

## 5.3 Cultural Resources

### 5.3.1 Introduction

This section evaluates the potential effects on cultural resources from the construction and operation of the Hidden Hills Solar Electric Generating System (HHSEGS).

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. Solar Plant 1 will occupy approximately 1,483 acres (or 2.3 square miles), and Solar Plant 2 will occupy approximately 1,510 acres (or 2.4 square miles). 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.

Each solar plant will use heliostats—elevated mirrors guided by a tracking system mounted on a pylon—to focus the sun’s rays on a solar receiver steam generator (SRSG) atop a tower near the center of each solar field. The solar power tower technology for the HHSEGS project design incorporates an important technology advancement, the 750-foot-tall solar power tower. One principle advantage of the HHSEGS solar power tower design is that it results in more efficient land use and greater power generation. The new, higher, 750-foot solar power tower allows the heliostat rows to be placed closer together, with the mirrors at a steeper angle. This substantially reduces mirror shading and allows more heliostats to be placed per acre. More megawatts can be generated per acre and the design is more efficient overall.

In each solar plant, one Rankine-cycle steam turbine will receive steam from the SRSG (or solar boiler) to generate electricity. The solar field and power generation equipment will start each morning after sunrise and, unless augmented, will shut down when insolation drops below the level required to keep the turbine online. Each solar plant will include a natural-gas-fired auxiliary boiler, used to augment the solar operation when solar energy diminishes or during transient cloudy conditions, as well as a startup boiler, used during the morning startup cycle, and a nighttime preservation boiler, used to maintain system temperatures overnight. On an annual basis heat input from natural gas will be limited by fuel use and other conditions to less than 10 percent of the heat input from the sun.

To save water in the site’s desert environment, each solar plant will use a dry-cooling condenser. Cooling will be provided by air-cooled condensers, supplemented by a partial dry-cooling system for auxiliary equipment cooling. Raw water will be drawn daily from onsite wells located in each power block and at the administration complex. Groundwater will be treated in an onsite treatment system for use as boiler make-up water and to wash the heliostats.

Two distinct transmission options are being considered because of a unique situation concerning Valley Electric Association (VEA). Under the first option, the project would interconnect via a 230-kilovolt (kV) transmission line to a new VEA-owned substation

(Tap Substation) at the intersection of Tecopa Road<sup>1</sup> and Nevada State Route (SR) 160 (the Tecopa/SR 160 Option). The other option is a 500-kV transmission line that interconnects to the electric grid at the Eldorado Substation (the Eldorado Option), in Boulder City, Nevada.

A 12- to 16-inch-diameter natural gas pipeline will be required for the project. It will exit the HHSEGS site at the California-Nevada border and travel on the Nevada side southeast along the state line, then northeast along Tecopa Road until it crosses under SR 160. From this location a 36-inch line will turn southeast and continue approximately 26 miles, following the proposed Eldorado Option transmission line corridor, to intersect with the Kern River Gas Transmission (KRGT) pipeline. A tap station will be constructed at that point to connect it to the KRGT line. The total length of the natural gas pipeline will be approximately 35.3 miles.

The transmission and natural gas pipeline alignments will be located in Nevada, primarily on federal land managed by the U.S. Bureau of Land Management (BLM), except for small segments of the transmission line (both options) in the vicinity of the Eldorado Substation, which is located within the city limits of Boulder City, Nevada. A detailed environmental impact analysis of the transmission and natural gas pipeline alignments will be prepared by BLM.

This section determines whether cultural resources are present and could be affected adversely by HHSEGS construction and operation. The significance of any potentially affected resources is assessed, and measures are proposed to mitigate potential adverse project effects. This study was conducted by Clint Helton, M.A., RPA, a Cultural Resource Specialist who meets the qualifications for Principal Investigator stated in the Secretary of the Interior's standards and guidelines for archaeology and historic preservation (USNPS, 1983). This study was performed consistent with California Environmental Quality Act (CEQA) compliance procedures and Section 106 of the National Historic Preservation Act (NHPA) set forth at 36 CFR 800.

This section is consistent with state regulatory requirements for cultural resources pursuant to CEQA. The study scope was developed in consultation with the California Energy Commission's (CEC) cultural resources staff and complies with *Instructions to the California Energy Commission Staff for the Review of and Information Requirements for an Application for Certification* (CEC, 1992) and *Regulations Pertaining to the Rules of Practice and Procedure and Power Plant Site Certification* (CEC, 2007).

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<sup>1</sup> The road is also called Tecopa Highway and Old Spanish Trail Highway. The names are generally used interchangeably.

Cultural resources include prehistoric and historic archaeological sites;<sup>2</sup> districts and objects; standing historic structures, buildings, districts, and objects; and locations of important historic events, or sites of traditional/cultural importance to various groups.<sup>3</sup>

Section 5.3.2 discusses the laws, ordinances, regulations, and standards (LORS) applicable to the protection of cultural resources. Section 5.3.3 describes the cultural resources environment that might be affected by the project. The environmental analysis to determine potential impacts and potential cumulative impacts on cultural resources as a result of construction and operation of the project are provided in Sections 5.3.4 and 5.3.5, respectively. Section 5.3.6 presents mitigation measures that will be implemented to avoid construction impacts. Section 5.3.7 lists the agencies involved and agency contacts, and Section 5.3.8 discusses permits and the permitting schedule. Section 5.3.9 lists reference materials used in preparing this section.

Per CEC data adequacy requirements, Appendix 5.3A provides copies of agency consultation letters. Confidential Appendix 5.3B provides the technical report including Department of Parks and Recreation (DPR) 523 forms for newly-recorded resources. Confidential Appendix 5.3C provides a copy of the California Historical Resources Information System's (CHRIS) literature search results including copies of previous technical reports occurring within 0.25 mile of the project, and DPR 523 forms for previously recorded resources occurring within 1 mile of the project and 0.25 mile of linear facilities. Appendix 5.3D provides names and qualifications of key personnel who contributed to this study. Confidential Appendix 5.3E provides maps of the project and known cultural resources that occur within one mile of the project or 0.25 mile of linear facilities.

### 5.3.2 Laws, Ordinances, Regulations, and Standards

Cultural resources are non-renewable scientific and educational resources and are protected by several federal and state statutes (California Office of Historic Preservation, 1983), most notably by the NHPA (36 California Code of Regulations [CFR] 800), the 1906 Federal Antiquities Act, and by the State of California's environmental regulations (CEQA, Section 15064.5) and Nevada's historic preservation statute (Historic Preservation and Archeology NRS 383.011, et seq.). HHSEGS construction will be conducted in accordance with all LORS

<sup>2</sup>Site: "The location of a significant event, a prehistoric or historic occupation or activity, or a building or structure...where the location itself possesses historic, cultural, or archeological value." (USNPS-IRD 1991:15).

<sup>3</sup>The federal definitions of cultural resource, historic property or historic resource, traditional use area, and sacred resources are reviewed below and are typically applied to non-federal projects.

- A cultural resource may be defined as a phenomenon associated with prehistory, historical events or individuals, or extant cultural systems. These include archaeological sites, districts, and objects; standing historic structures, districts, and objects; locations of important historic events; and places, objects, and living or non-living things that are important to the practice and continuity of traditional cultures. Cultural resources may involve historic properties, traditional use areas, and sacred resource areas.
- Historic property or historic resource means any prehistoric district, site building, structure, or object included in, or eligible for, inclusion in the National Register of Historic Places (NRHP). The definition also includes artifacts, records, and remains that are related to such a district, site, building, structure, or object.
- Traditional use area refers to an area or landscape identified by a cultural group to be necessary for the perpetuation of the traditional culture. The concept can include areas for the collection of food and non-food resources, occupation sites, and ceremonial and/or sacred areas.
- Sacred resources applies to traditional sites, places, or objects that Native American tribes or groups, or their members, perceive as having religious significance.

applicable to cultural resources. Federal, state, and local LORS applicable to cultural resources are summarized in Table 5.3-1 and discussed briefly below.

**TABLE 5.3-1**  
Laws, Ordinances, Regulations, and Standards Applicable to Cultural Resources

LORS	Requirements/Applicability	Administering Agency	AFC Section Explaining Conformance
<b>Federal</b>			
Antiquities Act of 1906	Protects archaeological resources on federal lands; requires inventory, assessment of effects, and mitigation if appropriate.	BLM	Section 5.3.6
National Historic Preservation Act	Protects archaeological resources on federal lands; requires inventory, assessment of effects, and mitigation if appropriate.	BLM	Section 5.3.6
Archaeological Resources Protection Act	Protects archaeological resources from vandalism and unauthorized collecting on federal land	BLM	Section 5.3.6
BLM State Office Cultural Resource Use Permit	General Permit to be obtained by archaeological contractor; Archaeological contractor to obtain Cultural Resource Use Permit from BLM prior to beginning work.	BLM	Section 5.3.8
BLM Southern Nevada Field Office BLM Field Use Authorization	Holder of Cultural Resource Use Permit obtains a Fieldwork Authorization for the Project from BLM Field Office.	BLM	Section 5.3.8
Archaeological Resources Protection Act (ARPA) of 1979, as amended Section 4	Holder of Cultural Resource Use Permit provides a research design and plan of work for the research Project to obtain an ARPA permit. This permit would be needed if subsurface investigations are needed to identify the National Register of Historic Places significance of an identified site	BLM	Section 5.3.8
Native American Graves Protection and Repatriation Act	Assigns ownership of Native American graves on federal land to Native American descendants or culturally affiliated organizations.	BLM	Section 5.3.8

**TABLE 5.3-1**  
Laws, Ordinances, Regulations, and Standards Applicable to Cultural Resources

<b>LORS</b>	<b>Requirements/Applicability</b>	<b>Administering Agency</b>	<b>AFC Section Explaining Conformance</b>
<b>State</b>			
California Environment Quality Act Guidelines	Project construction may encounter archaeological and/or historical resources.	CEC	Section 5.3.6
Health and Safety Code Section 7050.5	Construction may encounter Native American graves; coroner calls the Native American Heritage Commission (NAHC).	CEC	Section 5.3.6
Public Resources Code Section 5097.98	Construction may encounter Native American graves; NAHC assigns Most Likely Descendant.	CEC	Section 5.3.6
Historic Preservation and Archeology NRS 383.011 et seq.	Protects Native American graves on private, county and public land. Construction may encounter Native American graves. Report to Nevada Office of Historic Preservation.	Nevada Office of Historic Preservation	Section 5.3.6
<b>Local</b>			
Inyo County General Plan	Section 8.7.4 emphasizes protection, regulatory compliance, and Native American consultation.	County of Inyo	Section 5.3.6
Pahrump Regional Planning District Master Plan Update	Section 15 involves “an inventory of significant historical, archaeological, and architectural properties...and a statement of methods to encourage the preservation of those properties.”	Pahrump Regional Planning District, Nye County, Nevada.	Section 5.3.2.3.2
Nye County Comprehensive Plan	Section 2.14 involves “an inventory of significant historical, archaeological, and architectural properties...and a statement of methods to encourage the preservation of those properties.”	Nye County	Section 5.3.2.3.2

### 5.3.2.1 Federal LORS

Archaeological and architectural resources (buildings and structures) are protected through the NHPA of 1966 (16 United States Code [USC] 470f) and its implementing regulation, Protection of Historic Properties (36 CFR Part 800), the Archaeological and Historic Preservation Act of 1974, and the Archaeological Resources Protection Act of 1979. Section 106 of the NHPA requires federal agencies (Bureau of Indian Affairs, BLM, Bureau of Reclamation, U.S. Army Corps of Engineers, etc.), prior to implementing an “undertaking” (e.g., issuing a federal permit), to consider the effects of the undertaking on historic properties and to afford the Advisory Council on Historic Preservation (ACHP) and the

State Historic Preservation Office (SHPO) a reasonable opportunity to comment on any undertaking that would adversely affect properties eligible for listing on the NRHP. Section 101(d)(6)(A) of the NHPA allows properties of traditional religious and cultural importance to a tribe to be determined eligible for inclusion in the NRHP.

Under the NHPA, a find is significant if it meets the NRHP listing criteria at 36 CFR 60.4:

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and:

- That are associated with events that have made a significant contribution to the broad patterns of our history, or
- That are associated with the lives of persons significant in our past, or
- That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction, or
- That have yielded, or may be likely to yield, information important in prehistory or history.

Cultural institutions, lifeways, culturally valued viewsheds, places of cultural association, and other valued places and social institutions must also be considered under the National Environmental Policy Act (NEPA), Executive Order 12898, and sometimes other authorities.

The American Indian Religious Freedom Act of 1978 allows access to sites of religious importance to Native Americans. On federal land, the Archaeological Resources Protection Act (ARPA) and Native American Graves Protection and Repatriation Act (NAGPRA) would apply. ARPA assigns penalties for vandalism and the unauthorized collection of archaeological resources on federal land and provides for federal agencies to issue permits for scientific excavation by qualified archaeologists. NAGPRA assigns ownership of Native American graves found on federal land to their direct descendants or to a culturally affiliated tribe or organization and provides for repatriation of human remains and funerary items to identified Native American descendants.

If a federal permit of any kind is needed (such as a Clean Water Act Section 404 permit from the U.S. Army Corps of Engineers), the NHPA and its implementing regulations (16 USC 470 et seq., 36 CFR 800, 36 CFR 60, and 36 CFR 63) will apply. The NHPA establishes the federal government's policy on historic preservation and the programs, including the NRHP, through which that policy is implemented. Under the NHPA, historic properties include *"any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places"* (16 USC 470w (5)).

### **5.3.2.2 State LORS**

#### **5.3.2.2.1 California**

CEQA requires a review to determine if a project will have a significant effect on archaeological sites or a property of historic or cultural significance to a community or

ethnic group that is eligible for inclusion in the California Register of Historical Resources (CRHR) (CEQA Guidelines). CEQA equates a substantial adverse change in the significance of a historical resource with a significant effect on the environment (Section 21084.1 of the Public Resources Code) and defines substantial adverse change as demolition, destruction, relocation, or alteration that would impair historical significance (Section 5020.1). Section 21084.1 stipulates that any resource listed in, or eligible for listing in, the CRHR<sup>4</sup> is presumed to be historically or culturally significant.<sup>5</sup>

Resources listed in a local historic register or deemed significant in a historical resource survey (as provided under Section 5024.1g) are presumed historically or culturally significant unless the preponderance of evidence demonstrates they are not.

A resource that is not listed in or determined to be eligible for listing in the CRHR, is not included in a local register of historic resources, nor deemed significant in a historical resource survey, may nonetheless be historically significant (Section 21084.1; see Section 21098.1).

CEQA requires a Lead Agency to identify and examine environmental effects that may result in significant adverse effects. Where a project may adversely affect a unique archaeological resource,<sup>6</sup> Section 21083.2 requires the Lead Agency to treat that effect as a significant environmental effect and prepare an Environmental Impact Report. When an archaeological resource is listed in or is eligible to be listed in the CRHR, Section 21084.1 requires that any substantial adverse effect to that resource be considered a significant environmental effect. Sections 21083.2 and 21084.1 operate independently to ensure that potential effects on archaeological resources are considered as part of a project's environmental analysis. Either of these benchmarks may indicate that a project may have a potential adverse effect on archaeological resources.

Other state-level requirements for cultural resources management appear in the California Public Resources Code Chapter 1.7, Section 5097.5 (Archaeological, Paleontological, and Historical Sites), and Chapter 1.75, beginning at Section 5097.9 (Native American Historical, Cultural, and Sacred Sites) for lands owned by the state or a state agency.

<sup>4</sup>The CRHR is a listing of "...those properties which are to be protected from substantial adverse change." Any resource eligible for listing in the California Register is also to be considered under CEQA.

<sup>5</sup>A historical resource may be listed in the CRHR if it meets one or more of the following criteria: "(1) is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States; (2) is associated with the lives of persons important to local, California or national history; (3) embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or (4) has yielded or has the potential to yield information important in prehistory or history (...of the local area, California or the nation)" (Public Resources Code Section 5024.1, Title 14 CCR, Section 4852). Automatic CRHR listings include NRHP listed and determined eligible historic properties (either by the Keeper of the NRHP or through a consensus determination on a project review); State Historical Landmarks from number 770 onward; and Points of Historical Interest nominated from January 1998 onward. Landmarks prior to 770 and Points of Historical Interest may be listed through an action of the State Historical Resources Commission.

<sup>6</sup>Public Resources Code 21083.2 (g) defines a unique archaeological resource to be: An archaeological artifact, object, or site, about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria: (1) contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information; (2) has a special and particular quality such as being the oldest of its type or the best available example of its type; or (3) is directly associated with a scientifically recognized important prehistoric or historic event or person.

The disposition of Native American burials is governed by Section 7050.5 of the California Health and Safety Code and Sections 5097.94 and 5097.98 of the Public Resources Code, and falls within the jurisdiction of the NAHC.

If human remains are discovered in California, the County Coroner must be notified within 48 hours and there should be no further disturbance to the site where the remains were found. If the remains are determined by the coroner to be Native American, the Coroner is responsible for contacting the NAHC within 24 hours. The NAHC, pursuant to Section 5097.98, will immediately notify those persons it believes to be most likely descended from the deceased Native American so they can inspect the burial site and make recommendations for treatment or disposal.

#### **5.3.2.2 Nevada**

Nevada Revised Statute (NRS) Historic Preservation and Archaeology Chapter 383.011 through 383.440 requires protection of Native American graves on private, county and public lands. The essential elements include:

- Protects Native American graves on private, county and public lands (passed before NAGPRA)
- Archaeologists are required to consult with Native Americans to coordinate compliance with state and federal laws
- Illegal to find Indian burial and not report it

#### **5.3.2.3 Local LORS**

##### **5.3.2.3.1 California**

California Planning and Zoning Law requires each county and city jurisdiction to adopt a comprehensive, long-term General Plan for its development. The General Plan is a policy document designed to give long range guidance to those making decisions affecting the future character of the planning area. It represents the official statement of the community's physical development as well as its environmental goals. The General Plan also acts to clarify and articulate the relationship and intentions of local government to the rights and expectations of the general public, property owners, and prospective investors. Through its General Plan, the local jurisdiction can inform these groups of its goals, policies, and development standards; thereby communicating what must be done to meet the objectives of the General Plan.

Section 8.7 Cultural Resources of the Inyo County General Plan (County of Inyo, 2001) notes that the County intends to preserve and promote its cultural heritage. These goals include working in partnerships with private entities, other agencies, and educational institutions to support dissemination of knowledge of the historic and prehistoric past of the County, effectively mitigating impacts, including relocation of structures, adaptive reuse, preservation, and thorough documentation and archival of records, and outreach to Native American groups at the preliminary stages of a project that may result in effects to Native American resources.

##### **5.3.2.3.2 Nevada**

The Nye County Comprehensive Plan is a long-term, general policy plan to guide the "growth, management of natural resources, provision of public services and facilities, and to

ensure protection of the public health, safety, and welfare” (Nye County, 1994) of Nye County and satisfies the requirements of the NRS 278.160. The Historical Properties Preservation Plan section of the Nye County Comprehensive Plan notes that the County encourages programs designed to preserve and maintain historical, cultural, and archaeological resources. The Plan policies support the identification and evaluation of resources, cooperation with local, state, and federal agencies to promote resource protection, community efforts that promote the identification and protection of cultural resources, and efforts by communities to establish historic programs (Nye County, 1994).

The Pahrump Regional Planning District has adopted a Master Plan Update (Pahrump Regional Planning District, 2003) with goals and objectives similar to those found in the Nye County Comprehensive Plan. The Master Plan Update was created under NRS 278.150 and adopts the exact same language, goals, and objectives in Section 15 that defines the Historical Properties Preservation Plan.

### 5.3.3 Affected Environment

In southern California, cultural resources extend back in time for at least 11,500 years. Written historical sources tell the story of the past 200 years. Archaeologists have reconstructed general trends of prehistory.

#### 5.3.3.1 Regional Setting

HHSEGS lies in the Basin and Range physiographic province. This region received its name because it is typified by numerous (more than 100) linear mountain ranges, most oriented north-south, separated by intervening basins. The region extends south from southeastern Oregon between the Sierra Nevada and the Wasatch Range of Utah, and then east from the Peninsular Range of southern California to the Guadalupe Mountains of West Texas. A portion of this region, lying primarily in Nevada and western Utah, is called the Great Basin because all waterways drain internally to dry basins. No streams lying within the Great Basin reach the Pacific Ocean or the Gulf of California. The Pahrump Valley, in which the HHSEGS is located, lies within the Great Basin.

The vegetation of the Mojave Desert, where HHSEGS is located, predominantly consists of Mohave Desert Upland Scrub. The dominant species are creosote (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*). These species are less abundant in wash areas and share dominance with Mohave yucca (*Yucca mohavensis*) on some of the rockier hillsides. Other woody perennial plants observed in upland habitats on the project site include: Mormon tea (*Ephedra nevadensis*), and several species of cacti including silver cholla (*Opuntia echinocarpa*), diamond cholla (*Opuntia ramosissima*), beavertail cholla (*Opuntia basilaris*), chain cholla (*Opuntia acanthocarpa*), Engelman’s hedgehog (*Echinocereus engelmannii*), beehive cactus (*Echinomastus johnsonii*), and multiheaded barrel cactus (*Echinocactus polycephalus*) (CDFG, 2003; Schoenherr, 1995).

#### 5.3.3.2 Paleoenvironment and Chronology

Many discussions of Holocene paleoenvironments that likely influenced prehistoric cultural response and adaptive strategies in the region have relied on Antevs tripartite scheme and on the later work of Haynes (1967) and Mehringer (1967). These researchers postulate a relatively cool and wet transition from the Late Pleistocene followed by a warming trend

climaxing in a Middle Holocene hot and dry interval beginning about 8,000 years ago. Around this time, the vegetation becomes similar to that of today (Van Devender et al., 1987). Recent work by Wigand and Rhode (2002) has added significant detail to these environmental reconstructions. All of the records indicate the presence or absence of summer precipitation was an important factor influencing the structure of local vegetation communities.

Gradual warming and a shift from winter to summer precipitation patterns mark the Early Holocene. The shift to summer precipitation marks the northern resurgence of the summer monsoon into the region. The formation of small lakes in the Lake Mojave basin around the same time indicates that summer-related runoff and spring discharge increase during this time.

Data suggest the Middle Holocene was a time when drought conditions, including warmer temperatures and decreased precipitation, were the norm. The period spanning 8,000 to 5,500 years ago lacks detailed paleoenvironmental records, probably because of significant local erosion, reduction in plant activity, and lower plant density.

Return to cool temperatures and winter rainfall mark the Early Late Holocene (5,500 to 2,000 years ago). During this Neopluvial resurgence, juniper expanded into lower elevations and peat deposits developed on erosional surfaces formed during the previous dry period. In addition, the record indicates a regional decrease in high-energy flood events, probably because of increased vegetation cover and the lack of monsoonal storms (Wigand and Rhode, 2002).

The return of drought conditions following the cold/wet interval of the Neopluvial mark the Late Holocene. About 2,000 years ago, both summer precipitation and increased cyclic variability became the dominant patterns. Characteristic of this cyclic variability were generally dry or warm/wet conditions punctuated by periods of cool/wet on the scale of tens or hundreds of years. The intensity and rapidity of climatic fluctuations during the Late Holocene are the primary characteristics of the last 2,000 years. These punctuated changes undoubtedly had significant effects on vegetation, landform response, and local adaptive strategies.

Of the many chronological sequences proposed for the project area, two primary regional syntheses have been commonly used for the southern California deserts and the adjoining southwestern Great Basin: Warren (1968, 1984) and Warren and Crabtree (1986). Warren (1968, 1984) and Warren and Crabtree (1986) define five periods: Lake Mojave, Pinto, Gypsum, Saratoga Springs, and Protohistoric. In 2007, however, a new synthesis of cultural prehistory in the Mojave Desert was presented by Sutton et al. (2007), which includes results from 20 years of extensive fieldwork conducted in the Mojave Desert by various individuals and groups. Sutton et al. (2007) divides the Mojave Desert prehistory into four periods: Pleistocene, Early Holocene, Middle Holocene, and Late Holocene. Each period is further subdivided into complexes generally based on Warren (1984) and Warren and Crabtree (1986). The discussion below is based largely on the new work conducted since 1986 and a relatively newly proposed chronology (Sutton et al., 2007). See Table 5.3-2 for a brief comparison of these three chronologies.

None of the chronologies mentioned here begin prior to Terminal Pleistocene circa 12,000 B.P. (Before Present). More sites in North and South America are beginning to be accepted as dating to earlier times and although the Sutton et al. chronology acknowledges this fact by the inclusion of the hypothetical Pre-Clovis Complex, no sites from this period are currently documented in the Mojave Desert. A small fraction of the archaeological community has proposed Pre-Clovis sites within the Mojave Desert, but much of this data remains currently unpublished and not substantiated (Sutton et al., 2007).

**TABLE 5.3-2**  
Cultural Chronologies Proposed for the Mojave Desert

Approximate Date	Temporal Period	Sutton et al. (2007), Mojave Desert	Warren (1984), Southern California Desert	Warren and Crabtree (1986), Southwestern Great Basin	Associated Artifacts
		Cultural Complex	Cultural Period	Cultural Period	
Up to 10,000 B.C.	Pleistocene	Pre-Clovis (Hypothetical)			Unknown
10,000–8000 B.C.		Paleo-Indian	Clovis	Clovis	Fluted points
8000–6000 B.C.	Early Holocene	Lake Mojave	Lake Mojave	Lake Mojave	Stemmed points
7000–3000 B.C.	Middle Holocene	Pinto			Pinto points
		Deadman Lake (currently 29 Palms only)	Pinto	Pinto	Contracting stem and leaf-shaped points
2000 B.C. to A.D. 1100		Gypsum	Gypsum	Gypsum	Gypsum and Elko Series points
A.D. 200–1100	Late Holocene	Rose Springs	Saratoga Springs	Saratoga Springs	Rose Spring and Eastgate Series points
A.D. 1200– Contact		Late Prehistoric	Protohistoric	Shoshonean	Desert Series points, ceramics

### 5.3.3.3 Prehistoric Period

The general trend throughout California prehistory has been an increase in population density over time, coupled with greater sedentism and the use of a greater diversity of food resources. There is abundant evidence that humans were present in the New World for at least the past 11,500 years. There is also fragmentary, but growing, evidence that humans were present long before that date. Linguistic and genetic studies suggest that a date of 20,000 to 40,000 years ago for the human colonization of the New World may be correct. The evidence of this earlier occupation is not yet conclusive, but it is beginning to be accepted by archaeologists. The Meadowcroft Rockshelter in Pennsylvania and Monte Verde in Chile, for instance, are two early sites that have produced apparently reliable dates as early as 12,500 years BP. These earliest known remains indicate very small, mobile populations,

apparently dependent on hunting of large game animals as the primary subsistence strategy.

#### **5.3.3.3.1 Prehistory (12,000 to 200 B.P.)**

Although typically grouped within the Great Basin culture area (D'Azevedo, 1986), the region is situated along the edge of a number of major culture areas and a number of significant prehistoric cultures. Because the area is situated at the crossroads of several distinct cultural traditions, it is difficult to assign a comprehensive sequence of phases for the entire area. A substantial body of research has resulted in the production of a number of chronologies, many of which incorporate and summarize previous research (Ahlstrom and Roberts, 1999; Blair et al., 1999; Ezzo et al., 1995; Fowler and Madsen, 1986; Fowler et al., 1973; Kelly et al., 1990; Lyneis, 1982, 1995; Seymour, 1999; D. Seymour et al., 1996; G. Seymour et al., 1996; Shutler, 1961; Warren and Crabtree, 1986). For the purposes of outlining the prehistoric culture history, this discussion uses a variant of the terminology employed by Fowler and Madsen (1986), which divides the period into a Pre-Archaic (called Paleoindian) Period, the Archaic Period, the Horticultural Period or Saratoga Springs Phase, and the Numic Period.

#### **5.3.3.3.2 Paleoindian Period (Approximately 12,000 to 8000 cal B.C.)**

The Paleo-Indian Period covers the interval from the first accepted presence of humans in southern California desert and southwestern Great Basin in the late Pleistocene until approximately 8,000 cal B.C. (calibrated years Before Christ). Artifacts and cultural activities from this period represent a predominantly hunting culture; diagnostic artifacts include extremely large, often fluted bifaces associated with use of the spear and the atlatl. Populations appeared to have been relatively small and highly mobile, living in temporary camps near readily available water. Evidence for Clovis occupation in the Mojave Desert is currently limited to scattered isolated points and a single site at Lake China that is presumed to be an occupation site (Sutton et al., 2007).

#### **5.3.3.3.3 Lake Mojave Complex (8000 to 6000 cal B.C.)**

In the deserts of southern California and the southwestern Great Basin, the earliest substantive remains of human occupation are found along the shoreline of ancient Lake Mohave in the Mojave Desert of San Bernardino County (Sutton et al., 2007; Warren and Crabtree, 1986). The Lake Mohave Period (approximately 8000 to 6000 cal B.C.) is associated with now-dry pluvial lakes found throughout the Mojave Desert and considered a regional expression of the Western Pluvial Lakes Tradition. Artifacts observed at Lake Mohave Period sites include stylized dart points of the Lake Mohave and Silver Lake series, well-made bifacial knives and other cutting tools, large domed scrapers or scraping planes, crescents, occasional cobble core tools, and ground stone implements (Wallace, 1962; Sutton et al., 2007). Flaked stone artifacts, which make up the largest part of the toolkit, are often formal tools made of non-local materials, while ground stone tools, present in far smaller numbers, generally show ephemeral wear, thus suggesting long-term curation of more easily ported items and less reliance on floral resources. Site types include extensive habitation sites, small camps, and workshops (Sutton et al., 2007). In addition to sites known in the Lake Mojave area, a goodly density of Lake Mojave Period artifact assemblages are known at Fort Irwin, located south of the project area.

#### 5.3.3.3.4 Pinto Complex (7000 to 3000 cal B.C.)

The Pinto Complex is the mostly widely distributed of the early complexes in the Mojave Desert and occurs in a wide variety of topographic and environmental zones, including near remnant pluvial lake basins, near fossil stream channels, close to springs or seeps, and in upland areas. Large Pinto Complex sites with deep middens and a wide range of artifact types appear to correlate with stable water sources. In some parts of the Mojave Desert, a temporal overlap is noted between the Lake Mojave Complex and the Pinto Complex. Recent radiocarbon dates from Fort Irwin, Twentynine Palms, and the Garlock Fault in Kern County range from 8340 B.C. to 6300 B.C., indicating the development of the Pinto Complex in the early Holocene and corresponding to the end of the Lake Mojave Complex. There appears to be good continuity of flaked stone technologies from one complex to the next, including the material selection of locally available stone and use of bifacial and unifacial tool forms. The main distinction between the two periods appears to be the number of ground stone tools found at Pinto sites in comparison to the relative paucity of ground stone tools found at Lake Mojave sites. High levels of ground stone found at Pinto sites indicates that the emergence of intensive plant exploitation began by approximately 7000 cal B.C., before the Altithermal, as previously proposed (Sutton et al., 2007).

Pinto sites are found in a wide range of environments and the flourishing of new economies including greater plant exploitation, is seen both in the desert and on the coast during the Pinto Complex. *Olivella* shell beads have been found with Pinto sites, indicating the beginnings of trade with the coast. Diagnostic artifacts recovered from Pinto Period archaeological sites include heavy keeled scrapers, flat millings, manos, and Pinto series projectile points, which are large, coarsely made points, indicating the continued use of darts and atlatls (Warren 1984). By the end of the middle Holocene, conditions in the Mojave Desert became much hotter and much drier. Currently, few sites are known to date to the period between 3000 and 2000 cal. B.C. and it appears that parts of the Mojave may have been abandoned (Sutton et al., 2007).

#### 5.3.3.3.5 Gypsum Complex (2000 cal B.C. to A.D. 200)

The start of the Gypsum Complex coincides with the beginning of the Little Pluvial at approximately 4000 B.P. and continues into the dry period following the Little Pluvial. Despite the paucity of sites dating to this period, the first good evidence for contact between the desert and the coast dates to the Gypsum Period; Southwestern influence in the California deserts is also observed (Warren, 1984; Sutton et al., 2007). *Olivella* shell beads and *Haliotis* rings from the coast and split twig figures from the Southwest are found at Gypsum sites. Gypsum Complex toolkits include the diagnostic Elko and Elko eared points, leaf-shaped points, rectangular-based knives, flake scrapers, T-shaped drills, the occasional large scraper plane, and hammerstones. Elko series points are generally associated with the spread of Uto-Aztecans throughout the Mojave during this period (Moratto, 1984). A shift in food procurement strategies marks this period. Grinding implements, including manos and millings, became common and mortars and pestles were introduced (Warren, 1984).

People living in the deserts had adapted to the more arid conditions of the southern California deserts by the end of the Gypsum Complex. New procurement strategies and regular trade contact with peoples living on the coast provided stability to desert dwellers and despite the return to a warmer, drier climate at the end of the Little Pluvial, populations

did not decrease in the deserts at the end of the Gypsum Complex as they had at the end of the Pinto Complex (Sutton et al., 2007).

#### **5.3.3.3.6 Rose Spring Complex (A.D. 200 to 1100)**

During this period, a strong coastal influence extends into the western Mojave Desert and Antelope Valley (Warren, 1984). The bow and arrow moved into the western Mojave Desert at this time. Evidence for a significant population increase and rather dramatic changes in artifact assemblages characterize the Rose Spring Complex in the western Mojave (Sutton et al., 2007). Within the Great Basin, this period is referred to as the Saratoga Springs Period (Warren, 1984; Warren and Crabtree, 1986). During this period, the influence of the Basketmaker III and Pueblo development spreads into the eastern Mojave Desert. The project area is located at a crossroads of the influence of both the California coast and the Anasazi (Warren and Crabtree, 1986).

Much of the artifact assemblage found throughout the Mojave Desert is fairly consistent. Generally, the Rose Spring Complex appears to be in strong continuity with the Gypsum Complex. Similar artifacts, such as millingstones, manos, mortars, pestles, and incised stones are still used. Desert populations continued a successful hunting and gathering adaptation to the desert environment through increasingly complex subsistence strategies, including the development of the bow and arrow. These sites contain a variety of trade items, including southern California shell beads, steatite items, and other coastal artifacts. Eastgate and Rose Spring projectile points are the diagnostic artifacts (Sutton et al., 2007).

Rose Spring sites are found near springs, washes, and occasionally lakeshores. Architectural evidence of pit houses, wickiups, and other types of structures indicate an increase in sedentism during this period; however, the Medieval Climatic Anomaly began during the Rose Springs Complex. The resulting dessication of lakes and other water sources in the Mojave Desert appears to have significantly changed settlement patterns, resulting in a shift in dependence on permanent water sources to more ephemeral ones. The Rose Springs Complex ended by about A.D. 1100.

#### **5.3.3.3.7 Late Prehistoric Complexes (A.D. 1100 to Historic Period)**

During this period, there was a strong reliance on plant food gathering and hunting of small game, and a decreased reliance on large game (Warren, 1984). Within the southeastern Great Basin, the Late Prehistoric Period includes the Shoshonean Period (Warren and Crabtree, 1986). Separate complexes emerged that appear to represent the ethnographic groups. Anasazi turquoise mining and Hakatayan influence moved west from the Colorado River and the Numic Paiute and Shoshone culture spread east from the western Mojave Desert. Seasonal movement was common, resulting in a diverse array of site types. Characteristic artifacts include Desert series and Cottonwood projectile points, buffware and brownware ceramics, shell and steatite beads, and milling tools. Trade continued to develop and expand with groups on the coast, as well as with groups to the east.

#### **5.3.3.4 Ethnography**

HHSEGS is situated in a border region between territories inhabited by the Southern Paiute and the Panamint, a Western Shoshone group. The Chemehuevi also ventured into the areas near the project (see Figure 5.3-1, all figures are at the end of the section).

#### 5.3.3.4.1 Southern Paiute and Chemehuevi

The Southern Paiute peoples and the Chemehuevi, closely related peoples, belong to the Southern Numic branch of the Uto-Aztecan language family. The first historic observations of the Southern Paiute were made by fathers Escalante and Dominguez in 1776. The fathers observed Paiute homesteads and farms along the Colorado River, and small maize fields watered with river water that flowed through irrigation ditches. Subsequent expeditions through the area recorded similar observations regarding Paiute agriculture, adding that melon and squash were also cultivated (Stoffle and Zedeno, 2001).

Sixteen identifiable groups of the Southern Paiute, sometimes called “bands,” formerly occupied a broad strip of territory from southern Utah and southern Nevada and along the west side of the Colorado River into southern California. The Chemehuevi were strongly influenced culturally by the Mohave, who lived to the east across the Colorado River (Kelly and Fowler, 1986:368). Overall, the Chemehuevi territory was one of the largest areas in California with a uniform dialect (Kroeber, 1925). The Chemehuevi recognized local divisions among themselves. However, the sociopolitical organization of the Southern Paiute groups, including the Chemehuevi, was not centralized. Additionally, boundaries for each group appear to have been relatively fluid and permeable. Groups consisted of individual households that variously coalesced and dispersed during the year to facilitate different economic pursuits. Favored residence locations adjacent to springs or agricultural plots were held as private property and subject to inheritance. Large household clusters often had a headman, whose authority was more advisory than authoritative (Kelly and Fowler, 1986:380).

Both the Chemehuevi and the Southern Paiute practiced some limited agriculture. They also practiced a hunting and gathering subsistence. Small game, such as rabbits, rodents, birds, chuckwallas, and tortoises, were important to subsistence in this part of the desert; larger game such as deer, bear, and elk, which were more prevalent in the uplands, were not significant. Pine nuts, seeds, berries, and roots were basic staples. They were thought to cultivate corn, squash and gourds, pumpkins, sunflowers, and winter wheat wherever feasible, particularly on floodplains. The adoption of farming did not appear to have significantly altered the seasonally mobile way of life; the elderly generally stayed to tend crops while most of the population undertook its seasonal hunting and gathering forays (Kelly and Fowler, 1986:371).

The Chemehuevi and Southern Paiutes made both twined and coiled basketry items, including vessels, hats, and cradles (Kelly and Fowler, 1986:375). Kroeber (1925:597) attributes painted rather than woven artistic patterns on some basketry items. The Chemehuevi and Las Vegas Southern Paiute groups made pottery that seems to have mimicked Mohave styles. Their pottery technology was more developed than among other Southern Paiute groups and was used to create cooking and storage vessels, water jars, scoops or spoons, and large pots for ferrying children across rivers. They also constructed log rafts and reed balsas for river transport (Kelly and Fowler, 1986:377). Houses were simple frames with reeds, constructed to function only as shelters. Sweathouses were not constructed at Chemehuevi villages (Kroeber, 1925).

By the late nineteenth and early twentieth centuries, the majority of the Southern Paiutes were confined to reservations on largely marginal lands. Termination of the reservations by the federal government in the 1950s left most of the Southern Paiutes in deplorable

conditions. Subsequent settlements of suits for compensating the Native Americans for their lands provided little more than temporary windfalls. Some reservations were restored and have established various business enterprises with mixed success. Some vestiges of aboriginal culture have survived, but much of the language has largely died out. By 1980, only 124 Chemehuevi were recorded living in California (Kelly and Fowler, 1986:391-392).

#### **5.3.3.4.2 Panamint Shoshone**

The Western Shoshone territory extended from Death Valley in California through Nevada and into northwestern Utah. The Panamint, a group within the Western Shoshone, spoke a language that was Central Numic, rather than Shoshone and, thus, are sometimes referred to as only Panamint (Thomas et al., 1986).

The Shoshone used a number of different strategies to procure necessary resources. Frederick Vernon Coville, a botanist, observed in 1891, that the Panamint of Death Valley would spend the summers at high elevations in the mountains and descend during the winter into the valley below (Coville, 1892). Although the Panamint practiced some limited agriculture using irrigation, the majority of their food was collected or hunted. The main staple was the pine nut, but other seeds, including grass seeds, were also gathered and available. Animals, including rabbits, birds, chuckwalla lizards, woodrats, kangaroo rats, mice, and occasionally mountain sheep and deer, were hunted. Other plant foods such as prickly pear, devil's pincushion, Joshua tree leaves, and the berries from the *Lycium andersonii* bush were also consumed (Coville, 1892). Family groups foraged through the spring into the fall. During the winter months, however, villages made up of several of these family groups were established near water sources and food caches (Thomas et al., 1986).

Panamint structures were likely similar to other Shoshone structures. A typical winter house was a conical structure with a light frame and covered with bark (Thomas et al., 1986). Winter villages contained a sweathouse; Panamint sweathouses were also conical. Baskets were woven using willows, the roots of Joshua trees, and sumac pods. Baskets were used for cooking and water transport. Bows were made of juniper and arrows were constructed of reed stems and willow shoots. Points for arrows were made of stone and hard wood (Coville, 1892).

Life rituals were performed at birth, death, and when girls reached puberty. Girls' puberty rites were fairly widespread among Shoshone, including the Panamint. The Panamint cremated their dead. The Shoshone recognized three types of shamans: shamans who could cure specific ailments, shamans who used their abilities for their own benefit only, and shamans who were able to effect general cures (Thomas et al., 1986).

The Western Shoshone were among the last groups in the continental United States to be affected by European settlers. In 1863, the Western Shoshone signed the Treaty of Ruby Valley and agreed to move onto reservation land when provided and to give up nomadic life. Land was set aside for reservations in 1900. During the 1930s, several of the Western Shoshone groups joined together and elected a traditional council to interact with the U.S. Government. The U.S. Government did not recognize this group as a legal tribe and organized a government sponsored council, which was not popular with the Western Shoshone. They formed the United Western Shoshone Legal Defense and Education Association in 1974 and presented their interests and concerns to the Indian Claims Commission. The Indian Claims Commission ruled that the Western Shoshone had lost their

land in 1863. They were paid \$26 million for the lost land, approximately one dollar an acre, but the tribe appealed and the case was eventually heard before the U.S. Supreme Court. The Court ruled that the monies paid in 1979 extinguished their title to the land (Thomas et al., 1986).

### **5.3.3.5 Historic Period**

The border region of southeastern California and southern Nevada has long been a crossroads in the American West, a crossroads of cultures (both prehistoric and historic), a crossroads of economies, and a literal crossroads. The area began as part of the Spanish Empire, became part of independent Mexico, and then joined the United States at the cessation of the Mexican-American War.

The Historic Period is divided into several groupings that reflect Spanish, Mexican and Mormon influences, and also themes such as the development of mining, ranching and transportation corridors.

#### **5.3.3.5.1 Spanish Explorations**

Spanish explorers first came up the Colorado River in the early 1540s, but their search for precious metals only took them up the Colorado to the vicinity of the Gila River. The meager results of the Coronado expedition ended any grandiose schemes the Spanish may have had to conquer the Southwest. They did not visit the Colorado for another 200 years. While the Spanish developed a permanent presence in what is now New Mexico, they were much slower to colonize other areas of the Southwest. During the late 1760s and early 1770s, the Spanish had secured the region known as Alta California and established missions along the coast between San Diego and Monterey. Many of these missions became thriving enterprises, and the most impressive of these was the San Gabriel Mission. The town that grew beside it, Los Angeles, soon became a commercial center in its own right. In following years, many attempts were made to establish a permanent land route between Spanish outposts in Sonora and Alta California. A route along the Gila River and across the Colorado River through what is now Yuma, Arizona, was the most direct route, but the Quechan revolt of 1781 put an end to that development. For the rest of the Spanish period, land connections between California and Mexico were maintained along the Mojave Trail, which crossed the Colorado River about halfway between Yuma and what is now Las Vegas. The Spanish began looking for a better connection to California by skirting north of the impassable Grand Canyon. In 1776, Father Francisco Garces explored the Mojave Desert from the California end. Although it is unclear whether he actually entered what is now Nevada, he helped to establish the west end of what would later be called the Old Spanish Trail (Paher 1971; Roske 1986). In that same year, Father Francisco Silvestre Velez de Escalante explored eastern portions of what would become the Spanish Trail seeking a route to Monterey. He and Father Francisco Atanasio Dominguez entered the California-Nevada border region from the east (Elliott, 1987). The Old Spanish Trail was not established as a complete route until the late 1820s and early 1830s, several years after Spain lost control of Mexico and the rest of what is now the American Southwest and California.

#### **5.3.3.5.2 Mexican Period**

The first Europeans known to have entered present-day Nevada were fur trappers: Peter Skene Ogden of the Hudson's Bay Company and Jedidiah Strong Smith of the Rocky Mountain Fur Company. In 1826, both men crossed into Mexican Territory looking for the

San Buenaventura River and beavers. Smith and his party explored an impressive amount of Nevada and were the first Europeans to cross the state. Smith was also the first to indicate that the San Buenaventura River did not exist (Elliott, 1987). Trade connections between Santa Fe and Los Angeles developed quickly along what came to be called the Old Spanish Trail. Jedediah Smith was one of the first to realize the potential of the trail. He first traversed the route in 1826, traveling down the Virgin River to the Colorado River and then on to California. In 1829–1830, Antonio Armijo came down the Virgin River to the Colorado River below the Grand Canyon, and then journeyed across the desert reaches to the Mojave River. He followed the Mojave River to the Cajon Pass and then on to Los Angeles. Although Armijo’s party passed south of the Las Vegas Springs, a member of his expedition was the first to record their existence (Paher, 1971; Roske, 1986). After Armijo paved the way, annual trading expeditions between New Mexico and Los Angeles became common, particularly during the period from 1830 to 1848 when the Mexican-American War ended. During this time a number of alternate routes were developed. Many travelers avoided the Colorado River below the Grand Canyon. After descending out of the Utah Mountains by way of the Virgin River, travelers cut across the desert, establishing a direct route to the Mojave River. A less-well-documented activity during this period was slaving. Beginning in the Spanish Period, Paiutes were often captured by Ute and Navajo raiders and sold as slaves in New Mexico or California. As a result, the Paiute tended to avoid the route until the Mormons put a stop to the trade in the late 1840s and early 1850s (Kelly and Fowler, 1986). California gold was discovered in 1848, followed by subsequent lead, silver, and gold booms in Nevada. Traffic on the trail increased tremendously.

#### **5.3.3.5.3 Mormon Era**

By 1849, Brigham Young had established plans for the State of Deseret, encompassing the Great Basin, the Colorado River drainage, and most of southern California. Brigham Young and other Mormon leaders built what later became known as the “Mormon Fort” in 1855, but it was only occupied for 2 years. The fort was constructed in support of the Mormon dream to expand throughout the Great Basin and California, but Young’s plans were destroyed in 1848 when Mexico signed the Treaty of Guadalupe Hidalgo and surrendered Alta California and everything above the Gila River and the Rio Grande to the United States. In 1850, California became a state, and in the same year the land east of California was divided into the two territories of New Mexico and Utah. Despite these setbacks, Mormon colonies developed during the early and middle 1850s. Eastern portions of the Old Spanish Trail were abandoned and the western portions became part of what was known as the Mormon Road. In 1855, the establishment of a number of Mormon missions was proposed within Clark County, then a part of the New Mexico Territory. One of these groups, led by William Bringham, arrived at Las Vegas Springs later that year. Settlers at the spring intended the Mormon Fort to be a supply stop for travelers between the Mormon community in San Bernardino and Great Salt Lake City. In 1856, Mormon settlers at Las Vegas Springs discovered lead in the nearby Spring Mountains. Efforts to develop the Potosi Mine failed. Supplies to mine and smelt the ore were simply too short in supply (Jensen, 1926). The fort was officially abandoned in February 1857, under the direction of Brigham Young, although a few settlers remained to tend the fields and continue to operate as a waystation for travelers along the Mormon Road (Elliott, 1987).

By September of 1858, most of the San Bernardino Mormon population had returned to Salt Lake City as tensions heightened between President James Buchanan and Brigham Young. Young was worried that war would break out and called for all Mormons to return to Salt Lake City. The few remaining Mormon settlers left the fort at that time. In 1863, the border region around the HHSEGS project area became a part of the Arizona Territory (Land and Land, 2004). After the departure of the remaining Mormons, the fort and surrounding land was acquired by O.D. Gass, who established the Las Vegas Rancho. Gass restored many of the original Fort buildings and constructed irrigation canals in the fields. The ranch was fairly successful. However, in 1872, the area around the Las Vegas Rancho was given to the relatively new State of Nevada. Gass could not afford the newly assigned back taxes and the ranch passed to Archibald Stewart (Land and Land, 2004). After Archibald Stewart's notorious murder, his widow ran the ranch for another 18 years before selling it to Montana senator, William A. Clark, for the construction of the San Pedro, Los Angeles, and Salt Lake City Railroad.

#### **5.3.3.5.4 Mining and Ranching Era (1860s to early 1900s)**

Mining has been and still is an active pursuit in the HHSEGS area. Copper, silver, gold, lead, zinc, and iron ore were found in the mountains near the HHSEGS site. In 1861, the *Deseret News* published an article about the Las Vegas Silver Mines. These mines, actually located west of Las Vegas, attracted fortune hunters from Nevada and California. A small town was established 30 miles west of Las Vegas and named Potosi, after the Mormon lead mine. Indeed, the Colorado Mining Company accomplished in 1861 what the Mormons had been unable to do 4 years earlier: construct a successful smelting furnace in the Mojave Desert (Jensen, 1926). The Colorado Mining Company also determined that silver ran in the lead ore at Potosi. By 1900, zinc had also been identified in this mine. The mine was the first and eventually, a large, producer of zinc (Tingley et al., 1993).

Several other mines were established in the border region between California and Nevada. Supply centers, such as Ivanpah, Jean, and Goodsprings, arose in the vicinity of the project area (Hensher, 2005; GHS, 2001-2011). The completion of the San Pedro, Los Angeles, and Salt Lake City Railroad in 1905 increased mining activity in the area, as it became much easier to move ore to population centers. Much of the mining activity continued until World War I. The Potosi Mine was reopened after World War I due to the high price of sulfide zinc ore (Tingley et al., 1993). The transmission line corridor crosses directly through the Goodsprings District, which was active beginning in the late 1800s. By the end of World War II, most of the mining activity within the Goodsprings District had ceased (GHS, 2001-2011).

#### **5.3.3.5.5 Development of Railroads (1905 to 1920s)**

Southern California was connected to Salt Lake City by rails in the early 1900s. This line cut through the Mojave Desert from Los Angeles to Salt Lake City, via Las Vegas. Montana senator William A. Clark was the primary force in the organization of the San Pedro, Los Angeles and Salt Lake City Railroad in 1901. That year Clark began buying local lines in the Los Angeles area and surveying for new lines toward Utah. Clark's competition was Edward Henry Harriman, owner of the Oregon Short Line. At one point, both companies were building lines out of Utah and the competition became so intense that the crews came to blows in Meadow Valley Ranch, just north of Las Vegas. The skirmish was dubbed the Clark-Harriman War. Finally, Clark and Harriman reached a compromise and combined

their efforts. In January 1905, the Utah and California tracks were joined 23 miles south of Las Vegas in Jean. Shortly thereafter, Clark also completed a second rail line in the area, the Las Vegas and Tonopah Railroad (Burbank, 2009).

#### **5.3.3.5.6 Trails Near the Project Area**

The mostly undeveloped and open desert of the HHSEGS area has been used by prehistoric and historic travelers. Several trails traverse near the project site. Although portions of these trails were sometimes marked with rock cairns or creosote timbers, the majority were only generally known routes between water sources with a fairly wide usable transportation corridor rather than marked and specific roads. The name of the road depended on the traveler's destination: the Old Spanish Trail was also known as the Santa Fe Road. Although primarily a trade route between Santa Fe and Los Angeles, it also was used by explorers, trappers, prospectors, and immigrants. In 1847, Mormons initiated wagon travel along the western half of the trail while traveling between Salt Lake City and Los Angeles. The Mormon wagon route replicated or paralleled the Old Spanish Trail for most of the distance between Utah and California.

#### ***Old Spanish Trail–Mormon Road***

The Old Spanish Trail ran from Santa Fe, New Mexico, through Colorado, Utah, Arizona, Nevada, and into Los Angeles, California. The first travelers on this trail were likely the Utes, Paiutes, Comanches, and Navajo, who would have employed this route for trade and travel throughout the Southwest. European use of this trail dates from the late 1500s to Spanish traders and explorers and continues through the early 1800s when Mexican and American traders used the route. From the vicinity of Goodsprings, Nevada, one variant of the route crossed through the Ivanpah Valley to Mountain Pass, and then to Soda Springs before connecting with the Mojave River in the vicinity of present-day Barstow, California. This portion of the trail was heavily used by Mormon settlers and other emigrants to travel between Salt Lake City and Los Angeles from the 1850s until the early 1900s and became known as the Mormon Road.

In early historic times, the route was first travelled and described by Padre Francisco Garcés. However, prior to that it apparently was used by the Anasazi as a route from the Virgin River area to the turquoise mines in the Kingston Range, about 25 miles to the northwest. The road was then used for local traffic until the 1940s (Kelly et al., 1990). Jedidiah Strong Smith was the first American to travel the trail and the first to link the entire Santa Fe to Los Angeles route into one trail. The first party to travel over the Old Spanish Trail's entirety was a trapping party lead by William Wolfskill and George C. Yount in 1830–1831. For the next several years, trappers, mule traders, and settlers traveled in wagons, on horseback or by foot over the trail. The Old Spanish Trail-Mormon Road runs near the HHSEGS site. Travelers along the road would stop at Stump Springs. This portion of the trail is located to the south and outside of the HHSEGS boundary (see Figure 5.3-2).

### ***The Hidden Hills Ranch***

The Pahrump Valley has a number of artesian wells and cattle ranching quickly became a mainstay after Europeans settled in the valley in the mid-1800s. Many of these ranches were over 1,000 acres. In addition to cattle, several crops were grown including alfalfa, cotton, sugar beets, and wine grapes. One of the earliest ranches settled in the Pahrump Valley was that of Joseph Yount. Yount was originally from Missouri. He served in the U.S. Army during the Mexican War and left for California upon his release from the army. Yount left California and returned to Missouri in 1847, scant months before the discovery of gold at Sutter's Fort. Yount went back to California found gold in Trinity before returning once again to Missouri (McCracken, 2009).

Yount married Margaret Parent in 1853. The couple kept moving west, first to Nebraska then to Colorado. In 1862, Yount was selected as the captain of a 100-wagon train bound for Oregon. Yount and his family remained in Oregon for 14 years before heading for Tombstone, Arizona. The Yount wagon train, consisting of the family, adult children, and 100 cattle, stopped in the Pahrump Valley to spend the winter. The family remained at Manse Springs. Yount acquired squatter's rights to the Manse Springs and in 1877 the family acquired the ranch at the springs (McCracken, 2009).

The ranch became a stopping place for prospectors traveling between Las Vegas and the nearby mining camps of Goodsprings and Ivanpah. A post office was opened on the ranch in 1891. Stagecoaches running between Ivanpah and Bullfrog made regular stops at the ranch (McCracken, 2009). In 1902, one of Yount's sons, John B. Yount, acquired the land that would eventually become the Hidden Hills Ranch, which was located approximately 10 miles south of the Manse Ranch. John B. Yount acquired additional land for his ranch in 1922. John B. Yount was listed as a miner of ore on the 1900 census, but by 1920, he had become a rancher (U.S. Census 1900; U.S. Census 1920). John B. Yount never officially married, but upon his death his common law wife, Susie (Belle) Yount, a Native American, inherited Yount's Ranch.

Susie (Belle) Yount sold Yount's Ranch to Roland Wiley, a lawyer from Los Angeles, in 1934. Wiley acquired additional land that same year. The Hidden Hills Ranch in 1934 comprised 2,474 acres. Wiley purchased an additional 5 acres in June of 1938. See Table 5.3-3 for locational information. Wiley left Los Angeles for Las Vegas in 1929-1930 to continue the practice of law. Wiley was Clark County's District Attorney in 1941, when the El Rancho Vegas opened, establishing the Las Vegas Strip. Wiley ran for Nevada governor twice, unsuccessfully. Cathedral Canyon, located on the Hidden Hills Ranch property, was constructed by Wiley. The eclectic mix of statuary included the Christ of the Andes and Albert Einstein. Quotes were placed in steel-framed message boards along the trail to the canyon and Wiley installed a 200-foot suspension bridge that spanned the canyon (McCracken, 2009). Wiley also constructed the Hidden Hills airstrip, a small astronomical observatory, and a grader to maintain the dirt roads that lead into and out of the Pahrump Valley. On Wiley's death, his spouse, Mary Wiley, inherited the ranch.

**TABLE 5.3-3**  
Township, Range, and Section Information for the Hidden Hills Ranch

Township	Range	Section	Date Added to the Hidden Hills Ranch
<b>California:</b> (Records for California have not been checked against the legal land patent.)			
20 ½ North	9 East	35, 36	June 28, 1934
21 North	9 East	16, 17, 20, 21, 35, 36	June 28, 1934
<b>Nevada:</b>			
22 South	54 East	23, 24*, 25*, 26, 27	June 28, 1934
23 South	54 East	1, 12	June 28, 1934
23 South	55 East	6, 7	June 28, 1934
21 South	61 East	28	June 1, 1938

\*These sections are part of the original patent owned by John B. Yount and sold by Susie Yount to Roland Wiley.

Source: BLM database of original land patents. Available online at:  
<http://www.glorerecords.blm.gov/search/default.aspx#searchByTypeIndex=0&searchTabIndex=0>

### 5.3.3.6 Resources Inventory

The HHSEGS site was subject to a 100 percent (Class III, or complete) archeological resources inventory by CH2M HILL. This inventory is based on both archive/background research and surface pedestrian reconnaissance survey. The results of the resource inventory are presented in the following sections. An architectural resources survey was not performed because the rural project area lacks architectural resources.

#### 5.3.3.6.1 Archival Research

An archival literature search for the HHSEGS site in California was performed in-person at the CHRIS Eastern Information Center at the University of California, Riverside, by CH2M HILL on May 17, 2010. The literature search area included the project area and a 1-mile buffer.

A literature search was also conducted of the Nevada Cultural Resource Information System (NVCRIS) database and the files at the Harry Reid Center (HRC). Additionally, Kathleen Sprowl of the BLM Southern Nevada District Office was contacted to acquire additional information unavailable from the other sources. CH2M HILL requested data from NVCRIS staff on April 18, 2011. An in-person search was completed at the HRC by CH2M HILL on April 21, 2011. The search was conducted for the HHSEGS area along the California-Nevada border. As in California, the literature search area includes the project area and a 1-mile buffer.

The following maps were also reviewed to identify known historical land uses pertinent to the project site and vicinity.

- 1937 *Clark County, Nevada*, State of Nevada, Department of Highways. Sheets 1 and 3.
- 1954 *Official Highway Map of Nevada*.
- 1956 *Official Highway Map of Nevada*.
- 1939 *General Highway Map, Nye County, Nevada*
- 1955 Roach Lake 15' USGS quadrangle topographic map, University of Alabama, Historical Maps, electronic resource, <http://alabamamaps.ua.edu/index.html>

## Results

### California

Three studies have been conducted within the delineated literature search area in California (see Table 5.3-4). Only two of these studies intersect the HHSEGS. One previously recorded resource was identified within the search area. This resource is a prehistoric lithic scatter that has not yet been evaluated for inclusion in the NRHP. This scatter, CA-INY-2492, is located within the HHSEGS boundary (see Table 5.3-4).

### Nevada

Three studies have been conducted within the delineated literature search areas in Nevada. Of these studies, only one study crosses the California-Nevada border and intersects the HHSEGS (see Table 5.3-4). Neither study is on file with the CHRIS. No previously recorded resources were found within the HHSEGS boundary. One resource was noted within the literature search buffer area. This resource is the Old Spanish Trail-Mormon Road, site 26-CK-3848 (see Table 5.3-5). The Old Spanish Trail-Mormon Road ran from Santa Fe, New Mexico, through Colorado, Utah, Arizona, Nevada, and into Los Angeles, California. The trail generally now consists of wagon tracks and scatters or dumps of historic artifacts. Use of this trail dates from the late 1500s by Spanish traders and explorers and continues through the early 1800s when Mexican and American traders used the route. The trail was heavily used by Mormon settlers and other emigrants to travel between Salt Lake City and Los Angeles from the 1850s until the early 1900s. The road was then used for local traffic until the 1940s. The route is considered a trail of national significance that is related to the exploration, migration, settlement, and building of commerce of the western United States (Kelly et al., 1990; McBride, 2001). The Clark County, Nevada, segment of this trail was first listed on the NRHP in 2001 and covered the portion of the trail that extended from the California border, through Las Vegas, Nevada, to Arizona. Portions of this trail, located within Clark County, are listed on the NRHP and considered contributing elements to the Old Spanish Trail-Mormon Road Historic District. In 2005, a portion of the Old Spanish Trail-Mormon Road was updated during the preparation of the Pahrump Environmental Feasibility Report. This segment was noted to be in poor condition and lacking integrity. This segment was not considered a contributing element to the Old Spanish Trail-Mormon Road Historic District (SWCA, 2005).

**TABLE 5.3-4**  
Cultural Resources Reports within 1 Mile of the HHSEGS Project Area

Report Authors and Date	Report Numbers
Pollack and Hull (2005)*	IN-53
Westec Services, Inc. (1979)*	IN-69
SWCA Environmental Consultants (2005)	IN-816
Williams (1975)*	BLM 5-84
Myhrer and White (1989)	BLM 5-1950
Rafferty (1982)	BLM 5-1043

\*Included portions of the HHSEGS area.  
Source: CHRIS, NVCRIS, and HRC.

**TABLE 5.3-5**  
Previously Recorded Resources within the Literature Search Area

Site Number	Site Type	NRHP Status	Date Listed/Evaluated
P-14-2492*	Lithic scatter	n/a	n/a
NV-CK-3848	Old Spanish Trail; Mormon Road	Recommended eligible	1987

\*Located within the HHSEGS boundary.

Source: CHRIS, NVCRIS, and HRC.

### **Local Historical Societies**

CH2M HILL contacted historical societies in the Pahrump, Nevada, and Sandy Valley, California area, including the Pahrump Valley Historical Society, the Goodsprings Historical Society, and the Nevada State Museum and Historical Society. Because HHSEGS is also located near the Old Spanish Trail-Mormon Road, the Old Spanish Trail Association was also contacted. Letters describing the project and including maps of the project area were emailed or mailed to these organizations requesting information about historical features and structures near the project area and inviting comment on the project. As of this printing, no responses have been received. A summary of these contacts is provided as part of Appendix 5.3A.

#### **5.3.3.6.2 Field Survey**

CH2M HILL completed a surface-only, pedestrian survey of the HHSEGS site and a 200-foot buffer surrounding it from March 21 to April 1, 2011; May 23 to May 27, 2011; and June 28 to June 29, 2011. Fieldwork on BLM-managed land was conducted under Cultural Resources Use Permit No. N-83761 and Fieldwork Authorization from the Southern Nevada Field Office executed on June 23, 2011. As per the latest CEC requirements (CEC, 2007), cultural resources surveys conducted were inclusive of the project site extending to no less than 200 feet around it. No historic architectural standing structures are present in the project area.

Survey methodology for prehistoric and historic archaeological resources included using pedestrian transects spaced at 10- to 15-meter intervals throughout the entire surveyed area. The topography of the project area is relatively flat. Transect spacing and observation strategies allowed for the detection of small sites (fewer than five artifacts or features). The California Office of Historic Preservation's (OHP) Information Center Procedural Manual (1995) defines a site as the location of a prehistoric or historic occupation or activity.

Visibility was excellent throughout the project area at approximately 90 percent or higher. Sparse creosote and desert scrub dot the project area. Observed deposition was alluvial sand to developing and established desert pavement, and the terrain was uniformly level. Subsurface exposures, including rodent burrows and any cut banks, were examined. Soil stratigraphy was opportunistically examined in these areas for evidence of stratified cultural deposits, but none were present. Soils observed consist entirely of gravel/sandy alluvium.

Survey crews navigated via Trimble Geo XT global positioning system (GPS) units. Each GPS contained the survey area shape files, all previously recorded site boundaries, and all

previously recorded resources. Additionally, transects were recorded using GPS during the survey to record that the survey was accomplished using the 10- to 15-meter intervals.

The California OHP Information Center Procedural Manual (1995) defines a site as the location of a prehistoric or historic occupation or activity. Areas with five or more items were recorded as sites, while areas with four or fewer items were recorded as isolated occurrences. Features were recorded as sites. Resources separated by more than 50 meters or located on different landforms were recorded as distinct sites or as isolates.

Cultural resources, including previously identified and new sites and isolated finds, were recorded on appropriate DPR forms, mapped using a Trimble Geo XT GPS, and photographed. Information on the appearance and physical characteristics of the resources, as well as the location of the resources, was gathered. All artifacts were mapped and photographed in place. No artifacts were collected.

Cultural sensitivity is considered moderate within the HHSEGS site because several prehistoric lithic scatters are located in the southern half of the project site. One previously recorded site was relocated during the survey. Thirteen new archaeological sites and 49 isolated finds were discovered during the survey. Descriptions of each site are provided below. Table 5.3-6 lists the sites and their dispositions. Site locations are provided in Appendix 5.3E. Site records were prepared for all new sites on DPR forms. Completed DPR forms are provided in Appendix 5.3B.

**TABLE 5.3-6**  
Archaeological Sites within the HHSEGS Archaeological Survey Area

<b>Site Number</b>	<b>Site Description</b>	<b>Location</b>
CA-INY-2492	Lithic scatter	Solar Plant 2
S-1	Lithic scatter	Solar Plant 2
S-2	Lithic scatter/temporary camp	Solar Plant 2
S-3	Lithic scatter	Solar Plant 2
S-4	Lithic procurement/ quarry	Solar Plant 2
S-5	Lithic scatter	Solar Plant 2
S-6	Lithic scatter	Solar Plant 2
S-8	Rock cairn	Solar Plant 2
S-10	Lithic procurement/quarry	Solar Plant 2
S-11	Lithic scatter	Solar Plant 2
S-20	Refuse scatter	Solar Plant 2
S-23	Lithic scatter	Solar Plant 1
S-AF-1	Lithic scatter	Solar Plant 2
S-AF-2	Lithic scatter	Solar Plant 2

Fourteen sites were evaluated for inclusion in the NRHP/CRHR. All 14 sites are recommended by CH2M HILL as not eligible for either the CRHR or NRHP. Table 5.3-7 shows each site disposition and the CH2M HILL recommendations. Site descriptions and evaluations follow below.

**TABLE 5.3-7**  
NRHP/CRHR Evaluations of Archaeological Sites within the HHEGS Archaeological Survey Area

Site Number	Site Description	NRHP/CRHR
CA-INY-2492	Lithic scatter	Not eligible
S-1	Lithic scatter	Not eligible
S-2	Lithic scatter	Not eligible
S-3	Lithic scatter	Not eligible
S-4	Lithic scatter	Not eligible
S-5	Lithic scatter	Not eligible
S-6	Lithic scatter	Not eligible
S-8	Rock cairn	Not eligible
S-10	Lithic procurement	Not eligible
S-11	Lithic scatter	Not eligible
S-20	Refuse scatter	Not eligible
S-23	Lithic scatter	Not eligible
S-AF-1	Lithic scatter	Not eligible
S-AF-2	Lithic scatter	Not eligible

**Site CA-INY-2492.** This site was originally recorded in 1979 as a small lithic scatter. CH2M HILL revisited the site during the HHSEGS survey. This site was updated as a small lithic scatter that consists of eight flakes and one core. Artifacts observed at this site include one primary chert flake measuring less than 5 centimeters (cm), one secondary yellow chert flake measuring less than 3 cm, one primary yellow chert flake measuring less than 5 cm, one primary light brown igneous flake measuring less than 4 cm, three secondary light brown igneous flakes measuring less than 4 cm, one chert primary flake measuring less than 4 cm, and one brown chert core. The scatter was found in a relatively undisturbed and level area with sparse creosote. The site is located in an area with developing desert pavement.

Despite its good preservation, the site lies on undisturbed desert pavement and has no deposition that might contain buried features. It has little or no further research potential, and is recommended as not eligible for the NRHP/CRHR.

**Temporary Site No. S-1.** This site is a small lithic scatter that consists of one used flake, 12 flakes, and three pieces of shatter. The flakes consist mostly of primary flakes and vary in size from 3 cm to 7 cm. Observed materials are either a red and cream chert or a light brown igneous material. The scatter is quite discrete and the site measures 10 meters by 15 meters. The flake scatter was found approximately 20 meters west of a well-maintained dirt road in an area with developing desert pavement. Although the area is relatively undisturbed, three

small modern excavations were noted within the site boundary. These appear to have been hand dug recently. One excavation, located directly adjacent to the scatter, measured 77 cm by 60 cm and was approximately 10 cm deep. The flakes next to this excavation appear to have been arranged and are not likely in situ any longer. The remainder of the flakes at the site appear to be in situ. The subsurface sediment at this site is sterile. Vegetation in the area is mainly composed of creosote and lyceum bushes. Some native grasses were also noted.

This site has been recently disturbed, reducing its integrity, and the site is situated in an area with desert pavement, making it extremely unlikely that the site has a subsurface component. Its potential for contributing to the prehistory or history of the area has been exhausted by this recording. It has little or no further research potential, and is recommended as not eligible for the NRHP/CRHR.

**Temporary Site No. S-2.** This site appears to be a small temporary camp or resource procurement site that includes the remains of a roasting pit and a small lithic scatter. The lithic scatter consists of one utilized flake, eight flakes, and one core. The used flake was found nearly 30 meters east of the main portion of the site. This used flake measures 62 millimeters (mm) by 46 mm by 21 mm and has two well-used edges. One edge displays heavy chipping while the second edge displays finer-use wear. The flakes vary in size from 5 cm to 9 cm and are a red rhyolite material. The scatter of flakes is quite discrete measuring less than 10 meters in diameter. A cluster of cobbles around a small depression in the surface of the desert pavement was noted near the flakes. Three of the cobbles in this cluster were fire-affected. Three more cobbles were very exfoliated and also appeared to have been burned. The depression is 130 cm by 57 cm and 17 cm deep. The cluster appears to be the remains of a roasting pit. This site is located adjacent to a crossroads of two dirt roads. The used flake was found in the road bed; the remainder of the site is adjacent to the road. Generally, the site is in good condition. The subsurface sediment exposed at this site appears sterile. Vegetation in the area is mainly composed of creosote and lyceum bushes. Some native grasses were also noted. Visibility is excellent at nearly 100 percent.

Site S-2 is a small temporary campsite with a roasting pit and a number of flakes. Despite its good preservation, the site lies on desert pavement and has no deposition that might contain buried features. It has little or no further research potential, and is recommended as not eligible for the NRHP/CRHR.

**Temporary Site No. S-3.** This site is a small lithic scatter that consists of six flakes and two cores. Both cores are multidirectional cores. The flakes are mostly primary flakes; one secondary and one tertiary flake were noted. The scatter is very concentrated and the majority of the artifacts were found in a one-by-one-meter area. Materials noted include a red rhyolite and a yellow and red igneous material, which is likely a welded tuff. The scatter was found in a relatively undisturbed and level area with developing desert pavement. Vegetation in the area is mainly composed of creosote and lyceum bushes. Some native grasses were also noted. Visibility is excellent at nearly 100 percent.

Despite its good preservation, the site lies on undisturbed desert pavement and has no deposition that might contain buried features. It has little or no further research potential, and is recommended as not eligible for the NRHP/CRHR.

**Temporary Site No. S-4.** This site is lithic scatter that consists of 41 flakes. The flakes vary in size from 1 cm to 9 cm and are primarily a light brown igneous medium-grained material. One of the flakes is a salmon-colored chert material. The majority of these flakes were produced from an extremely poor quality material. This material was observed as large untouched cobbles within the site boundary. Testing of materials and possibly lithic procurement appear to have been the primary activity at this site. The overall site area is generally undisturbed and level. The site is situated in an area with well-developed desert pavement. Vegetation in the area includes creosote and lyceum bushes, but several invasive weeds were also noted. Visibility is excellent at nearly 100 percent.

The site is situated in an area with desert pavement, making it extremely unlikely that the site has a subsurface component. Its potential for contributing to the prehistory or history of the area has been exhausted by this recording. It has little or no further research potential, and is recommended as not eligible for the NRHP/CRHR.

**Temporary Site No. S-5.** This site is a small lithic scatter that consists of five flakes situated in a 50-cm-by-50-cm area. The flakes vary in size from 4 cm to 8 cm and are a red and black banded rhyolitic material. Overall, the site measures 10 meters by 10 meters and was found in a relatively undisturbed and level area with developing to well-developed desert pavement. A depression was noted near the site that appears to be the remains of a small spring or wash. The area is 10 meters long and 5 meters wide. Developing desert pavement covers this area; it has likely been dry a long time. Visibility at this site is excellent at nearly 100 percent.

The site is situated in an area with desert pavement, making it extremely unlikely that the site has a subsurface component. Its potential for contributing to the prehistory or history of the area has been exhausted by this recording. It has little or no further research potential, and is recommended as not eligible for the NRHP/CRHR.

**Temporary Site No. S-6.** This site is a small lithic scatter that consists of 11 flakes, two cores, and one used flake. Both cores are multidirectional. One core is a green chert and the other core is a rhyolite. Use wear was noted along two edges of the used flake. This flake is basalt and the flaked edges are slightly rounded and water worn. The flakes are mostly secondary flakes and all are a poor quality rhyolite. Other pieces of the same material were observed at the site but these pieces did not have any cultural features and were not recorded. One trowel probe was completed measuring 10 cm in diameter and 10 cm deep. The subsurface sediment at this site is sterile. Vegetation in the area is mainly composed of creosote and lyceum bushes. Some native grasses were also noted. Visibility is excellent at nearly 100 percent.

The site is situated in an area with desert pavement, making it extremely unlikely that the site has a subsurface component. Its potential for contributing to the prehistory or history of the area has been exhausted by this recording. It has little or no further research potential, and is recommended as not eligible for the NRHP/CRHR.

**Temporary Site No. S-8.** This site is a small rock cairn. It measures 33 inches by 22 inches and consists of 26 fist-sized to soccer-ball-sized rocks. The lowest level of rock is set into developing desert pavement. Age of the cairn is indeterminate.

No artifacts were found associated with the cairn. It has little or no further research potential, and is recommended as not eligible for the NRHP/CRHR.

**Temporary Site No. S-10.** This site is a large, widely dispersed lithic procurement site or quarry. Artifacts at this site include three flake tools, nine cores, and 150+ flakes. The majority of these items are a good quality, light-brown chert. A drainage runs through the site and several cobbles of the chert material were noted within the drainage. The site is adjacent to a well-maintained transmission line road that runs along the border between Nevada and California. The California side of this site is situated on a slope of less than two percent. The Nevada side of the site is on a slope of less than five percent. The area is developing to developed desert pavement. Two trowel probes were completed measuring 10 cm in diameter and 10 cm deep. The subsurface sediment at this site is sterile. Vegetation in the area is mainly composed of creosote and lyceum bushes. Some native grasses were also noted. Visibility is excellent at nearly 100 percent.

Despite its good preservation, the site lies on undisturbed desert pavement and has no deposition that might contain buried features. It has little or no further research potential, and is recommended as not eligible for the NRHP/CRHR.

**Temporary Site No. S-11.** This site is a small lithic scatter that is situated south of a large wash. The wash separates S-11 from S-10. A large and well-maintained dirt road is located adjacent to S-11. At least two flakes were noted in the road bed, and it appears likely that a good portion of the site has been affected by the road. The site has 13 flakes and two cores, which were identified in the undisturbed area south of the wash and road. Most of the artifacts identified at this site are chert. Vegetation in the area is mainly composed of creosote and lyceum bushes. Some native grasses were also noted. Visibility is excellent at nearly 100 percent.

Despite its good preservation, the site lies on undisturbed desert pavement and has no deposition that might contain buried features. It has little or no further research potential, and is recommended as not eligible for the NRHP/CRHR.

**Temporary Site No. S-20.** This site is a trash scatter that consists of one solder dot can, five sanitary cans, three soft-top cans, and three bottle bases. The solder dot can dates to the 1950s. The three soft-top cans and the maker's marks on the three bottle bases date to the late 1960s. The difference in dates could represent multiple dumping episodes, one from the historic era and one from the modern era. The site was found in a relatively undisturbed area with sparse creosote and alluvial sand. A dirt road is located adjacent to the site.

Although this historic refuse scatter is in fair condition and retains integrity of location, design, setting, materials, feeling, and association, the site does not possess any particular archaeological potential to yield significant information on local history. Additionally, this site is situated in an area with desert pavement and it is extremely unlikely that the site has a subsurface component. Thus, its potential for contributing to the prehistory or history of the area has been exhausted by this recording. It has little or no further research potential, and is recommended as not eligible for the NRHP/CRHR.

**Temporary Site No. S-23.** This site is a small lithic scatter that consists of nine secondary and tertiary flakes of a light-brown, medium-grained igneous material. This site is situated in a relatively level area with developing desert pavement. Vegetation in the area is mainly

composed of creosote and lyceum bushes. Some native grasses were also noted. Visibility is excellent at nearly 100 percent.

Despite its good preservation, the site lies on undisturbed desert pavement and has no deposition that might contain buried features. It has little or no further research potential, and is recommended as not eligible for the NRHP/CRHR.

**Temporary Site No. S-AF-1.** This site is a small, sparse lithic scatter measuring 13 meters in diameter. The site is located at the base of a low ridge between an access road and a transmission line. This lithic scatter consists primarily of decortications or primary flakes. All materials are chert, ranging from sandy-colored and fine-grained to coarse-grained, as well as some light-brown chert and one fragment of quartzite. The cortex on the flakes are white, and many of the flakes likely originated from the same core. Twenty-five flakes were located, ranging in size from 2 cm to 6 cm. The site is located in a deflationary environment with the formation of a desert pavement. No features or diagnostics were located. This site likely represents testing of cores or removal of cortex for further processing elsewhere.

This site is a small, simple lithic scatter located in an area of active deflation and formation of desert pavement. There are no diagnostic features or artifacts that would provide a temporal context for the occupation of the site. In fact, due to the high number of primary, decortications flakes, many of which appear to have come from the same core, this site may represent a simple testing of cores. There is no further research potential associated with this site and it is recommended as not eligible for the NRHP/CRHR.

**Temporary Site No. S-AF-2.** This site is a small lithic scatter containing 19 flakes in a 4-meter area. The site is located on the edge of a ridge east of an access road and a transmission line. This lithic scatter consists primarily of decortications or primary flakes with three secondary flakes. All materials are caramel-colored chert decortication flakes. The flakes likely originated from the same core. The site is located in a deflationary environment with the formation of a desert pavement. No features or diagnostics were located. This site likely represents testing of cores or removal of cortex for further processing elsewhere.

This site is a small simple lithic scatter located in an area of active deflation and formation of desert pavement. There are no diagnostic features or artifacts that would provide a temporal context for the occupation of the site. In fact, due to the high number of primary, decortications flakes, many of which appear to have come from the same core, this site may represent a simple testing of cores. There is no further research potential associated with this site and it is recommended as not eligible for the NRHP/CRHR.

**Isolated Finds.** The survey documented 49 new isolates. These isolated finds are listed in detail in Appendix 5.3B.

Isolates, by definition, lack immediate cultural context and therefore lack the data potential that would be required to be considered eligible for the NRHP or CRHR. None of the isolated finds represent unique archaeological resources and none are considered historical properties for the purpose of CEQA or Section 106.

#### **5.3.3.6.3 Native American Consultation**

A Sacred Lands File search and a Native American contacts list were requested from the NAHC on May 27, 2011. The NAHC responded on June 1, 2011, with a list of Native

Americans interested in consulting on development projects. Federal government-to-government consultation with Native Americans will be conducted by BLM.

The NAHC record search of the Sacred Lands file did not indicate the presence of Native American cultural resources within 1 mile of the HHSEGS site. The record search conducted at the CHRIS Eastern Information Center also did not indicate the presence of Native American traditional cultural properties. No other historical features or structures were found in the project area.

Letters to tribes and individuals listed on the NAHC contact list were mailed or faxed by CH2M HILL on June 7, 2011.

Copies of the contact letters are provided in Appendix 5.3A. Also, a detailed summary table of the results of consultations with the individual Native American organizations on the NAHC contact list is included in Appendix 5.3A.

The NAHC record search of the Sacred Lands file failed to indicate the presence of Native American cultural resources in the immediate project area. The record search conducted at the Information Center of CHRIS for CH2M HILL also do not indicate the presence of Native American traditional cultural properties.

### **5.3.4 Environmental Analysis**

This section describes the environmental effects of HHSEGS construction and operations. CH2M HILL conducted a complete survey of the project area.

CH2M HILL conducted archival research; contacted other interested agencies, Native American groups, and historical societies; and conducted a complete field investigation. These efforts yielded no historical resources or historic properties that have the potential to be affected by the HHSEGS project. No other significant prehistoric or historic archaeological remains, or any historically or architecturally significant buildings were identified to have potential for impact.

No impacts on historical resources or historic properties are expected to occur. Significant archaeological and historical sites were not found during the project field survey. While considered highly unlikely within the HHSEGS site boundary, subsurface construction could uncover buried archaeological remains. If unanticipated archaeological and/or historical resources are discovered during construction, potential impacts will be mitigated to a less-than-significant level with the implementation of the mitigation measures identified in Section 5.3.6.

### **5.3.5 Cumulative Effects**

A cumulative effect refers to a proposed project's incremental effect together with other closely related past, present, and reasonably foreseeable future projects whose impacts may compound or increase the incremental effect of the proposed project (Public Resources Code Section 21083; 14 CCR Sections 15064(h), 15065(c), 15130, and 15355). Cumulative projects are described in Section 5.6.7 and include the Pahrump Valley General Aviation Airport, St. Therese Mission (a commercial enterprise), and the Element Power Solar Project. Standard mitigation measures exist to reduce impacts to cultural resources to a less-than-significant level, and it is anticipated that impacts to cultural resources from the cumulative

projects, if any, would be mitigated to a less than significant level. The project is unlikely, therefore, to have impacts that would combine cumulatively with other closely related past, present, and reasonably foreseeable future projects.

### **5.3.6 Mitigation Measures**

Although significant archaeological and historical sites were not found during the project field survey, it is possible that subsurface construction could encounter buried archaeological remains. For this reason, the Applicant proposes to implement measures to mitigate any potential adverse impacts that could occur if there were an inadvertent discovery of buried cultural resources. These measures include: (1) designation of a cultural resources specialist (CRS) to be on-call to investigate any cultural resources finds made during construction; (2) implementation of a construction worker training program; (3) monitoring during initial clearing of the solar plant site and excavation at the solar plant site; (4) procedures for halting construction in the event that there is an inadvertent discovery of archaeological deposits or human remains; (5) procedures for evaluating an inadvertent archaeological discovery; and (6) procedures to mitigate adverse impacts on any inadvertent archaeological discovery determined significant.

#### **5.3.6.1 Designated Cultural Resources Specialist**

The Applicant will retain a designated CRS who will be available during the earth-disturbing portion of the HHSEGS construction period to inspect and evaluate any finds of buried archaeological resources that might occur during the various construction phases. If there is a discovery of archaeological remains during construction, the CRS, in conjunction with the construction superintendent and environmental compliance manager, will make certain that construction activity stops in the immediate vicinity of the find until the find can be evaluated. The CRS will inspect the find and evaluate its potential significance, in consultation with CEC staff and the CEC compliance project manager (CPM). The CRS will make a recommendation as to the significance of the find and any measures that would mitigate adverse impacts of construction on a significant find.

The CRS will meet the minimum qualifications for Principal Investigator on federal projects under the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation. The CRS will be qualified, in addition to site detection, to evaluate the significance of the deposits, consult with regulatory agencies, and plan site evaluation and mitigation activities.

#### **5.3.6.2 Construction Worker Sensitivity Training**

The Applicant will prepare a construction worker sensitivity training program to ensure implementation of procedures to follow in the event that cultural resources are discovered during construction. This training will be provided to each construction worker as part of their environmental, health, and safety training. The training will include photographs of various types of historic and prehistoric artifacts and will describe the specific steps that will be taken in the event of an unanticipated discovery of cultural material, including human remains. It will explain the importance of, and legal basis for, the protection of significant archaeological resources. The training will also be presented in the form of a written brochure.

### **5.3.6.3 Monitoring**

The Applicant will retain a qualified archaeologist to monitor excavations during the project's various construction phases. If archaeological material is observed by the monitoring archaeologist, ground-disturbing activity will be halted in the vicinity of the find so that its significance (CRHR eligibility) can be determined. If evaluated as significant, mitigation measures (avoidance or data recovery) will be developed in consultation with the CEC.

### **5.3.6.4 Emergency Discovery**

If the archaeological monitor, construction staff, or others identify archaeological resources during construction, they will immediately notify the CRS and the site superintendent, who will halt construction in the immediate vicinity of the find, if necessary. The archaeological monitor or CRS will use flagging tape, rope, or some other means, as necessary, to delineate the area of the find within which construction will halt. This area will include the excavation trench from which the archaeological finds came as well as any piles of dirt or rock spoil from that area. Construction will not take place within the delineated find area until the CRS, in consultation with the CEC staff and CEC CPM, can inspect and evaluate the find.

### **5.3.6.5 Site Recording and Evaluation**

The CRS will follow accepted professional standards in recording any find and will submit the standard Department of Parks and Recreation historic site form (Form DPR 523) and locational information to the Eastern Information Center of the CHRIS. The standard IMACS forms will be submitted to the Harry Reid Center and NVCRIS. If the CRS determines that the find is not significant, and the CEC CPM concurs, construction will proceed without further delay. If the CRS determines that further information is needed to determine whether the find is significant, the designated CRS will, in consultation with the CEC, prepare a plan and a timetable for evaluating the find.

### **5.3.6.6 Mitigation Planning**

If the CRS, CEC staff, and CPM determine that the find is significant, the CRS will prepare and carry out a mitigation plan in accordance with state guidelines. This plan will emphasize the avoidance, if possible, of significant archaeological resources. If avoidance is not possible, recovery of a sample of the deposit from which archaeologists can define scientific data to address archaeological research questions will be considered an effective mitigation measure for damage to, or destruction of, the deposit.

The mitigation program, if necessary, will be carried out as soon as possible to avoid construction delays. Construction will resume at the site as soon as the field data collection phase of any data recovery efforts is completed. The CRS will verify the completion of field data collection by letter to the project owner and the CPM so that the project owner and the CPM can authorize resuming construction.

### **5.3.6.7 Curation**

The CRS will arrange for curation of archaeological materials collected during an archaeological data recovery mitigation program. Curation will be at a qualified curation facility meeting the standards of the California Office of Historic Preservation. The CRS will

submit field notes, stratigraphic drawings, and other materials developed as part of the data recovery/mitigation program to the curation facility along with the archaeological collection, in accordance with the mitigation plan.

### 5.3.6.8 Report of Findings

If a data recovery program is planned and implemented during construction, as a mitigation measure, the CRS will prepare a detailed scientific report summarizing results of the excavations to recover data from an archaeological site. This report will describe the site soils and stratigraphy, describe and analyze artifacts and other materials recovered, and draw scientific conclusions regarding the results of the excavations. This report will be submitted to the curation facility with the collection.

### 5.3.6.9 Inadvertent Discovery of Human Burials

If human remains are found during construction, project officials are required by the California Health and Safety Code (Section 7050.5) to contact the county coroner. If the coroner determines that the find is Native American, he/she must contact the NAHC. The NAHC, as required by the Public Resources Code (Section 5097.98), determines and notifies the Most Likely Descendant with a request to inspect the burial and make recommendations for treatment or disposal.

## 5.3.7 Involved Agencies and Agency Contacts

Table 5.3-8 lists the agencies involved in cultural resources management for the project and a contact person at each agency. These agencies include the NAHC and, for federal lands, the Office of Historic Preservation, and BLM.

**TABLE 5.3-8**  
Agency Contacts for Cultural Resources

Issue	Agency	Contact
Native American traditional cultural properties	Native American Heritage Commission	Dave Singleton Associate Governmental Program Analyst (916) 653-6251 email: ds_nahc@pacbell.net
Federal agency NHPA Section 106 compliance	Office of Historic Preservation	Milford Wayne Donaldson State Historic Preservation Officer (916) 653-6624 email: mwdonaldson@parks.ca.gov
Federal agency NHPA Section 106 compliance	Bureau of Land Management Southern Nevada District Office	Kathleen Sprowl Archaeologist (702) 515-5055 email: kathleen_sprowl@blm.gov

## 5.3.8 Permits Required and Permit Schedule

In addition to certification by the CEC, performing archaeological survey on BLM land requires that such work be performed under a Cultural Resource Use Permit. Field Survey work for the project was completed under CH2M HILL's California BLM Cultural Use

Permit No. CA-07-17 and Nevada BLM Cultural Use Permit N-83761. A separate Fieldwork Authorization was not required from the BLM Barstow office, but was required from the BLM Southern Nevada Field Office to conduct the field survey.

If a previously undiscovered archaeological site is found during construction on federal land the newly discovered site would require NRHP eligibility evaluation. Also, consultation with the SHPO under Section 106 of the NHPA is required given the project's location on federal land, in order to consider whether the project would affect historic properties listed on, or meeting the criteria for listing in, the NRHP. Consultation with the SHPO and/or the state or local lead agency(s) is required if the project would affect historic properties listed on, or meeting the criteria for listing in, the NRHP or CRHR.

The following Section 106 compliance procedures apply to the project, as appropriate:

- If the federal agency finds no historic properties that the undertaking might affect, the agency informs the SHPO, documents the finding, and proceeds with the undertaking.
- If the agency finds historic properties and determines that the project would not affect them, then the agency informs the SHPO and documents the finding. The SHPO has 15 days in which to object to the finding, after which the agency may proceed with the undertaking.
- If the agency finds historic properties that the project would affect, the agency and SHPO consult to determine whether the effect would be adverse. If the agency and SHPO find that the effect would not be adverse, the agency informs the ACHP, documents the finding, and the ACHP has 30 days in which to object to the finding. If there is no objection, the agency proceeds with the undertaking.
- If the agency finds historic properties and determines that the project effects would be adverse, the agency and SHPO consult to determine how to mitigate these effects. This consultation culminates in a Memorandum of Agreement (MOA) between the agency, SHPO, and ACHP. The ACHP and SHPO are allotted 30 days in which to review and comment on a draft MOA. If the parties agree, the agency proceeds with the undertaking after signing and executing the MOA. If the agency does not agree to prepare an MOA, the ACHP must provide its comments on the undertaking within 60 days.

The Section 106 regulatory compliance process thus takes a minimum of 15 days if historic properties are found. This process can take from 60 to 90 days or more, depending on the complexity of the issues involved, the necessity of preparing a MOA, and other factors.

If Native American burials are discovered on federally owned land, the NAGPRA would require that the federal land management agency halt construction in the immediate vicinity of the find and contact a lineal descendant of the buried person or culturally affiliated organization. The regulations implementing NAGPRA (43 CFR 10) require that the federal agency notify the appropriate Native American persons or organizations within 3 days of the find. These regulations also require that construction activity in the immediate vicinity of the find stop for 30 days or until a written agreement is executed to adopt a recovery plan for the treatment or removal of the human remains.

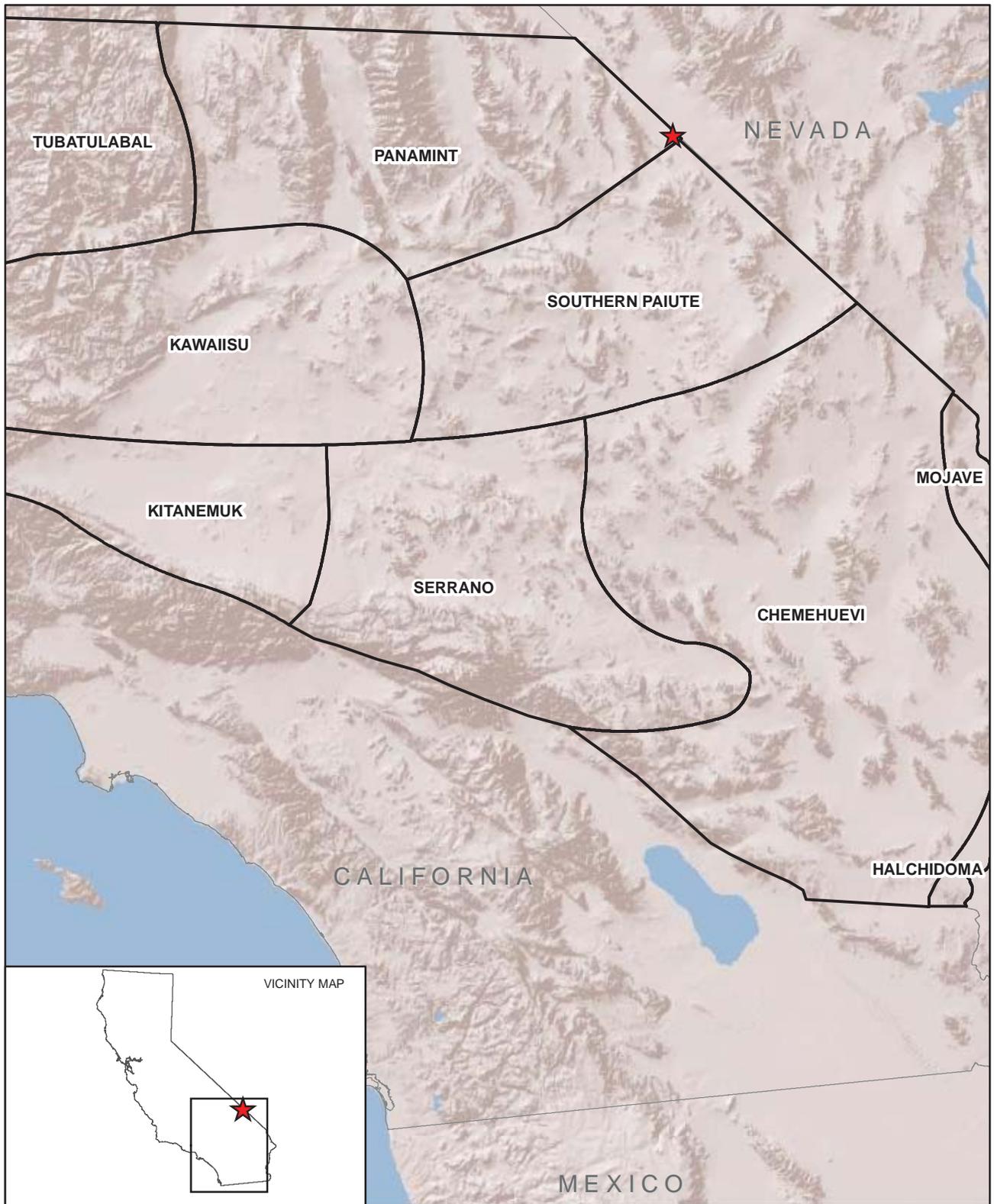
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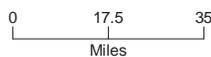


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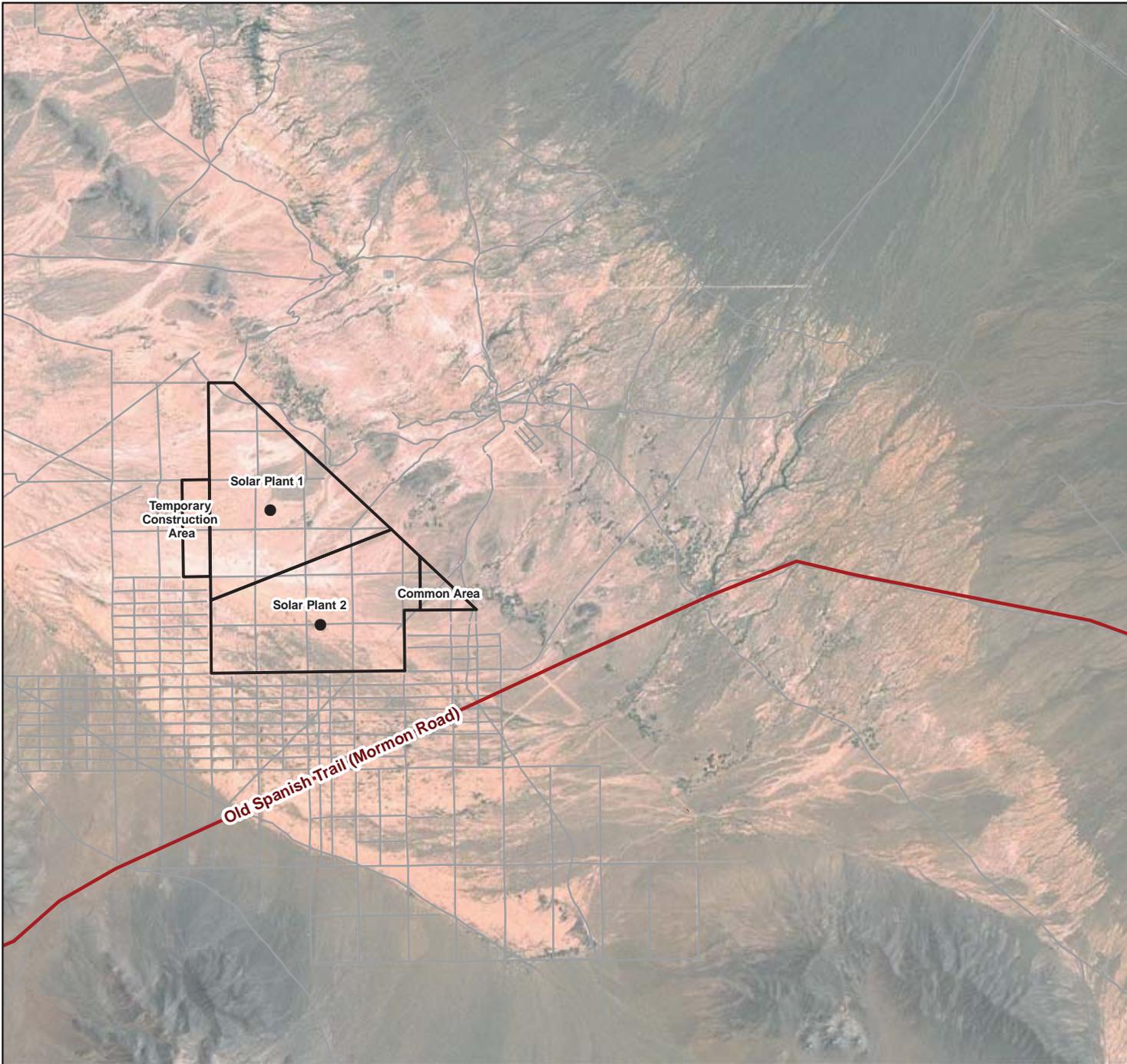
- ★ HHSEGS Location
- Ethnographic Groups

Source: Sutton et al. 2007

This map was compiled from various scale source data and maps and is intended for use as only an approximate representation of actual locations.



**FIGURE 5.3-1**  
**Ethnographic Distribution in the Study Area**  
*Hidden Hills Solar Electric Generating System*

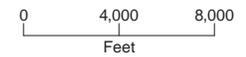


**LEGEND**

- Old Spanish Trail (Mormon Road)\*
- HHSEGS Boundary

**Notes:**

\* Data obtained from the National Historic Trails department of the National Park Service. Data accuracy is based on a scale of 1:100,000.



**Figure 5.3-2**  
**The Old Spanish Trail Near the**  
**Project Site**  
*Hidden Hills Solar Electric Generating System*