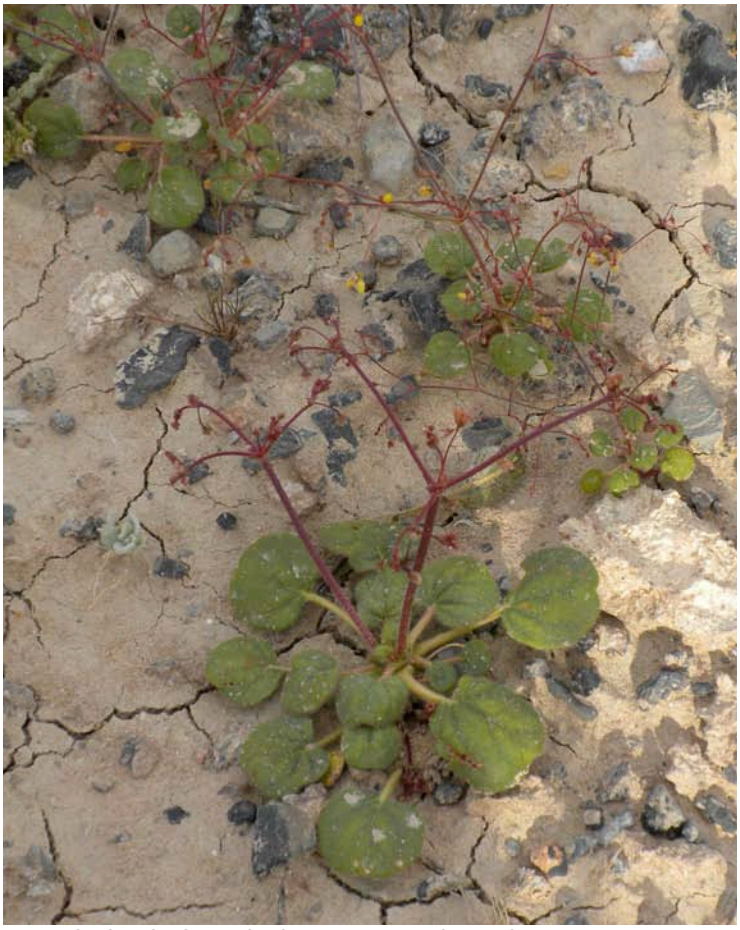
Tidestrom's milkvetch (*Astragalus tidestromii*) (Photo by Chloe Scott)

Wheeler's skeletonweed (*Chaetadelpha wheeleri*) (Photo by Bill Clark)

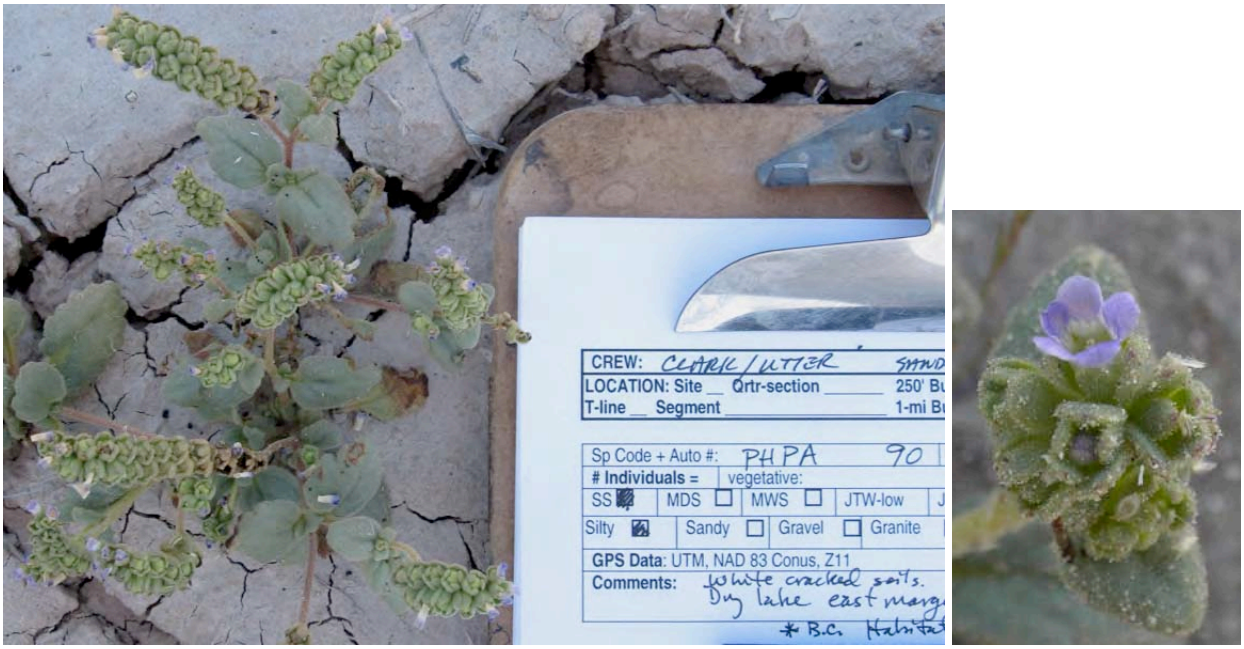
Purplenerve springparsley, close-up of fruit (*Cymopterus multinervatus*)

Utah vine milkweed (*Cynanchum [=Funastrum] utahense*) (Photo by Bill Clark)

Pahrump Valley buckwheat (*Eriogonum bifurcatum*) (Photo by Bill Clark)



Reveal's buckwheat (*Eriogonum contiguum*)



Parish's phacelia (*Phacelia parishii*) (Photos by Bill Clark and Ann Howald)


Goodding's phacelia (*Phacelia pulchella* var. *gooddingii*) (Photo by Bill Clark)

Johnson’s bee-hive cactus (*Sclerocactus johnsonii*) (Photo by Bill Clark)


Desert wing-fruit showing fruits (*Selinocarpus nevadensis*) (Photo by Chloe Scott)

Attachment DR63-3

Technical Report: Late-Season 2010 and 2011 Surveys for Special-Status Plants for the Hidden Hills Solar Electric Generating System

Prepared for

Hidden Hills Solar I, LLC, and Hidden Hills Solar II, LLC

January 2012

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Executive Summary

The Hidden Hills Solar Electric Generating System (HHSEGS) will be located on approximately 3,277 acres of privately owned land in Inyo County, California, adjacent to the Nevada border and north of Tecopa Road.[1] The project site is approximately 18 miles south of Pahrump, Nevada, and approximately 45 miles west of Las Vegas, Nevada.

HHSEGS will comprise two solar fields and associated facilities: the northern solar plant (Solar Plant 1) and the southern solar plant (Solar Plant 2). Each solar plant will generate 270 megawatts (MW) gross (250 MW net), for a total net output of 500 MW. Solar Plant 1 will occupy approximately 1,483 acres and Solar Plant 2 will occupy approximately 1,510 acres. A 103-acre common area will be established on the southeastern corner of the site to accommodate an administration, warehouse, and maintenance complex, and an onsite switchyard. A temporary construction laydown and parking area on the west side of the site will occupy approximately 180 acres.

The HHSEGS site is located in Inyo County, California, within the southern Pahrump Valley. This area is at the toe of an alluvial fan complex, or bajada, that extends southwest from the Spring Mountains about 13 miles to the northeast. The Pahrump Valley is part of a northwest-southeast-trending valley system that includes Sandy (Mesquite) Valley to the southeast and Stewart Valley to the northwest of Pahrump Valley. In the vicinity of the project site, drainage is generally to the west and northwest toward Pahrump Playa. The elevation of the Pahrump Valley floor ranges from 2,515 feet at Pahrump Dry Lake to about 2,655 feet in the southwestern part of the basin along Tecopa Road. Topography within the HHSEGS site is gently sloping, with the highest elevations in the southeast corner and the lowest along the northwest boundary. Several ephemeral washes enter from the eastern boundary and quickly dissipate through the site.

This report describes the methods and results of the 2010 and 2011 late-season surveys for special-status plants[2] at the site and the 250-foot buffer area surrounding it. The 2010 late-season survey included a protocol-level survey for special-status plants within the solar fields and common area (3,096 acres). The 2010 late-season survey was conducted October 25 through 30, 2010. In 2011, an 180-acre temporary construction laydown and parking area was added to the site. The 2011 protocol-level survey included surveys of the 180-acre temporary construction laydown and parking area and a 250-foot-wide buffer around the entire site. The 2011 late-season survey was conducted October 10 through 13, 2011.

No plant species that are federally or state-listed, proposed or candidate for listing as threatened, endangered or rare were found: (1) within the HHSEGS site (including the 180-acre temporary construction laydown and parking area), or (2) within the 250-foot buffer surrounding the site. Three species of special-status plants were identified within the site, temporary construction parking and laydown area, and the 250-foot buffer during the late-season surveys in 2010 and 2011. These species are: Pahrump Valley buckwheat (*Eriogonum bifurcatum*), Wheeler's skeletonweed (*Chaetadelpha wheeleri*), and Goodding's phacelia (*Phacelia pulchella* var. *gooddingii*).

In addition to the late-season surveys reported here, protocol-level surveys for special-status plants were conducted within the 3,277-acre HHSEGS site in spring 2011. A 1-mile buffer surrounding the site was surveyed at a reconnaissance-level in spring 2011. Reconnaissance level offsite surveys were conducted in several locations in California and Nevada during the spring of 2011. Prior to the 2010 late-

[1] Also referred to as Old Spanish Trail Highway.

[2] The term "special-status" species is not limited in scope to describe threatened, endangered or candidate species under the federal ESA or CESA. Instead, the term "special-status" is a more expansive term, employed by many agencies as described herein.

season survey, a reconnaissance-level visit to the study area was completed on September 21 and 22, 2010. As used in this report, the study area is defined as the HHSEGS site, 250-foot buffer surrounding it, and the temporary construction laydown and parking area. Results of all offsite special-status plant species surveys, including a summary of the 1-mile buffer survey, are addressed in a separate offsite report.

Contents

Tables

Appendixes

SECTION 1

Introduction

The Hidden Hills Solar Electric Generating System (HHSEGS) will be located on approximately 3,277 acres of privately owned land in Inyo County, California, adjacent to the Nevada border and north of Tecopa Road.[3] The project site is approximately 18 miles south of Pahrump, Nevada, and approximately 45 miles west of Las Vegas, Nevada.

HHSEGS will comprise two solar fields and associated facilities: the northern solar plant (Solar Plant 1) and the southern solar plant (Solar Plant 2). Each solar plant will generate 270 megawatts (MW) gross (250 MW net), for a total net output of 500 MW. Solar Plant 1 will occupy approximately 1,483 acres and Solar Plant 2 will occupy approximately 1,510 acres. A 103-acre common area will be established on the southeastern corner of the site to accommodate an administration, warehouse, and maintenance complex, and an onsite switchyard. A temporary construction laydown and parking area on the west side of the site will occupy approximately 180 acres.

The HHSEGS site is located in Inyo County, California, within the southern Pahrump Valley. This area is at the toe of an alluvial fan complex, or bajada, that extends southwest from the Spring Mountains about 13 miles to the northeast. The Pahrump Valley is part of a northwest-southeast-trending valley system that includes Sandy (Mesquite) Valley to the southeast and Stewart Valley to the northwest of Pahrump Valley. In the vicinity of the project site, drainage is generally to the west and northwest toward Pahrump Playa. The elevation of the Pahrump Valley floor ranges from 2,515 feet at Pahrump Dry Lake to about 2,655 feet in the southwestern part of the basin along Tecopa Road. Topography within the HHSEGS site is gently sloping, with the highest elevations in the southeast corner and the lowest along the northwest boundary. Several ephemeral washes enter from the eastern boundary and quickly dissipate through the site.

This report describes the methods and results of the 2010 and 2011 late-season surveys for special-status plants.[4] The purpose of the late-season surveys was to locate special-status plant species detectable during the late part of the blooming season.

The 2010 late-season survey included a protocol-level survey for special-status plants within the 3,096-acre HHSEGS solar fields and common area. The 2010 late-season protocol-level survey was conducted October 25 through 30, 2010. Prior to the 2010 late-season survey, a reconnaissance-level visit to the study area was completed on September 21 and 22, 2010. Results of all offsite special-status plant species surveys, including a summary of the 1-mile buffer survey, are addressed in a separate offsite report.

In 2011, a 180-acre temporary construction laydown and parking area was added to the site. The 2011 late-season protocol-level survey included surveys of the 180-acre temporary construction laydown and parking area and a 250-foot-wide buffer around the entire 3,277-acre site. The 2011 late-season survey was conducted October 10 through 13, 2011.

Areas included in the HHSEGS late-season (October) HHSEGS surveys:

- Late-season (October) 2010: HHSEGS solar fields and common area (3,096 acres)
- Late-season (October) 2011: 180-acre temporary construction laydown and parking area, and 250-foot-wide site buffer

[3] Also referred to as Old Spanish Trail Highway.

[4] The term “special-status” species is not limited in scope to describe threatened, endangered or candidate species under the federal ESA or CESA. Instead, the term “special-status” is a more expansive term, employed by many agencies as described herein.

Survey methods are described in Section 2. Results are included in Section 3. References are listed in Section 4. Figures are included in Appendix A. Tables are included in Appendix B. A plant species list is included in Appendix C. Representative photos are included in Appendix D.

SECTION 2

Methods

The late-season special-status plant surveys described in this report focused on those species of plants that have potential to occur in the vicinity of the study area and that bloom or are otherwise identifiable during the late part of the blooming season. As used in this report, the study area refers to the 3,277-acre HHSEGS site and 250-foot buffer surrounding it. The late-season surveys in combination with the other survey reports submitted satisfy the recommendations from agencies for seasonal surveys that cover the blooming times of all potentially occurring special-status plants.

The California Department of Fish and Game's (CDFG) Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities (CDFG, 2009), and the survey recommendations of the U.S. Fish and Wildlife Service (USFWS, 1996), the Bureau of Land Management (BLM, 2011) and the California Native Plant Society (CNPS, 2001) formed the methods for the surveys. In addition to the 2010 and 2011 late-season surveys, a protocol-level survey in spring 2011 also was conducted in the HHSEGS site and 250-foot buffer. Results from the spring 2011 site survey are addressed in a separate report. Spring surveys were also conducted off-site, including a 1-mile buffer area around the HHSEGS site, and these surveys are addressed in a separate report.

In summary, the spring 2011 and late-season 2010/2011 surveys were scheduled to cover the blooming times of all special-status plants with the potential to occur as determined prior to the commencement of the surveys.

Pre-field Preparations

Pre-field research was conducted to identify special-status plant species with potential to be found within the vicinity of the study area. For the purposes of this report, the study area is defined as the HHSEGS site, 250-foot buffer area, and temporary construction laydown and parking area.

In 2010, a list of special-status plants with known presence in the greater vicinity of the study area was developed through searches of online databases (CNPS, 2010, CNDDB, 2010a; Jepson Online Interchange, 2010). In 2011, this list was checked and updated (CNPS, 2011; CNDDB, 2011a; Jepson Online Interchange, 2011).

Based on these queries, 11 species with potential to occur within the study area (as identified prior to the surveys) that bloom or are otherwise identifiable during the late part of the blooming season are listed in Appendix B. For each potentially occurring special-status plant species, information was compiled on conservation status, distribution, habitat characteristics, blooming time, and presence in the project region (Appendix B).

In accordance with the guidance provided by CDFG Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities (CDFG, 2009), a plant was considered to be of special status if it met one or more of the following criteria:

- Federally or state-listed, proposed, or candidate for listing, as rare, threatened or endangered (USFWS 1996a, 2006; CDFG 2011, CNPS 2011); or
- Special Plant as defined by the California Natural Diversity Database (CNDDB 2011c); or
- Designated by the California Native Plant Society in its online Inventory of Rare and Endangered Plants of California (CNPS 2011); or
- Meets the definition of rare or endangered under CEQA Section 15380 (b) and (d) (CDFG 2009); or

- Considered a locally significant species (CDFG 2009).[5]

A species was determined to have potential to occur within the study area if its known or expected geographic range includes the study area or the greater vicinity of the study area, and if its known or expected habitat is found within or near the study area. For this project, the greater vicinity of the study area extends north to Ash Meadows National Wildlife Refuge, west to Shoshone and Tecopa, northwest to Death Valley Junction, and south to Mesquite and Sandy valleys. This large area was used to check for potentially occurring species in recognition of the fact that the distributions of many special-status plants in the Mojave Desert are poorly known, and new localities often are discovered many miles distant from those that were previously known.

Reference Site Visits

The special-status plant survey guidelines of the CDFG (2009) and the CNPS (2001) recommend reference site visits to determine the blooming condition of potentially occurring special-status plants to the degree that this is reasonable given the scope of the project and the presence of reference sites in the vicinity of the study area. This is intended to assure that the plants are in flower and identifiable at the time of the survey and to obtain a visual image of the plant, and the habitat and vegetation in which it occurs (CDFG, 2009).

Reference Site Visits Conducted in 2010

For this project, reference site visits were conducted in 2010 for the following species:

- Tecopa bird's-beak (*Cordylanthus tecopensis*): A population of approximately 600 individuals, with about 30 percent in flower, was observed. This population was located in salt-encrusted clay soil, at 2,050 feet elevation, in the Amargosa River drainage. This reference population is located south of Stateline Road, about 2.7 miles east of its intersection with Highway 127 at Death Valley Junction, in Inyo County, California. The site was observed on October 23 and October 31, 2010. This is CNDDB EO #3[6] for this species.
- Pahrump Valley buckwheat (*Eriogonum bifurcatum*): A population of approximately 200 individuals, mostly in fruit, was observed in silty-gravelly soil in Mojave Desert scrub habitat. This reference site was located at about 2,500 feet elevation, on two small hills at an old dump site, south of Highway 372, 1.0 mile east of the California/Nevada state line, in Nye County, Nevada. This site is the type locality[7] for this species (Reveal, 1971). This site was visited on October 24, 2010. In addition, this species was observed within the HHSEGS site at the beginning of the 2010 survey period, and during the 2011 spring survey.
- Copperwort (*Iva acerosa*): One population with plants in flower and in fruit was observed in salt-encrusted clay soil, at 2,030 feet elevation, in the Amargosa River drainage. This reference site was located south of Stateline Road, about 3.0 miles east of its intersection with Highway 127 at Death

[5] Locally significant species" are defined as a species that is not rare from a statewide perspective but is rare or uncommon in a local context such as within a county or region, or is so designated in local or regional plans, policies, or ordinances (CDFG, 2009).

[6] *Element Occurrence* (EO) is a term used by CNDDB to indicate a location where a rare plant is found. An EO can consist of a single individual or a group of individuals, which may include sub-groups. Element occurrences are, by definition, separated from the nearest EO(s) by ¼ mile or more (NatureServe 2010, CNDDB 2010b). An EO is usually not equivalent to a biological population.

[7] The holotype is the original type specimen, which is the specimen selected by the taxonomist who named the species as the one most typical of the taxon. The type locality refers to the location where the holotype was collected. Later collections from the type locality are referred to as isotypes.

Valley Junction, in Inyo County, California. The site was observed on October 23 and October 31, 2010.

- Amargosa nitrophila (*Nitrophila mohavensis*): A population of approximately 25 individuals, mainly in fruit, was observed in gravelly clay bottomland habitat. This reference site is located at 2,050 feet elevation, and is in the Amargosa River drainage, south of Stateline Road, about 2.7 miles east of its intersection with Highway 127 at Death Valley Junction, in Inyo County, California. The site was observed on October 23 and October 31, 2010. This is CNDDB EO #1 for this species.

Field Survey Methods

In 2010, protocol-level surveys were performed within the 3,096-acre HHSEGS solar fields and common area. In 2011, protocol-level surveys were conducted within a 250-foot-buffer surrounding the site and the 180-acre temporary construction laydown and parking area. The survey methods for 2010 and 2011 are described by year, in separate sections, below.

2010 Late-season Survey Methods

The 2010 late-season survey was conducted October 25 through 30, 2010. Survey team members included: GANDA Senior Botanist Ann Howald, GANDA Botanist Onkar Singh, GANDA Biologist Chloe Scott, Biologists Bill Clark and Russell Kokx, and Botanist Eve Laeger. University of California, Riverside, Herbarium Director Andrew Sanders worked with the team for the first 3 days of the survey.

Prior to beginning the 2010 survey, a safety briefing was completed, and the team members were oriented to the layout of the HHSEGS site and other features within the southern Pahrump Valley. Also, the team reviewed the survey and data collection methods at a locality within the HHSEGS site containing Pahrump Valley buckwheat. For safety reasons and to facilitate communications, throughout the survey period all team members worked in close geographical proximity both within the HHSEGS site and offsite.

Methods used for the 2010 HHSEGS late-season survey followed the Intuitive Controlled approach, as described in Attachment A of the Renewable Energy Action Team's (REAT) Desert Renewable Energy Projects Best Management Practices and Guidance Manual (REAT 2010). The Intuitive Controlled approach is approved by the BLM and the U.S. Forest Service.

Late-season surveys in 2010 were conducted within the boundary of the 3,096-acre HHSEGS solar fields and common area. Surveys were organized by quarter-section, as defined in the field (approximately) by the existing road network. Each quarter-section (160 acres) was examined by a crew of 2 or 3 people. The level of effort dedicated to each quarter-section was approximately 6 to 7 person-hours. In surveying each quarter-section, the crew walked through the quarter-section and selected several survey localities for close examination. The survey localities were selected to include the range of habitat variation within the quarter-section, and to represent the entire quarter-section geographically. At each survey locality an area approximately 1 to 5 acres in size was investigated by walking meandering transects. A Global Positioning System (GPS) waypoint was recorded near the center of each survey locality, and basic habitat information was recorded on a data sheet. If special-status plants were present within the survey locality, one or more waypoints were taken at each locality, and an estimate of abundance for each locality was recorded on the data sheet.

2010 GPS Units, Navigation, and Data Quality Control

In 2010, waypoints marking the survey localities and special-status plant localities were recorded using Garmin Oregon and Garmin eTrex Vista GPS units. Data were recorded in Universal Transverse Mercator (UTM) coordinates, datum NAD 83, with an accuracy of approximately 10 feet. These highly portable

and accurate GPS units display USGS 7.5-minute quadrangle base maps showing the HHSEGS site road network, which was used to navigate to and within individual quarter-sections. The crews also used paper maps with the HHSEGS site boundaries depicted on aerial and topographic base maps for navigation. The Google Earth application for iPhone also was used as a navigation tool. GPS data were recorded on data sheets, and data were transferred each evening to a computer spreadsheet as a back-up. Data were downloaded from the GPS units by a Geographic Information System (GIS) technician at the end of the field survey period.

2011 Late-season Survey Methods

The 2011 late-season protocol level survey was conducted October 10 through 13, 2011. Survey team members included: GANDA Senior Botanist Ann Howald, Botanist Onkar Singh and Botanist Josh Utter. These botanists also worked on the 2011 HHSEGS site surveys, HHSEGS offsite surveys, and the linear corridor surveys.

Prior to beginning the 2011 survey, a safety briefing was completed. Team members were familiar with the HHSEGS site from surveys in spring 2011 and employed those same methods. Team members worked together in one crew throughout the survey period.

2011 HHSEGS Late-season Site Survey Protocols

The 2011 late-season survey covered only the 180-acre area (the temporary construction laydown and parking area) that was added to the HHSEGS site in 2011, and a 250-foot-wide buffer around the entire 3,277-acre site. The Intuitive Controlled method (REAT, 2010) used during the late-season 2010 survey was also used for the 2011 late-season survey. The spring 2011 surveys of the HHSEGS site included the 250-foot site buffer the temporary construction laydown and parking area. To avoid mapping any special-status plant localities that had already been mapped during the spring 2011 surveys, GPS units were loaded with the 2011 spring survey data. Based on findings from previous surveys, it was expected that Pahrump Valley buckwheat would still be blooming and identifiable during the 2011 late-season survey. Localities of this species mapped in spring 2011 were shown on the GPS units, and waypoints were taken only for localities that had not been previously mapped to avoid duplication. Data collected at each special-status plant locality included: date, unique data point number, species name, number of individuals, phenology, and vegetation type. Data was recorded using data dictionaries on the GPS units and on paper data sheets for backup.

2011 GPS Units, Navigation, and Data Quality Control

For the 2011 late-season survey, data collected in the field was recorded using Trimble GeoXH or GeoXT Global Positioning System (GPS) units. Location data collected with these units is accurate to the sub-meter level after the data have been post-processed. GPS units were equipped with background files for navigation, and data dictionaries for data collection. In addition, a Garmin eTrex GPS unit with topographic map background files was used to assist with navigation. A project-specific data dictionary was used in the field to increase data recording efficiency and data quality. Surveyors were proficient in the use of GPS units from previous experience.

All data collected with GPS units was downloaded and backed up each night onto a laptop computer, and was emailed to the project's GIS technician. GPS data were post-processed by the GIS technician and downloaded into a project GIS database. All location data were mapped onto aerial photography or USGS topographic map basemaps by the GIS technician. These draft figures were checked for accuracy by the field supervisor, using the backup data on the paper data sheets.

SECTION 3

Survey Results

Overview

Three species of special-status plants were identified within the study area during the late-season surveys in 2010 and 2011. These species include Pahrump Valley buckwheat (*Eriogonum bifurcatum*), Goodding's phacelia (*Phacelia pulchella* var. *gooddingii*), and Wheeler's skeletonweed (*Chaetadelpha wheeleri*). Species accounts and survey results for all three special-status plant species are included in "Species Accounts" section below.

Special-Status Plant Species Identified in 2010

Late-season (October) 2010 surveys were performed within the 3,096-acre HHSEGS site (Figures 2 and 4, Appendix A). Pahrump Valley buckwheat was mapped in 47 locations within the HHSEGS site (Table 3-1). In addition to Pahrump Valley buckwheat, plant skeletons tentatively identified as Goodding's phacelia were identified within the HHSEGS site but were not mapped in 2010.

TABLE 3-1
Special-status Plants Observed During 2010 Late-season Surveys Within the HHSEGS Site.

Common Name/ Scientific Name	HHSEGS Site No. of Localities	Total No. of Individuals
Pahrump Valley buckwheat *Eriogonum bifurcatum*	47	>10,000
Goodding's phacelia *Phacelia pulchella* var. *gooddingii*	*	*

Source: Field surveys conducted by GANDA (October 2010).

Notes:

The 180-acre temporary construction and laydown area, and 250-ft buffer were not surveyed in 2010; they are included in Table 3-2.

*Plant skeletons tentatively identified as Goodding's phacelia were located within the HHSEGS site. Goodding's phacelia was not mapped in 2010. Numerous individuals and localities of Goodding's phacelia were observed during the spring 2011 surveys, and this species is addressed in the HHSEGS site botany report, provided separately (Attachment DR63-1A, Data Response Set 1B-2).

Special-Status Plant Species Identified in 2011

In 2011, three species of special-status plants were mapped within surveys of the 180-acre temporary construction laydown and parking area and the 250-foot buffer (Table 3-2, Figures 3 and 4, Appendix A). Pahrump Valley buckwheat was mapped in 10 locations, with a total of 4,688 individuals. Goodding's phacelia was mapped in 3 locations with a total of 200 individuals. Wheeler's skeletonweed was mapped in 3 locations with a total of 39 individuals.

TABLE 3-2
Special-status Plants Observed During 2011 Late-season Surveys Within the HHSEGS Temporary Construction Laydown and Parking Area and the 250-foot Site Buffer

Common Name/ Scientific Name	Temporary Construction Laydown and Parking Area and the 250-foot Site Buffer	
	No. of Localities	No. of Individuals
Wheeler's skeletonweed *Chaetadelpha wheeleri*	3	39
Pahrump Valley buckwheat *Eriogonum bifurcatum*	10	4,688
Goodding's phacelia *Phacelia pulchella var. gooddingii*	3	200

Source: Field surveys conducted by GANDA (October 2011).

Note: The 3,096-acre HHSEGS solar field and common area was not surveyed in 2011; they are included in Table 3-1.

Species Accounts

Wheeler's skeletonweed (*Chaetadelpha wheeleri*) – CRPR 2.2

Wheeler's skeletonweed is a white-flowered perennial herb in the Sunflower Family (*Asteraceae*). The mature plants are about 1 foot tall, broom-like, with many bright green stems with very small leaves (Baldwin et al., 2002). In California and Nevada, this species flowers from April to September (CNPS, 2011; Kartesz, 1988). Line drawings of this species are found in Baldwin and others (2002) and Cronquist and others (1994). Photos can be viewed on the CalPhotos website, and in Appendix D.

Wheeler's skeletonweed grows in sandy to silty soil, in desert dunes, Mojave Desert scrub, and Great Basin scrub in California and Nevada, at elevations from 2,790 to 6,235 feet (CNPS, 2011; Kartesz, 1988).

Prior to surveys completed for this project, Wheeler's skeletonweed was known in California mainly from the Death Valley region (CNPS, 2011), and the nearest known locality to the HHSEGS site was about 50 miles north, in dunes at the base of the Last Chance Range, east of Death Valley (Jepson Online Interchange, 2011). Thus, localities found during surveys for this project have resulted in a 50-mile southern range extension for this species in California. The Consortium lists 38 specimen records for this species (Jepson Online Interchange, 2011). The CNDDB lists ten EOs for Wheeler's skeletonweed (CNDDB, 2011a), of which three are recent and seven are historic. Wheeler's skeletonweed is also known from Nevada and Oregon (Cronquist et al., 1994; Kartesz, 1988).

During the 2011 late-season survey, Wheeler's skeletonweed was mapped in three localities within the 250-foot buffer, with a total of 39 individuals (Table 3-2). Figures 3 and 4 (Appendix A) show these localities. Wheeler's skeletonweed was not identified within the HHSEGS site during the 2010 late-season survey.

Wheeler's skeletonweed was also found in several locations within the linear corridors. During offsite surveys conducted for this project, Wheeler's skeletonweed was found in several additional new locations in Inyo County, California, near the California-Nevada state line.

Wheeler's skeletonweed is not state or federally listed. In California, Wheeler's skeletonweed is designated CRPR 2.2. The CNDDB classifies it as G4 S1S2, meaning that globally it is apparently secure, and in California it is imperiled to critically imperiled (CNDDB 2011b). In Nevada this species has no conservation status.

Pahrump Valley buckwheat (*Eriogonum bifurcatum*) – CRPR 1B.2

Pahrump Valley buckwheat is an annual herb in the Buckwheat Family (Polygonaceae). Its distinctive features include involucres (structures surrounding a group of flowers) that are sessile (attached directly

to the major branches) and upright; stout branches; and a strongly dichotomous (forked) branching pattern (Reveal 1971, 2010; Baldwin et al., 2002). Both living plants and skeletons are distinctive, and can be identified at a distance. Line drawings of Pahrump Valley buckwheat are included in Mozingo and Williams (1980) and Baldwin and others (2002). Photographs of this species can be viewed at the CalPhotos website, and in Appendix D.

The habitat for Pahrump Valley buckwheat in California has been described as sandy soil areas in chenopod scrub at 2,330 to 2,625 feet in elevation (CNPS, 2011; CNDDB, 2011a). In Nevada, the habitat is described as barren, saline, heavy clay or silty hardpan soils on and near dry playa margins, and on adjacent shore terraces and stabilized sand dunes, at 2,300 to 2,800 feet (Reveal, 2010; NNHP, 2001, Knight, 1988). Pahrump Valley buckwheat has been described as endemic to the Pahrump, Stewart, Mesquite and Sandy valleys, near the California-Nevada border (ibid.). It was noted by Beatley (1976) as common near the California-Nevada border west of the town of Pahrump.

Prior to studies conducted for the HHSEGS project, the most recent comprehensive account of Pahrump Valley buckwheat in Nevada is provided by the Nevada Natural Heritage Program's 2001 rare plant fact sheet for this species (NNHP, 2001). Population census information from this fact sheet states that 18 occurrences are known for Pahrump Valley buckwheat in Nevada using a mapping separation of 1.0 km (0.6 mile), or 47 occurrences if a separation of 0.16 km (0.1 mile) is used. Some of these occurrences were surveyed by Knight in 1988 (Knight, 1988). The NNHP fact sheet also states that the total estimated number of individuals in Nevada is 1,109 or more, and the total estimated area occupied by this species is 651 or more hectares (1,609 or more acres) (ibid.). In California, the Consortium includes two records, that are duplicates of a single collection from the southern Pahrump Valley, collected in 1941 by Carl Wolf (Jepson Online Interchange, 2011).

During protocol-level surveys within the HHSEGS site and 250-foot buffer, Pahrump Valley buckwheat was found to be common in shadscale scrub in the western half of the site and buffer (CH2M HILL, 2011a). Figures 2 through 4 (Appendix A) show the locations of Pahrump Valley buckwheat mapped during the 2010 and 2011 late-season surveys. More than 10,000 individuals were observed in 47 localities in 2010 (Table 3-1). In 2011, 10 localities with 4,688 individuals were mapped in the temporary construction laydown and parking area and 250-ft buffer (Table 3-2). Information on data collected during the spring 2011 surveys is provided in a separate report.

Offsite surveys in California and Nevada conducted as a part of this project confirmed the existence of large populations of Pahrump Valley buckwheat in previously known locations and in new locations. In California, populations with thousands of individuals, including some with at least 100,000 plants and some much larger, were documented in Stewart Valley, northern and southern Pahrump Valley, and in Chicago Valley. The Chicago Valley locality, with at least 100,000 individuals, was newly discovered during offsite surveys for this project. It is on the west side of the Nopah Range, so it represents an extension of this species into a new watershed to the west of its previously known range. In Nevada, populations with at least 100,000 plants, some much larger, were documented in Stewart Valley, on the east side of Stewart Dry Lake. Additional large populations were documented in Nevada in the northern Pahrump Valley, within and near the town of Pahrump and northeast of Pahrump Dry Lake. One new locality of 5,000 or more individuals was found in the linear corridor.

Pahrump Valley buckwheat is not state or federally listed. It is designated as CRPR 1B.2 Until 2010, Pahrump Valley buckwheat was documented in California from only four CNDDB Element Occurrences (EOs #1-4). In 2010 CNPS changed the status of Pahrump Valley buckwheat from 1B.1 to 1B.2, and added five new EOs for this species to its database (EOs #5-9). These new records are from the Kingston Spring and Kingston Peak USGS 7.5-minute quadrangles (Thomas 2001, CNDDB 2010a) and, if accurate, they would represent a range expansion to the west in California for this species, compared with previous accounts (Reveal 2010). These newly added occurrences are based on data collected in 1997 from a project to map the vegetation of the central Mojave Desert (Thomas 2001). There do not appear to be voucher specimens from the locations represented by EOs #5-9, and those localities have not been

checked recently, so the current status of Pahrump Valley buckwheat in these locations is uncertain. Of the nine current EOs, seven are recent and two are historic (CNDDB 2011a).

The CNDDB ranking of Pahrump Valley buckwheat is G2 S2. The Nevada Natural Heritage Program also ranks it G2 S2 (NNHP 2010). Pahrump Valley buckwheat is a BLM sensitive species in California and Nevada.

Goodding's phacelia (*Phacelia pulchella* var. *gooddingii*) – CRPR 2.3

Goodding's phacelia is a small, purple-flowered annual herb in the Waterleaf Family (Hydrophyllaceae). Its distinctive features include flowers that are all purple, stamens that are included within the corolla (flower), and leaves that are longer than wide, and entire to only slightly lobed (Baldwin et al. 2002). It flowers from April to July (ibid.). Line drawings of this species are found in Baldwin and others (2002). Photos can be viewed on the CalPhotos website, and in Appendix D.

In California, the habitat of Goodding's phacelia has been described as alkaline clay soils in Mojave Desert scrub, from 2,500 to 3,280 feet in elevation (CNPS, 2011; CNDDB, 2011a). In Nevada, it grows on gravelly slopes, valleys and flats, mostly on alkaline or gypsum alluvial clay soils, at 1,000 to 5,000 feet in elevation (Kartesz, 1988).

Prior to 2010, Goodding's phacelia was known in California only from Mesquite Valley (Jepson Online Interchange 2011), and possibly from Salsberry Pass in the Amargosa Mountains, south of Death Valley. One specimen previously identified as this species from Clark Mountain has been re-examined by Andrew Sanders and is actually *Phacelia barnebyana* (ibid.). The Consortium contains five records for this species, from San Bernardino and Inyo counties (Jepson Online Interchange 2011). The CNDDB (2011a) lists six EOs for Goodding's phacelia, of which three are recent and three are historic. It is also known from Nevada, Arizona and Utah (Kartesz, 1988).

During the 2011 late-season survey, this species was mapped in the HHSEGS site in 3 locations with 200 individuals (Table 3-2). These locations are shown in Figures 3 and 4 (Appendix A). During the 2010 late-season survey fragile skeletons thought likely to be Goodding's phacelia were seen within the site. The identity of these was uncertain, so they were not mapped.

Goodding's phacelia was also found in a number of locations within the linear corridor. During offsite surveys conducted for this project, Goodding's phacelia was found in several additional new offsite locations in Inyo County, California. These finds are addressed in separate reports.

Goodding's phacelia is not state or federally listed. In California, this species has a rank of CRPR 2.3 (CNDDB, 2011). In Nevada Goodding's phacelia has no conservation status.

SECTION 4

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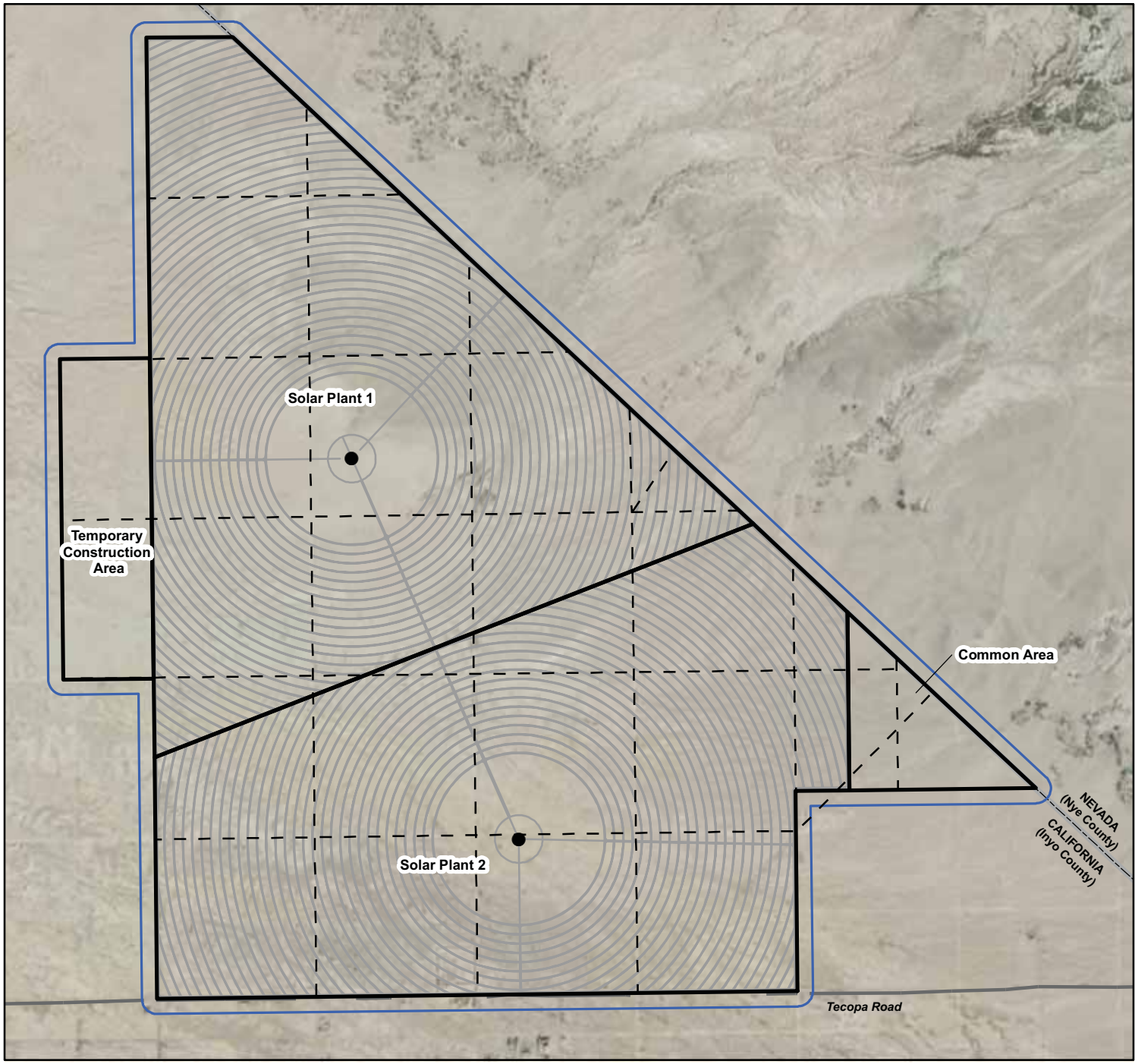
Appendix A
Figures



LEGEND

- Solar Power Tower
- Site Road
- Solar Field Heliostat Arrays
- HHSEGS Boundary
- 250-foot Buffer

Data Source: GANDA Botanical Survey, 2011

N

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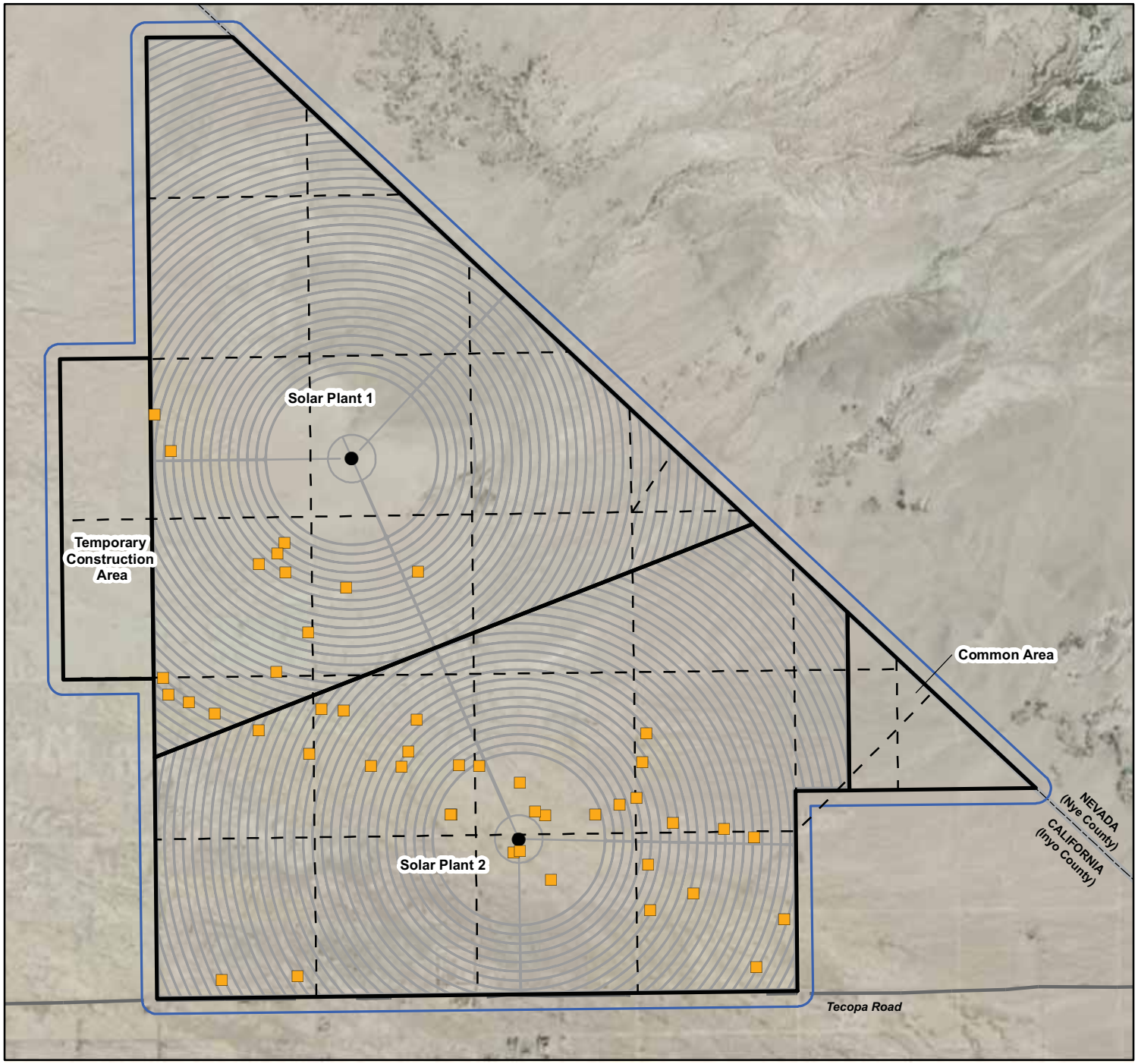
Feet

Figure 1
2010 and 2011 Late-Season Survey Area Boundaries
Hidden Hills Solar Electric Generating System



LEGEND

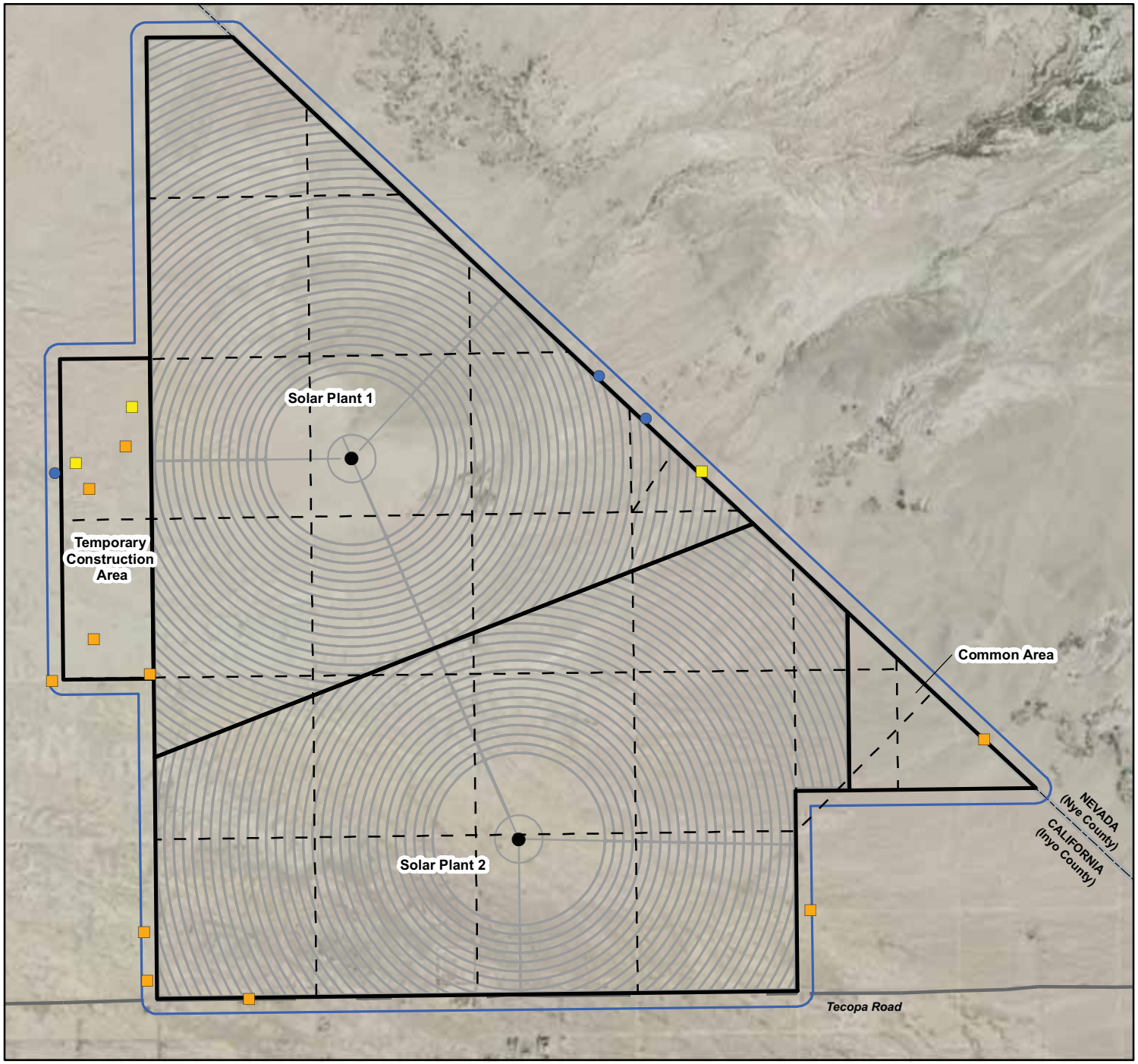
- *Eriogonum bifurcatum* (Pahrump Valley buckwheat)
- Solar Power Tower
- Site Road
- Solar Field Heliostat Arrays
- HHSEGS Boundary
- 250-foot Buffer

Data Source: GANDA Botanical Survey, 2011

N

0 1,200 2,400
Feet

Figure 2
2010 Late-Season Survey Results, Special-Status Plants
Hidden Hills Solar Electric Generating System



LEGEND

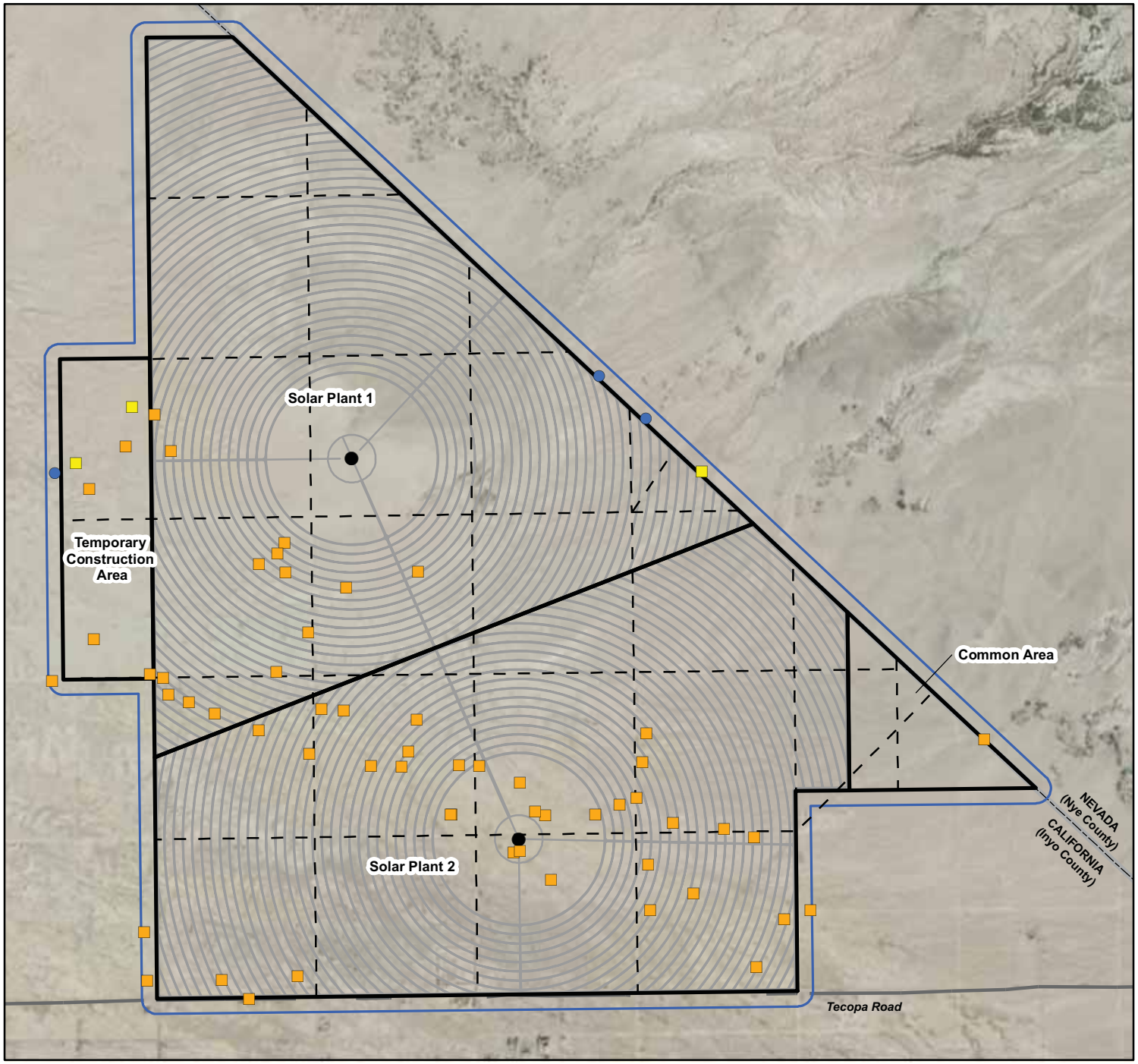
- *Chaetadelpha wheeleri* (Wheeler's skeletonweed)
- *Eriogonum bifurcatum* (Pahrump Valley buckwheat)
- *Phacelia pulchella var. gooddingii* (Goodding's phacelia)
- Solar Power Tower
- Site Road
- Solar Field Heliostat Arrays
- HHSEGS Boundary
- 250-foot Buffer

Data Source: GANDA Botanical Survey, 2011

N

0 1,200 2,400
Feet

Figure 3
2011 Late-Season Survey Results, Special-Status Plants
Hidden Hills Solar Electric Generating System



LEGEND

- *Chaetadelpha wheeleri* (Wheeler's skeletonweed)
- *Eriogonum bifurcatum* (Pahrump Valley buckwheat)
- *Phacelia pulchella var. gooddingii* (Goodding's phacelia)
- Solar Power Tower
- Site Road
- Solar Field Heliostat Arrays
- HHSEGS Boundary
- 250-foot Buffer

Data Source: GANDA Botanical Survey, 2011

N

0 1,200 2,400
Feet

Figure 4
2010 amd 2011 Late-Season Survey Results, Special-Status Plants
Hidden Hills Solar Electric Generating System

Appendix B
Tables

TABLE B-1
Species of special-status plants with potential to occur within the HHSEGS site that were identifiable during 2010 and 2011 late-season surveys, Inyo County, California.

Common Name/ Scientific Name	Conservation Status (Fed/CA/ CNPS)	Habitat Preferences	Flowering Period	Potential to Occur within the Study Area, as Estimated Prior to Surveys
Preuss' milk-vetch *Astragalus preussii* var. *preussii*	CRPR 2.3	Chenopod scrub, Mojave desert scrub; clay. 750-780m	May-June	**Low.** Nearest known localities are about 15 mi SE in Mesquite Valley in CA, and about 30 mi NW in Ash Meadows National Wildlife Refuge in NV. Found W of HHSEGS site during late-season surveys conducted for this project.
Tecopa bird's-beak *Cordylanthus (=Chloropyron) tecopensis*	CRPR 1B.2	Mojave desert scrub, meadows and seeps; mesic, alkaline. 60-900m	July-Oct	**Very Low**. Nearest known locality near Tecopa, about 15 mi W of the study area.
White-flowered rabbitbrush (*Ericameria [=Chrysothamnus] albida*)	CRPR 4.2	Chenopod scrub, meadows and seeps, playas; saline or alkaline. 300-1950m	June-Nov	**Low**. Nearest known locations near Tecopa and Shoshone, about 15-20 mi W of the study area.
Pahrump Valley buckwheat (*Eriogonum bifurcatum*)	CRPR 1B.2	Chenopod scrub; sandy. 700-810m	Apr-June (Sept-Oct)	**High**. Nearest known location within HHSEGS site. Many new localities documented within HHSEGS site and offsite during surveys conducted for this project.
Hot springs fimbristylis (*Fimbristylis thermalis*)	CRPR 2.2	Meadows and seeps; alkaline, near hot springs. 110-1340m	July-Sept	**Very Low**. Nearest known locality near Shoshone, 20 mi W of study area.
Ash Meadows gumplant (*Grindelia fraxinipratensis*)	FT CRPR 1B.2	Meadows and seeps; mesic clay. 635-700m	June-Oct	**Very Low**. Known from 3 extant EOs in CA. Nearest known localities in Carson Slough, Amargosa River drainage, about 30 mi NW of the study area.
Copperwort (*Iva acerosa*)	CRPR 4.2	Meadows and seeps (alkaline), playas (saline). 60-900m	May-Dec	**Very Low**. Nearest known locality Tecopa Hot Springs, about 15 mi W of the project area.
Cooper's rush (*Juncus cooperi*)	CRPR 4.3	Meadows and seeps; mesic, alkaline or saline. 260-1770m	Apr-May (Aug)	**Very Low**. Nearest known localities Tecopa and Shoshone, about 15-20 mi W of study area.
Wing-seed blazing star (*Mentzelia pterosperma*)	CRPR 2.2	Mojave desert scrub; gypsum soils. 1,140m	Apr-June	**Very Low**. Known from two locations in CA, near Valley Wells and Clark Mtn, about 35 mi S of study area. Found in one location W of HHSEGS site during offsite survey for this project.
Amargosa nitrophila (*Nitrophila mohavensis*)	FE SE CRPR 1B.1	Playas; mesic, clay. 425-750m.	May-Oct	**Very Low**. Fewer than 5 EOs in CA, mainly near Carson Slough in the Amargosa Desert. Nearest known location near Tecopa, about 15 mi SW of the study area.

TABLE B-1

Species of special-status plants with potential to occur within the HHSEGS site that were identifiable during 2010 and 2011 late-season surveys, Inyo County, California.

Common Name/ Scientific Name	Conservation Status (Fed/CA/ CNPS)	Habitat Preferences	Flowering Period	Potential to Occur within the Study Area, as Estimated Prior to Surveys
Desert wing-fruit (*Sellnocarpus nevadensis*)	CRPR 2.3	Joshua tree woodland, Mojave desert scrub; rocky. 1160-1250m.	June-Sept	**Very Low**. Known in CA from 1 location, NE end of the Kingston Range, about 10 mi SE of the study area. Found within the HHSEGS site and in offsite locations during surveys completed for this project.

Status Codes:

Federal Status
FE – Federally listed as endangered
FT – Federally listed as threatened
State Status
SE – State listed as endangered
ST – State listed as threatened
SR – State listed as rare
California Rare Plant Rank (CRPR) Status
1A – Plants presumed extinct in California
1B – Plants rare, threatened, or endangered in California and elsewhere
2 – Plants rare, threatened, or endangered in California, but more common elsewhere
3 – Plants about which we need more information – a review list
4 – Plants of limited distribution – a watch list

CRPR threat code extensions:
1 -- Seriously endangered in California.
2 -- Fairly endangered in California.
3 -- Not very endangered in California.
? -- Not determined.

Appendix C
List of Plant Species Observed Within the HHSEGS Site and 250-foot Buffer During Surveys in 2010 and 2011

TABLE C-1
Plant Species Observed Within the HHSEGS Site and the 250-foot Buffer In 2010 and 2011

Scientific Name	Common Name	Site	250' Site Buffer	Life Form
	GYMNOSPERMS			
Cupressaceae	**Cypress Family**			
Cupressus arizonica var. *glabra**	blue Arizona cypress	x		tree
Ephedraceae	**Ephedra Family**			
Ephedra funerea	Death Valley ephedra	x	x	shrub
Ephedra nevadensis	Nevada ephedra	x	x	shrub
	FLOWERING PLANTS: DICOTS			
Amaranthaceae	**Amaranth Family**			
*Amaranthus albus**	tumbleweed	x		annual
Apiaceae	**Carrot Family**			
Cymopterus multinervatus	purplenerve springparsley	x		perennial
Asclepiadaceae	**Milkweed Family**			
Asclepias erosa	desert milkweed	x	x	perennial
Asteraceae	**Sunflower Family**			
Acamptopappus shockleyi	Shockley's goldenhead	x	x	shrub
Acamptopappus sphaerocephalus var. sphaerocephalus	goldenhead	x	x	shrub
*Acroptilon repens**	Russian knapweed	x		annual
Adenophyllum cooperi	Cooper's dogweed	x		subshrub
Ambrosia dumosa	burrobush	x	x	shrub
Baccharis brachyphylla	short-leaf baccharis	x	x	shrub
Baccharis sergiloides	desert baccharis		x	shrub
Baileya multiradiata var. *multiradiata*	desert marigold	x	x	annual
Baileya pleniradiata	woolly desert marigold	x	x	annual
Calycoseris wrightii	white tackstem		x	annual
Chaenactis carphoclinia	pebble pincushion	x	x	annual
Chaenactis fremontii	desert pincushion	x	x	annual
Chaenactis macrantha	Mojave pincushion	x	x	annual
Chaenactis stevioides	desert pincushion	x	x	annual
Chaetadelpha wheeleri	Wheeler's dune broom	x	x	perennial
Chrysothamnus nauseosus	rubber rabbitbrush	x		shrub
Encelia virginensis	Virgin River encelia	x	x	shrub
Eriophyllum wallacei	Wallace's woolly daisy	x	x	annual
Glyptopleura marginata	carved seed	x	x	annual
Gutierrezia microcephala	broom snakeweed	x	x	shrub
Gutierrezia sarothrae	broom snakeweed	x	x	shrub
Hymenoclea salsola	cheesebush	x	x	shrub
Isocoma acradenia	goldenbush	x		shrub
Malacothrix coulteri	snake's head	x		annual
Malacothrix glabrata	desert dandelion	x	x	annual
Monoptilon bellioides	desert star	x	x	annual
Pectis papposa	chinchweed	x		annual
Prenanthella exigua	brightwhite	x	x	annual
Psathyrotes annua	turtleback	x	x	annual
Psilostrophe cooperi	paper-daisy	x	x	subshrub
Rafinesquia neomexicana	desert chicory	x	x	annual
Stephanomeria exigua	small wire-lettuce	x		annual
Stephanomeria pauciflora	wire-lettuce	x	x	perennial
Stylocline micropoides	desert nest-straw	x		annual

TABLE C-1
Plant Species Observed Within the HHSEGS Site and the 250-foot Buffer In 2010 and 2011

Scientific Name	Common Name	Site	250' Site Buffer	Life Form
Tetradymia axillaris	cotton-thorn		x	shrub
Xylorhiza tortifolia	Mojave aster	x	x	perennial
Boraginaceae	**Borage Family**			
Amsinckia tessellata	fiddleneck	x	x	annual
Cryptantha angustifolia	narrow leaved cryptantha	x	x	annual
Cryptantha barbigera	bearded cryptantha		x	annual
Cryptantha circumscissa	cushion cryptantha	x	x	annual
Cryptantha micrantha ssp. *micrantha*	purple-rooted cryptantha	x	x	annual
Cryptantha nevadensis	Nevada cryptantha	x	x	annual
Cryptantha pterocarya	wingnut cryptantha	x	x	annual
Cryptantha recurvata	curved cryptantha	x	x	annual
Cryptantha virginensis	Virgin River cat's-eye	x		annual
Heliotropium curassavicum	heliotrope		x	perennial
Lappula redowskii var. *cupulata*	stickseed	x	x	annual
Pectocarya heterocarpa	chuckwalla combseed	x	x	annual
Pectocarya platycarpa	broadfruit combseed	x	x	annual
Pectocarya recurvata	curvenut combseed		x	annual
Plagiobothrys jonesii	Jones' popcorn flower	x		annual
Brassicaceae	**Mustard Family**			
Caulanthus cooperi	Cooper's jewelflower	x	x	annual
*Chorispora tenella**	blue mustard	x		annual
Descurainia pinnata ssp. *glabra*	tansy mustard	x	x	annual
*Descurainia sophia**	flix weed	x	x	annual
Guillenia lasiophylla	California mustard	x	x	annual
Lepidium fremontii	desert alyssum	x	x	subshrub
Lepidium lasiocarpum var. *lasiocarpum*	modest peppergrass	x	x	annual
*Malcolmia africana**	African mustard	x	x	annual
*Sisymbrium altissimum**	tumble mustard	x	x	annual
*Sisymbrium irio**	London rocket	x	x	annual
*Sisymbrium orientale**	Indian hedge mustard		x	annual or perennial
Stanleya pinnata var. *pinnata*	prince's-plume	x	x	subshrub
Streptanthella longirostris	longbeak streptanthella	x	x	annual
Cactaceae	**Cactus Family**			
Opuntia basilaris var. *basilaris*	beavertail cactus	x	x	stem succulent
Opuntia echinocarpa	silver cholla	x	x	stem succulent
Opuntia ramosissima	pencil cholla	x		stem succulent
Chenopodiaceae	**Goosefoot Family**			
Atriplex canescens	four-wing saltbush	x	x	shrub
Atriplex confertifolia	shadscale	x	x	shrub
Atriplex polycarpa	allscale	x	x	shrub
*Halogeton glomeratus**	halogeton	x	x	annual
Kraschenninikovia lanata	winter fat	x	x	shrub
*Salsola sp.**	Russian thistle	x	x	annual
Convolvulaceae	**Morning Glory Family**			
*Convolvulus arvensis**	bindweed		X	perennial herb/vine
Cuscutaceae	**Dodder Family**			
Cuscuta cf. californica	California dodder	x	X	parasitic vine
Euphorbiaceae	**Spurge Family**			
Chamaesyce albomarginata	rattlesnake weed	x	X	perennial

TABLE C-1
Plant Species Observed Within the HHSEGS Site and the 250-foot Buffer In 2010 and 2011

Scientific Name	Common Name	Site	250' Site Buffer	Life Form
Chamaesyce micromera	desert spurge	x		annual
Fabaceae	**Pea Family**			
Astragalus lentiginosus var. *fremontii*	freckled milk-vetch	x	X	perennial
Astragalus nuttallianus	Nuttall locoweed	x	X	annual
Astragalus nyensis	Nye milk-vetch	x	X	annual
Astragalus preussii var. *preussii*	Preuss' milk-vetch	x	X	perennial
Astragalus sabulonum	gravel milk-vetch	x	X	annual
Astragalus tidestromii	Tidestrom's milk-vetch	x	X	perennial
*Gleditsia triacanthos**	honey locust	x		tree
Hoffmannseggia glauca	hog potato	x	X	perennial
Prosopis glandulosa	honey mesquite	x	X	shrub
Psorothamnus arborescens var. *arborescens*	Mojave indigo bush	x	X	shrub
Senna armata	desert senna	x		shrub
Geraniaceae	**Geranium Family**			
*Erodium cicutarium**	red-stemmed filaree	x	x	annual
Hydrophyllaceae	**Waterleaf Family**			
Nama demissum	purple mat	x	x	annual
Phacelia crenulata var. *ambigua*	purple phacelia	x	x	annual
Phacelia fremontii	Fremont's phacelia	x	x	annual
Phacelia ivesiana	Ives' phacelia		x	annual
Phacelia pulchella var. *gooddingii*	Goodding's phacelia	x	x	annual
Krameriaceae	**Rhatany Family**			
Krameria erecta	pima ratany	x	x	shrub
Lamiaceae	**Mint Family**			
Salazaria mexicana	Mexican bladder sage	x		shrub
Loasaceae	**Sandpaper-plant Family**			
Mentzelia cf. albicaulis	little blazing star	x	x	annual
Malvaceae	**Mallow Family**			
Eremalche rotundifolia	desert five-spot	x		annual
Sphaeralcea ambigua	desert mallow	x	x	subshrub
Sphaeralcea emoryi	Emory's globemallow	x	x	subshrub
Nyctaginaceae	**Four-o'clock Family**			
Mirabilis bigelovii	wishbone bush	x		perennial
Selinocarpus nevadensis	desert moonpod	x		perennial
Oleaceae	**Olive Family**			
Menodora spinescens	spiny menodora	x	x	shrub
Fraxinus sp.*	ash		x	tree
Onagraceae	**Evening-primrose Family**			
Camissonia boothii	Booth's sun cup	x	x	annual
Camissonia brevipes	yellow cups	x	x	annual
Camissonia claviformis	brown-eyed evening-primrose	x		annual
Camissonia refracta	narrowleaf suncup	x	x	annual
Gaura coccinea	scarlet beeblossom	x	x	perennial
Oenothera primiveris	yellow evening-primrose	x	x	annual

TABLE C-1
Plant Species Observed Within the HHSEGS Site and the 250-foot Buffer In 2010 and 2011

Scientific Name	Common Name	Site	250' Site Buffer	Life Form
Papaveraceae	**Poppy Family**			
Eschscholzia glyptosperma	desert golden poppy	x		annual
Plantaginaceae	**Plantain Family**			
Plantago ovata	woolly plantain	x	x	annual
Polemoniaceae	**Phlox Family**			
Aliciella hutchinsifolia	Marta's Beckett's tutu	x	x	annual
Gilia sp.	gilia	x	x	annual
Gilia cana ssp. *speciformis*	showy gilia	x	x	annual
Gilia stellata	star gilia	x	x	annual
Ipomopsis polycladon	branching gilia	x	x	annual
Langloisia setosissima ssp. *setosissima*	lilac sunbonnet	x	x	annual
Linanthus jonesii	Jones' linanthus	x		annual
Loeseliastrum matthewsii	desert calico	x	x	annual
Loeseliastrum schottii	Schott's calico	x	x	annual
Polygonaceae	**Buckwheat Family**			
Chorizanthe brevicornu var. *brevicornu*	brittle spineflower	x	x	annual
Chorizanthe rigida	rigid spiny-herb	x	x	annual
Eriogonum bifurcatum	Pahrump Valley buckwheat	x	x	annual
Eriogonum brachypodum	glandular skeleton-weed	x	x	annual
Eriogonum inflatum var. *inflatum*	desert trumpet	x	x	perennial
Eriogonum nidularium	birdnest buckwheat	x		annual
Eriogonum trichopes	little desert trumpet	x	x	annual
Ranunculaceae	**Buttercup Family**			
Delphinium parishii var. *parishii*	desert larkspur	x		perennial
Rosaceae	**Rose Family**			
*Prunus persica**	peach (planted)	x		tree
Scrophulariaceae	**Figwort Family**			
Antirrhinum filipes	tangled snapdragon	x	x	annual
Antirrhinum kingii	King's snapdragon		x	annual
Castilleja angustifolia	desert paintbrush	x	x	perennial
Solanaceae	**Nightshade Family**			
Datura wrightii	devil's trumpet	x		perennial
Lycium andersonii	Anderson's box-thorn	x	x	shrub
Lycium cooperi	Cooper's box-thorn	x	x	shrub
Lycium pallidum var. *oligospermum*	rabbit-thorn	x	x	shrub
Tamaricaceae	**Tamarisk Family**			
*Tamarix ramosissima**	tamarisk	x	x	tree
Zygophyllaceae	**Caltrop Family**			
Larrea tridentata	creosote bush	x	x	shrub
	FLOWERING PLANTS: MONOCOTS			
Liliaceae	**Lily Family**			
Androstephium breviflorum	pink funnel-lily	x	x	perennial
Calochortus flexuosus	winding mariposa lily	x		perennial
Dichelostemma capitatum var. *pauciflora*	desert blue dicks	x		perennial

TABLE C-1
Plant Species Observed Within the HHSEGS Site and the 250-foot Buffer In 2010 and 2011

Scientific Name	Common Name	Site	250' Site Buffer	Life Form
Poaceae	**Grass Family**			
Achnatherum hymenoides	Indian ricegrass	x	x	perennial
Achnatherum speciosum	desert needlegrass	x		perennial
Bromus madritensis ssp. *rubens**	red brome	x	x	annual
*Bromus tectorum**	cheat grass	x	x	annual
*Cynodon dactylon**	Bermuda grass	x	x	perennial
Elymus elymoides	squirreltail	x	x	perennial
Erioneuron pulchellum	fluff grass	x		perennial
Hordeum murinum ssp. *leporinum**	foxtail barley	x	x	annual
Muhlenbergia porteri	Porter's muhly	x		perennial
Pleuraphis rigida	big galleta	x	x	perennial
*Schismus arabicus**	Mediterranean grass	x	x	annual
Sporobolus airoides	alkali sacaton	x		perennial
Vulpia octoflora	sixweeks fescue	x	x	Annual

Source: GANDA field surveys conducted for the HHSEGS project in 2010 and 2011.

Appendix D
Photographs

Pahrump Valley buckwheat (*Eriogonum bifurcatum*), HHSEGS site, October 2010. (Photo by Bill Clark).

Pahrump Valley buckwheat, in flower, HHSEGS site, October 2010. (Photo by Bill Clark)

Wheeler's skeletonweed (*Chaetadelpha wheeleri*) (Photo by Bill Clark)

Gooddings phacelia (Phacelia pulchella var. gooddingii) (Photo by Bill Clark)

Wing-seed blazing star (*Mentzelia pterosperma*) (Photo by Bill Clark)

Shadscale scrub habitat of Pahrump Valley buckwheat, HHSEGS site, October 2010.

Mojave Desert scrub, HHSEGS site, October 2010.

Shadscale scrub, infested with the noxious weed halogeton (*Halogeton glomeratus*), HHSEGS site 250-foot buffer, October 2011.

Shadscale scrub, infested with the noxious weed halogeton, HHSEGS site, Temporary Construction Area, October 2011.

Halogeton, Caliornia Dept. of Food and Agriculture A-rated noxious weed, HHSEGS site, October 2011.